

# CHEMICAL ENGINEERING

November 2014

www.chemengonline.com

**CE Buyers' Guide 2015**  
In this Issue! Starts Page 65

## Maintenance of Critical Components: Burners and Bolts

page 40

**CPI Workforce Issues**

**Preparing for Disaster**

**Facts at Your Fingertips: Wire Cloths for Filtration**

**Bulk-Solids Heat Exchangers**

**Focus on Simulation and Modeling Software**

**Design of Experiments**

# Proven Process Solutions for You



CT.39e-6

- You get the best from our innovative range of technologies: distillation – evaporation – liquid-liquid extraction – crystallization – membrane separation – hybrid solutions – polymer production.
- Jointly we fully develop your process solution from first concept and pilot testing to an installed plant with guaranteed performance.

Whether you are active in the chemical, pharmaceutical, biofuels or food & beverage industry, we are here to support you.

Circle 34 on p. 180 or go to [adlinks.che.com/50982-34](http://adlinks.che.com/50982-34)

## SULZER

**Sulzer Chemtech Ltd**  
Process Technology  
4123 Allschwil, Switzerland  
Phone +41 61 486 3737  
[contactpt@sulzer.com](mailto:contactpt@sulzer.com)  
[www.sulzer.com](http://www.sulzer.com)

**Sulzer Chemtech USA, Inc.**  
Tulsa, OK 74131, USA  
Phone +1 918 446 6672

**Sulzer Chemtech Pte. Ltd.**  
Singapore 629845  
Phone +65 6515 5500

## COVER STORY

- 40 Cover Story Part 1 Burner Inspection and Maintenance**  
Burners and their components can be quite complex — establishing maintenance and inspection best practices encourages longterm operational reliability
- 46 Cover Story Part 2 Critical Connections Demand Certainty**  
Understanding bolts' behavior during routine tightening procedures helps to ensure leak-free, reliable operations



## NEWS

- 11 Chementator** Profitable potential for trash-to-liquids process; Refinery combines upgrading with EOR and CCS; Making biodiesel and biopropane from vegetable oil; A waterless hydraulic-fracturing technique gets field-tested; Partnership targets bio-based building blocks from CO<sub>2</sub>; Cut O<sub>2</sub>-production costs in half with this PSA technology; and more
- 17 Newsfront CPI Workforce Issues: Filling the Gaps** Construction and retirement continue to create high demand for CPI workers — as well as knowledge gaps, which are being addressed on a number of fronts
- 22 Newsfront Don't Let Your Disaster Plan Collect Dust** New software and technologies turn dated disaster plans into active, realtime safety systems



## ENGINEERING

- 36 Facts at Your Fingertips Wire Cloths for Filtration**  
This one-page reference outlines the major types of wire mesh for industrial filtration and their key parameters
- 38 Technology Profile D,L-Methionine Production via the Carbonate Process** This one-page profile outlines the production of D,L-methionine, a key additive to animal feed
- 50 Feature Report Design of Experiments (DoE): Optimizing Products and Processes Efficiently** Learn how DoE can help save time and money in process design and optimization with this primer

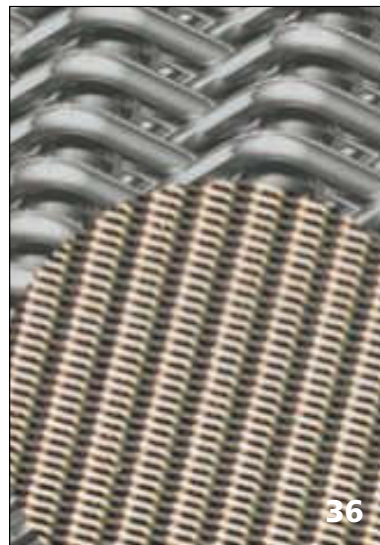


- 58 Solids Processing Bulk Solids: Designing and Operating Direct-Contact Heat Exchangers** Such units provide advantages over heated or water-cooled screws, fluidized beds and rotating drums for heating and cooling bulk solids

## EQUIPMENT & SERVICES

---

- 28 Focus on Simulation and Modeling Software** Track energy consumption with this new software; Model-based support for process design; A unique tool to improve the energy efficiency of processes; Fast, easy and flexible dynamic simulation for lifecycle results; Update improves ability to plan for explosive incidents; and more
- 32 New Products** These washers evenly distribute bolt tension, reducing relaxation; A dual-shaft mixer that ensures thorough turnover; Improved flange options among the updates to this pump series; Achieve efficient drying and filtration in pilot-plant operations; Use these single-float level transmitters in very small tanks; and more



## COMMENTARY

---

- 5 Editor's Page Winning achievements in green chemistry**  
The U.S. Environmental Protection Agency has announced the 2014 Presidential Green Chemistry Challenge Award winners. These innovative technologies reduce hazards to human health and the environment

## DEPARTMENTS

---

- 7** Letters  
**8** Bookshelf  
**180** Reader Service  
**182** Who's Who  
**183** Economic Indicators

## ADVERTISERS

---

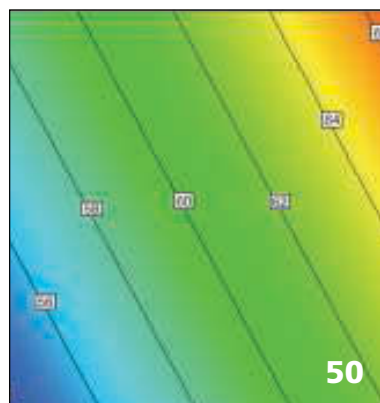
- 65** 2015 CE Buyers' Guide  
**178** Product Showcase/Classified  
**181** Advertiser Index

## COMING IN DECEMBER

---

Look for: **Feature Reports** on Energy Management; and Cost Estimation; A **Focus** on Analyzers; A **Facts at Your Fingertips** column on Distillation; **News** articles on Electrochemistry; and Industrial Enzymes; and more

Cover: Rob Hudgins



### ONLY ON CHEMENGONLINE.COM

Look for more on CPI workforce issues; as well as Web-exclusive articles; "Test your Knowledge" quizzes; New Products; Latest News; and more

# TRANSFER **HEAT,** NOT BLAME.

In your line of work, you can't afford downtime. You have to know that everything is doing its job so you can actually do yours. That's why, at Eastman, we have you covered with a wide range of dependable Therminol heat transfer fluids for some of the world's most technical applications. And with our Total Lifecycle Care<sup>®</sup> Program, you can count on dedicated support throughout the system's lifecycle. To learn more, go to [Therminol.com](http://Therminol.com) or call 1-800-426-2463 in North America. In Europe, call 32.2.746.5134.

**THERMINOL.**  
Heat Transfer Fluids by Eastman





Another I/O change? Great.  
So another wiring schedule.  
Another marshalling design.  
And another cabinet...  
Just make it all go away!

# YOU CAN DO THAT



**DELTA V**

**Electronic marshalling eliminates the rework, the redesign and the headaches.**

With DeltaV Electronic Marshalling, Emerson lets you make I/O changes where and when you need them without costly engineering and schedule delays. Our new DeltaV CHARacterization Module (CHARM) completely eliminates the cross-wiring from the marshalling panel to the I/O card—regardless of signal type—so you're no longer held to predefined specifications. All those wires, gone. All that time and engineering, gone. See how easy it can be by scanning the code below or by visiting [IOonDemandCalculator.com](http://IOonDemandCalculator.com)



The Emerson logo is a trademark and a service mark of Emerson Electric Co. © 2012 Emerson Electric Co.



**EMERSON**  
Process Management

**EMERSON. CONSIDER IT SOLVED.™**

Winner of Eight Jesse H. Neal Awards for Editorial Excellence



# CHEMICAL ENGINEERING

Published since 1902  
An Access Intelligence Publication

## PUBLISHER

**MICHAEL GROSSMAN**  
Vice President and Group Publisher  
mgrossman@accessintel.com

## EDITORS

**DOROTHY LOZOWSKI**  
Editor in Chief  
dlozowski@chemengonline.com

**GERALD ONDREY** (Frankfurt)  
Senior Editor  
gondrey@chemengonline.com

**SCOTT JENKINS**  
Senior Editor  
sjenkins@chemengonline.com

**MARY PAGE BAILEY**  
Assistant Editor  
m Bailey@chemengonline.com

## AUDIENCE DEVELOPMENT

**SARAH GARWOOD**  
Audience Marketing Director  
sgarwood@accessintel.com

**GEORGE SEVERINE**  
Fulfillment Manager  
gseverine@accessintel.com

**JEN FELLING**  
List Sales, Statistics (203) 778-8700  
j.felling@statistics.com

## EDITORIAL ADVISORY BOARD

**JOHN CARSON**  
Jenike & Johanson, Inc.

**DAVID DICKEY**  
MixTech, Inc.

**MUKESH DOBLE**  
IIT Madras, India

## HEADQUARTERS

88 Pine Street, 5th Floor, New York, NY 10005, U.S.  
Tel: 212-621-4900 Fax: 212-621-4694

## EUROPEAN EDITORIAL OFFICES

Zeilweg 44, D-60439 Frankfurt am Main, Germany  
Tel: 49-69-9573-8296 Fax: 49-69-5700-2484

## CIRCULATION REQUESTS:

Tel: 847-564-9290 Fax: 847-564-9453  
Fulfillment Manager; P.O. Box 3588,  
Northbrook, IL 60065-3588 email: chemeng@omeda.com

## ADVERTISING REQUESTS: see p. 72

For reprints, licensing and permissions: Wright's Media, 1-877-652-5295, sales@wrightsmedia.com

## ACCESS INTELLIGENCE, LLC

**DON PAZOUR**  
Chief Executive Officer

**HEATHER FARLEY**  
Chief Operating Officer,  
Business Information Group

**ED PINEDO**  
Executive Vice President  
& Chief Financial Officer

**MACY L. FECTO**  
Exec. Vice President,  
Human Resources & Administration

**JENNIFER SCHWARTZ**  
Senior Vice President & Group Publisher  
Aerospace, Energy, Healthcare

## ART & DESIGN

**ROB HUDGINS**  
Graphic Designer  
rhdgins@accessintel.com

## PRODUCTION

**JOHN BLAYLOCK-COOKE**  
Ad Production Manager  
jcooke@accessintel.com

## INFORMATION SERVICES

**CHARLES SANDS**  
Director of Digital Development  
csands@accessintel.com

## CONTRIBUTING EDITORS

**SUZANNE A. SHELLEY**  
sshelley@chemengonline.com

**CHARLES BUTCHER** (U.K.)  
cbutcher@chemengonline.com

**PAUL S. GRAD** (Australia)  
pgrad@chemengonline.com

**TETSUO SATOH** (Japan)  
tsatoh@chemengonline.com

**JOY LEPREE** (New Jersey)  
jlepre@chemengonline.com

**GERALD PARKINSON**  
(California)  
gparkinson@chemengonline.com

**HENRY KISTER**  
Fluor Corp.

**GERHARD KREYSA** (retired)  
DEHEMA e.V.

**RAM RAMACHANDRAN**  
(Retired) The Linde Group

Access Intelligence

4 Choke Cherry Road, Second Floor  
Rockville, MD 20850 • www.accessintel.com



## Editor's Page

# Winning achievements in 'green chemistry'

For the past 19 years, the U.S. Environmental Protection Agency (EPA; Washington, D.C.; www.epa.gov) has been honoring innovative technologies that reduce hazards to humans and the environment. These achievements are of great interest since developing safer and environmentally sustainable processes is an important goal for the chemical process industries (CPI).

Chemical technologies that are nominated for the Presidential Green Chemistry Challenge Awards are judged on three selection criteria: 1) the technology must be innovative and of scientific merit; 2) the technology must offer human health or environmental benefits; and 3) the technology should have a significant impact — either by being broadly applicable to the CPI, or by having a strong impact in a narrowly defined area.

The winners of the 2014 Presidential Green Chemistry Challenge Awards, in each of five categories, are described here (Source: EPA): **Designing Greener Chemicals Award** — The Solberg Company (Green Bay, Wis.; www.solbergfoam.com) replaced fluorinated surfactants in its firefighting foam concentrate with a blend of non-fluorinated surfactants and sugars. The new foams eliminate the significant health and environmental concerns associated with the fluorinated surfactants, which are considered to be persistent, bioaccumulative and toxic (PBT). The new foam concentrates have achieved full regulatory compliance with fire-protection standards and are considered to be as good as, or even superior to the fluorinated materials.

**Greener Reaction Conditions Award** — QD Vision Inc. (Lexington, Mass.; www.qdvision.com) received this award for developing high-quality quantum dots that are used for energy-efficient display and lighting products, and for manufacturing them using a "greener" process. The synthesis is estimated to use about 40,000 gal/yr less solvent and replaces organo-cadmium and organo-zinc building blocks with less hazardous precursors.

**Greener Synthetic Pathways Award** — Solazyme Inc. (San Francisco, Calif.; www.solazyme.com) was honored with this award for its work in producing novel oils derived from microalgae. The manufacturing process is expected to have a lower environmental impact than currently produced oils based on petroleum or plant products. Solazyme has demonstrated that its oils and lubricants reduce volatile organic compound (VOC) emissions compared to using regular vegetable oils, and the oils are being tested and sold for a variety of applications including food, fuel and industrial products.\*

**Academic Award** — Shannon Stahl, professor at the University of Wisconsin (Madison; www.wisc.edu) was recognized for his work in developing safe, aerobic oxidation methods for use in pharmaceutical synthesis.

**Small Business Award** — Amyris (Emeryville, Calif.; www.amyris.com) won this award for engineering yeast to make farnesene — a hydrocarbon building block that can be used to make a renewable replacement for petroleum diesel fuel.\*

Dorothy Lozowski, Editor in Chief

\* For more on these topics, see several Latest News items on www.chemengonline.com, including Solazyme: Commercial production of renewable algal oils at Iowa facilities, January 31, 2014; First shipment of bio-based farnesene is made, February 1, 2013; and Amyris and Total form joint venture for fuels, December 5, 2013



# CHEMICAL ENGINEERING

Chemical Engineering is getting an online facelift. The first part of our makeover is a dynamic new URL –  
**[www.chemengonline.com](http://www.chemengonline.com)**

Save us in your favorites today.  
And remember, [www.che.com](http://www.che.com) is NOW  
**[www.chemengonline.com](http://www.chemengonline.com)**



## Facts at Your Fingertips: Forces Acting on a Gasket

This letter is in reference to the article, Forces Acting on a Gasket [*Chem. Eng.* October, 2014, p. 32a]. I need to clear my understanding on the seating stress required for the proper sealing.

As per the article, seating stress for the proper sealing is indicated [see Equation (4) in the article]. This formula provides the total/maximum bolt loads on the gasket, which can be applied for the selected bolt size and the material. This total bolt load may or may not be suitable to provide minimum required force/load for gasket seating and operating conditions.

Different codes and standards provide guidelines to calculate minimum-required bolt load for the proper sealing of the gasket joint. This minimum required force depends on gasket properties (gasket seating stress and factor) based on which, selection is made for the number and the size of the bolts. Material shall be obviously based on intended service.

I think that [Equation (4)] is not properly presented in the article and should be corrected.

There are many references available in different international codes and industry standards. One of the worldwide used reference is ASME Sec VIII Div 1 (ASME Boiler and Pressure Vessel Code). Please refer to mandatory Appendix 2 (Rules for bolted flange connections with ring type gaskets), Sections 2-5 for the calculation of the bolt loads. Required bolt loads for the proper sealing are to be checked for the following two conditions:

1. Gasket Seating Condition: This is the minimum required initial bolt load for the proper seating at atmospheric temperature and pressure and is a function of gasket properties and the effective gasket or contact area to be seated.
2. Operating Conditions: This is the minimum load required to resist the hydrostatic end force (for design conditions) on the area bounded by the diameter of the gasket reaction in addition to maintain sufficient compressive load on the gasket for the proper sealing. This is a function of design pressure, gasket properties and the effective gasket area to be kept tight under the pressure.

**Sanjeev Shukla, Sr. Engineer-Mechanical**  
Engineering & Technology Department  
PTT Exploration and Production Public Co. Ltd.  
Bangkok, Thailand

**Editor's note:** We appreciate the comments and added information. The above are excerpts of two letters received on this topic. For the full text, and to take part in the discussion, search the article title, Forces Acting on a Gasket, on our website at [www.chemengonline.com](http://www.chemengonline.com)

Visit us!  
Emballage, Paris-Nord, France  
November 17 - 20, 2014  
Hall 5a, stand L104

**SOME THINK  
A 90%  
DECREASE  
IN ENERGY  
USE WILL  
COMPROMISE  
THROUGHPUT.  
WE THINK  
DIFFERENT.**

At BEUMER we have a reputation for making things a little different. Take the stretch-film pallet packaging system, BEUMER stretch hood®. In a sector where energy-intensive shrink hooding is still common, BEUMER stretch hood® uses a non-thermal stretch-film system. The result: better load stability, higher throughput, up to 10 times less film consumption and 90% energy savings. All this makes a big difference to productivity - and to the environment.

For more information, visit [www.beumergroup.com](http://www.beumergroup.com)  
Circle 6 on p. 180 or go to [adlinks.che.com/50982-06](http://adlinks.che.com/50982-06)



**BEUMER**  
BEUMERGROUP

**MADE  
DIFFERENT**

Frankfurt am Main · 15 – 19 June 2015

# ACHEMA 2015

- World Forum and Leading Show for the Process Industries
- 3,800 Exhibitors from 50 Countries
- 170,000 Attendees from 100 Countries

Be informed.  
Be inspired.  
Be there.

[www.achema.de](http://www.achema.de)

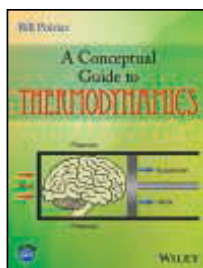
Circle 11 on p. 180 or go to [adlinks.che.com/50982-11](http://adlinks.che.com/50982-11)

## Bookshelf



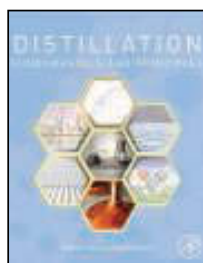
### **Creating and Leading a High-Performance Chemical Plant.**

By Bob Gilbert. Tate Publishing & Enterprises LLC, 127 East Trade Center Terrace, Mustang, OK, 73064. Web: [tatepublishing.com](http://tatepublishing.com). 2014. 56 pages. \$7.99.



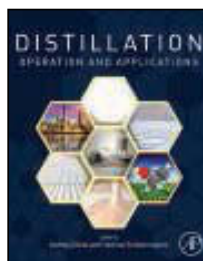
### **A Conceptual Guide to Thermodynamics.**

By Bill Poirier. John Wiley & Sons Co. 111 River Street, Hoboken, NJ 07030. Web: [wiley.com](http://wiley.com). 2014. 184 pages. \$50.00.



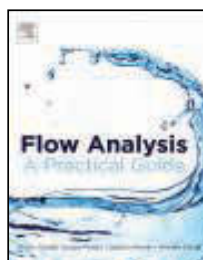
### **Distillation: Fundamentals and Principles.**

By Andrzej Gorak and Eva Sorensen. Academic Press, Elsevier Inc., 225 Wyman Street, Waltham, MA 02144. Web: [elsevier.com](http://elsevier.com). 2014. 450 pages. \$195.00.



### **Distillation: Equipment and Processes.**

By Andrzej Gorak and Zarko Olujic. Academic Press, Elsevier Inc., 225 Wyman Street, Waltham, MA 02144. Web: [elsevier.com](http://elsevier.com). 2014. 420 pages. \$195.00.



### **Distillation: Operation and Applications.**

By Andrezej Gorak and Harmat Schoenmakers. Academic Press, Elsevier Inc., 225 Wyman Street, Waltham, MA 02144. Web: [elsevier.com](http://elsevier.com). 2014. 450 pages. \$195.00.

### **Advances in Reactor Measurement and Control.**

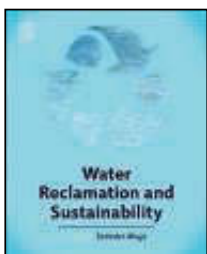
By Gregory McMillan. International Society of Automation (ISA), 67 T.W. Alexander Drive, Research Triangle Park, NC 27709. Web: [isa.org](http://isa.org). 2015. 311 pages \$79.00.

### **Flow Analysis: A Practical Guide.**

By Victor Cerda, Laura Ferrer, Jessica Avivar and Amalia Cerda. Academic Press, Elsevier Inc. 225 Wyman Street, Waltham, MA 02144. Web: [elsevier.com](http://elsevier.com). 2014. 288 pages. \$250.00.



**Dimensional Analysis: Practical Guides for Chemical Engineering.** By Jonathan Worstell. Institution of Chemical Engineers (IChemE), Butterworth-Heinemann, Elsevier Inc. 225 Wyman Street, Waltham, MA 02144. Web: elsevier.com. 2014. 169 pages. \$39.95.



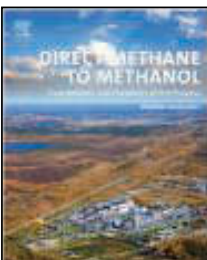
**Thermodynamics with Chemical Engineering Applications.** By Elias Franses. Cambridge University Press, 32 Avenue of the Americas, New York, NY 10013. Web: cambridge.org. 2014. 466 pages. \$110.00.

**Water Reclamation and Sustainability.** By Satinder Ahuja. Elsevier Inc. 225 Wyman Street, Waltham, MA 02144. Web: elsevier.com. 2014. 184 pages. \$230.00.



**Managing Industrial Controls.** By N.E. Battikha. International Society of Automation (ISA), 67 T.W. Alexander Drive, Research Triangle Park, NC 27709. Web: isa.org. 2014. 448 pages \$109.00.

**Heterogeneous Catalytic Materials: Solid State Chemistry, Surface Chemistry and Catalytic Behaviour.** By Guido Busca. Academic Press, Elsevier Inc. 225 Wyman Street, Waltham, MA 02144. Web: elsevier.com. 2014. 478 pages. \$175.00.



**Direct Methane to Methanol: Foundations and Prospects of the Process.** By Vladimir Arutyunov. Elsevier Inc. 225 Wyman Street, Waltham, MA 02144. Web: elsevier.com. 2014. 320 pages. \$199.95.

**Supercritical Fluid Technology for Energy and Environmental Applications.** By Vladimir Anikeev and Maohong Fan. Elsevier Inc. 225 Wyman Street, Waltham, MA 02144. Web: elsevier.com. 2014. 284 pages. \$200.00.



**The Role of Colloidal Systems in Environmental Protection.** Edited by Monzer Fanun. Elsevier Inc. 225 Wyman Street, Waltham, MA 02144. Web: elsevier.com. 2014. 720 pages. \$229.95. ■

*Scott Jenkins*

## Excellence Down to the Smallest Detail

### Innovative separation technology



Safe, compact and efficient: Whether gas-tight or made of hastelloy C 276, our decanters reliably prevent against explosion and corrosion respectively. You need, we care.

### GEA Westfalia Separator Group GmbH

Werner-Habig-Straße 1, 59302 Oelde, Germany  
Phone: +49 2522 77-0, Fax: +49 2522 77-2828  
ws.info@gea.com, www.gea.com

Circle 17 on p. 180 or go to [adlinks.che.com/50982-17](http://adlinks.che.com/50982-17)

GEA Mechanical Equipment  
engineering for a better world



# “From 1 to 300 HP. From New York to New Delhi...”

With our plants in India, China and the United States, Ross is now the world's #1 manufacturer of High Speed Dispersers. For a multitude of applications from coatings to chemicals and adhesives, no one can deliver the production capacity you need as fast as we can. Anywhere in the world.

Lokendra Singh, Director  
Ross Process Equipment Pvt. Ltd.  
Pune, Maharashtra, India



Whether you need 50 High Speed Dispersers at once – as in the order shown here – or just one, every unit is backed by Ross, the world leader in mixing and blending.

**The incomparable Ross  
High Speed Disperser.**

See the Ross High Speed Disperser  
now at [dispersers.com](http://dispersers.com).  
Or call 1-800-243-ROSS



**Scan to learn more.**  
Free Tag Reader: <http://gettag.mobi>

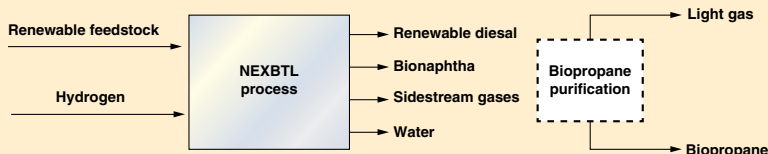


## Making renewable diesel and biopropane from vegetable oil

Before the end of 2016, Neste Oil Oyj's (Espoo, Finland; [www.nesteoil.com](http://www.nesteoil.com)) refinery in Rotterdam, the Netherlands will start producing 30,000–40,000 ton/yr of biopropane. The feedstock is a sidestream from the company's 800,000-ton/yr renewable diesel-fuel plant. The refinery, which started up in 2011, makes renewable diesel fuel from vegetable oils and residue fats using Neste Oil's NEXBTL (next generation biomass-to-liquid) process.

Up to now, the propane side product has been sold as fuel to a power station. The €60-million addition to the refinery will utilize a new separation process — developed together with Neste Jacobs Oy (Porvoo, Finland; [www.nestejacobs.com](http://www.nestejacobs.com)) — to recover and purify the biopropane, thereby adding a new renewable product to Neste Oil's product portfolio. Neste Jacobs was selected (in September) as the EPCM (engineering, procurement and construction management) contractor for the project. Neste Jacobs has also done the basic engineering for the project.

In the proprietary NEXBTL process (flowsheet), renewable feedstock (veg-



etable oils and residue fats) are hydrotreated into renewable diesel fuel. Unlike alternative renewable diesel processes, NEXBTL does not generate glycerin as a byproduct. Instead, the glycerol chain of the triglycerides is catalytically hydrogenated into propane, and the fatty acid components hydrodeoxygenated, decarbonylated or decarboxylated into the corresponding alkanes (renewable diesel fuel). The process takes place in bed reactors packed with proprietary catalysts.

The NEXBTL process was first commercialized in 2007, with the startup of a 190,000 ton/yr renewable diesel plant in Porvoo, Finland. A twin unit was added in Porvoo in 2009, followed by a 800,000-ton/yr renewable diesel refinery in Singapore (2010) and another 800,000 ton/yr renewable diesel refinery in Rotterdam (2011).

### 'Clean power' demo

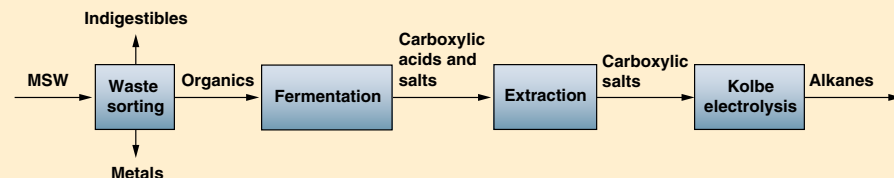
Last month, NET Power, LLC (Durham, N.C.; [www.net-power.com](http://www.net-power.com)) announced the completion of major project agreements for its first-of-a-kind power plant — a 50-MW<sub>th</sub> demonstration plant that will validate the world's first natural-gas power generation system that produces no air emissions, and includes full CO<sub>2</sub> capture without requiring expensive, efficiency-reducing carbon-capture equipment.

The \$140 million project is funded by a combination of cash and in-kind contributions from Exelon Corp. (Chicago, Ill.) and CB&I (The Woodlands, Tex.; [www.cbi.com](http://www.cbi.com)).

Toshiba Corp. (Tokyo, Japan; [www.toshiba.co.jp](http://www.toshiba.co.jp)), following several years of development and testing, has begun manufacturing a novel supercritical-CO<sub>2</sub> turbine for the project. Operations, maintenance and development arrangements have been completed with Exelon. Contracts for plant engineering, procurement and construction are in place with CB&I. The inventor of the technology, 8 Rivers Capital, LLC (Durham, N.C.; [www.8riverscapital.com](http://www.8riverscapital.com)), will provide continued technology development services and the intellectual property for the project. The plant will be built at a site in Texas, with commissioning expected to begin in 2016, and be completed in 2017. Design and development is also progressing on the first 295-MW<sub>e</sub> commercial-scale NET Power plant.

NET Power's system uses a  
(Continues on p. 12)

## Profitable potential for trash-to-liquids process



A group at Texas A&M University (College Station, Tex.; [www.tamu.edu](http://www.tamu.edu)) is developing a process that converts organic municipal solid waste (MSW) into straight-chain alkanes, a primary component in gasoline. The four-step process (diagram) begins with a proven industrial waste-sorting method (using vibration, magnetism and air currents) that isolates the organic, digestible portion (typically food scraps, paper, wood and yard waste) of the MSW. Next, a countercurrent fermentation step employs naturally occurring microbes to digest the organic portion of the MSW, converting it into various carboxylic acids, ranging from

two to eight carbons in length. The fermentation process occurs in-situ, in plastic- or concrete-lined holes in the ground. Therefore, any type of organic material can be processed, and sterile conditions are not required. The acidic fermentation broth is then transferred to a continuous membrane-extraction process. Medium-chain carboxylic acids are selectively extracted and recovered in an alkaline environment, resulting in a solution that is rich in carboxylate salts. Finally, the carboxylate salts undergo Kolbe electrolysis, which combines two organic acids to form an alkane. The alkanes are separated for  
(Continues on p. 12)

## PROFITABLE POTENTIAL

*(Continued from p. 11)*

sale, and the remaining aqueous solution is recycled back to the extraction unit.

The group has conducted extensive feasibility analyses to determine the profitability of combining these four steps to produce alkanes. Although the process is highly location-dependent, the group's work has determined that the process can indeed return on its investment and can be profitable under the correct conditions. Future work and funding is

still required, though, to demonstrate the steps running continuously in series, and also to further examine the mass-transfer behavior during the membrane-extraction step. Additionally, to optimize results, the group plans to investigate other conversion methods besides the Kolbe process. It has established a partnership with Earth Energy Renewables (Bryan, Tex.; [www.ee-renewables.com](http://www.ee-renewables.com)) for the advancement and commercialization of this process.

## A new carrier for MBBR technology

Last month, Veolia Water Technologies (Birmingham, England; [www.veoliawaterst.co.uk](http://www.veoliawaterst.co.uk)) introduced a new generation of biofilm carriers for moving-bed biofilm reactors (MBBRs). Trade-named AnoxKaldness Z-MBBR, the new carrier is the result of two decades of development work, says the company.

Unlike conventional MBBR carriers, Z-MBBR has a unique, three-dimensional contoured structure (photo) that allows the creation of a self-controlled, pre-determined biofilm thickness on the carrier. This gives a controlled redox gradient and maximizes mass transfer, says the company. The Z carriers are customized to give biofilm thicknesses from 200  $\mu\text{m}$  (for fully aerobic processes, such as nitrifi-



fication) to 500  $\mu\text{m}$  (for applications like the company's ammonox denitrification system [AntiMox], which require aerobic, anoxic and anaerobic conditions).

The first full-scale plant using Z-MBBR is currently under construction, and will be operational by the end of this year.

## Refinery project combines upgrading with EOR and CCS

Construction has begun on a unique refinery project that will convert Canadian bitumen into ultralow-sulfur diesel while producing high-purity  $\text{CO}_2$  for enhanced oil recovery (EOR) and subsequent carbon capture and sequestration (CCS).

The project, located near Edmonton, Alta. and run by the North West Redwater Partnership (Calgary, Alta., Canada; [www.nwrpartnership.com](http://www.nwrpartnership.com)), combines a set of proven technologies in a novel way to refine bitumen, a low-value heavy crude oil from oil sands, with a small environmental impact.

The refining operation will involve conventional upgrading techniques, such as atmospheric and vacuum distillation, to produce material for hydrotreating and

hydrocracking. The project also includes a hydrogen production unit that features Lurgi gasification technology from Air Liquide Global E&C Solutions (Frankfurt am Main, Germany; [www.engineering.solutions.airliquide.com](http://www.engineering.solutions.airliquide.com)). The Lurgi Multipurpose Gasification process generates synthesis gas from the refining residue, which is used in the hydrotreating and hydrocracking units, where low-sulfur diesel fuel is produced. The carbon monoxide in the syngas is converted for carbon dioxide and used for EOR. The refinery will also have a Claus unit for sulfur recovery.

"Alberta has an abundance of underexploited petroleum reservoirs that can be re-activated using EOR, but in the

*(Continues on p. 14)*

novel supercritical  $\text{CO}_2$  power cycle known as the Allam cycle, which uses  $\text{CO}_2$  as a working fluid to drive a combustion turbine and ultimately produces pipeline-quality  $\text{CO}_2$  that can be sequestered or used in various industrial processes, including enhanced oil recovery (EOR).

## Large-scale CCS

Last month, the first commercial-scale, post-combustion carbon capture and storage (CCS) plant started up in Saskatchewan, Canada. The SaskPower facility at the Boundary Dam Power Station is expected to capture around 1 million m.t./yr of  $\text{CO}_2$ , which is up to 90% of  $\text{CO}_2$  emissions from one train of the power plant. It is said to be the world's first commercial-scale post-combustion CCS at a coal-fired power plant in the world.

The facility uses technology of Shell Consolv (Montreal, Canada; [www.shell.com/shellconsolv](http://www.shell.com/shellconsolv)) to capture  $\text{CO}_2$  and  $\text{SO}_2$  from the power plant's fluegas emissions, and marks the company's largest carbon-capture project to date (for more, see,  $\text{CO}_2$  Gets Grounded, *Chem. Eng.*, April 2014, pp. 21–23). Most of the captured  $\text{CO}_2$  will be used in EOR projects. Some  $\text{CO}_2$  will also be injected into a deep saline formation as part of the Aquistore Project. In both cases, the  $\text{CO}_2$  will be permanently stored underground so that it does not enter the atmosphere. The captured  $\text{SO}_2$  will be used as feedstock for an  $\text{H}_2\text{SO}_4$  plant.

## Making nanoparticles

Scientists from the Materials Science and Technology Div. of the U.S. Naval Research Laboratory (Washington, D.C.; [www.nrl.navy.mil](http://www.nrl.navy.mil)) have developed a one-step process to form oxide nanoparticles. The technique is capable of producing large quantities (10 g) of oxide nanoparticles — said to be four orders of magnitude higher yield than other methods, which normally involve metal concentrations in range of millimoles to prevent aggregation.

The NRL method uses

*(Continues on p. 14)*



Simply reliable:  
Process safety from Endress+Hauser.



## Eliminate the risk of storage tank overflow

Do you need to revamp your safety instrumented system? Do you want to comply to the latest safety guidelines and standards such as **API2350 Edition 4** and **IEC 61511/61508**? Eliminate your risk of storage tank overflow without compromising availability and efficiency.

Together with our partners, such as Rockwell Automation, we can provide a complete solution for field-proven, standardized overflow prevention systems which include:

- **“Safety by design”** - systems with built-in mechanical integrity
- **State-of-the-art vibronic fork technology with failsafe design** - a second line of defense and active warning system with detailed information
- **Simple and remote built-in proof testing function** helps reduce downtime and prevents staff from working in hazardous areas
- **SIL3 - 1oo1** using point level tuning fork with up to 12 year proof test interval

[www.us.endress.com/overflow-prevention-news](http://www.us.endress.com/overflow-prevention-news)



Endress+Hauser, Inc  
2350 Endress Place  
Greenwood, IN 46143  
info@us.endress.com  
www.us.endress.com

Sales: 888-ENDRESS  
Service: 800-642-8737  
Fax: 317-535-8498

Endress+Hauser 

People for Process Automation

Circle 13 on p. 180 or go to [adlinks.che.com/50982-13](http://adlinks.che.com/50982-13)

## REFINERY PROJECT

*(Continued from p. 11)*

past, there has not been a good way to obtain the required quantities of CO<sub>2</sub>,” explains Ian MacGregor, chairman of North West Upgrading, a partner in the project. “This refinery will supply high-purity CO<sub>2</sub> for EOR of wells in close proximity to the project.”

As the CO<sub>2</sub> displaces previously unattainable petroleum, it is stored underground, making the process effectively a CCS solution. When completed in 2016, Phase 1 of the refinery will process 50,000 barrels per day (bbl/d) of bitumen into 40,000 bbl of diesel and will generate 5,000 ton/d of CO<sub>2</sub> for EOR/CCS.

*(Continued from p. 12)*

potassium superoxide (KO<sub>2</sub>), which, when simply added to an aqueous salt solution, causes a rapid, exothermic reaction with the salts to form insoluble oxide or hydroxide nanoparticles. Such materials have been shown to be crucial components in many applications, including electronic and magnetic devices, energy storage and generation, and medical applications.

## A waterless hydraulic-fracturing technique gets field-tested

A method for using liquid CO<sub>2</sub>, rather than water, as a hydraulic fracturing fluid has been field-tested in a mid-continent oil well, and has benefited well productivity, according to developer Praxair Inc. (Danbury, Conn.; [www.praxair.com](http://www.praxair.com)). Aside from enhanced well performance, the technology is designed to relieve pressure on freshwater supplies in drought-affected areas.

The patent-pending DryFrac waterless hydraulic fracturing technology depends on a proprietary process for blending proppant (specialized sand) with pressurized CO<sub>2</sub> that is capable of controlling sand concentration before it is pumped into wells at pressures of between 4,000 and 8,000 psi.

CO<sub>2</sub> is said to be superior to water as a fracking fluid because it reduces damage to

clays, and eliminates blocking of fractures that occurs with water-based fluids, allowing more gas and oil to flow out of fractures in the formation. “For these reasons, fracking with CO<sub>2</sub> is ideal for water-sensitive or pressure-depleted wells, and those in areas where water resources are constrained,” says Mark Weise, business development director for oil and gas services at Praxair. In addition, the CO<sub>2</sub> does not carry the same flammability risk as hydrocarbon dry-fracking fluids, such as propane.

A portion of the CO<sub>2</sub> remains below-ground after the fracturing, says Weise, making the technology a partial carbon sequestration method.

Following the first hydraulic fracturing job mentioned, Praxair is now offering DryFrac widely, and has other projects lined up for the near future, Weise notes.

## Graphene surprise

Researchers from Monash University (Melbourne, Australia; [www.monash.edu.au](http://www.monash.edu.au)) have discovered that graphene-oxide sheets can change their structure and become liquid droplets spontaneously. Because graphene droplets change their structure in response to an applied magnetic field, they could be used for controlled drug release, says lead researcher, Mainak Majumder.

Usually special equipment, such as an atomizer, is needed to change graphene into a spherical form. The Monash University researchers simply placed the graphene sheets in a solution to process them for industrial use. They made the surprise discovery during routine tests that under certain pH conditions, while in solution, the graphene changes shape by itself. The observation was made using a polarized light microscope at the Marine Biological Laboratory (near Cape Cod, Mass.). The researchers have been working with industry partner Strategic Energy Resources Ltd. (Melbourne, Australia) and Rudolf Oldenbourg from the Marine Biological Laboratory, to explore the possibility of commercializing their work.

Majumder says drug-delivery systems often use magnetic particles, but the particles cannot always be used because they can be toxic under certain physiological conditions. The researchers now want to verify whether graphene-based assemblies can

## Partnership targets bio-based building blocks from CO<sub>2</sub>

AkzoNobel N.V. ([www.akzonobel.com](http://www.akzonobel.com)) has partnered with Dutch start-up company Photanol (both Amsterdam, the Netherlands; [www.photanol.com](http://www.photanol.com)) to manufacture specialty chemicals using a photosynthesis-like process that combines sugar production with fermentation in a single organism.

Photanol has developed genetically engineered cyanobacteria that are capable of consuming carbon dioxide and sunlight to make sugars via photosynthesis, and also converting the sugar into specific chemicals. “The beauty of these organisms is that they are efficient photosynthesizers, they are very amenable to genetic engineering and they excrete the fermentation products, which eliminates the need to harvest product by lysing the cells,” says Michiel Lensink, CEO of Photanol.

The cyanobacteria are housed in closed-loop bioreactors that can be used on non-arable land and in areas with scarce water supplies, Photanol says, because

only minimal quantities of water are required. Several possible CO<sub>2</sub> sources are being considered.

“In developing the engineered organisms, we have worked hard to de-couple the growth of the organism from the production of the fermentation product,” says Lensink, so that the microbes can continue making product for longer periods rather than using the energy inputs for growth.

Within the partnership, AkzoNobel is targeting production of acetic acid and butanol, among other chemicals, and is developing downstream separations and processing technology for converting the acetic acid and butanol to specialty products. The acetic acid will be converted into a set of monochloric acids that can be used in a variety of applications, says Marco Waas, AkzoNobel director of R&D and technology for industrial chemicals, while the butanol will be used to make industrial solvents.



## Slash energy costs with this new electrowinning anode

The research group of Masatsugu Morimitsu at Doshisha University (Kyoto, Japan; [www.doshisha.ac.jp](http://www.doshisha.ac.jp)) has developed an “evolutionary” electro-winning process for the production of rare and base metals that promises to reduce both the power consumption and environmental burden. The process features a hybrid anode, called MSA (Morimitsu Smart Anode), which is composed of nanoparticle oxides dispersed in an oxide matrix. The MSA enhances the catalytic activity up to ten times while reducing the electrowinning voltage by 700 mV, which corresponds to energy savings of up to 36%, compared to traditional lead-alloy anodes. The generation of metal sludge is also said to be suppressed.

The MSA features a bifunctional electrocatalyst composed of nanoparticles of metal oxides uniformly

dispersed in an amorphous matrix. The catalyst is very active for the evolution of oxygen or chlorine gas, while suppressing side reactions caused by thermal decomposition.

Doshisha University has licensed the technology to Republic Alternative Technologies (Strongsville, Ohio), which was acquired by Outotec USA, Inc. (Denver, Colo.; [www.outotec.com](http://www.outotec.com)) last April. Full-scale production of electrowinning electrodes is now underway. The first commercial application of the new anode is the Cobre del Mayo Copper SXEW plant, located south of Hermosillo, Sonora province in Mexico, which produces 30,000 ton/yr of copper. Since then, electrowinning companies in twelve countries are moving forward to install this anode technology, says the university.

change spontaneously when exposed to toxic substances, potentially providing a new method for disease detection.

## Ultrasound enzyme hydrolysis

Aiming to understand the nature of the synergistic effect of ultrasound and enzymes in the production of fermentable sugars from lignocellulosic biomass, researchers from the Institute of Chemical Technology (Mumbai, India; [www.ictmumbai.edu.in](http://www.ictmumbai.edu.in)) have studied the ultrasound-assisted enzymatic hydrolysis of waste newspaper. Waste newspaper has a high cellulosic content, making it a potential feedstock for bioethanol production.

The researchers found that the sugar yield from enzymatic hydrolysis was increased by a factor of 2.4 with sonication (60 W power), producing 27.6 g/L of sugar (substrate load of 3 wt.%) after 6.5 h. In contrast, conventional enzymatic hydrolysis (without ultrasound) produced 11.6 g/L after 72 h. According to the researchers, the



[www.burkert.com](http://www.burkert.com)



## Insider Tip!

Did you know...? The Bürkert Type 330 is more than just a solenoid valve: it's many in one. Featuring a body made of plastic, brass, aluminium or stainless steel and with various ports and sealants, it adapts to perfectly fit every requirement. Which means its unique and versatile valve technology is suitable for use in nearly all industries. Full encapsulation, the IP65 rating and an explosion-proof enclosure make the 330 fit for rough environments and critical media. Its long service life ensures it won't be a thing of the past tomorrow. So spread the word!

**We make ideas flow.**

## Cut O<sub>2</sub>-production costs in half with this PSA technology

A high-temperature pressure-swing-absorption (HT-PSA) process that reduces energy consumption by up to 50% compared to conventional PSA technology is being developed by Tokyo Gas Co. (Tokyo, Japan; [www.tokyo-gas.co.jp](http://www.tokyo-gas.co.jp)), with support from the New Energy and Industrial Technology Development Organization (NEDO). The HT-PSA process uses a perovskite-type oxide absorbent. Oxygen is separated from pressurized air by absorption, and then recovered by desorption under vacuum and a temperature of 600°C.

From 2011–2013, the company has operated a pilot plant with O<sub>2</sub>-production capacity of 5 Nm<sup>3</sup>/h. The results of the testing showed that the newly developed perovskite-type oxide absorbent can be used continuously for nine months (about 160,000 cycles of O<sub>2</sub> adsorption and

desorption) at temperatures above 600°C. Heat recoveries of more than 95% were achieved through a combination of heat-storage materials and other procedures. The company estimates that the technology can be scaled up to capacities of more than 1,000 Nm<sup>3</sup>/h of O<sub>2</sub>, with production costs of 0.2 kWh/Nm<sup>3</sup> — about half the energy needed by conventional PSA technology.

Under a three-year program started this year, Tokyo Gas and NEDO aim to develop a 500-Nm<sup>3</sup>/h demonstration unit that has a power consumption of less than 0.25 kWh/Nm<sup>3</sup>. A 100-Nm<sup>3</sup>/h prototype — scheduled to start up in 2015 — will also be used to further develop lower-cost absorbent materials and optimize heat recovery methods. By 2017, the partners aim to operate a commercial production unit, with a capacity of 10,000 Nm<sup>3</sup>/h of O<sub>2</sub>. ■

ultrasound increases the contact between enzyme and substrate, resulting in an increased reaction rate and a faster product release rate. The cavitation energy improves mass transfer and diffusion of the substrate toward the enzyme and the product release into the solution.

### High-strength steel checkup

Researchers from the Fraunhofer Institute for Nondestructive Testing (IZFP; Saarbrücken, Germany; [www.izfp.fraunhofer.de](http://www.izfp.fraunhofer.de)) have developed the so-called Magnus hybrid — an inspection system that combines micromagnetic and ultrasound techniques to characterize materials. The micromagnetic method helps determine hardness, tensile strength and internal stress, whereas the ultrasound testing provides information about the texture of the material. The device is especially useful for examining high-strength steels used in lightweight construction materials. □



## Predictive solid-liquid, vapor-solid, and vapor-liquid-solid equilibrium calculations.

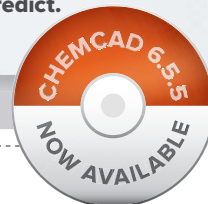
### Good thinking.

Feedback from our users is what inspires us to keep making CHEMCAD better. Many features, like this one, were added to the software as a direct response to user need. That's why we consider every CHEMCAD user part of our development team.



Get the whole story behind this user-inspired feature and learn more about how CHEMCAD advances engineering at [chemstations.com/predict](http://chemstations.com/predict).

← Neil Gray, CHEMCAD Developer



# CPI WORKFORCE: FILLING THE GAPS

**Construction and retirement continue to create high demand for CPI workers, as knowledge gaps persist. They are being addressed on a number of fronts**

An increasingly tight labor market for engineers in the chemical process industries (CPI) is pushing salaries for engineers higher, while a strengthening wave of retirements is driving efforts in several communities to address the gaps in experience and education.

Data from several sources, including a survey by *Chemical Engineering*, indicate that average salaries for engineers in the CPI continued to climb in 2014 (see sidebar, right). In the *CE* survey, the average salary for all respondents was \$109,300, up from \$104,000 last year, and for U.S. respondents, the average was \$126,700, up from \$123,000 last year. Information about the survey takers can be found in Figures 1–4.

“Skilled people with a breadth of knowledge and a global perspective are very difficult to find,” comments Joe Vaszily, vice president for global engineering contractors with Emerson Process Management (Chanhassan, Minn.; [www.emersonprocess.com](http://www.emersonprocess.com)). The sentiment is echoed by human-resource search firms working in the CPI space, who say that the demand for skilled workers in the CPI has never been greater, especially in areas of high activity, such as the U.S. Gulf Coast.

“The market for engineers and other technical skilled labor in the chemical industry continues to be tight and will remain so for the next decade, especially in North America, where there will be significant investment in downstream assets to capitalize on low-cost feedstocks from shale gas,” says Alex Martin, senior client partner and global sec-

## CPI-RELATED SALARY DATA

Data from various sources seem to suggest significant increases in compensation for chemical engineers and other engineering disciplines found in the CPI, and education in chemical engineering predicts high lifetime earnings compared to other fields of study. For example, a survey of close to 2,500 members of the U.K.-based IChemE produced a median salary of \$113,000 for chartered engineers. The level is nearly 6% higher than in 2012 and 12% higher than in 2010, says IChemE’s Libby Steele. Starting salaries for chemical engineers were also higher, she said, with the average starting salary 5.3% higher in 2014 than in 2012. Steele pointed out that the increase in median salary for female engineers outstripped that of their male counterparts (10.3% versus 7.1%) over the past two years. However, median salaries for women are around 28% less than men (\$69,600 versus \$97,200) over the course of their careers. The earning potential of women declines significantly between the ages of 30 to 40 years with median salaries of female engineers typically nearly 25% lower than men of a similar age.

The *Wall Street Journal* recently published median mid-career, annual earnings for a range of job fields, and chemical engineering was ranked fourth, with a mid-career median salary of \$116,700. Petroleum engineering topped the list at \$176,300 with nuclear engineering (\$118,000) third after actuarial mathematics. Recent research from the Hamilton Project ([www.hamiltonproject.org](http://www.hamiltonproject.org)), reported by the *Washington Post*, found that chemical engineering as a college major led to the highest median lifetime earnings compared to about 90 other fields of university study.

In October of this year, *Chemical Engineering* magazine repeated an informal survey of its readers and social media followers. More than 1,600 people responded, and the average salary for all respondents was \$109,300, up from \$104,000 last year. With a 57.7% share, the majority of survey takers were from the U.S. Among U.S. responders, the average annual salary was \$126,700, up from \$123,000 last year.

In this year’s survey, respondents were asked to compare their expected earnings in 2014 to last year. Almost 57% said they anticipated earning more in 2014 than last year, while 37% expected about the same salary and 6% expected a lower annual salary. The 2014 *CE* salary survey also asked about current work status. Close to 94% of respondents were employed full time, while 3% reported part-time work, 1.8% said they were retired, and 1.2% said they were unemployed. □

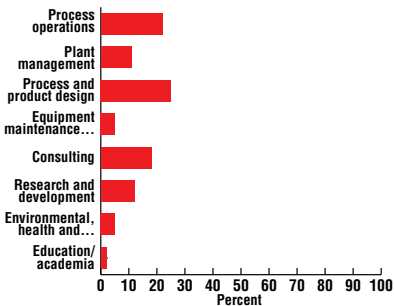
tor leader for chemical and process manufacturing with talent consulting firm KornFerry International (Los Angeles; [www.kornferry.com](http://www.kornferry.com)).

Patrick Ropella, CEO of the CPI-focused recruiting firm Ropella Group (Milton, Fla.; [www.ropella.com](http://www.ropella.com)) says “We’re expanding services [in CPI-related areas] because the demand has risen so much. In 30 years, I’ve never seen anything like it.”

## Building boom

Much of the demand growth for chemical engineers and engineers in related fields has to do with aggressive construction in various areas, as well as a more general trend toward larger and more complex facilities projects. “Project activity is intensifying in many areas around the globe,” says Emerson’s Vaszily, “and there is a shortage of skilled

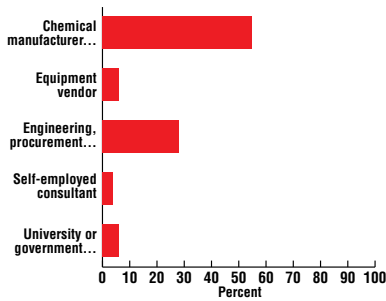
## Newsfront



**FIGURE 1.** Among respondents to the CE salary survey, process and product design was the most common job function

engineers in most regions.” At the same time, the size and complexity of projects growing as well, he adds.

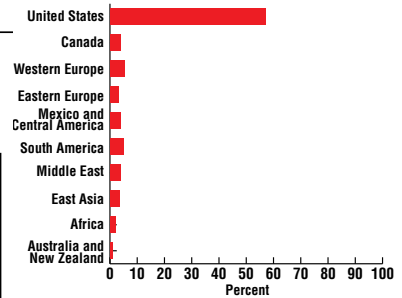
In the U.K., for example, 12 nuclear power plants are scheduled to be constructed by 2020, which is greatly increasing the demand for nuclear engineers, explains Libby Steele, head of educational affairs and continuing professional development at the Institution for Chemical Engineers



**FIGURE 2.** The majority of respondents are employed by chemical manufacturers

(IChemE; Rugby, U.K.; [www.icheme.org](http://www.icheme.org)). Meanwhile, a chemical facility that will be among the world’s largest when it becomes operational in 2015 is being constructed in Jubail Industrial City, Saudi Arabia by Sadara (Dharhan, Saudi Arabia; [www.sadara.com](http://www.sadara.com)), a joint venture between Saudi Aramco and Dow Chemical.

But over the past two years, the availability of inexpensive natural gas from shale formations has



**FIGURE 3.** Almost 60% of survey takers in the CE salary survey hail from the U.S.

driven a wide range of chemical facility projects. As of September 2014, 208 chemical industry projects have been started or announced in the U.S., mostly in the Gulf Coast region, according to the American Chemistry Council (ACC; Washington, D.C.; [www.americanchemistry.com](http://www.americanchemistry.com)), representing a cumulative investment of \$127.5 billion. “The current [expansion of chemical plants] is the biggest explosion of work I’ve seen since the 1970s in this area,” says Jim Richardson, division chair of technical studies at Lee College (Baytown, Tex.; [www.lee.edu](http://www.lee.edu)). “The demand for workers is huge.”



# BLASTS HAPPEN

## GET PROVEN PROTECTION.



**LEASE FLEET**



**SAFETY SUITE**



AS THE INDUSTRY’S LEADING MANUFACTURER OF SUCCESSFULLY TESTED BLAST-RESISTANT BUILDINGS, RedGuard is the name you can count on when lives are on the line. Whether you’re looking for a little extra space for your next turnaround or a permanent addition to your existing site, we provide proven protection for your peace of mind.

LEARN MORE ABOUT WHAT MAKES REDGUARD THE SAFE CHOICE IN BLAST RESISTANCE.

855.REDGUARD | [redguard.com](http://redguard.com)

Circle 2 on p. 180 or go to [adlinks.che.com/50982-02](http://adlinks.che.com/50982-02)

## Newsfront

The building boom has led to project backlogs for engineering, procurement and construction (EPC) firms, as well as shortages of workers in the skilled trades. Two-year schools such as Lee have become instrumental in addressing the shortage and in raising awareness among students of the opportunities available in the chemical industry (see sidebar on community colleges, p. 21).

### Experience gap

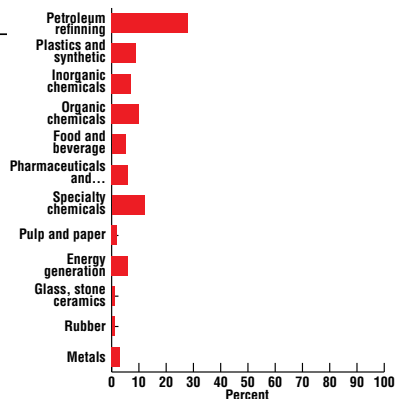
Coupled with the intense project activity in the CPI is the ongoing wave of retirements of engineers of the "Baby Boom" generation. The retirements are putting pressure on companies to run facilities and processes with a lower overall level of experience and to find ways to capture the knowledge and operational nuances of plants, processes and equipment built over time by the most experienced workers.

"It seems like the experience gap

created by retirees, along with the outflow of institutional knowledge that goes with them has not eased up, and in fact may be getting gradually worse," says Tom O'Banion, director of industry differentiation at Emerson Process Management.

The challenge of the "demographic time bomb" also exists in the U.K. and Europe, remarks Libby Steele of IChemE. "The loss of expertise and knowledge is significant." She points out that 33% of the current chemical engineering workforce is over 55 years of age, so the issue of retirements will continue to loom large in the CPI. However, Steele says that the situation with chemical engineers is not as severe as in some other engineering disciplines.

Although a definitive set of best practices for knowledge transfer has yet to solidify, a number of strategies have emerged as being effective for minimizing the knowledge loss with retirement. While transfer-



**FIGURE 4.** A wide range of industry sectors are represented in the survey takers

ring knowledge of procedures can be somewhat straightforward, capturing the less tangible "tacit knowledge" — those impressions that are obtained only as a result of years of experience — is much more difficult. Tacit knowledge includes on-the-job experiences, stories of particular occurrences, impressions of equipment, and creative solutions, among others. To help capture less tangible knowledge, many companies are increasingly using job shadowing and

**BROOKFIELD**

# New Look, New Feel, New Features!

## DV1™ Viscometer

*Our lowest-cost, continuous sensing digital viscometer!*

Easy-to-read, customizable display

Three hot keys for quick access to spindle selection, test speed and other functions

Multiple language choices included

*Optional Wingather SQ Software allows the user to collect, analyze and record test data.*

TEL 800-628-8139 or 508-946-6200 [www.belusa.com](http://www.belusa.com)

**Circle 7 on p. 180 or go to [adlinks.che.com/50982-07](http://adlinks.che.com/50982-07)**

**PREMIUM  
EXPLOSION  
PROTECTION**

Indoor / Outdoor Venting  
With Flame Absorber  
and Dust Retainer

**BULK FLOW  
CONTROL**

...for Powder,  
Granulate,  
Grain, Flour  
and Dust

**WE DO IT BETTER**

**contact us** ...for Europe

REMBE® GMBH SAFETY + CONTROL  
59929 Birlow/Germany  
T +49 (0) 29 61 - 74 05 - 0  
F +49 (0) 29 61 - 5 07 14  
info@rembe.de

...for North America

REMBE®, INC.  
Charlotte, NC 28217  
T +1 704.716.7022  
F +1 704.716.7025  
info@rembe.us

All rights reserved © REMBE - QROBCL2-4C-RSCRN

Circle 31 on p. 180 or go to [adlinks.che.com/50982-31](http://adlinks.che.com/50982-31)

mentoring programs, as well as delaying retirements and hiring recent retirees as temporary contractors.

In other cases, companies are relying more on equipment vendors and strategic suppliers to fill experience gaps with information and education in specific topic areas. For example, Emerson's Vaszily explains that his company forecasted a shortage of engineering capacity for EPC firms and began offering "Technology Roadshows," — live-demonstrations and workshops on topics chosen by the EPC company for helping to fill experience gaps and provide learning. "We've reached over 20,000 customers with the events," Vaszily says. "We've held them all over the world, and the program has been very well received, especially for younger engineers who want to be more familiar with technology in an application-specific manner."

KornFerry's Martin says the most progressive companies develop tal-

ent strategies that are mapped to their business strategy and that incorporate plans for talent acquisition, development and retention. "We believe this will be a source of significant competitive advantage for [those companies] in the future, as having the right talent in place becomes the ultimate enabler for strategy execution," he says.

### Filling the pipeline

Training and workforce education approaches also play a role in another, longer-term issue for the CPI — attracting young people to pursue careers in CPI sectors and becoming the workforce of the future.

"Many companies used to have more extensive training programs that were very attractive to candidates, but over time they died out," says Emerson's O'Banion. "Now the companies need to bring them back to compete for and retain the labor."

In this area, IChemE offers a

service to accredit the training programs of companies who employ chemical engineers. Steele says that companies have been enthusiastic about the service because job candidates are very concerned about the training they will receive once they begin work. "Accreditation is a great talent recruitment and retention tool," she says, adding, "There's been an increasing use of the program."

Before they can become job candidates, individuals must become attracted into the engineering field, however, and that has been a significant challenge in itself. Ensuring a sufficient number of college graduates in the science, technology, engineering and mathematics (STEM) fields has been a global concern, and will continue to be an area of focus for chemical companies, says KornFerry's Martin.

Ultimately convincing students to pursue a career in the CPI may hinge on a continuing marketing ef-



# T r a n s f e r r i n g t o s u b s t a

### Müller Containment Valve MCV

- Suitable for EEB 3/5 (OE)
- Available sizes: DN 100, DN 200 and DN 250
- Explosion pressure shock up to +10 bar
- Vacuum-tight version
- Explosion-proof to ATEX
- Easy-to-wipe flat surface
- AISI 316L stainless steel available on request
- GMP-compliant design



Müller GmbH - 79618 Rheinfelden (Germany)  
Industrieweg 5 - Phone: +49 (0) 76 23/969-0 - Fax: +49 (0) 76 23/969-69  
A company of the Müller group  
info@mueller-gmbh.com - www.mueller-gmbh.com

Circle 23 on p. 180 or go to [adlinks.che.com/50982-23](http://adlinks.che.com/50982-23)

**Call the Experts**  
for all your solids processing.

**Applications:**  
APIs · Ag-Chemicals  
Artificial Sweeteners  
Biologics · Catalysts  
Ceramics · Chemicals  
Cosmetics · Food Ingredients  
Herbicides · Minerals  
Nutraceuticals · Pesticides  
Pharmaceuticals · Pigments  
Polymers · Powdered Metals  
Proteins · Resins · Vitamins

**Vacuum Drying**  
Rota-Cone and V-Dryers

**Solids Mixing**  
Rota-Cone and V-Blenders  
Ribbon & Paddle Mixers  
Fluidizing Dual Shaft Mixers  
Sigma Mixers & Extruders

**Size Reduction**  
Ball & Ceramic Lined Mills  
Jars & Jar Rolling Mills

Manufacturing Quality Process Systems Since 1911

**PAULO.ABBE**

[www.pauloabbe.com](http://www.pauloabbe.com) 800-524-2188 sales@pauloabbe.com

Circle 3 on p. 180 or go to [adlinks.che.com/50982-03](http://adlinks.che.com/50982-03)

## COMMUNITY COLLEGE TO THE CPI

Local two-year colleges that grant associate's degrees have become an instrumental part of the effort to address the shortage of skilled trade workers in the growing petrochemical industry of the U.S. Gulf Coast and elsewhere.

"Our 2014 enrollment is up an average of 25% from last year in most of the skilled trade programs," says Debi Jordan, executive director of the Lee College Center for Workforce and Community Development, "and our biggest issue has become finding qualified faculty to teach the classes." The college has hands-on learning programs in process technology, safety, electrical instrumentation, analytical instrumentation, welding, pipefitting, millwright, drafting and design, and fieldbus certification.

Lee College is the lead institution in a nine-school Gulf Coast Consortium group that has taken a regional approach to educating the workforce needed for the petrochemical industry along the Gulf Coast. As part of a longstanding relationship with its neighbor ExxonMobil, which has one of its largest complexes in Baytown, Tex., Lee College has received two grants of \$500,000 from the company to invest in educational programs for the skilled trades.

"We have a \$1-million pilot plant to help train workers, and we have strong relationships with many companies who have donated equipment and funds to purchase equipment," explains Lee's Jim Richardson.

The diverse opportunities in the petrochemical industry for skilled trade positions are so good that the college has seen a sizable number of students that already hold bachelor's degrees are returning to the community college for certificate programs in the skilled trades or an associates degree.

Community colleges also help students understand what a career in the chemical industry is like. "Most people are aware that there are opportunities, but we still need to educate students on what the jobs entail," Jordan says "so we've made videos that provide a view into a day in the life of a worker in several of the positions."

"There's an increased enthusiasm on the part of industry for partnering with community colleges — companies want to do more to work collaboratively, Jordan says, because they increasingly view them as partners in solving the workforce crunch. □

fort for the industry as a whole. "The industry faces a general challenge in that it is not viewed as attractive compared to other sectors such as consumer goods, technology, health-care or professional services," says KornFerry's Martin, "especially for women and minorities."

"We need to work to change the general perception of working in

the chemical industry," adds Emerson's O'Banion. "Marketing the petrochemicals industry, for example, as an intriguing, stable, high-technology industry, rather than a dirty, dangerous and old industry," would go far in attracting the talent necessary for the future, O'Banion comments. ■

Scott Jenkins

**CORZAN HP**  
INDUSTRIAL SYSTEMS

Introducing Corzan® HP, creating piping systems with better

**CORROSION RESISTANCE**  
**AND HIGH-TEMPERATURE PERFORMANCE**  
for transmission of **CHEMICAL FLUIDS**,  
*all made with LUBRIZOL TECHNOLOGY*  
**TO GIVE YOU MORE INSIDE™**



Follow us  
on Twitter  
@LZ\_CPVC

Corzan HP is a high-pressure, high-temperature, high-impact-strength piping system engineered with Lubrizol's specially formulated chlorinated polyvinyl chloride (CPVC) compounds that meet the ASTM D1784 certification for 24448 cell class. **It's the first pipe that meets ASTM F441 material classification 4120-06, with a pressure rating 25% higher than standard CPVC at 180°F (82°C).**

Choose Corzan HP for Chemical Processing, Semiconductor & Electronics, Water Treatment, Industrial Manufacturing, Mining and Power Generation applications.

See how the details on the inside make all the difference on the outside. Call a piping systems consultant at **1.216.447.7397** or visit [corzancpvc.com](http://corzancpvc.com) to learn more.

**Lubrizol**

© 2014 The Lubrizol Corporation, all rights reserved. All marks are the property of The Lubrizol Corporation. The Lubrizol Corporation is a Berkshire Hathaway company. GC 140681

Circle 21 on p. 180 or go to [adlinks.che.com/50982-21](http://adlinks.che.com/50982-21)

# DON'T LET YOUR DISASTER PLAN COLLECT DUST

**New software and technologies turn dated disaster plans into active, realtime safety systems**

According to the Federal Emergency Management Agency (FEMA; Washington, D.C.) there were 95 Federal disaster declarations in the year 2013 in the U.S. The state-by-state disaster statistics show even higher numbers of events, emergencies and disasters in 2013 for many states in the U.S.

For the same year, there were at least four major explosions at chemical plants, including the West Fertilizer explosion and fire in West, Tex., which killed 15; the Williams Olefins plant explosion and fire in Geismar, La., which killed two; the CF Industries fire and explosion in Donaldsonville, La., which killed one; and the Danlin Chemical Plant fire and explosion in Thomas, Okla., in which no one was injured, but the facility was destroyed.

Obviously, when serious disaster strikes at a chemical processing facility, the aftermath can be tremendous, not only for the employees, emergency responders and the financial health of the company, but also for the communities surrounding the facility. According to the U.S. Environmental Protection Agency (EPA; Washington, D.C.), about 480 chemical facilities in the U.S. each could put about 100,000 or more people at risk both in the plant and in the surrounding communities if the chemicals produced or stored



**FIGURE 1.** Providers of automation and safety systems suggest looking at “layers of protection” to ensure the highest level of safety

Source: Emerson Process Management

were to be released during an accident or by terrorists.

For this reason, it is of the utmost importance that chemical processors have emergency response plans in place. The good news is that most of them do. The bad news is that in some facilities, the plans are created, placed in a series of binders and set on a shelf. The experts will tell you that preparing for disaster is not something that is done once and then left to collect dust. Rather, it is an active and ongoing process in which both plans and safety technologies are updated on a regular basis. Fortunately, as automation systems and software are improving, becoming more advanced and increasingly more user friendly, these technologies can help chemical processors transfer those dated plans into realtime, active safety systems and software packages that can help the plant and its personnel react much faster to prevent disaster or manage an emergency, should one occur.

## Layers of protection

Automation solution providers work diligently to provide safety systems with the primary function of preventing incidents that may cause damage, pollution or injury. For example, safety instrumented systems (SIS) are designed to detect an out-of-control process and take automatic action to ensure that the process and the plant are returned to a safe state.

“To prevent disaster, we design safety in layers, each one of these layers is designed to perform independently, providing its own safety function, so when we talk safety and disaster prevention, we talk about ‘layers of protection,’” notes Pete Skipp, engineering manager of applied technology with Rockwell Automation (Milwaukee, Wisc.; [www.rockwellautomation.com](http://www.rockwellautomation.com)).

A common industry illustration shows the layers of protection (Figure 1). The lowest two layers show the areas of prevention provided by the control system and operator in-





**YOUR SINGLE SOURCE  
FOR SERVICE:**

- + Bolting/Torquing
- + Concrete Repair
- + Emissions Control
- + Exchanger Services
- + Field Machining
- + Fitness for Service
- + Heat Treating
- + Hot Tap/Line Stop
- + Isolation Test Plugs
- + Leak Repair
- + Manufacturing/Engineering
- + Mechanical Integrity
- + NDE/NDT Inspection
- + Specialty Welding
- + Turnkey Tank Program
- + Valve Insertion
- + Valve Repair

# KEEP IT ONLINE.

Downtime. A word often associated with high cost and low production. Team has been helping companies minimize downtime for over 40 years with our global online inspection, mechanical, and heat treating services. We're here to help you repair, maintain, and ensure the integrity of your equipment to keep your facility up and operational.

Team experts are available 24 hours a day, 7 days a week, 365 days a year.

**Call TEAM today: 1-800-662-8326**

**[www.teamindustrialservices.com](http://www.teamindustrialservices.com)**

**TEAM**<sup>®</sup> Industrial Services

Minimizing Downtime. Maximizing Performance.

**INDUSTRIES SERVED:**





PRESENTING THE 19TH ANNUAL ARC INDUSTRY FORUM

# Industry in Transition: The Information Driven Enterprise for the Connected World

FEBRUARY 9-12, 2015 • ORLANDO, FLORIDA

What does it mean to be information-driven? New information technologies such as Internet of Things, predictive analytics, intelligent embedded systems, network connectivity, additive manufacturing, cloud computing, mobility, and 3D visualization are beginning to disrupt and radically change the way companies do business. An information-driven enterprise leverages these new technology solutions to improve business processes, achieve agility, and sustain a competitive edge. Join us to learn how an information-driven strategy can better position you to succeed and determine how you can best approach critical technology decisions.

- Cyber Security
- Analytics and Big Data
- Connected Asset Performance
- Cloud Computing
- Innovations in Automation
- Industrial Internet of Things
- Workforce Development and Training
- Energy Optimization

***Don't Miss Industry's #1 Networking and Learning Event:***

Go to [www.arcweb.com/events/arc-industry-forum-orlando/](http://www.arcweb.com/events/arc-industry-forum-orlando/) or call 781-471-1175.

Co-Sponsored by *Chemical Engineering*

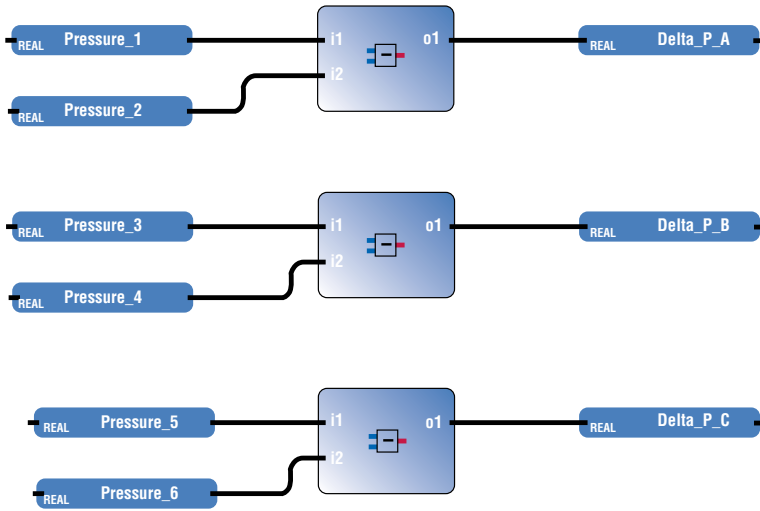


**VISION, EXPERIENCE, ANSWERS FOR INDUSTRY**

Circle 5 on p. 180 or go to [adlinks.che.com/50982-05](http://adlinks.che.com/50982-05)

A PASSION  
FOR PERFECTION

Source: Rockwell Automation



**FIGURE 2.** Designed specifically for process safety applications, the ADDvance system is a distributed, scalable architecture comprised of both a hardware controller and a software environment that allows the user to apply different levels of module redundancy as required by specific parts of their application

tervention. The next two layers demonstrate where technology kicks in to prevent significant disaster from occurring. There is an SIS layer, in which the system will shut the plant down should the process exceed safe conditions. If any or all three of these layers have succeeded, then serious threat has been prevented. However, it is possible that there has been some sort of accidental leak during this time or that something did not go according to plan, and additional layers of protection, such as fire and gas system technologies, are required to prevent further escalation, says Skipp.

“In the event of flammable or toxic gas detection, or flame detection, the SIS automatically takes action, or notifies operators to take action, which activates suppression systems and notification appliances such as alarms, strobes and public address systems,” explains Patrick Seiler, director of Global Safety Instrumented Systems with Emerson Process Management (McKinney, Tex.; [www.emersonprocess.com](http://www.emersonprocess.com)).

In the area of “layers of protection,” Rockwell Automation offers both control and safety technology, providing all of the functionality required for efficient and safe operation of

processes. Under that umbrella, designed specifically for process safety applications comes the AADvance system, which is a distributed, scalable architecture comprised of both a hardware controller and a software environment that allows the user to apply different levels of module redundancy as required by specific parts of the application (Figure 2). Trusted is the company’s triple modular redundant (TMR) controller, designed to provide maximum safety and availability in all circumstances. Trusted incorporates a fault-tolerant architecture to help eliminate spurious system trips and provide high availability as part of the inherent safety-related function.

In the same area, Seiler stated that Emerson released a new controller in 2013 and now has two SIS platforms that address the smallest applications but scale to address the largest, distributed applications. The DeltaV SIS platform (Figure 3) takes a modern approach to safety, implementing comprehensive safety loop diagnostics, which maximize safety integrity and process availability. The system can act as a standalone SIS solution with any third party distributed control system (DCS) using standard communication pro-



Magnetically coupled Roots pump combines a magnetic coupling with category 2 or 3 explosion protection

### OktaLine® ATEX

- Explosion safety due to reliable construction and temperature monitoring – installation without additional flame arrester possible
- Hermetically sealed (leakrate < 10<sup>-8</sup> Pa m<sup>3</sup>/s) – risk of zone entrainment is minimized
- ATEX protection in case of passive rotation
- Flexible application – pump can start against atmospheric pressure
- Pressure surge resistance according to EN 1333, PN level 16

Are you looking for a perfect vacuum solution?  
Please contact us:

Pfeiffer Vacuum GmbH  
Headquarters/Germany  
T +49 6441 802-0  
F +49 6441 802-1202  
[info@pfeiffer-vacuum.de](mailto:info@pfeiffer-vacuum.de)  
[www.pfeiffer-vacuum.com](http://www.pfeiffer-vacuum.com)



## STAINLESS STEEL HEAT EXCHANGER TUBING



Seamless & Welded  
U-Bends  
Quick Delivery



Best in Class  
Technical Assistance

Alloys Available:  
Duplex, Austenitic,  
Nickel, Ferritic,  
Super-Ferritic



Plymouth Tube Co.

Find out more at [www.plymouth.com](http://www.plymouth.com)  
[hxtubes@plymouth.com](mailto:hxtubes@plymouth.com)

## Newsfront

### IT'S A VIRTUAL WORLD

**W**hile some disasters, especially those that mother nature throws at a facility, can't be prevented by technology, technology in the form of server virtualization can help save the day and decrease the cost associated with lost revenue.

"Our customers talk about the importance of business continuity and ask us, as suppliers of control systems, how we can help make sure that they can manufacture, process and deliver on a continuous basis," says Grant Le Sueur, with Schneider Electric. "In addition to suggesting that they have plans in place to ensure they can remedy damages and get the plant back to its necessary running state, we suggest that disaster-recovery plans might also include an offsite storage mechanism for archiving and saving the latest backups of their control system."

This practice, called server virtualization, can come in handy if the servers and workstations required for continuous production within a plant go down, notes Le Sueur. "For example, if a plant has a control system distributed across a site and all the collected information comes back into a central control room and that central control room was subjected to localized fire or various workstations were compromised through cyber attack, do they have a back up control room so that plant operations may continue?" asks Le Sueur. "It is becoming important to employ virtual servers to create a back up control room as part of disaster recovery strategy. Virtualization gives us the opportunity to get them back up and running using another location that is not compromised. □

protocols, or as part of a DeltaV DCS installation. Whether standalone or integrated with the DeltaV control system, the DeltaV SIS continuously monitors transmitters through final elements of the safety equipment and transforms these data into information actionable by all stakeholders in the facility. The logic solver, certified to safety integrity level (SIL) 3, uniquely uses electronic marshaling technology to cost-effectively allow late project changes while also reducing installation, commissioning, lifecycle maintenance costs as never available before.

Schneider Electric (Houston, [www.schneider-electric.com](http://www.schneider-electric.com)) provides safety protection via the Triconex safety instrumented system (Figure 4), which controls emergency shutdown, to help prevent disasters and also via its Foxboro Evo process automation system, which can help companies recover from disasters. The company also offers software that can help customers verify, validate and generate safety requirements. "The software helps visualize the entire safety lifecycle, from design and construction of a new plant to the execution and delivery of the safety shutdown system, to operating and maintaining that system during production. They can use the software to verify that all the mitigations they've designed are still in working order," explains Grant Le Sueur, director of control and safety



**FIGURE 3.** The DeltaV SIS platform takes a modern approach to safety, implementing comprehensive safety loop diagnostics, which maximize safety integrity and process availability

Source: Emerson Process Management

software with Schneider Electric. "We see this safety management tool helping customers know that, based on their design principles and parameters, they are staying safely within their operating envelope. It serves as part of a holistic approach to safety management in that it makes sure that all is functioning as it should be to avoid process upset-related emergencies."

### Managing the disaster

"In many industries people invest in resources that plan for an incident, prevent an accident or that will reduce the probability of a disaster occurring," says Sukh Grewal, CEO with Veoci, (New Haven, Conn.; [www.veoci.com](http://www.veoci.com)). "There's obviously good reason to do that, but on the other hand, people have to realize that just because you invested in a

Source: Schneider Electric



**FIGURE 4.** Schneider Electric provides safety protection via the Triconex safety instrumented system, which controls emergency shutdown to help prevent disasters

safety system, it doesn't mean a bad thing won't happen. It is not enough to prepare for a disaster that might happen. You have to have technology in place for when disaster does happen. You need both. It's not an either-or situation."

The technology he is referring to is emergency management software, which transforms emergency response plans from notes in a binder into automated tasks and computerized actions. "In other words, instead of a line on a piece of paper that says you should call the plant manager, the software provides an automated phone call to him. If he doesn't answer, it rings his home phone, if that doesn't work, it texts his wife and so on. What we're talking about is transforming the planning that people have already done into actual, realtime actions and tasks," explains Grewal.

Veoci offers a Web-based emergency management solution that manages the four key stages of emergency management, including preparedness, response, recovery and mitigation. The preparation tool assists users in the creation of digitized plans that organize people, activities and information. It helps initiate a structured response based on a pre-designed plan at the click of a button and can be used to conduct drills, test runs and improvise plans before, during or after the event.

Possibly the most important aspect of emergency management, says Jim Paulson, president with Alert Tech-

nologies Corp. (Pleasanton, Calif.; [www.alerttech.com](http://www.alerttech.com)) is managing the information in real time, allowing the business to respond as quickly as possible following an emergency so that it may resume production and reduce costs associated with lost production. "We see organizations staffed with quality people who know what they're doing and know how to solve problems, but as a situation unfolds, it's hard to keep everyone informed and get the right information to the right experts," he says. "When a critical situation is occurring, a large organization, like a chemical company, needs to be fairly nimble. They can't take forever to make decisions or to respond. However, large corporations tend to be bureaucratic, which is often a problem."

He cites, as an example, a large manufacturing facility that was knocked off line by flooding. The plant generated \$1 million of revenue a day, but due to flooding was offline. They needed to buy \$30,000 worth of tents and temporary shelters to store equipment and get things organized so they could get back online. It took over a week to get that \$30,000 purchase approved and, during that week, they were losing \$1 million a day.

"Someone could have made that happen at the snap of a finger to get them back online, but they had no clue how to get the information to that person. An emergency management solution allows businesses to gather and distribute information about the incident, the situation, what people need, what actions are taking place in response, the damage and the operational impact," Paulson explains.

Alert Technologies' OpsCenter allows users to manage response to emergency disruptions in an orderly, efficient and cost-effective way. Such responses often require cooperation and communication between parts of the organization that might not normally come into contact with one another. Internet-based OpsCenter provides a centralized information base to keep these groups informed and coordinated. ■

*Joy LePree*



# RECEIVE FULL ACCESS

to ALL of Chemical Engineering's Facts at Your Fingertips articles in one convenient location.

## EACH INFORMATION

**PACKED PDF ARTICLE** includes graphs, charts, tables, equations and columns on the full chemical engineering processes you deal with on a daily basis. This is the tool you will come to rely on, referring back to the information again and again with just the click of a mouse.

## Facts at Your Fingertips Topics Include:

- Conservation Economics: Carbon Pricing Impacts
- Distillation Tray Design
- Burner Operating Characteristics
- Measurement Guide for Replacement Seals
- Steam Tracer Lines and Traps
- Positive Displacement Pumps
- Low-Pressure Measurement for Control Valves
- Creating Installed Gain Graphs
- Aboveground and Underground Storage Tanks

Receive full access today by visiting [store.chemengonline.com/product/facts](http://store.chemengonline.com/product/facts)

**CHEMICAL ENGINEERING**

24870

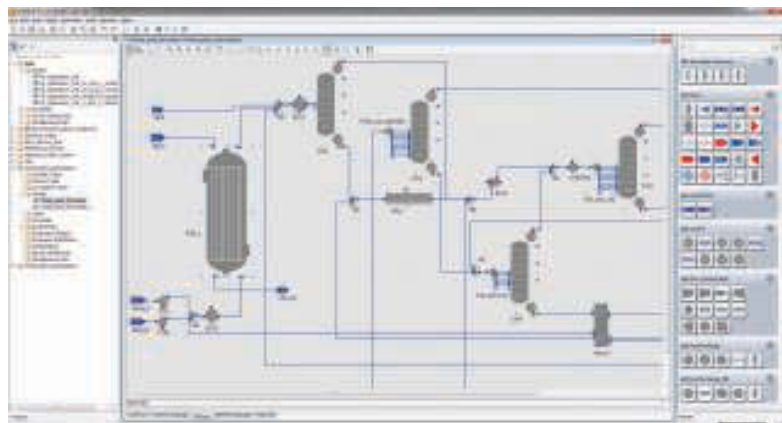
## FOCUS ON

# Simulation and Modeling Software

Yokogawa

### Track energy consumption with this new software

This month, this company is releasing Energy Performance Analytics (EP-Analytics; photo), a software tool that uses energy performance indicators (EnPI) to track how energy is being consumed in a plant, identifies gaps between EnPI targets and actual performance, and helps to identify countermeasures to improve energy performance. The EP-Analytics software is powered by the Visual MESA energy management and optimization solution. The EP-Analytics software runs on a workstation that is connected via an OPC interface to the control system, giving it access to pressure, temperature, flowrate and other plant data. Based on the Visual MESA simulation engine, the EP-Analytics software uses rigorous first-principle models to track energy flows throughout the plant and calculate the energy performance for each individual process unit and piece of equipment. — *Yokogawa Corp. of America, Sugar Land, Tex.*  
[www.us.yokogawa.com](http://www.us.yokogawa.com)



Process Systems Enterprise

### Model-based support for process design

The gPROMS ProcessBuilder (photo) is an advanced process-simulation tool aimed at model-based support of key design and operating decisions for organizations in the chemicals and petrochemicals sectors. It combines ease of use and solution robustness with comprehensive libraries of steady-state and dynamic process models of all standard flow-sheeting units, as well as high-fidelity reactor models and advanced separation processes such as adsorption and membranes. In addition to its steady-state and dynamic-simulation capabilities, ProcessBuilder delivers competitive advantage through a range of advanced applications including whole-plant optimization involving both parametric

and structural decisions, dynamic optimization of batch recipes and sensitivity analyses. — *Process Systems Enterprise Ltd., London, U.K.*  
[www.psenderprise.com](http://www.psenderprise.com)

### A unique tool to improve the energy efficiency of processes

Launched in September, Simulis Pinch (photo, p. 31) is a new tool dedicated to improving energy efficiency. This software can generate significant gains with a very short return on investment (at most a few months), says the company. Simulis Pinch integrates the general principles of the Pinch method and is applicable to any industrial process where utilities energy is consumed for heating or cooling the process fluids. Based on Pinch Technology, Sim-

ulis Pinch enables users to quickly find the most efficient configuration for the process, allowing the best compromise between investments and operating cost, to reach the objective of energy-consumption reduction. Simulis Pinch is a standalone product, available for use directly in Microsoft Excel. It can also be used with ProSimPlus and then becomes particularly powerful for improving the energy efficiency of complex processes. — *ProSim, Labège, France*  
[www.prosim.net](http://www.prosim.net)

### Fast, easy & flexible dynamic simulation for lifecycle results

Scheduled for release in January 2015, Mimic Simulation Software v3.6 is a next-generation software platform for the chemical process

You're building the future.  
**We're here to help.™**



From commercial construction to industrial operations and public projects, the United Rentals team is proud to provide our customers the best equipment, tools and solutions in the industry.

 **United Rentals®**

[UnitedRentals.com/Futures](http://UnitedRentals.com/Futures) | 800.UR.RENTS

#URBuildingFutures    

Aerial | Earthmoving | Power & HVAC | Trench Safety | Tools | Technology

© 2014 United Rentals, Inc.

Circle 36 on p. 180 or go to [adlinks.che.com/50982-36](http://adlinks.che.com/50982-36)

industries (CPI), providing fast, easy, flexible, dynamic simulation for plant operations lifecycle results. Mimic v3.6 includes the release of the mineral-processing object library, which includes 14 new advanced modeling objects, integrated with solids property tracking, particle-size distribution

and tunable comminution matrix in every object. Life science users will be able to fully reap the benefits of lifecycle dynamic simulation with the introduction of the new Bioreactor advanced modeling object, which provides new opportunities to improve the operation of biotech facilities and the development of

biotherapeutics. — *MYNAH Technologies LLC, Chesterfield, Mo.*  
[www.mynah.com](http://www.mynah.com)

**This update improves ability to plan for explosive incidents**

Version 10.2 is the latest iteration of this company's advanced consequence-analysis software, Safer Trace. Safer Trace is used to help assess, understand and reduce chemical risk, and plan for worst-case scenarios. Among the new features and enhancements with Version 10.2 are improved vapor-cloud explosion modeling for materials such as ethylene oxide, and solid chemical explosion-modeling capability for materials such as ammonium nitrate, and commercial explosives like TNT. The improved and enhanced functionality afforded by the improvements in explosion modeling greatly enhance site building and explosion hazard safety-analysis capability, help improve customers' pre-planning efforts where risks exist, help identify and pre-plan evacuation zones and routes, as well as safe collection points, and can elevate awareness of the urgency and scale of response required when such threats are identified or developing, says the company. — *Safer Systems, Camarillo, Calif.*

[www.safersystem.com](http://www.safersystem.com)

**Enhanced manufacturing and supply-chain software**

Last September, this company introduced major upgrades to aspenONE Version 8.7, its manufacturing and supply chain software. This latest version of aspenONE software is designed to allow plant operations personnel to spend less time dealing with ongoing baseline operations and more time on activities that will enable them to maximize the effectiveness and profitability of their manufacturing operation. Significant enhancements to the AspenTech software span across advanced process control, manufacturing execution systems and petroleum supply chain — additional highlights include: new capabilities in Aspen



The Equipment Solutions Company

(877) 503-9745 or  
[www.fedequip.com](http://www.fedequip.com)

Examples of Typical Inventory

**Federal Equipment Company Buys and Sells Used Chemical Equipment**



10,000 Gal DCI Storage Tank, 316L S/S



500mm X 250mm Rousset Robatel Peeler Centrifuge, Hastelloy C22



150 Gal. Ross Double Planetary Mixer, Model DPM 150, 316L S/S, Unused

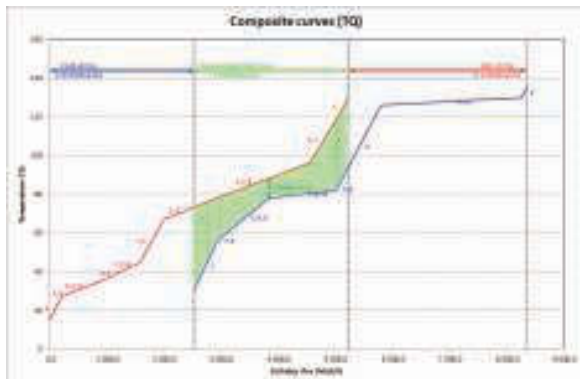
8200 Bessemer Ave. • Cleveland, Ohio 44127 • T (877) 503-9745  
[www.fedequip.com](http://www.fedequip.com) • [chemical@fedequip.com](mailto:chemical@fedequip.com)

Circle 14 on p. 180 or go to [adlinks.che.com/50982-14](http://adlinks.che.com/50982-14)



## Focus

ProSim



problem within one application; Aspen PIMS-AO software implements new optimization capabilities that enable the feedstock planner to achieve the most profitable solution at least eight times faster than before. — *Aspen Technology, Inc., Burlington, Mass.*

[www.aspentech.com](http://www.aspentech.com)

### Modeling software helps plant operators maximize profitability

Earlier this year, this company announced a major enhancement to its Refinery and Petrochemical Modeling System (RPMS) that will improve model building and maintenance, case management and optimization to help plants maximize profitability. The new release, RPMS 500 (photo), incorporates analytics



software that is based on the company's innovative Intuition process management to better apply planning results. RPMS also helps petroleum-refining and petrochemical firms assess their long-term investment options and understand the critical differences in potential yield and value of various feedstocks, as well as determine the best operating conditions over the planning horizon. Key new features with the RPMS 500 release include support for Windows 7/8 64-bit platforms, as well as tools to simplify migration to the current software version. — *Honeywell Process Solutions, Houston*

[www.honeywellprocess.com](http://www.honeywellprocess.com) ■

*Gerald Ondrey*

DMC3 software enable the process controller to stay online and sustain optimum performance for a much broader range of changing operating conditions, generating significantly more business benefits; Aspen Petroleum Scheduler software extends its scheduling capability with the addition of new Pipeline Scheduling, which when combined with the Dock Scheduling, addresses for the first time the complete petroleum scheduling

Model: NTM -X  
Explosion Proof  
4" x 4"

## Looking for a new EXPLOSION PROOF Transmitter / Meter / Controller?

The **NTM-X** has an FM and CSA-approved explosion proof housing in National Pipe Thread (NPT) or wall mount. Tempered UV coated glass protects both the 300° bargraph and digital display.

### OTEEKS **NEW TECHNOLOGY** METER SERIES for Analog and Digital Replacement

- 20 Models (Plastic or Metal Housing)
- Current Loop, Signal or External Power
- Nuclear, Military and Industrial Grades
- <60mW Power Consumption (Loop Powered)
- SV&V Firmware
- Input Failure Alarms
- Only 2" Behind the Panel
- Full Bar or Pointer

**LIFETIME  
WARRANTY**

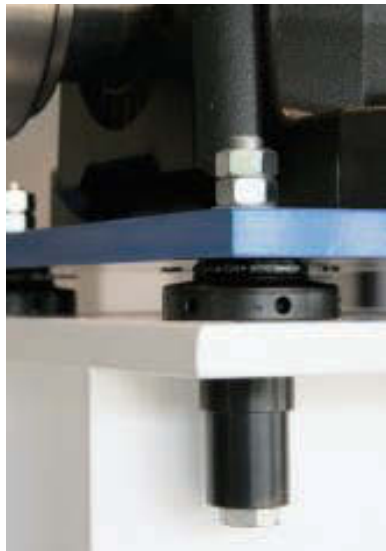
**OTEEK**™  
CORP.

Call: (520)748-7900 Visit: [www.otekcorp.com](http://www.otekcorp.com)

Circle 25 on p. 180 or go to [adlinks.che.com/50982-25](http://adlinks.che.com/50982-25)



# NOVEMBER New Products



SKF USA

## These washers evenly distribute bolt tension, reducing relaxation

These all-spherical, two-piece washers (photo) optimize bolt mounting for machinery and bolted equipment. They automatically adjust under compression to compensate for up to 4 deg. of angular deviation, creating an exact parallel plane between the inner faces of the bolt head and the nut to distribute the load evenly over the entire inner contact-surface areas. Any need for onsite machining to achieve parallelism is eliminated. These washers ultimately reduce the likelihood of bolt relaxation by distributing bolt tension evenly, retaining proper bolt tension by preventing bolt bending and keeping bolts straight as intended. The extended length of the spherical washer allows for the use of longer bolts, resulting in additional bolt clamping length and elongation in the bolt. The washers also incorporate a larger concave ring that connects to its corresponding smaller convex piece to achieve an enlarged contact area with a reduced surface-contact pressure. Manufactured from high-grade alloy steel, all washers feature a special



Charles Ross & Son

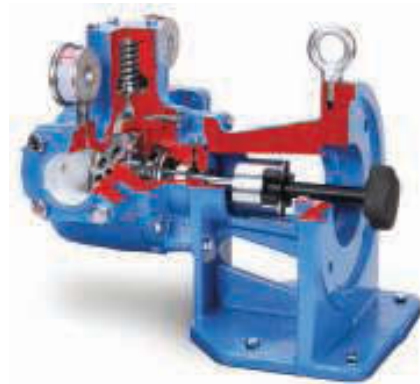
surface treatment to enhance corrosion protection in humid, salty and other corrosive or harsh environmental conditions. — *SKF USA, Inc., Lansdale, Pa.*

[www.skfusa.com](http://www.skfusa.com)

## A dual-shaft mixer that ensures thorough turnover

The CDA-100 dual-shaft mixer (photo) is a 100-gal model that enables efficient powder dispersion and batch temperature control in the manufacture of both high- and low-viscosity formulations. The CDA-100 is equipped with an air-oil hydraulic lift for raising or lowering the agitators. Two independently-driven agitators, a high-speed disperser and a two-wing anchor deliver a wide range of shear levels and flow patterns that can adapt to the varying rheologies of solutions, pastes, gels, suspensions and slurries all throughout the mixing cycle. The sawtooth disperser blade draws solids into a vortex and disintegrates dry agglomerates as the low-speed anchor continuously stirs the batch. This combination of mixing actions ensures a very thorough turnover. Fresh product is constantly coming into contact with the disperser and

Blackmer



materials around the periphery are continuously being scraped off the vessel surfaces. — *Charles Ross & Son Co., Hauppauge, N.Y.*

[www.mixers.com](http://www.mixers.com)

## Improved flange options among the updates to this pump series

The upgraded LGL Series "C" of sliding vane pumps (photo) offers square four-bolt flanges in addition to ANSI-style flanges. The four-bolt flange design allows for the use of multiple sizes and types of flanges, including 1.25, 1.5 and 2 in., in both NPT and weld flanges. Another improvement to the series is a repositioned relief valve, which creates adequate space for inlet and discharge pressure gages to be installed without using extensions. The upgraded line also includes a new motor or adapter bracket for easier bolting into an existing footprint. The LGL150 Series of pumps features suction lift capabilities up to 13 ft, replaceable cavitation-suppression liners and ductile-iron construction. — *Blackmer, Grand Rapids, Mich.*

[www.blackmer.com](http://www.blackmer.com)

## Achieve efficient drying and filtration in pilot-plant operations

This company's simple filter dryer (photo, p. 33) is intended for use in pilot-plant applications that require efficient filtration and drying. The

## New Products

PSL



equipment features a heated insulated jacket, a heated plate with filtration-media support (for enhanced draining capability) and a side discharge plug. The finished product can be totally and safely recovered using the GloveBag accessory that is mounted on the discharge plug. The optional agitation and various filtration media make the simple filter dryer a truly polyvalent piece of process equipment for manufacturers. The equipment is available in two sizes: 0.125-m<sup>2</sup> filtration area on a swing-out base for a total vessel volume of 50 L; and 0.3-m<sup>2</sup> removable filter-plate area, for a total volume of 130 L. Different construction materials are offered to suit any pilot-plant requirements: perfluoroalkoxy (PFA) resin-coated carbon steel, 316L stainless steel and C22 alloy. — *Powder Systems Ltd. (PSL), Liverpool, U.K.*

[www.powdersystems.com](http://www.powdersystems.com)

### Use these single-float level transmitters in very small tanks

The XM/XT Series of single-float transmitters (photo, p. 34) is expressly designed to provide continuous fluid-level monitoring within smaller, more compact tank environments, specifically those with tank depths of less than 20 in. (50.8 cm). The XM/XT 300 Series of fluid-level transmitters is constructed from all-wetted polysulfone plastic parts, ensuring their direct compatibility with a variety of chemicals. The counterpart XM/XT-700 Series combines the extended durability of stainless steel or brass within a lightweight

Alicat Scientific

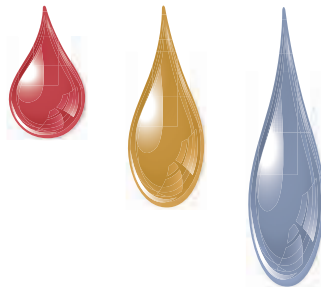


package. Both models are designed to serve as effective drop-in replacements using existing tank fittings. They feature 3.5-mm resolution; an indicating length to 35.5 cm; and a stem length to 50.8 cm. XM/XT Series units are also available with a broad choice of mountings and float materials to suit individual requirements. — *Gems Sensors & Controls, Plainville, Conn.*

[www.gemssensors.com](http://www.gemssensors.com)

### Portable meters for flowrate, pressure and temperature

This company's new, rechargeable, portable gas-mass flowmeters (photo) feature reading accuracy of  $\pm 0.8\%$  with 18 h of continuous operations available on a single charge. These meters feature rapid multi-parameter measurements capable of producing live readouts of mass and volumetric flowrates, pressure and temperature, making them appropriate for



## Proven performance



ROTOFORM  
GRANULATION  
FOR PETROCHEMICALS  
AND OLEOCHEMICALS



High productivity solidification of products as different as resins, hot melts, waxes, fat chemicals and caprolactam has made Rotoform<sup>®</sup> the granulation system of choice for chemical processors the world over. Whatever your solidification requirements, choose Rotoform for reliable, proven performance and a premium quality end product.

- High productivity – on-stream factor of 96%
- Proven Rotoform technology – nearly 2000 systems installed in 30+ years
- Complete process lines or retrofit of existing equipment
- Global service / spare parts supply

**SANDVIK**

Sandvik Process Systems

Division of Sandvik Materials Technology Deutschland GmbH  
Sallerstr. 35, 70736 Fellbach, Germany  
Tel: +49 711 5105-0 · Fax: +49 711 5105-152  
info.spssde@sandvik.com

[www.processsystems.sandvik.com](http://www.processsystems.sandvik.com)

Circle 33 on p. 180 or go to [adlinks.che.com/50982-33](http://adlinks.che.com/50982-33)

# SEPARATION ANXIETY?™

Pentair designs and manufactures high performance filtration and separation technology that help chemical plants with:

- Filtration and purification of hydraulic and lubricating fluids
- Purification of feedstocks and water
- Recovery of liquid and solid catalysts
- Steam cracker feed stock conditioning
- Wastewater treatment
- Water/chemical recovery and reuse
- Final product purification

Call today to reduce your separation anxiety!

1.888.896.6300 • 1.936.788.1000

[www.pentairseparations.com](http://www.pentairseparations.com)

Circle 26 on p. 180 or go to [adlinks.che.com/50982-26](http://adlinks.che.com/50982-26)

 **PENTAIR**



## New Products

environmental analysis, flowrate verification and field flow calibration in the environmental, manufacturing and meteorological industries. — *Alicat Scientific Inc., Tucson, Ariz.*

[www.alicat.com](http://www.alicat.com)

### This energy-efficient conveyor can be configured many ways

The Tubular Drag Conveyor (photo) gently moves abrasive, blended or friable materials, including high-moisture-content ingredients and easy-to-compact materials without compromising quality. A versatile design allows for numerous configurations, with conveying occurring on multiple planes in any direction from numerous inlets and outlets. This flexibility allows for conveying beneath floors, through walls and ceilings and around doors or other obstacles. The conveyor is totally enclosed to decrease plant exposure. — *Hapman, Kalamazoo, Mich.*

[www.hapman.com](http://www.hapman.com)

### This weld scanner can be operated manually or motorized

The Weld Crawler (photo, p. 35) is a weld-inspection tool, combining software and hardware into a modular design. It can be operated manually or motorized, and is easily converted from a circumferential to an axial scanner. All versions feature a clearance of 2.25 in. and can be used in the inspection of thin welded plate and pipes. The addition of an optional frame allows the inspection of greater wall thicknesses of up to 6 in. The Weld Crawler's four probes have their own individually adjustable suspension so that each probe is correctly matched to follow the specimen geometry. The scanner is supported by four magnetic wheels, which are easy to clean and can be quickly disengaged by means of an integral lift-off lever. Each wheel has its own braking system, so that any wheel can be locked in position, no matter what the scanner orientation. An additional four wheels can be added to double the magnetic adhesion, if required. — *Zetec Inc., Snoqualmie, Wash.*

[www.zetec.com](http://www.zetec.com)



Hapman

Gems Sensors

### This vibration sensor connects to smartphones, tablets and PCs

The USB ICP Digital Dynamic Accelerometer (Model 333D01; photo, p. 35) is an integrated and ruggedized high-resolution, broad-frequency piezoelectric vibration sensor with integrated data acquisition. The device works directly with smartphones, tablets and personal computers (PCs), making accurate vibration measurement extremely accessible. Users can select from a growing number of third-party vibration-analysis packages on all popular platforms or write their own applications in any programming environment that can access the audio input driver, such as MathWorks Matlab or National Instruments LabVIEW. By pairing the 333D01 with a smartphone, a user no longer needs separate and cumbersome signal conditioners or dedicated digital data acquisition. The 333D01 packages both the piezoelectric sensing element and internal electronics within a laser-welded, ground-isolated, stainless-steel casing. This provides durability, portability and reliability for the entire measurement channel in both factory and laboratory environments. — *Digiducer Inc., Cincinnati, Ohio*

[www.digiducer.com](http://www.digiducer.com)

## New Products

Omega Engineering



Digiducer

### Use this temperature transmitter in areas with space limitations

The M12TX temperature transmitter (photo) features a sensor with a built-in programmable transmitter, molded connector, 4–20-mA output and a –50 to 500°C temperature range. The probe is ideal for areas where traditional head connections are too large to fit. The temperature transmitter is designed with a mineral-insulated cable probe (MgO), which allows the probe to have a minimum bend radius of three times the diameter. The transmitter has

Zetec



Load Cell Central

an accuracy maximum of  $\pm 0.2^\circ\text{C}$  or  $\pm 0.2\%$  of span. — *Omega Engineering Inc., Stamford, Conn.*  
[www.omega.com](http://www.omega.com)

### A testing instrument designed specifically for load cells

The SST1 (photo) is expressly designed for testing and troubleshooting load cells, providing results that help determine if the cell has experienced overload or shock, or if there is water damage or metal fatigue. Featuring realtime readings in percentage of full scale, the SST1 allows users to perform tests without removing the load cell from its installation. This accurate tester will check resistance within  $\pm 0.5\%$ . The SST1 is housed in a durable, compact, portable enclosure. Capable of bridge testing, resistance testing, fullscale output and zero-balance testing, the menu navigation of the SST1 is extremely user friendly. The SST1 can support four or six wire load cells. — *Load Cell Central, Milan, Pa.*

[www.800loadcel.com](http://www.800loadcel.com)

Mary Page Bailey

## Environmental Applications



for example:

Sludge drying  
Glycol recovery  
Used oil recovery  
Lubricant recycling



**GIG KARASEK**  
Distillation · Evaporation · Drying

[www.gigkarasek.com](http://www.gigkarasek.com)

Circle 19 on p. 180 or go to [adlinks.che.com/50982-19](http://adlinks.che.com/50982-19)

**F**abricated metal-wire mesh is one of the major categories of filter media. Woven metal cloths are often used to support a filter aid coating or a bed of granular or porous material. Proper selection of wire cloth can have a large impact on the cost and efficiency of the system. This column provides information on the options available for wire meshes in industrial filtration applications.

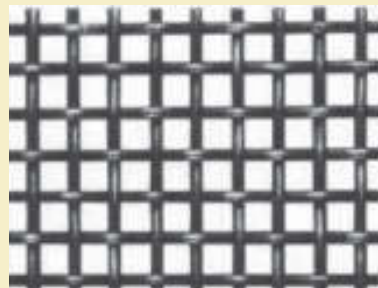
#### Key questions for selection

Before selecting a wire mesh for filtration, consider the following questions:

- Is the mesh product capable of withstanding the system pressures encountered in the given application?
- Is the mesh designed to avoid clogging during filtration?
- In the event of clogging, will the mesh withstand the added strain or is it likely to collapse?
- Is the mesh sized such that particles are retained in normal use?
- Will the mesh allow the desired flow?
- Has the system been designed to minimize pressure loss?
- Have the corrosion properties of the fluid been considered relative to the mesh material?
- Are proper alloys available and specified?
- Will the product fit the filtration system without requiring field modification?
- Can the mesh be successfully back-washed, or must it be removed for cleaning?
- If it must be removed, is it easy to take out and put in again?
- What is the expected lifetime of the mesh?

#### Mesh size

Wire mesh is defined by the diameter of wires used and the spacing of the openings. Wire sizes may range from 1-in. in diameter to wire sizes finer than human hair. Mesh opening sizes range from 4 in. and larger down to one micron. Mesh is the number of openings



Newark Wire Cloth Co.

**FIGURE 1.** Wire cloth offers a filtration surface to separate solids from liquids. Most wire cloth is made with a square configuration with the same count vertically and horizontally, although many variations are available

Newark Wire Cloth Co.



per linear inch. Square meshes have the same mesh count in both the horizontal and vertical direction. For example, a 40 x 40 mesh cloth has 40 openings per linear inch in both directions. A rectangular (off-count) mesh has a different number of openings in one direction than the other.

#### Computing mesh

Take the wire diameter and the size of the desired opening space. Add the two dimensions together and divide the total into one. For example, given a wire diameter of 0.035 in. and an open space dimension of 0.048, the total is 0.083.  $1/0.083 \approx 12$ , which corresponds to the mesh number, or spaces in the wire cloth across one linear inch.

#### Weave type

Wire cloth is produced on looms similar to those used for fabrics. Most wire cloth is made with a square configuration (square weave) with the same count vertically and horizontally (Figure 1). Dutch weave and twilled Dutch weave are also widely used (Figure 2). Dutch and twilled Dutch weaves do not produce square openings, but rather wedge-shaped openings which are not parallel to the surface of the cloth. These cloths serve in centrifugal and precoat filters, and make up the majority of the ultrafine wire cloths. One of the most commonly used wire meshes is 24 x 110-mesh size Dutch weave. It provides the strength, retention and surface characteristics for most filter-aids, and can withstand backwash and surface cleaning. It is rigid and has a smooth surface for ease of cake release.

#### Opening size

In most applications, the function of the screen is to keep the filter media in place, while facilitating fluid flow through the bed. For example, in ion exchange applications, the resins are tiny beads of a uniform size. If a specification calls for 0.012-in. openings, it is important to maintain that size. An opening of 0.015 in. is too large, allowing the resin to leak out. On the other hand, 0.008 in. is too restrictive, impeding flow and leading to



**FIGURE 2.** Wire cloths employing Dutch weave and twilled Dutch weave are the most common, behind square weave

clogging. Either situation will involve a noticeable performance drop.

#### Widths of wire cloth

Wire cloth is traditionally woven in rolls 100 ft long and either 36 or 48 in. wide. In some cases, cloths as wide as 96 in. are woven. Finer wire cloths are usually available in standard 36-in. widths. Cloths of any desired dimensions can be produced by welding junctions together.

#### Materials of construction

Wire cloth may be woven of any malleable metal or alloy. The most common cloths are stainless steel, copper, brass and Monel. Aluminum, bronze, phosphor bronze, nickel, Nichrome, the Hastelloys, galvanized or tinned steel and steel are also readily available. Noble, rare and refractory metals are also used: gold and gold-plated metal; platinum; silver; tungsten; molybdenum; columbium; tantalum; and titanium.

#### Calendaring

Wire cloth for filtration is often "calendared," a process wherein it is fed through rollers to flatten and smooth the material. Calendaring improves retention and cake-release properties. The process involves feeding filter cloth through rollers to flatten and smooth the material. ■

**Editor's note:** The editor would like to acknowledge Marvin Greenstein for supplying information for this column. Greenstein is the director of engineering for Newark Wire Cloth Co. (Clifton, N.J.; [www.newarkwire.com](http://www.newarkwire.com)), a supplier of wire cloth for multiple industries, including pharmaceutical, chemical, food, environmental and others.



# When you need **BIG POWER**, total integration generates bigger and better results.

No matter the business — refinery, utility, manufacturing or petrochemical — if you are in an industry that demands big power, you'll want to check out the complete range of boiler systems from Cleaver-Brooks. For more than 80 years, we have set the industry standard in the design and production of boiler systems that continually maximize efficiency and deliver uncompromising reliability and the lowest possible emissions. Our total integration is that every component — from gas inlet to stack outlet — is designed, engineered and manufactured by just one company.

**To find your nearest representative,  
visit [cleaverbrooks.com](http://cleaverbrooks.com) or call 800.250.5883.**

**M**ethionine is an essential amino acid that is not synthesized by animals, so it must be obtained from their diets.

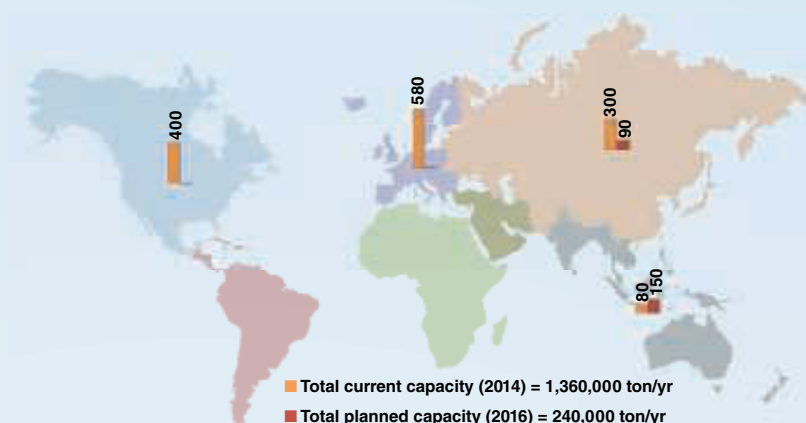
Synthetic methionine is traditionally commercially available in two varieties: D,L-methionine (DLM), a racemic mixture of the two stereoisomers, and methionine hydroxy analog (MHA). For animal nutrition, the two are equivalent. Globally, 98% of methionine produced is used as an animal feed additive, especially in the poultry market. Methionine is also used in pharmaceuticals and cosmetics.

### The process

In the process shown in Figure 1, DLM is obtained via the carbonate process from 3-methylthiopropionaldehyde (MMP) and hydrogen cyanide (HCN), without forming co-products. The process presented here is similar to one developed by Evonik Industries AG (Essen, Germany; [www.evonik.com](http://www.evonik.com)), and can be divided into four main areas: hydantoin production; hydantoin hydrolysis; DLM production and filtration; and drying. Hydantoin corresponds to the intermediate 5-(2-methylmercaptoethyl)-hydantoin generated in the process.

**Hydantoin production.** MMP, HCN and an aqueous solution of carbon dioxide ( $\text{CO}_2$ ) and ammonia ( $\text{NH}_3$ ) are fed to the hydantoin primary reactor. A gas stream containing  $\text{CO}_2$ ,  $\text{NH}_3$  and impurities leaves the reactor and is washed with MMP and water in a scrubbing column. Purified  $\text{CO}_2$  is released in the overheads and used in DLM production. The reaction mixture is fed to a hydantoin secondary reactor, where the reaction is completed.

**Hydantoin hydrolysis.** The hydantoin product stream and potassium carbonate ( $\text{K}_2\text{CO}_3$ ) are fed to the hydrolysis reactive column, which contains zirconium fittings that serve as catalysts and prevent corrosion.  $\text{CO}_2$  and  $\text{NH}_3$  are liberated in the overhead stream of the column and recycled to the hydantoin primary reactor. The bottom stream, containing potassium methioninate (KMET), is sent to the DLM production portion of the process.  $\text{K}_2\text{CO}_3$  is obtained from the regeneration of a



**FIGURE 2.** Worldwide methionine production capacity

potassium bicarbonate ( $\text{KHCO}_3$ ) solution from DLM filtration. This occurs in a decarbonator, where  $\text{CO}_2$  is separated in the overheads and directed to the DLM reactor.

**DLM production and filtration.** The KMET stream and recycled  $\text{CO}_2$  are fed to the DLM reactor, forming  $\text{KHCO}_3$  and DLM. The methionine is fed to a vacuum crystallizer and the crystals are vacuum-filtered. The resulting  $\text{KHCO}_3$ -containing filtrate is sent to the decarbonator.

**Drying.** The methionine cake is directed to a dryer, where water is evaporated and sent to wash column before being used in methionine washing during filtration. Methionine product (99 wt.%) is sent to packaging and storage.

### Economic performance

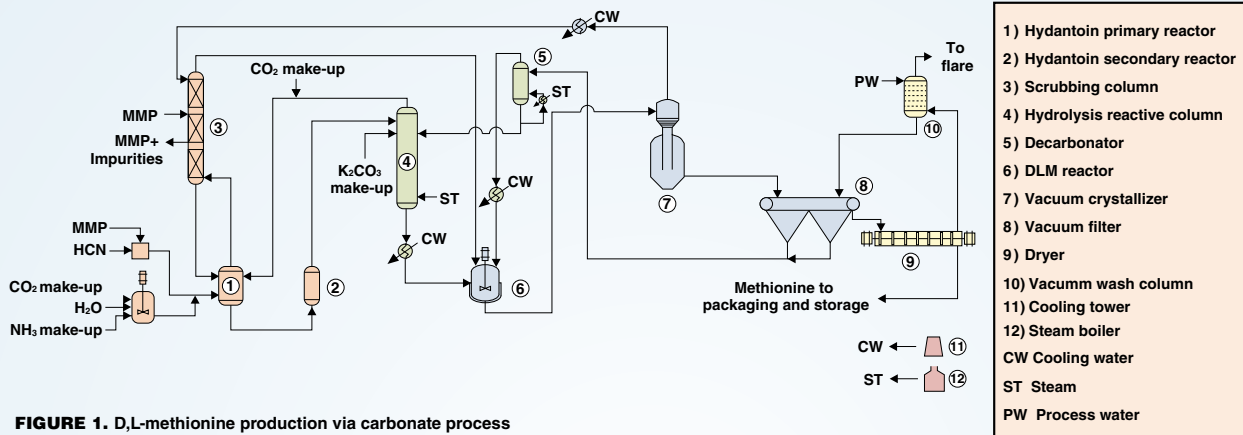
An economic evaluation of the process was conducted, assuming a 150,000 ton/yr methionine unit erected on the U.S. Gulf Coast and integrated with nearby MMP and HCN facilities. The storage autonomy is equal to 30 days of operation for methionine, aqueous  $\text{NH}_3$  and liquefied  $\text{CO}_2$ . The estimated capital investment is about \$390 million, while operating expenses are about \$2,600 per ton of product.

### Global perspective

In the past few years, methionine global demand has increased at an average rate of 5%/yr, and is expected to increase further. This expansion of methionine demand is driven by rising meat consumption and, in particular, growth in global poultry, associated with population growth and increased purchasing power, mainly in developing countries. Also, there has been consolidation in the agricultural sector, leading to larger, more industrialized farms with more efficient animal nutrition with higher inclusion rates of amino acids.

In this context, Asian markets present strong methionine demand, driving its manufacture toward that region. This can be observed through the methionine capacity expansion planned in this area (Figure 2). ■

**Editor's Note:** The content for this column is supplied by Intratec Solutions LLC (Houston; [www.intratec.us](http://www.intratec.us)) and edited by *Chemical Engineering*. The analyses and models presented are prepared on the basis of publicly available and non-confidential information. The content represents the opinions of Intratec only. More information about the methodology for preparing analysis can be found, along with terms of use, at [www.intratec.us/che](http://www.intratec.us/che).







**INGENIOUS INDUSTRIAL PUMP SOLUTIONS.  
CREATED FROM BRAIN POWER**

We work with **HEART, MIND** and **BODY**, because we are **PEOPLE**  
**PEOPLE** serving **PEOPLE**, with **PASSION, INTELLIGENCE** and **COMMITTMENT**  
that's why we are able to offer **SOLUTION PACKAGES, NOT JUST PUMPS**

- ✓ Design for excellence
- ✓ Personalized guidance in the pump selection process
- ✓ Fast response and delivery
- ✓ Long term after market support
- ✓ Trained service and spare parts available worldwide



**pompetravaini**  
*Committed to stay ahead*

[www.pompetravaini.it](http://www.pompetravaini.it)

Pompetravaini has been manufacturing industrial pump since **1929**.  
**85 years of passionate service!**



**Pompetravaini Spa** Via per Turbigo, 44 • 20022 Castano Primo (Mi) • Tel. +39.0331.889000 • Fax +39.0331.889057  
vendite@pompetravaini.it • [www.pompetravaini.it](http://www.pompetravaini.it) **Circle 30 on p. 180 or go to [adlinks.che.com/50982-30](http://adlinks.che.com/50982-30)**

# Burner Inspection and Maintenance

**Burners and their components can be quite complex. Establishing maintenance and inspection best practices encourages longterm operational reliability**

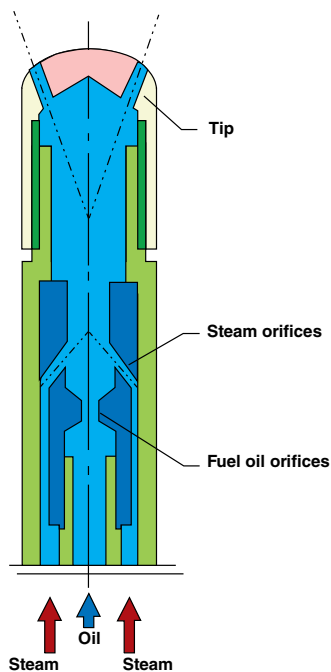
Mohammed H. Al-Hajji  
Saudi Arabian Oil Co.  
(Saudi Aramco)

**B**urners are mechanical devices that are utilized for mixing proper quantities of fuel and air, and also for maintaining a stable flame inside fired equipment. Burners are critical components that must be periodically maintained to ensure the reliability of fired equipment in the chemical process industries (CPI), as well as many other industries. This article discusses the internal components and applications for different types of burners (gas, oil and combination), as well as the maintenance procedures that are required to ensure the integrity and reliability of burners in the CPI.

## Gas burners

There are two principal types of gas-fired burners used in the CPI: raw gas and pre-mix.

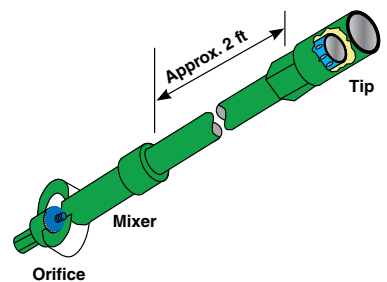
Raw-gas burners are used for most applications. In these burners, the fuel gas passes through orifices in the gas tip and is injected directly into the combustion zone, where it mixes with air. A stab-



**FIGURE 1. Fuel atomizers are designed to provide proper mixing between the oil and steam in oil burners**

lizer cone is located just below the gas to improve combustion stability. These burners are suitable for mounting in plenum chambers (the area where air enters the burner), and can be used with preheated combustion air.

Pre-mix burners are sometimes used in specialized applications. In these burners, the kinetic energy made available by the expansion of the fuel gas through the fuel-gas orifice introduces about half of the combustion air (called primary air) into the Venturi mixer. This mixture then exits through a large burner tip, where it is mixed with the balance of the combustion air (secondary air). This secondary air-flow enters the burner through the



**FIGURE 2. Pilot burners provide both ignition and stabilization for the main flame**

outer, secondary air register. Pre-mix burners require less furnace draft than raw-gas burners. Pre-mix burners can produce a wide range of flame shapes.

## Oil burners

Steam is always added to assist in the atomization of liquid fuels. In oil burners, the steam and oil are mixed in specially designed fuel atomizers, where the kinetic energy of the steam jets breaks up the fuel into small droplets. The resulting mixture of steam and finely dispersed oil is then released into the airstream through a number of orifices in the burner tip. A typical atomizer is shown in Figure 1.

The steam used for atomization must be perfectly dry. If there is moisture in the steam, this moisture will flash when it mixes with the oil, causing erratic oil flow. Furthermore, the atomizing steam should be superheated.

Mechanical atomization can be used when steam is not available. In this method, the kinetic energy in the oil itself is used for atomization by releasing the oil through the tip under very high pressure. Mechanical atomization is usually used only in very large burners or with extremely clean fuels, since

the very small orifices required in smaller burners can become plugged by small dirt or coke particles in the fuel.

### Combination burners

The principles of gas and oil burners can be combined into a third category of burner, the combination burner. A typical combination gas-and-oil burner can be used to fire liquid, gas or a combination of liquid and gas fuels, depending upon the fuel systems supplied with the burner. Liquid fuel is fired through a centrally located oil gun. The oil and atomizing steam are fed through separate pipes in the feed tube to the atomizer and burner tip. The fuel-steam mixture is injected through orifices in the burner tip into the primary airstream, where combustion begins.

### Reducing NO<sub>x</sub> in burners

Combustion operations frequently create nitrogen oxides (NO<sub>x</sub>), specifically NO and NO<sub>2</sub>, which must be highly controlled, as they can be harmful pollutants. Currently, three burner configuration methods exist for reducing nitrogen oxides in burners: staged air, staged fuel and internal fluegas recirculation combined with staged air or staged fuel.

**Staged air burners.** These types of burners work by introducing 100% of the fuel into the burner and only part of the combustion air (primary air), thus creating a sub-stoichiometric flame. This flame has a reduced temperature and therefore inhibits NO<sub>x</sub> formation. The flame is completed with the addition of the secondary air to complete the combustion process. This process allows for greater control at lower burner loads and also accommodates a wider range of fuels.

**Staged fuel burners.** This burner method introduces 100% of the combustion air into the burner and splits the fuel supply into primary and secondary volumes. The primary fuel mixes with the combustion air to create a flame. Again, as with staged air burners, the peak flame temperature is lower, and NO<sub>x</sub> for-

mation is reduced. Secondary fuel is added to complete the combustion process. Staged fuel burners provide greater NO<sub>x</sub> reduction, as the fuel supply has a larger effect on NO<sub>x</sub> formation. This method is more commonly used when a consistent fuel supply is available.

**Internal fluegas recirculation burners.** This method combines either staged air or staged fuel with internal fluegas recirculation to help reduce NO<sub>x</sub> formation. The best results are obtained where internal fluegas recirculation is used to dilute the fuel gas in a staged fuel burner, creating a gas with a low calorific value.

### Pilot burner

Pilot burners (or, simply pilots) are small burners used for ignition of the main burner flame. In some systems, a pilot can also act as a stabilizer for the main flame. Pilots in process-heater burners usually operate continuously. Individual pilots should be removable for maintenance, even while the process heater remains in operation. A typical pilot burner is shown in Figure 2.

More and more process heaters require the presence of a permanent pilot with electrical ignition. These types of pilots use a low-tension ignition rod and usually combine the function of the low-tension rod with ionization detection.

When the ignition transformer is connected directly to the end of the pilot, standard low-tension cable can be used. This eliminates the need for high-tension cable and, as a result, longer cable runs can be used from the pilot to the distributed control system (DCS).

An electrical current is conducted between the flame and the flame-retention head. The flame is ionized, and the ionization part of the flame rod detects this change in the current. This electrical current change is then relayed by a lamp to indicate the presence of the flame (Figure 3). It is crucial to ensure that the pilot flame has a very strong core to enable consistent detection of the flame's presence in the pilot burner.



**FIGURE 3.** Pilot burners use electrical current to detect the flame's presence

### Burner components

Burners are very complex devices — not only are there many varieties of burners utilized in the CPI, each burner is equipped with a number of integral components that are critical to operations.

**Burner air registers.** Air enters the burner through the air register. Airflow can be controlled by adjusting the size of the openings in the register. For natural-draft burners, the most common type of air register consists of fixed and moveable concentric cylinders, each with slots. For forced-draft burners, air registers are controlled either manually or automatically. Burner registers may also be a single-bladed or twin-bladed opposed butterfly type. This variety is used for greater control of the combustion air pressure.

**Plenum chamber.** Sometimes called a windbox, the plenum chamber is where all the air for the burners enters the device. The plenum chamber may contain control vanes, as well as the air registers for the burners. The plenum chamber can serve several purposes, including noise and emissions reduction, single-source combustion air supply and total airflow to the furnace controls.

**Burner fuel-gas piping.** Burner fuel-gas piping consists of the manifolds and piping that deliver fuel to the burner tips. The fuel passes through one or more openings in the tips, which act as restriction orifices. Here, the fuel is injected into, and mixes with, the airstream. Various types of burner tips are used, depending upon the type of fuel and the flame pattern desired.

**Burner throat tiles.** Located at the burner edge are the throat tiles of the burner. Throat tiles help stabilize combustion and shape the flame. The burner tile is usually shaped so that one section has a minimum cross-sectional flow area. This area, called the throat, acts as a Venturi component in the airstream. The opening in most burner tiles is circular. In some cases, the tile and other components are designed to produce a non-circular flame shape. A rectangular-shaped tile opening can be used to produce a flat flame, which is needed in some furnace arrangements.

**Swirlers.** The function of swirl in burners is to increase flow turbulence. Turbulence facilitates the mixing of fuel and air, and various elements within the burner can induce a swirl phenomenon. Some burners contain tangentially disposed doors in the air registers, which increase turbulence. Other burners contain axially disposed spin vanes to impart swirl in the combustion air. Other burners may use adjustable swirl vanes to increase turbulence.

### Fired equipment

Burners are utilized in fired equipment in the CPI to combust fuel. The energy created from combustion is mainly used to convert water into steam for various processes, or to heat up a process to a desired temperature. The main fired equipment that utilize burners are boilers, heaters and heat-recovery steam generators (HRSGs).

- Fired boilers use forced-draft burners to combust either oil or gas to heat water and convert it to steam. Boiler tubes can contain water (water-tube boilers), or there may be flames in the tubes (fire-tube boilers)
- Heaters use natural-draft burners that rely on the draft (negative pressure) in the furnace's radiant box to induce the air required for combustion
- HRSGs use duct burners for the supplementary firing to produce more steam to satisfy the operation requirements

### Sulfur recovery units

Sulfur recovery units (SRUs) consist of many different fired-equipment elements, so they merit special mention here. The fired equipment and burners found in SRUs are detailed in the following section.

**Air and acid preheater.** Multiple burners and continuous pilots are incorporated into air and acid preheaters. The pilots and burners are individually supervised, each with its own flame monitor. The pilots are lit via integrated spark igniters.

**Reaction furnace.** Typically equipped with one high-intensity burner, reaction furnaces are an important element in an SRU. The high-intensity burner is a forced-draft burner that requires a relatively high air-pressure drop. The burner carries out a thermal conversion process to convert acid gas into sulfur. This conversion operates sub-stoichiometrically, meaning that there is insufficient air to allow complete combustion of the acid gas. The burner is usually ignited by a high-energy, direct-spark ignition system. Optical flame monitors are used to check for the presence of the main flame.

**Reheater burner.** Reheater burners use a single forced-draft, fuel-gas or fuel-gas/acid-gas fired burner to reheat the process stream above the liquid-sulfur dewpoint prior to entering the next catalytic conversion stage. Burners operate at near stoichiometric fuel-to-air ratios. The burner usually ignites by a high-energy, direct-spark ignition system. Optical flame monitors are used to check for the presence of the main flame.

**Thermal oxidizer.** Thermal oxidizers use either natural- or forced-draft burners to provide the heat input required to combust the SRU tailgas in the incinerator chamber to form sulfur dioxide (SO<sub>2</sub>). Thermal oxidizers can use either single or multiple burners with or without continuous pilots. Optical flame monitors can be ultraviolet (UV) or infrared (IR), and are used to check for the presence of the main flame.



**FIGURE 4.** A burner in a thermal oxidizer in a sulfur recovery unit combusts the incinerator gas to form SO<sub>2</sub>

Figure 4 shows a typical SRU thermal-oxidizer burner.

### Flare system burners

Flare systems form an important part of the emergency relief systems in CPI plants, allowing for safe dissipation and disposal of certain gases by combustion. The flare burner's tip can be located at ground level or elevated on a support structure. Figure 5 shows a typical flare burner with an elevated tip.

There are various types of flares and burner configurations, and their applications depend on the requirements of the process. An awareness of smoke in the flare system is especially important for combustion operations. The various type of flares include the following:

- Pipe flares are used where the gases to be burnt do not create smoke, or there is no requirement for smokeless combustion
- Steam-assist flares inject steam into the flare tip through a series of nozzles to promote entrainment of air to improve combustion and reduce smoke formation
- Air-assist flare tips introduce air directly into the flare tip to improve combustion and reduce smoke formation
- High-pressure (sonic) flare tips use the high exit velocity of the gas to be burnt to entrain air, improving combustion and reducing smoke formation

**Burn pits.** The burn pit of a flare system is equipped with a burner to safely combust hydro-



**FIGURE 5.** A typical flare burner tip helps to dissipate hydrocarbon gases via combustion, and can be located at ground level or on an elevated structure

carbon fluids before they are discharged to the atmosphere. The burner fires horizontally into a pit at ground level.

**Flare pilots and ignition.** In a flare system, the flare burner is equipped with pilot burners, which are used to ignite the flared gases when needed. The number of pilot burners is dependent on the size of the flare. The pilot burners are installed at the flare tip. The pilot burners have their own ignition system. Two main types of ignition systems are used to ignite the flare pilots: flame-front generators (FFG), and high-energy ignition systems. Some flares use both systems as primary and backup ignition sources. If desired, flame monitoring can be installed in the flare pilot.

### Burner inspection

Burners are expected to be continuously reliable and efficient enough to meet the rigorous requirements of the CPI. Periodic inspection and maintenance should be conducted according to the burner manufacturer's guidelines. Malfunctioning burners can result in inefficient combustion or poor flame patterns. This can lead to localized overheating and damage to furnaces or equipment components, resulting in increased maintenance costs. This damage can also cause premature shutdowns due to failure

of critical equipment components, such as tubes or refractory lining. The following is a checklist of the main burner components that operations and maintenance personnel should inspect when developing an inspection worksheet:

- The atomizer of an oil burner should be inspected for any defects or misalignment
- The gas nozzles of a gas burner should be inspected for any defect or deterioration
- The nozzle diameter of an atomizer or gas nozzle should be inspected to ensure that it is within the burner vendor's specification datasheet
- The movement of the mechanical air registers should be inspected to ensure proper free movement
- The gasket at the atomizer of an oil burner must be inspected
- The burner throat should be inspected by measuring its dimension and ensuring it matches the vendor's drawings
- The burner throat must be inspected to detect any damage

In addition to inspecting the various burner components, there are several physical dimensions that must be confirmed in order to ensure correct operations. The main components and allowable deviations from vendors' datasheets that must be measured and verified in the burners are as follows:

- The burner tile diameter must be within  $\pm 1/8$  in.
- The burner tile concentricity (roundness) must be within  $\pm 1/8$  in.
- The tip port angles must be  $\pm 4$  deg
- The bolting dimensions must be  $\pm 1/8$  in.
- The gas tip locations should be no more than  $\pm 1/8$  in. deviation in the horizontal direction, and no more than  $\pm 1/4$  in. deviation in the vertical direction

### Piping and auxiliaries

The integrity of the piping and auxiliaries of the burners also requires attention, and there are certain tasks that must be performed to maintain normal operations. Some

best practices for maintaining burner piping are as follows:

- Perform leakage tests on the burners' associated piping and valves by conducting a soap test or three-in-one gas tester procedure
- Check the pilot pressure regulator setting to ensure that it is within the recommended setpoint
- Verify the tightness of scanners and conduit connections to prevent water intrusion
- Inspect electrical components to ensure that they are working properly, including switches, lights, relays and other related parts
- Check that the pilot gas jet is clear and that the pilot flame is strong

Most burners are fitted with optical main flame-detection systems, which also require maintenance. The following must be checked to ensure best performance of flame-detection systems:

- The sight path from the viewing head to the flame is aligned correctly to provide visibility of the flame
- The head mount and sighting tube are clear from any fouling
- The wiring is installed as specified by the original operation and maintenance manual

### Burner maintenance

A burner's performance deteriorates with operating time due to fouling, plugging and wear on burner components. Fouling, plugging and wear reduce the effectiveness of fuel-air mixing and can affect the flame and heat flux patterns, resulting in lower heater efficiency and heating capability. Burner parts requiring frequent maintenance to avoid serious performance loss or safety issues include the orifice, tip, atomizer, tile, flame stabilizer, register, damper, pilot burner and detection systems.

**Gas tip and orifice.** In a burner, the fuel-gas tips and fuel-gas orifice have drilled ports that direct the stream of fuel into the airstream and combustion zone. These ports must be kept free of foreign mate-

rial that could decrease the effective port size. If the ports become partially or completely plugged, the quantity and distribution of fuel entering the burning zone may vary from the design objective, and combustion problems may occur. The type of material plugging the ports determines how it should be cleaned. Foreign material must be carefully removed from the fuel orifices so as not to affect the orifice dimensions. Fuel tips should be replaced if any orifices exceed the specified diameter by more than one to two twist-drill sizes. If the material is not easily removed, some cleaning guidelines should be followed:

- Soak the burner part in a solvent to loosen the deposit
- Use a twist drill to remove the deposit. Never use a power tool with the twist drill because it is likely to enlarge the ports
- Use a welder's file to gently remove the scale from the orifices. If the scale cannot be removed, the fuel tip or orifice must be replaced
- Use wet steam or hot water if the source of the foreign material is an amine compound, because amines are water-soluble
- Shut down the fuel gas valve and inject steam into the burner if the amine plugging occurs frequently without removing the burner. Note that injection cleaning may not clear all tip ports equally
- Soak the tips in a hydrocarbon solvent, followed by cleaning with a twist drill if the tips are plugged with polymers
- Remove the coking, polymer or solid deposit by oxidation in a small, high-temperature furnace. Many tips can be cleaned at the same time with this technique

**Oil tip and atomizer.** Fuel-oil tips are harder to maintain than gas tips and require more frequent cleaning. Tips in light fuel-oil service may have only a slight carbon-like deposit on the surface. To clean fuel-oil tips, do the following:

- Use a wire brush to remove slight carbon-like deposits. Tips

in heavy fuel-oil service will usually have stubborn hard deposits on the surface and in the ports

- Use steam cleaning or a twist drill, in combination or individually, to remove harder deposits. It is not recommended to use a power drill or tool to clean ports or oil tip surfaces, as any nick or notch on the oil tip's surface acts as a site to collect oil and accelerate tip-coking problems
- Soak the tip in a solvent, followed by blowing steam through the orifice to remove the remaining oil or solid deposits
- Handle the atomizer carefully when removed from the oil gun to protect the labyrinth seal. This seal separates the oil from the steam by a series of rings on the atomizer with a tight tolerance between the atomizer and the gun body. If the atomizer is continuously getting stuck and cannot be removed from the gun without breaking the atomizer, the metallurgy may be at fault. In this case, it is recommended to exchange the atomizer metallurgy with a different metallurgy than that of the oil tip

**Burner tiles.** The unique profile of a burner tile's surface is challenging to reproduce, making tiles difficult to fix and return to service successfully. Also, the refractory of the tile undergoes phase transformation while in service, and refractory repairs usually do not adhere to the surface for very long periods of time. Burner tiles should be replaced if they experience any cracks or deformations. Especially of concern are major cracks, mainly in wall- or roof-mounted burner tiles, where the tile pieces are expected to fall. Also, one should look carefully for multiple cracks in a section, which present evidence of crushing due to restrained expansion, and are reason for replacement. The primary or oil tile shall be checked as well. If it is badly pitted or cracked, the recirculation of gases within the tile is uneven, and coking can occur on the tile. This coking can lead to oil dripping and spilling from the burner. If this is observed, the tile

must be removed and cleaned.

**Flame stabilizer.** Different flame-stabilizer designs are used to maintain a stable flame in the combustion zone. For natural-draft burners, these designs take into account the diffuse cones, ledges and tapered tiles of the burner. Poor conditions or the absence of a stabilizer can result in unsatisfactory flame shape or an unsafe flame that can lift off the burner and leave the zone where combustion is initiated. Operations suffer when part of the flame lifts off the burner due to a damaged stabilizer because irregular, erratic flame patterns occur, and new risks are introduced into the process. A damaged stabilizer must be replaced.

**Air registers and dampers.** All registers and dampers should be exercised periodically to ensure that they are functional. If dampers are inoperable, check the actuator and repair if necessary. Dampers are often inaccessible during operation and repairs must wait until the equipment has been shut down. Clean the register of foreign materials, spilled oil, sand, rust and insulation that blocks airflow. If the register is deformed, possibly due to incorrect operating procedures, or the operating handle is broken, repair or replace the part.

**Pilot burners.** The most common pilot burners used in the CPI are small, heat-release pre-mix burners. The basic parts of these pilot burners include the pilot tip, gas mixer, mixing tube and orifice. The gas orifice is commonly 1/16 in. in diameter and can be easily plugged by pipe scale. This element is cleaned by hand with a twist drill, as previously described. If inspection reveals a damaged pilot tip, the tip should be replaced.

**Flare pilot burners.** When the flare system is in service, monitor the supply pressure and clean the fuel strainers, knockout pots and drains that are accessible from grade. When the flare system is not in service, it is recommended to clean the strainer upstream of the orifice and to inspect the orifice.

Flame-front generators require

maintenance for valves (cleaning), gages (recalibration) and the spark generator (adjusting the spark gap). These ignition systems should be regularly tested to ensure correct operation for unplanned startup.

High-energy ignition systems should be cleaned, inspected and replaced, if damaged. Ignition systems are a critical safety control system, so periodic functional tests of these components is highly recommended, as well as training for the operators.

**Pilot burners with flame detection.** In addition to checking the gas jet above the burner, check that the ionization rod is set at the correct spark-gap distance for ionization and ignition. Also ensure the integrity of the ionization rod's insulation by checking for earth leaks between the rod and pilot body casing by connecting a multimeter at the rod and to the pilot flame retention head.

The inspection and maintenance best practices outlined in this article should provide engineers with the know-how required to ensure optimal longterm operation from all types of burners and all of their components, in many different applications in the CPI. ■

*Edited by Mary Page Bailey*

**References**

1. API Standard 535, "Burners for Fired Heaters in General Refinery Services"
2. API Standard 537, "Flare Details for General Refinery and Petrochemical Service"
3. NFPA 85, "Boiler and Combustion Systems Hazards Code"

**Author**



**Mohammed H. Al-Hajji** is a fired-equipment engineering specialist at Saudi Aramco (WC-1038C Al-Midra Building, Dhahran, Saudi Arabia; Phone: +966-3-880-9591; Email: hajjmh0a@aramco.com.sa) with more than 25 years of oil-and-gas processing experience. His areas of expertise are boilers, heaters, heat-recovery steam generators

(HRSGs), sulfur plants, refractory and insulation materials and water treatment. He is a member of the Saudi Arabia Section of American Institute of Chemical Engineers (SAS-AIChE), Saudi Council of Engineers and Toastmasters International. He earned a B.S.Ch.E. from the University of Tulsa in 1989.

**PROCESS SOLUTIONS**

**FROM FEEDSTOCK TO END PRODUCT**

You won't find a more comprehensive offering of separations and phase contacting process internals than AMACS. Whether it's demothballing, debottlenecking or grassroots, AMACS can provide the components, hardware, know how and field support to streamline your process. From your process inlet to its outlet, AMACS can provide the engineered solutions to meet your desired performance requirements or build to meet your specifications. In short, if it is separations or phase contacting related –contact AMACS!



**RANDOM PACKING**



**STRUCTURED PACKING**



**LIQUID DISTRIBUTORS**



**MESH MIST ELIMINATORS**



**INLET DIFFUSERS**



**TRAYS**

[www.amacs.com](http://www.amacs.com)

AMACS 24-7 Emergency Service Available at (281) 716 - 1179  
© 2013 Amacs Process Towers Internals. All Rights Reserved.

Circle 4 on p. 180 or go to [adlinks.che.com/50982-04](http://adlinks.che.com/50982-04)

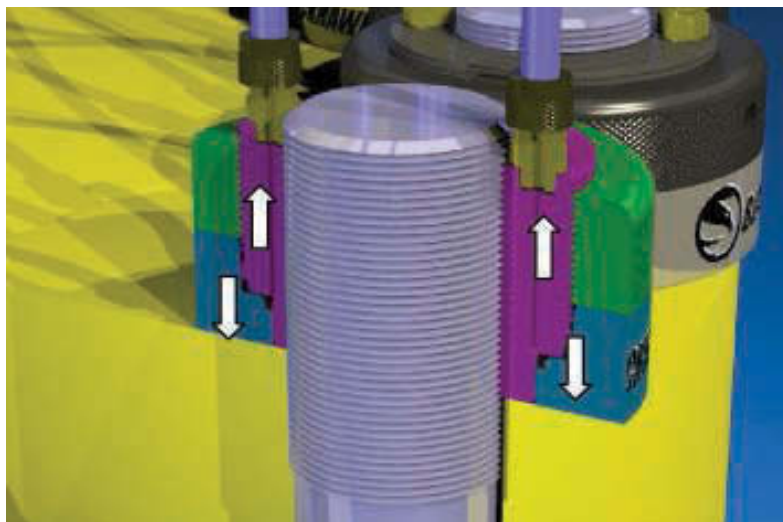
# Critical Connections Demand Certainty

**Understanding bolts' behavior during routine tightening procedures helps to ensure leak-free, reliable operations**

Yvette Schmiz and Gord Britton  
Integra Technologies

Common knowledge dictates that planning ahead ensures effective results, regardless of the task at hand. Controlling the process is essential to controlling the outcome. Operations in the chemical process industries (CPI) require accuracy and attention to detail, right down to some of the smallest elements — bolts. Delays, defects and accidents in the CPI can be avoided by improving the effectiveness and reliability of bolted joints. Many questions arise when considering bolt performance and maintenance. For instance, how often does one pay attention to the behavior of a stud bolt when tightening? How often should routine tightening checks be completed, and how does one know which tightening method is best for a specific application? Some of these issues can be addressed with an understanding of bolts' behavior under various tightening methods.

Bolted flanges are certainly not designed to leak, and simple procedures and maintenance routines exist to help prevent prolonged shutdowns, save on costs and improve overall safety. With proper planning, downtime due to leaks and related issues can be minimized, thus increasing revenue and



**FIGURE 1.** During tightening, hydraulic pressure load within a bolt should be uniformly and accurately applied to avoid gasket damage and other issues that can create leakage

reducing project creep. Most importantly, safety remains the number one focus of the job for the personnel performing the work. It seems all too common that planning for a failure is built into a project's schedule. In reality, planning for zero leaks at startup is a reasonable and completely obtainable goal. This article provides insights regarding tightening methods — specifically torquing and tensioning — for bolted connections, and their importance in preventing leaks and maintaining normal operations.

## Connection fundamentals

Before going into detail about tightening options for bolted connections, it is important to understand the preliminary work that is crucial to a truly successful connection. Flange alignment, both before and during tightening, is essential to the flange's integrity. Particular care is required during the assembly of the flange to avoid misalign-

ment or pipeline tension, both of which can reduce the effectiveness of the bolt load and create circumstances that promote undesirable leakage. Misalignment not only detrimentally affects the bolt load, but may also damage the gasket, bend the bolts or unset the nuts, all of which will adversely affect the joint's integrity.

Gasket seating requires the correct amount of gasket compression. This compression must be uniform around the entire gasket surface. Correct gasket compression is achieved by precise and uniform bolt loading. Distortion of gasketed joints usually causes a non-uniform pressure distribution over the gasket. Joint distortion exists when the flange faces are not parallel or the bolts or studs experience deformation outside of that caused by normal tightening activities. There should be an equal space between the faces at the top and bottom and on each side of the flange.



Flanges become distorted when flexing occurs at the flange, usually due to uncontrolled bolt loads, which leads to leakage at points where compression is too low for sealing. A flange can be checked for distortion by taking a face run-out reading of the flange as it is rotated slowly on a portable lathe. Lasers can also be used for more exact readings. Furthermore, by employing a non-drying blue pigment and an accurate straightedge, the amount of warpage or waviness in the flange face can be detected by observing the contact points. Machining of the faces may be required to restore the flange face to the required flatness and desired sealing surface. Even with relatively rigid flanges, bolt loads can cause a certain amount of bending in the flange between bolt centers.

Internal pressure also adds to the loading on flanges, gaskets and bolts. Internal pressure can cause bolt elongation, add to flange bowing and cause gasket blowouts. The internal pressure creates forces that act to separate the flanges. The bolt cross-section in Figure 1 shows the directional path of applied internal hydraulic pressure through the element. The bolt loads must be uniform and accurately applied to keep the stress in the gasket, resisting gasket blowout. Needless to say, given the variety and intricate details that go into the makeup of a bolted connection — namely, gasket type, sealing-face finish and the flatness and stiffness of the flange — simply adding more bolt load to a leaking joint may not always be the most suitable solution. It is important to investigate the situation and confirm that additional tightening is the best path moving forward. Other options may include flange machining or upgrading the bolts and gaskets themselves.

### Bolt behavior

Any tightening method applied will result in stretching of the bolt. The bolt behaves like a spring, in that it has a certain elastic limit that it can reach and still return to its original shape and size when the



**FIGURE 2. A hydraulic nut on a heat-exchanger flange helps to maintain proper tightness, since the nut stays in place even after a breakout**

force is removed without incurring any distortion. If a bolt is in tension, the stress it experiences is a tensile stress, representing the amount of force applied. Tensile strength is the maximum tension-applied stress a fastener can support before it fractures. The amount of distortion occurring in a part, as long as it is kept within the material's elastic limits, will be directly proportional to the applied force. If the force exceeds these limits, the result is permanent set. Permanent set of a bolt refers to the elongation that remains in a fastener after it is unloaded, and is also commonly known as necking or yielding.

Simply put, necking occurs when a bolt is stretched past the spring-like state and the bolt becomes longer than it originally was. In this situation, the bolt is overstretched and the material to create this length has been displaced from other areas of the bolt. Typically, bolt material is transferred from the diameter when this elongation occurs. It is not visibly apparent when the stud bolt is engaged, but this material migration can cause major problems if ignored or unnoticed. Necking decreases a part's strength, which therefore reduces the integrity of the bolted joint as a whole. When the bolt needs to be tightened again, there will be a new stress-strain curve and the thread pitch (how closely the threads in a screw or bolt are spaced) will change, even on the threads that were not engaged during tightening. Hence, when comparing a new or properly used bolt to a bolt of the same makeup that has previously exceeded its capacity, the threads will not match.

Yield strength is another impor-

tant parameter in bolt tensioning. It is defined as the tension-applied stress at which the fastener experiences a specified amount of permanent deformation. When tightening a bolt, it is crucial to remain below the yield strength up to the proof load. The proof load is typically defined as the tension-applied load that the fastener must support without evidence of any deformation.

Unfortunately, it is a common misconception that simply tightening a joint is something of a cure-all for leaking connections. Of course, there is the possibility that tightening the joint will correct the issue. However, the likelihood also exists that the joint was previously overtightened and therefore has compounded problem areas, including necking issues or distorted flange faces. This brings up a key point that illustrates how essential it is to maintain accurate records of the work performed on each application. Detailed documentation saves time and resources regarding the continued maintenance and performance of any asset.

### Bolt-tightening methods

Several methods of bolt tightening are in practice currently. Bolt-tightening practices and technologies have evolved in many ways over the years. In the past, the tightness of a bolted joint relied almost entirely on the physical strength of the individual operating the manual torque wrench. As technological efforts progressed, the pneumatic impact wrench was introduced to simplify control and provide improved accuracy. Hydraulic torquing followed, further allowing individuals to rely more heavily on the tool itself rather than personal strength. Yet another method, hydraulic tensioning, is a more recent development that can drastically reduce inaccuracies and elevate the level of safety in tightening applications.

Hydraulic nuts are a very versatile type of tool used in tensioning procedures. Installation applications for hydraulic nuts include heat exchangers (Figure 2) and re-

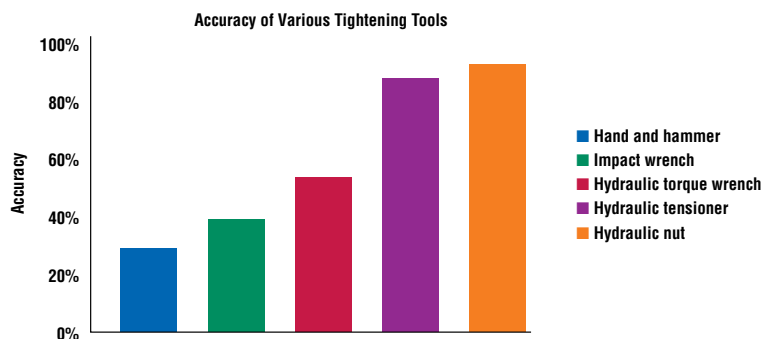


**FIGURE 3.** Hydraulic nuts can be applied on a reactor manway flange for tightening via the tensioning method

actor manway flanges (Figure 3), among others. The primary distinguishing feature of hydraulic nuts compared to other tightening tools is that the hydraulic nut remains on the application flange until the next breakout, essentially replacing the nut itself.

The possibility of damaging a bolt during the tightening procedure should be taken into account, regardless of the method selected to perform the job. However, the accuracy in properly distributing the desired load varies when comparing bolt-tightening methods. For example, tools used for tensioning are designed to not cause yielding in the stud. As long as the correct calculations are taken into account and tools are used properly, it is physically impossible for stud yield to occur with tensioning. Tensioning also eliminates the risk of galling (wear due to adhesion between surfaces) during breakouts.

Each application is different, and there are various factors to consider when determining the best tightening method for individual cases. In some cases, tensioning can be the safest and most accurate method available, but there are specific requirements for its application, including stud spacing and the number of exposed threads on the length of the bolt. Stud spacing is a limiting factor for the application of tensioning because there must be enough room between studs on the flange for the tools to maneuver. Also, there must be an



**FIGURE 4.** Accuracy is crucial in bolt-tightening applications, because improper loading can result in damage or failure

adequate length of exposed thread (typically 1.5 times the diameter of the thread) for the tool to adhere to, unless customizations have been applied to the tools.

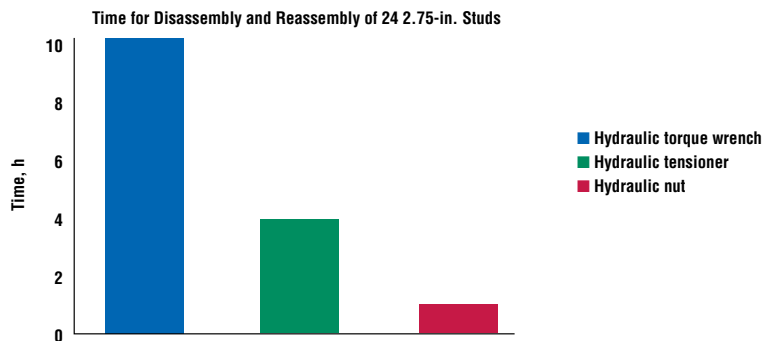
When compared to other bolt-tightening methods, tensioning has many advantages. Bolt tensioning uses a hydraulic jack to apply force directly to the end of the bolt. The stud bolt is “stretched” to a pre-defined limit or proof load, and the operator is then able to tighten the nuts to the flange face. Also, unlike other methods, friction is not an issue with tensioning. The hydraulic load is transferred from the tensioner to the nut by a simple turn of the nut by hand. After this maneuver, the stud bolt remains tensioned.

Despite these advantages, tensioning is not the most common method of bolt tightening applied in industry. Currently, the most common bolt-tightening method is torque tightening, or torquing. Torquing uses the thread helix of the turning nut to elongate the bolt. Obtaining uniform bolt loading to seal the gasket with torquing is challenging, due to difficulties related to controlling friction. Cross-talk (elastic interactions between grouped bolts) in the flange also hinders bolt-loading uniformity when torquing is applied.

Another advantage is that the process of tensioning is not dependent on the type of lubricant used. Torquing is greatly affected by friction, and proper lubrication is crucial. Friction is found both under

the bolt head and in the threads of the stud during tightening. Friction is the biggest issue that must be considered when calculating the appropriate yield for each application. About 50% of the input torque goes directly toward mitigating the friction found under the bolt head. Another 40% of the input torque is lost in the thread frictions, leaving the remaining 10% of input torque to stretch the bolt. The application of lubricants helps to reduce friction in these situations. A well-lubricated bolt will stretch more and exert a higher clamping force than a dry bolt. The bolt force applied must be great enough to create a “flow” phenomenon at the surface of the gasket material and cause it to yield and seat effectively. The bolt force must always exceed the force due to internal pressure to ensure the contents passing through the connection points remain contained.

When torquing a bolt set, immediately after the fasteners are tightened, the assembled joint will relax with an accompanying loss of 2–11% of initial bolt preload — the tension caused by the tightening action itself is diminished. Several events may happen in the joint, including: rough spots on contacting surfaces may flatten; mating threads may accommodate to each other; the bolt head and nut may embed into the jointed material; and fasteners may adjust to non-parallel bearing surfaces. These reactions cause relaxation. Relaxation of the load at bearing surfaces, along with friction



**FIGURE 5.** The time required for tightening procedures varies with the type of tool used — hydraulic nuts' simplicity allows for quicker completion of tightening tasks

and cross-talk, reduce the accuracy of torquing methods. Figure 4 shows a comparison of the accuracy of various bolting tools. Torque methods often only have a bolt-load accuracy of 50%. With critical connections demanding precise control over bolt load and uniform gasket stress, torquing can fall short in these areas. Conversely, hydraulic tensioners and nuts provide increased bolt-load accuracy. The tensioning method eliminates the effect of friction under the nut and between threads by applying force directly to stretch the bolt. By taking friction and cross-talk out of the equation, more accurate bolt loads are obtained. To ensure leak-free startups, bolt loads applied by hydraulic nuts are approximately 90% more accurate than torquing.

Employees' time is another resource that must be considered when examining bolt tightening and maintenance. With tensioning, every alternate bolt or every individual bolt may be tensioned simultaneously to pull down the flange evenly. Multi-stud tensioning eliminates bolt load cross-talk. Bolt tensioning can simultaneously achieve accurate and predetermined bolt loading in a single operation, providing the uniform gasket compression that is essential for the integrity of critical bolted connections. Particularly on larger flanges, bolt tensioning can also be significantly quicker than torque tightening. Since torquing tightens each bolt in succession in a star-like pattern across the flange face, a multi-pass

approach is required. Some of the already tightened bolts may need to be re-tightened throughout the entire procedure, thus requiring significantly more time. Figure 5 illustrates that torquing operations require considerably more time than hydraulic tensioning methods. Tensioning can potentially reduce the time required to remove and replace large, high-pressure flanges by up to 80%. Furthermore, when compared to other methods, less manpower will be required to accomplish the same tasks when tensioning is applied.

Because tensioning facilitates simultaneous tightening, any number of tensioning tools can be connected together. This sort of configuration can simultaneously tension either 50 or 100% of the bolts on a given flange, producing uniform gasket compression and eliminating the damage incurred by bowing or overloading the flange. Underwater tensioning is usually 100% simultaneous to simplify the work of the diver. Topside applications generally tension alternate bolts in two passes from the same side of the flange. Stud bolts are set with an additional one diameter of length protruding on the same side. Hydraulic bolt tensioners are fitted to every other bolt for the first pass before being moved to the remaining bolts for the second pass. Where access is restricted, some bolts can be tensioned from the other side of the flange. Subsea applications are set with the additional length protruding on alternate sides of the flange.

Hydraulic bolt tensioners are attached to every bolt on alternate sides of the flange in order to obtain 100% simultaneous tensioning. Tensioning's simultaneous tightening capabilities across a flange face greatly decrease the amount of time spent on each face. Since the nuts remain on the face, tensioning also eliminates the threat of inherent pinch points while tightening stud bolts. Pinch points are areas where a technician's skin or extremities can get pinched by tools, causing potentially catastrophic injuries. Along with creating a safer work environment for personnel, this type of procedure results in a more effective and faster turnaround, greatly reducing costs.

CPI operations demand a certainty of outcome to deliver reliable, leak-free connections with zero delays and zero accidents. New bolt-tightening technologies, such as multi-stud tensioners and hydraulic nuts, should certainly be considered to help deliver the high level of reliability that critical bolted connections in the CPI demand. ■

*Edited by Mary Page Bailey*

## Authors



**Yvette Schmitz** is the Gulf Coast sales and marketing coordinator for Integra Technologies (3238 E. Pasadena Frwy., Pasadena, TX. 77503; Phone: 713-920-2400; Website: [www.integratechnologies.com](http://www.integratechnologies.com); Email: [yschmitz@integratechnologies.com](mailto:yschmitz@integratechnologies.com)). She works closely with the senior engineers of Black-Hawk Engineered Products, a division of Integra Technologies, offering services, sales and rentals pertaining to critical connections to the U.S. and Canada. Prior to joining Integra in 2013, Schmitz served as director of design and product development at SOMO Generations. She attended the University of North Texas, receiving a bachelor's degree in fine arts in 2009.



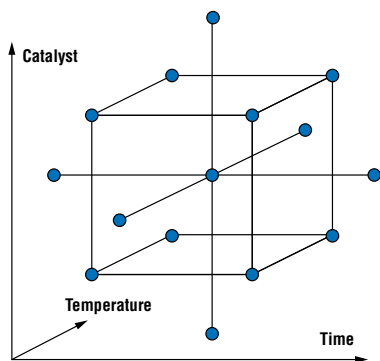
**Gord Britton** is president and co-owner of Integra Technologies (same address as above). Britton is a professional engineer, with many years of experience within the industry. He has written and presented several papers on bolted, gasketed sealing technologies and is the creator of the FlangeTrak leak-prevention process. He is the co-developer of five patents and pending patents on hydraulic tensioning technology. He has also authored a chapter for McGraw Hill's Piping Handbook.

# Design of Experiments (DoE): Optimizing Products and Processes Efficiently

Learn how DoE can help save time and money in process design and optimization with this primer

Wilhelm Kleppmann  
Hochschule Aalen

Experiments are done to quantify cause-and-effect relationships between adjustable parameters (inputs, factors,  $x$ ) and the results (outputs, responses,  $y$ ). They help to answer questions like: How do the ingredients and proportions of a mixture (inputs) influence its properties (outputs)? How do process parameters like temperature and stir-rate (inputs) influence the



**FIGURE 1.** Shown here is the central composite design for the factors used in the example. The corners of the cube are at time 40 and 50 min, temperature 80 and 90°C and catalyst amount 2 and 3%

Reaction time	Temperature	Catalyst	Conversion	Thermal activity
(min)	(°C)	(%)	(%)	
40.0	80.0	2.0	74.0	53.2
50.0	80.0	2.0	51.0	62.9
40.0	90.0	2.0	88.0	53.4
50.0	90.0	2.0	70.0	62.6
40.0	80.0	3.0	71.0	57.3
50.0	80.0	3.0	90.0	67.9
40.0	90.0	3.0	66.0	59.8
50.0	90.0	3.0	97.0	67.8
45.0	85.0	2.5	81.0	59.2
45.0	85.0	2.5	75.0	60.4
45.0	85.0	2.5	76.0	59.1
45.0	85.0	2.5	83.0	60.6
36.6	85.0	2.5	76.0	53.6
53.4	85.0	2.5	79.0	65.9
45.0	76.6	2.5	85.0	60.0
45.0	93.4	2.5	97.0	60.7
45.0	85.0	1.7	55.0	57.4
45.0	85.0	3.3	81.0	63.2
45.0	85.0	2.5	80.0	60.8
45.0	85.0	2.5	91.0	58.9

yield of a reaction and the purity of the end product (outputs)? Which settings offer the best compromise between conflicting aims, such as yield and purity? What range of inputs is permissible without causing out-of-specification outputs?

Design of experiments (DoE) looks at a complete experimental program, that is, a whole set of factor level combinations (individual experiments, runs) and addresses questions like: How should I distrib-

ute these runs in design space (that is, the plausible range for all factors) to gain as much information as possible? How many runs do I need to achieve the desired accuracy? In what order should I do these runs to avoid spurious results? And afterwards, DoE helps to draw the right conclusions from the results.

DoE can be used on its own. But DoE is also the crucial learning method within a Six-Sigma-Strategy (the Improve), or the more

chemically oriented Quality by Design (QbD) methodology. Experiments are done with many different aims. Correspondingly, DoE is not an individual tool, but rather a collection of ideas, or a toolbox. It is an adaptation of statistical methods to industrial experimentation.

The aim of this article is to give an introduction and an overview to help you decide whether DoE is useful for you.

Generally speaking, DoE is not a cure-all in itself. However, it is a valuable set of tools that helps you, the process expert, to learn as much as possible from as few individual experiments as possible in order to save time and money and to get better, more reliable results.

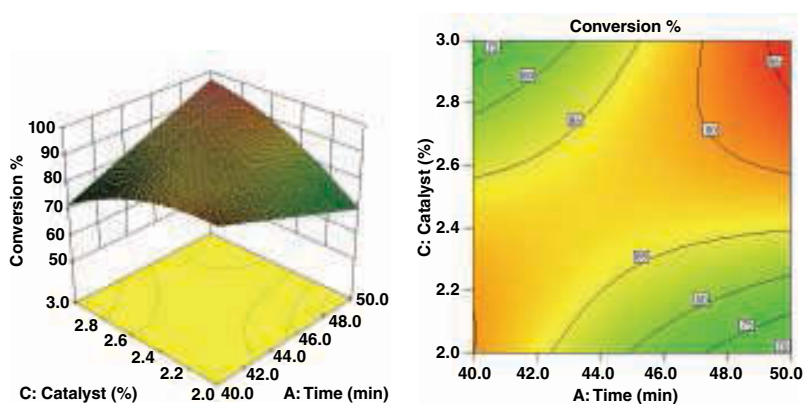
### Introductory example

To show what DoE is about, let me start with an example [1]. Important factors influencing a particular chemical reaction are as follows:

- Reaction time — best results are expected in the range 40 to 50 min
- Reaction temperature — best results are expected in the range 80 to 90°C
- Catalyst amount — best results are expected in the range 2 to 3%

Important results or responses are the conversion (yield, in percentage), which of course should be as high as possible, and the thermal activity — a dimensionless quality characteristic, which should be in the range 55 to 60, ideally near the middle of this range. This sort of starting information is initial process knowledge and is crucial for the success of a DoE.

The design space, then, is the cube defined by these three factor ranges (or slightly beyond). The experimental design is a list of points in this design space. Figure 1 shows the design used in this case — a so-called “central composite design,” which is a frequently useful standard design. The points are at the corners and center of the cube defined by the above ranges, and at axial or star points slightly outside the face-centers of the cube. It is graphically obvious that the design points are evenly distributed in the region of

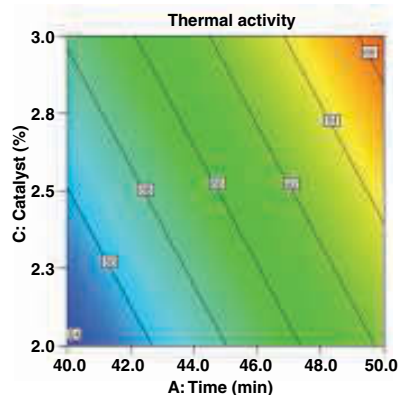


**FIGURE 2.** The response surface (left) shows the dependence of conversion on time and catalyst for a constant temperature of 90°C. Projecting this surface onto the catalyst-time plane gives the contour diagram (right)

interest and therefore well suited to learn as much as possible about the dependence of the responses on the factors in these ranges — and this is what DoE is all about.

Table 1 shows the experimental design and the results used for the example. Every line is an individual experiment, called a run. All runs together are the experimental design, the experimental program as a whole.

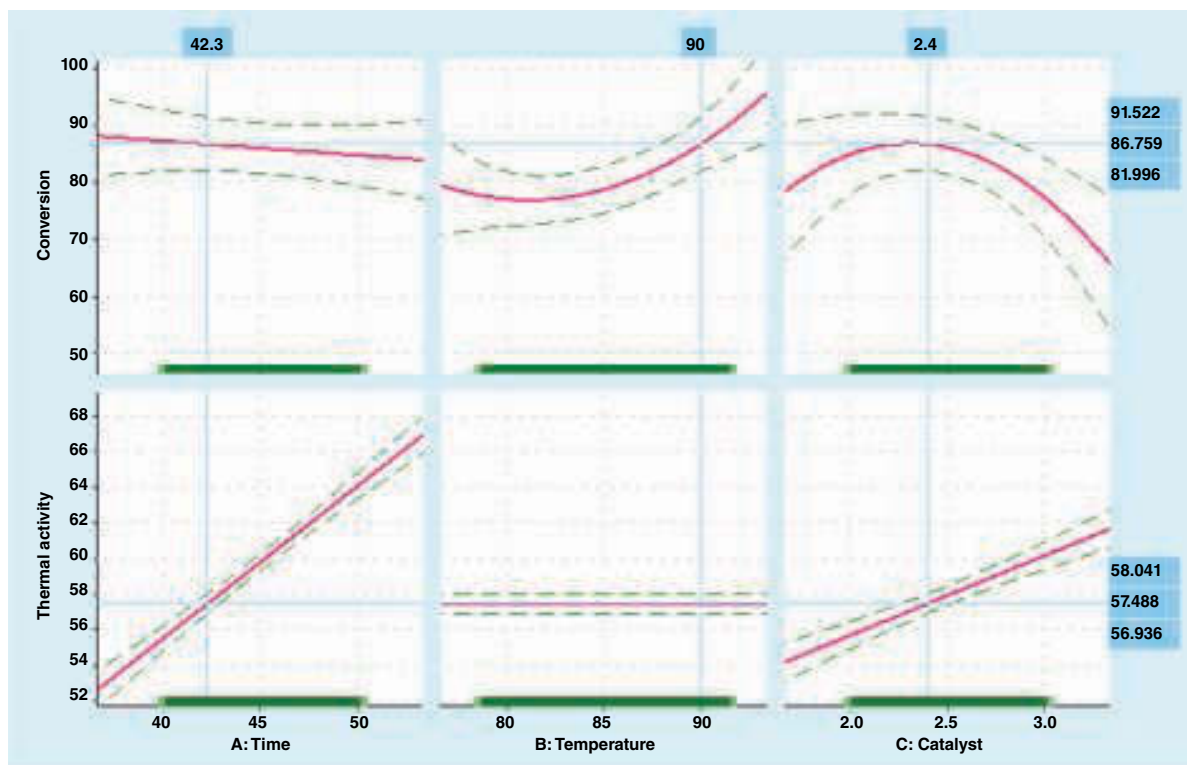
Using suitable software, models are fit to the data — usually, low order polynomials (mainly quadratic) are used. They smooth out random variation and sort of interpolate between the observed results. These models can then be presented graphically. From them we see that the conversion is highest at high temperatures and the thermal activity is independent of temperature. So the highest temperature is obviously the best. Figure 2 shows the fitted model for conversion as a function of time and catalyst as a surface in space (the z-axis is the response conversion) — the so-called response surface. Figure 2 also shows the same dependence as a contour diagram, to be interpreted like a map. The surface has the shape of a sloping ridge, the highest conversion being achieved for a time of 50 min and 3% catalyst. Always try to understand the model bearing in mind what you already know about your process. This is an excellent way of learning



**FIGURE 3.** This contour diagram shows the dependence of thermal activity on time and catalyst for any temperature (it is independent of temperature).

more about the cause-and-effect relationships in your process.

Figure 3 shows the contour diagram for the thermal activity. It is lowest for time 40 min and 2% catalyst and highest at 50 min and 3%, increasing linearly from one corner to the other. Comparing Figures 2 and 3, one recognizes that highest conversion (about 87%) combined with thermal activity in the middle of the range 55 to 60 is achieved at 42.3 min with 2.4% catalyst at a temperature of 90°C. Better conversion (about 96%) would be achieved at 50 min with 3% catalyst, but the thermal activity (67%) is far outside the permitted range. Also, for temperatures greater than 90°C, higher conversion is expected.



**FIGURE 4.** Intersection plots or profiles are useful for graphical optimization. On the left, the dependence of conversion and thermal activity on time (for temperature 90°C and catalyst 2.4%) shows that conversion is almost independent of time while activity increases rapidly with time. The middle graphs show the behavior of conversion and thermal activity versus temperature (for time 42.3 min and catalyst 2.4%). The right-hand graphs show conversion and thermal activity versus catalyst (for time 42.3 min and temperature 90°C)

In this comparatively simple situation it was possible to find an optimal compromise by looking at the contour diagrams. Often there are more than three factors or more than two responses, and graphical optimization is tedious or even impossible. Therefore, good software helps to find compromises. Frequently the so-called “desirability” is used as a standardized way of telling the software what the user wants. Alternatively, intersection plots or profiles, as shown in Figure 4, can be used for graphical optimization. Intersection plots show the dependence of all responses on all factors, when the other factors are held constant at the values given. These curves are cuts (intersections) through the response surface, such as the surface in Figure 2. Changing the fixed value for any of the factors changes the shape of the curves for the other

factors, because the cut is made in a different position.

The red lines in Figure 4 show the model, the dashed green lines above and below show the 95%-confidence interval (an estimate for the uncertainty of the model). The solid green lines at the bottom of all diagrams indicate the ranges covered in the experiment.

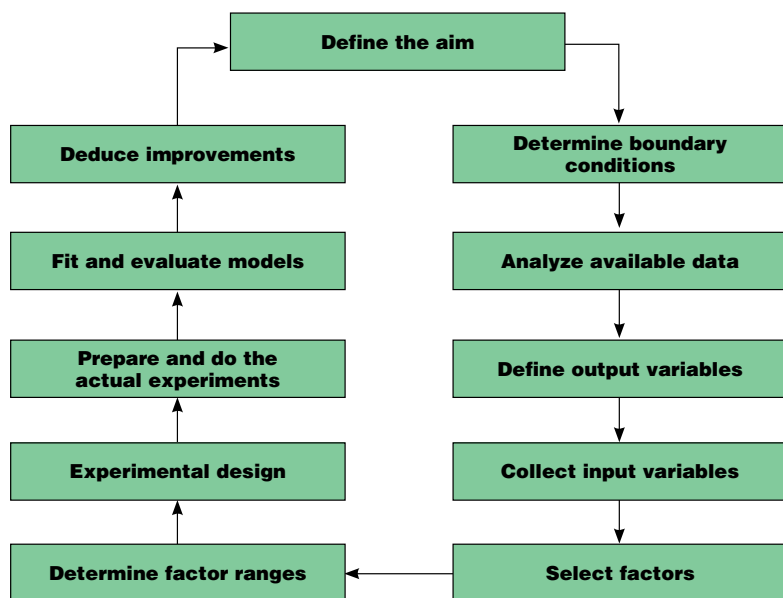
The aim of this introductory example is to show what an experimental design can look like, what sort of results can be obtained, how the resulting models can be visualized and how they can be used to better understand the cause-and-effect relationships and find compromises between conflicting aims.

However, it is important to realize that experiments can also be done for completely different reasons. For example, you might be interested in reducing random variation of the results or become

independent of noise or nuisance variables (robust processes).

Finally, let us have another look at Figure 2. Please note that for a catalyst amount of 2%, an increase in time leads to a decrease in conversion, while for a catalyst amount of 3%, it leads to an increase in conversion — the effect of time on conversion depends on catalyst amount. Similarly, the effect of catalyst amount depends on time. In DoE, this behavior is called an interaction between the factors time and catalyst for the response conversion: the effect of one factor on the response depends on the value of the other factor.

Experimentally, interactions can only be detected if both factors involved are changed simultaneously. This is an important aspect of DoE and runs counter to the frequently heard advice to only vary one factor at a time.



**FIGURE 5.** The experimental cycle, described in the text, is summarized here

## The experimental cycle

Learning from experiments is done in cycles, as shown in Figure 5. Each cycle starts with a problem to be solved or with questions to be answered — the aim, which should be as quantitative as possible. After careful preparation, the factors and their ranges are chosen. These steps are crucial for the success of designed experiments. Then the actual design is set up, the experiments are done, the models fitted and the conclusions drawn. Several such cycles may be required.

**Define the aim.** What improvement is wanted or what problem is to be solved? A good aim has the following properties:

- Specific and precise
- Measurable
- Accepted by everybody involved
- Realistic

A good starting point is the customer (internal or external). Leading questions are: What is his or her problem with the present product or process? What does he or she need? How valuable is the expected improvement to him or her?

**Determine the boundary conditions.** When choosing the boundary conditions, the following questions should be considered:

- How much time and money are available for the experiment?
- Is the necessary equipment (both for the experiments and for the measurement of the results) available?
- How many components are involved, or how much material is available? Is it homogeneous?

Often these boundary conditions impose serious limitations on what is possible. They may require adjustment of the aim.

**Analyze available data (if there are any).** The following questions are asked regarding available data:

- What are the present settings for the process parameters? What results are achieved with these settings?
- How much do the results vary? (The standard deviation is a good measure for variation.)

If process parameters, material properties or environmental conditions vary in the available data, it is useful to look for correlations between all of these parameters and all important outputs (responses). Strong correlations may indicate that a parameter is important. But beware of the following:

- If a process parameter is tightly controlled (for example, because

it is known to be important) and therefore does not vary much, no correlation with outputs will be found and it looks unimportant.

- Even strong correlations may be spurious. For example, just imagine that occasionally your starting material is contaminated, and this contamination causes foaming and a low yield. To suppress the foaming, you then increase the pressure. If now you plot yield versus pressure, you will find low yield at high pressure — but it is no cause-and-effect relationship. Only if you decide on the pressure before the experiment (as you would do in a designed experiment) can you be sure that the observed dependence is cause-and-effect.

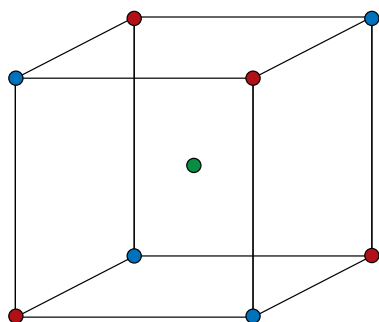
**Define the output variables.** The output variables should represent the aim (that is, from their value you can see whether the problem has been solved and the intended improvement reached or not). Furthermore, all quantities that are important to the customer should be included as outputs. They may be directly measured or calculated from one or several measured quantities.

Outputs should be quantitative (as conversion or thermal activity are in the introductory example), rather than just a yes or no, because numbers contain much more information. If no measurement is possible (for instance, taste), a grade is better than just yes or no, or good or bad.

**Collect input variables.** Collect all variables that may influence the outputs, such as process variables, environmental conditions, material properties and so on. Use your experience and also brainstorm in a small team, to make sure that nothing is forgotten. For a particular process, this list only has to be compiled once (possibly extended later with new experience). It may be very long.

The aim of this list is to not to forget important influences and ensure comparability of the results with later experiments.

**Select factors.** Only after the complete list of input variables is compiled are the factors for the present



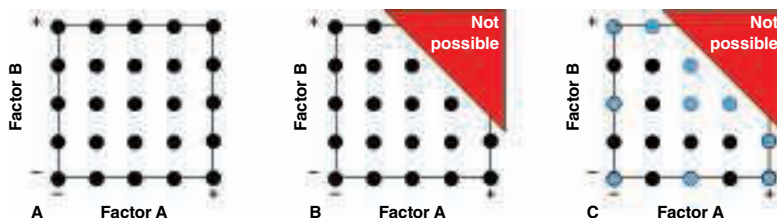
**FIGURE 6.** Shown here is a two-level factorial design. The red and blue points are the full factorial design,  $2^3$ ; only red or only blue points are fractional factorial design  $2^{3-1}$ ; the green point is the center point, which is a recommended addition, if possible

design selected. The selection criterion is the expected importance of the factors for achieving the aim or for the process generally. Good selection is crucial for the success of the whole cycle, because only the effect of factors selected can be determined. So take care and use all your experience. Also, make sure that the levels of all factors can be set independently of each other.

For a response-surface design as used in the introductory example, two to six factors are usually selected. If you cannot decide on such a small number of important factors, a two-step-procedure is used: first, use a screening design, which only has the aim to separate the unimportant factors (the trivial many) from the vital few. And only afterwards use a response-surface design. Details are given later.

The input variables that were not selected are held fixed at their presumed best value (to the extent possible) and this value is documented for future comparability. In this way, the random variation of the outputs is minimized. Inputs that cannot be held fixed (for example, uncontrollable environmental conditions) are measured and documented. If they turn out to be important, they can later be included in the model.

**Determine factor ranges.** The next step is to choose a suitable range for the factors to be varied in the design. Here too, your experience is crucial.



**FIGURE 7.** These graphs illustrate optimal design selection. A) a list of candidates; B) a subset satisfying boundary conditions; C) the final selection (blue)

For response-surface designs as in the introductory example, a promising range around the expected optimum should be used. No phase transitions or other dramatic changes should occur in the chosen range. If the chosen range is too broad, the simple smooth models used for the fit do not work. If the range is too narrow, the optimum may not be in the chosen range and the effects of the factors may be so small that they are difficult to detect.

For screening designs, the ranges can be broader, but they should be realistic. The idea is that, if a factor still has no significant effect, it is definitely not important.

**Set up the experimental design.**

There are many good designs. The most suitable one depends on your problem. An overview of the most common designs is given in the next section. One of them is the central composite design in Figure 1. And all of these designs are statistically efficient, which means the model fitting will be as accurate as possible (for a given number of runs).

Generally, setting up the design is done using software, and is normally not a problem. However, there are two questions that I would like to discuss here, as follows:

- How often should each point in the design be done (that is, replicated)?
- In what order should the individual experiments be run?
- How often, that is, how many runs altogether? This is a trade-off

Obviously, the more runs there are, the more expensive the whole experiment becomes. And frequently the boundary conditions dictate the maximum number of runs possible.

On the other hand, more runs give more accurate models. Aver-

ages vary less than individual results and the width of confidence intervals decreases inversely as the square root of  $n$ , the number of runs, ( $n^{-1/2}$ ). So, for example, you need four times as many runs to double the accuracy (at least as a good approximation). A term in the model fit to the data is called statistically significant if it is bigger than the width of its confidence interval, that is, if it stands outside of random variation. This happens earlier, if there are more data.

In what order? Use randomization whenever possible and blocking when appropriate.

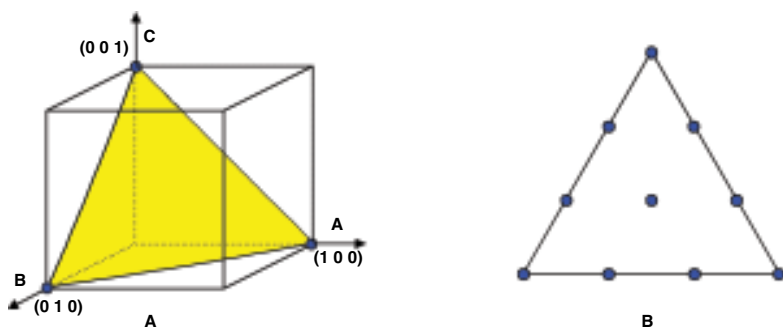
Randomization means doing the runs in randomized order, that is, mixed up, not in the systematic order shown in Table 1. If randomization is used, then a trend in the data (for instance, due to aging of a chemical or degradation of an apparatus) or an unexpected change cannot lead to a systematic error in the model.

Blocking means keeping expected differences (for example, different lots of the raw materials, different operators) out of the random variation (and thus increasing the accuracy and sensitivity of the experiment). This is achieved by a careful balancing of the levels of all factors between the blocks.

**Prepare and do the actual experiment.** The basic principles here are care and attention to detail. The designs are very efficient — all data are used for fitting all model terms. Therefore, every single data point is important. Frequently useful steps are as follows:

- Plan all necessary resources (material, equipment, personnel) and make sure all materials are available, homogeneous and so on; all





**FIGURE 8.** These graphs show the principle of a mixture design. A) Since the sum of all components must be 1, the possible values are restricted to a triangular part of a plane. B) Example for a mixture design in the plane of Figure 8A

equipment is in good working condition; all personnel are well trained, and so on

- Write down the experimental and measuring procedure in detail and practice it beforehand
- Test whether possibly problematic extreme combinations in your design still work
- Calibrate your measuring equipment and do some repeat-measurements to know the random variation and pitfalls of your equipment before, and take appropriate precautions
- Make sure all runs are done in the planned order (and not re-ordered for convenience) — the “messed up” (randomized) order is intentional
- Stay with the experiments, particularly if they are run in a production environment or if it is the first designed experiment. Many surprising discoveries have been made in that way
- Document any departures from the procedures laid down, even if they seem unimportant at first. Document environmental and other relevant conditions run-by-run
- If there are any departures from the planned design, always use the actual factor values in modeling (rather than the design values)
- Make sure that no settings or results are confused — this could have a dramatic effect on the modeling. Check all results for plausibility

**Fit and evaluate models.** This is done using suitable software.

Usually simple polynomial models are fitted using standard linear or quasi-linear regression, a common statistical procedure. Model terms that are significant (that is, those that are larger than random variation) are retained in the model. The usual criterion is the  $p$ -value, which is the probability with which the observed term, or an even bigger one, occurs by chance, given the observed random variation. If this  $p$ -value is small (often  $<5\%$ , but this is only a guideline), the corresponding term is called significant.

There are many diagnostic plots of the residuals (that is, deviations from the fitted model) to help in checking the results. The most important ones are as follows:

- Normal plot of residuals: Deviations from a normal distribution can be recognized, in particular outliers — these are results that are unusual. The reason may be a mistake in the experiment, but it may also indicate that something new happens at the factor-level combination (setting) involved
- Residuals in the run order: Trends or sudden changes may be recognized
- Residuals versus factors: Systematic deviations from the model can be detected
- Box-Cox-plot: It shows whether a transformation of the response (for instance, taking the logarithm) leads to a model that fits the data better

A wide variety of further diagnostic information is given, such as the following:

- Lack-of-fit: It checks whether the systematic deviations from the model are comparable to the random variation found from replications at identical settings of the factors
- Predicted  $r^2$  or cross-validation: It checks the capability of the model to predict responses at settings not used for fitting the model, to avoid overfitting

**Deduce improvements.** If the model is good, it can be plotted for a response-surface design as shown in Figures 2, 3 and 4. As shown in the introductory example, these plots can be used for a better understanding of the cause-and-effect relationships in the process or product studied and for finding optimal compromises between conflicting aims. A confirmation experiment at this setting rounds off the program.

For screening designs, the results can be used to distinguish between important and not so important factors to then investigate the important factors in a response-surface design. Or the results can be used to identify the direction of steepest improvement, if one is far from the optimum — and then proceed in that direction.

In other words, either the improvement is complete after the current cycle or a new cycle starts. In any case, important new information has been gained.

### Typical experimental designs

There are many different experimental designs. They all have in common that they are efficient for a particular purpose. What follows are some typical designs.

**Two-level factorial designs.** Figure 6 shows a two-level factorial design for three factors. The full factorial design consists of all  $2^3 = 8$  corners of the cube (the red and the blue points in Figure 6). With it, only linear effects of the factors and all their interactions can be determined. For  $k$  factors, the design consists of the  $2^k$  corners of a  $k$ -dimensional cube.

If all factors are numerical (as in the introductory example, where any value between, for example,

time 40 and 50 min is possible), a center point (green) is strongly recommended. For categorical factors (for example, Supplier 1 and Supplier 2, or solvents water and alcohol), no center is possible. Even if the other points are not replicated, at least the center point should be replicated to get an independent measure for the random variation of the results.

The first eight runs in Table 1 are a full factorial  $2^3$ , the next four runs are the replicated center (in systematic order, they should of course be randomized).

With a center point, a departure from linearity can be recognized (although it cannot be attributed to a particular factor). However, as Table 1 shows that a full factorial with center can later be extended to a central composite design, simply by adding extra runs.

Factorial designs are very efficient, particularly if the random variation is noticeable. The effect of each factor is the difference between the average of all four points on one face of the cube and the opposite face, that is, each result is involved in the calculation of each effect.

Only the four red points or only the four blue points (if possible combined with the center) are a fractional factorial design. Fractional factorial designs contain only a fraction (here half) of the points of a full factorial design. Their advantage is that they contain fewer runs and therefore need less effort. The disadvantage is that not all effects can be calculated separately (this is called confounding). This may involve a risk, but if a suitable design is selected carefully, they are very useful for screening. More details are given in the literature below.

**Central composite designs.** A central composite design was used in the introductory example and is shown in Figure 1. Central composite designs are very useful for fitting response-surface models and optimization. Central composite designs are very efficient if they fit the situation, that is, when only numerical factors and all points shown in Figure 1 are possible. In

more complicated situations, optimal designs are used.

**Optimal designs.** Optimal designs are not better than central composite designs, but they are more flexible, and they are used in most non-standard situations. They are particularly useful when the following conditions exist:

- If there are some numerical and some categorical factors (and mixture factors, see below)
- If specific (more complicated) models are known to be required
- If specific boundary conditions are to be taken into account
- If factors restrict each other, that is, if certain combinations are not possible (for instance, high temperature combined with a long reaction time, or low temperature with short reaction times)

Optimal designs require software for setting them up. Figure 7 illustrates the basic idea for the case of two factors A and B that restrict each other — in this case it is assumed that high values of A (marked +) cannot be combined with high values of B (+). The starting point is a list of settings far greater than necessary (Figure 7A; here  $5 \times 5$ ). Taking away the settings that are not possible still leaves much more than enough (Figure 7B). The task then is to select the subset that is most suitable. This requires specifying the model to be fitted (frequently quadratic), the number of settings to be included (which must be larger than the number of terms in the model) and any further boundary conditions. Using an exchange algorithm, the software then chooses iteratively a “best” subset that satisfies all conditions. For “best” there are different optimality criteria, which in practice do not differ very much. Figure 7C shows such a selection (marked blue) from the 19 candidates in Figure 7B for a quadratic model (which contains six terms), if the ten (>6) “best” points were wanted.

**Mixture designs.** The components of a mixture cannot be varied independently of each other; the sum of all components is fixed, usually to 1 or 100%. For example, for three

components, only two can be chosen independently, the third is then fixed. Figure 8A shows the principle. The setting of the three components cannot vary within the cube, but are restricted to a triangular part of the plane. Mixture designs take that into account, as exemplified in Figure 8B.

If within the same experiment, components of a mixture and process variables (like temperature) are varied, an optimal design has to be used, as there are no suitable standard designs. An optimal design also has to be used if there are restrictions on the ranges of the components.

### Advantages & limitations of DoE

DoE as a systematic procedure offers many advantages, including the following:

- Systematic preparation of experiments, involving everybody concerned and clear aims
- All results are used for the calculation of all effects, resulting in efficient use of the data and reduced numbers of runs
- The number of runs required and hence the resulting costs can be estimated in advance
- Interactions between factors can be detected, resulting in an improved and quantitative description of the cause-and-effect relationships — allowing good compromises even for conflicting aims
- Consequences are drawn only from statistically significant results — this avoids chasing after spurious results
- The results of an experiment are presented systematically and graphically — this improves the transfer of experiences to new but similar contexts.

DoE is particularly advantageous when the following situations occur:

- If there is appreciable random variation, which might lead to spurious results without the use of statistics
  - If several factors influence several responses, all in a complicated and not obvious way
- Typical savings reported using

## Feature Report

DoE are in the range 40 to 75%, both in time and money. Savings up to some millions of dollars have been reported (of course only in high-volume production).

However, if your process is still a very long way from optimum and you know obvious improvements (based on your process knowledge), you should harvest these improvements and get closer to the optimum first. DoE is efficient, if the direction of further improvement is no longer obvious and you need a systematic search for further improvement.

DoE is efficient if the response surface is smooth, as in the introductory example and in most common applications. However, if the response surface contains sudden jumps (discontinuities, such as phase transitions) or narrow spikes (for instance, resonances), difficulties arise. For sudden jumps, you should first decide, which side of the jump is better and then stay on that side — never fit a model across the discontinuity. Narrow spikes in several factors would require huge amounts of data to localize, therefore you should keep the factor causing the resonance separate, optimize with respect to the other (smooth) factors first and then search for the resonance in one factor only, or always only measure the peak of the resonance.

DoE is a powerful technique to learn from experimental results. To get the best out of it requires some experience to select the most suitable design, to handle the initially unfamiliar software, to help interpret the results and learn from them. For your first project, you should either get somebody with experience to help or start with a simple project with at most three factors and progress to more complicated applications gradually.

### Brief guide to the literature

The aim of this article was to give an introduction to what DoE can do to help optimize processes and products, describe the procedure and give an overview over designs. More details can be found in the literature. A small selection of suit-

able books is provided below in the References section. The level of the books range from a short introduction [2] through those with higher levels of detail and difficulty. A more detailed introductory book is available in German [3]. Software-based introductions are available for factorial designs [4] and response-surface design [5]. Ref. 6 is a very readable book showing the flexibility of optimal designs, based on examples. Ref. 7 is a very good and detailed classic, mainly on factorial designs. A classic on response surfaces (including the introductory example) is Ref. 1. Finally, Ref. 8 is a classic on mixtures (a shorter version has been published more recently). ■

*Edited by Gerald Ondrey*

### References

1. Myers, R.H., Montgomery, D.C., and Anderson-Cook, "Response Surface Methodology: Process and Product Optimization Using Designed Experiments," 3rd ed., John Wiley & Sons, Inc., Hoboken, N.J., 2009.
2. Antony, J., "Design of Experiments for Engineers and Scientists," Elsevier, Inc., Waltham, Mass., 2003.
3. Kleppmann, W., "Versuchsplanung - Produkte und Prozesse optimieren," 8th ed., Carl Hanser Verlag GmbH & Co. KG, Munich, Germany, 2013.
4. Anderson, M.J. and Whitcomb, P.J., "DOE Simplified: Practical Tools for Effective Experimentation," 2nd ed., Productivity Press Publishing, New York, N.Y., 2007.
5. Whitcomb, P.J., and Anderson, M.J., "RSM Simplified: Optimizing Processes Using Response Surface Methods for Design of Experiments," Productivity Press Publishing, New York, N.Y., 2004.
6. Goos, P. and Jones, B., "Optimal Design of Experiments: A Case Study Approach," John Wiley & Sons, Inc., Hoboken, N.J., 2011.
7. Montgomery, D.C., "Design and Analysis of Experiments," 8th ed., John Wiley & Sons, Inc., Hoboken, N.J., 2012.
8. Cornell, J., "Experiments with Mixtures: Designs, Models, and the Analysis of Mixture Data," 3rd ed., John Wiley & Sons, Inc., Hoboken, N.J., 2002.

### Author



**Wilhelm Kleppmann** is a professor in the Dept. of Electronics and Information Technology at the Hochschule Aalen (Beethovenstrasse 1, 73430 Aalen, Germany; Phone: +49-7361-576-4307; Email: wilhelm.kleppmann@htw-aalen.de). In addition to design of experiments, Kleppmann's research interests include six sigma, statistical process control, interpretation and analysis of process data. He has over 30 years of experience in the application of statistical methods in industry. Kleppmann has received B.A., M.A. and Ph.D. degrees in physics from Oxford University.

# RESULT DRIVEN

# INNOVATION

solving complex  
chemical processing  
flow control demands.

### Valving



### Filtration



### Special applications



Quality crafted  
from stainless  
steel aluminum,  
brass and steel.

We'll design, test and  
manufacture or build to  
your specifications!



Fluid Line  
Products, Inc.

Designer and Manufacturer of Fluid Transfer Components

(440) 946-9470 Fax: (440) 946-9472

flp@fluidline.com  
www.fluidline.com

Circle 16 on p. 180 or go to [adlinks.che.com/50982-16](http://adlinks.che.com/50982-16)

# BULK SOLIDS: Operating Direct-Contact Heat Exchangers

Greg Mehos  
Jenike & Johanson, Inc.

**B**ulk solids are frequently used as reactants, catalysts or products in chemical process industries (CPI) operations. Often, they must be heated or cooled so that they can be handled safely or processed at a desired temperature. Traditionally, heat transfer to or from powders is carried out using heated or water-cooled screws, fluidized beds or rotating drums. However, a more economical means of heating or cooling bulk solids may be to use a direct-contact, bulk-solids heat exchanger.

These devices are designed as hoppers, bins or silos that have been modified to allow for the injection of air or another gas. Heat transfer takes place between the powder and gas when the two streams are fed at different temperatures. The cooling or heating gas can be injected from the bottom of the bulk-solids heat exchanger, such that it passes upward through the moving bed of solids (countercurrent), or it can be injected through the walls of the vessel so that it flows perpendicular to the solids flow (cross-current). Countercurrent and cross-flow designs are shown in Figures 1 and 2.

Direct bulk-solids heat exchangers offer a number of advantages over other types of heating or cooling equipment. Because there are no moving parts, capital costs and maintenance expenses are low. They are ideally suited for heat-sensitive materials because using this approach, the temperature of the solids changes gradually. Direct heat exchangers can also be used to remove trace volatile compounds, or when a humid gas is injected, to provide the residence time neces-

**Such units provide advantages over heated or water-cooled screws, fluidized beds and rotating drums for heating and cooling bulk solids**

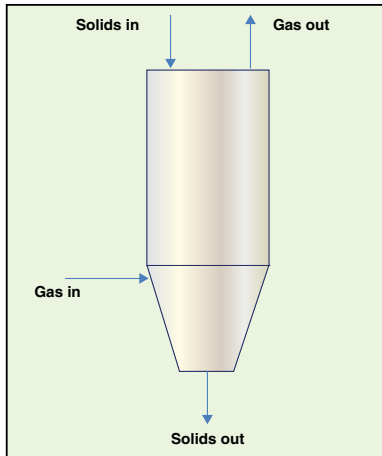
TABLE 1. NOMENCLATURE

$\alpha$	Surface area per unit volume of bed		
$A$	Cross-sectional area (side)		
$A_z$	Cross-sectional area (plan)		
$B$	Outlet size		
$C_p$	Heat capacity		
$dP/dz$	Pressure gradient		
$g$	Gravitational constant		
$G$	Mass flowrate of gas		
$h$	Heat transfer coefficient		
$H$	Height of moving bed in contact with gas		
$H(\theta')$	Function given by Jenike [2]		
$L$	Length of cooler		
$m$	Constant equal to 1 for round outlets, 0 for slotted outlets		
$S$	Mass flow of solids		
$T$	Local temperature		
$\bar{T}$	Average temperature		
$V$	Cooler volume		
$x, z$	Spatial coordinates		
$\delta$	Effective angle of internal friction		
$\epsilon$	Void fraction		
$\theta'$	Hopper angle (from vertical)		
$\sigma_1$	Major consolidation stress		
$\bar{\sigma}'$	Arch stress		
$\phi'$	Angle of wall friction		
<b>Subscripts</b>			
$g$	Gas	$s$	Solids
$min$	Minimum	$x$	Side
$o$	Outlet	$z$	Plan

sary to condition a powder.

This article discusses the design criteria for a bulk solids cooler — a direct-contact heat exchanger that is used to reduce the temperature

of a bulk material. The same procedure can be used to design a solids heater except that, of course, a hot gas is used to raise the temperature of the bulk material.



**FIGURE 1.** In countercurrent designs, injected gas passes upward through a moving bed of solids

In order for a direct-contact heat exchanger to operate effectively, the following are required:

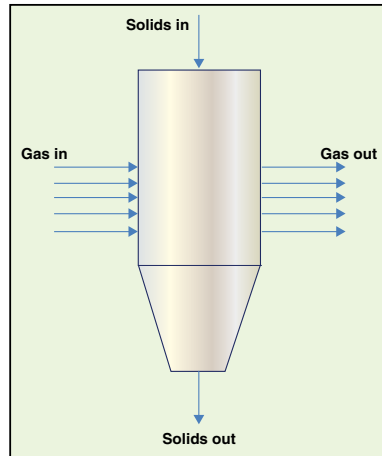
**Adequate heat transfer.** Sufficient thermal mass (that is, the product of the gas flowrate and its heat capacity) must be provided to allow the solids to be cooled to the desired temperature.

**Uniform solids flow.** The solids-velocity profile must be uniform, otherwise, the exposure of the solids to the cooling gas will be inconsistent, and heat transfer will be insufficient. In extreme cases, solids will only flow in a central channel above the cooler outlet, resulting in significantly less residence time and insufficient heat transfer.

**Proper outlet size.** The outlet of the cooler must be large enough to prevent obstructions to flow from developing and allow discharge of the tempered product at the desired rate.

**Reliable gas flow.** For countercurrent designs, the distributor that injects the gas must provide a constant gas velocity throughout the cross-section of the vessel. The gas velocity must be low enough to prevent fluidization, otherwise, channeling will cause the gas to bypass a portion of the solids and create other flow instabilities.

With cross-flow designs, the gas velocity must be low enough to prevent pinning, which occurs when



**FIGURE 2.** In cross-flow designs, the injected gas passes perpendicular to the solids flow in the vessel

the friction between the solids and the permeable wall through which the gas exits becomes too great and prevents solids flow along the wall. Excessive gas velocity may also push the solids away from the permeable wall through which the air enters the cooler. As a result, the air will begin to escape upward along the wall rather than through the bed.

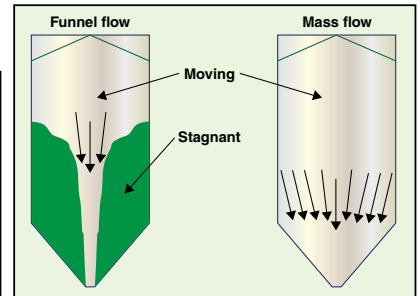
**Sufficient cooler volume.** The required heat duty depends on the heat-transfer coefficient between the gas and solids, the total surface area and the temperature driving force. The available heat-transfer area in a direct-contact bulk solids heat exchanger is the product of the powder's specific surface area (that is, its surface area per unit volume) and the volume of the bed of material in the cooler.

### Heat transfer

The temperatures of the gas and solids streams entering or leaving the cooler are generally known. In most cases, the temperatures of the solids entering and leaving the cooler are specified, as is the temperature of the cooling gas. A steady-state energy balance of the gas and solids can be written as according to Equation (1):

$$GC_{pg}(\bar{T}_{gout} - \bar{T}_{gin}) = SC_{ps}(\bar{T}_{sin} - \bar{T}_{sout}) \quad (1)$$

(Table 1 provides the nomenclature



**FIGURE 3.** Two types of flow typically arise in bulk-solids vessels. In general, mass flow (right) is preferred over funnel flow (left)

for all terms used here.) The energy balance, as written, assumes that only sensible heat is transferred — thus, that there is no condensation or evaporation. Otherwise, a term that describes the latent heat would have to be included in the energy balance. In addition, Equation (1) assumes that heat losses from the cooler are negligible.

The minimum gas injection required to obtain the target temperature of the solids product,  $G_{min}$ , can be determined by performing the energy balance over an infinitely tall cooler, using Equation (2):

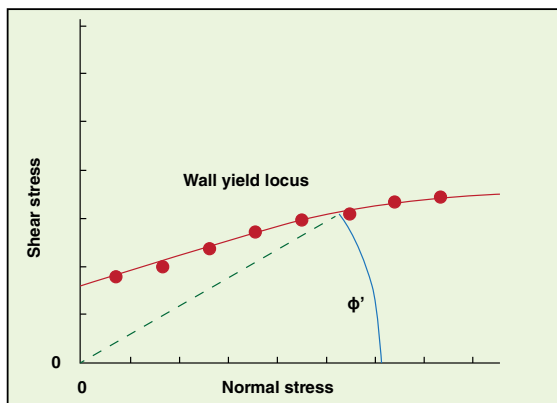
$$G_{min} = \frac{SC_{ps}(\bar{T}_{sin} - \bar{T}_{sout})}{C_{pg}(\bar{T}_{sin} - \bar{T}_{gin})} \quad (2)$$

The design gas feedrate must exceed the  $G_{min}$ . Alternatively, an approach temperature (the difference between the inlet gas and outlet solids temperatures) can be specified.

### Solids flow

Two primary flow patterns can occur in a bin or silo: mass flow and funnel flow (Figure 3).

**Funnel flow.** When funnel flow occurs, an active flow channel forms above the outlet, with stagnant material (this solids buildup is called a rathole) remaining at the periphery. Funnel flow can cause erratic flow, reduces the solids residence time, and induces high loads (depending on vessel size) on the structure and downstream equipment due to collapsing ratholes and eccentric flow channels. In the case of countercurrent designs, gas is likely to flow preferentially in the central flow channel because of its lower perme-



**FIGURE 4.** The angle of wall friction,  $\phi'$ , is determined by the wall yield locus, which is constructed by plotting shear stress against normal stress

ability. Funnel flow occurs when the walls of the hopper section of the cooler are not steep enough or low enough in friction for the solids to flow along them.

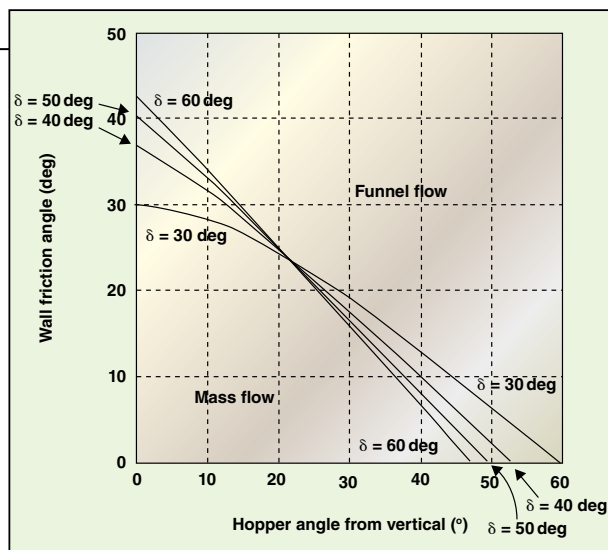
**Mass flow.** Mass flow is the preferred pattern in a bulk-solids heat exchanger. In mass flow, the entire bed of solids is in motion when material is discharged from the outlet. This flow behavior eliminates stagnant regions in the vessel and results in a first-in, first-out flow sequence, which provides a more uniform velocity profile. A uniform gas-velocity profile also allows uniform tempering of the solids when the gas flow is countercurrent. Mass flow occurs when the walls of the converging section of the cooler are steep enough and have low enough friction, thereby enabling the bulk material to flow along them.

The recommended hopper angle to ensure mass flow is readily calculated from wall friction results. The angle of wall friction  $\phi'$  is obtained by following the method described in ASTM D-6128 [1]. The test is performed using an instrument in which a sample of powder is placed inside a retaining ring on a flat coupon of wall material. Various normal loads are then applied to the powder. The ring and powder in the ring are forced to slide along the stationary wall material, and the resulting shear stress is measured as a function of the applied normal stress.

After a number of values have been recorded, the wall yield locus is constructed by plotting shear stress against normal stress. The angle of wall friction  $\phi'$  is the angle that is formed when a line is drawn from the origin to a point on the wall yield locus. A representative wall yield locus is shown in Figure 4.

Design charts originally developed by Jenike [2] provide allowable hopper angles for mass flow, given values of the wall friction angle and  $\delta$ , the effective angle of internal friction (which is determined by shear-cell testing; this is discussed later). These charts are summarized in Figures 5 and 6 for conical and planar hoppers (for example, wedge-shaped hoppers and transition hoppers), respectively. The outlet of a wedge-shaped hopper must be at least three times as long as it is wide for Figure 6 to apply. Values of the allowable hopper angle  $\theta'$  (measured from vertical) are on the ordinate, and values of the wall friction angle  $\phi'$  are on the abscissa. Any combination of  $\phi'$  and  $\theta'$  that falls within the mass-flow region of the chart will provide mass flow.

Hoppers with round outlets should not be designed at the theoretical mass-flow hopper-angle value. Otherwise, a small change in powder properties may cause the flow pattern inside the hopper to change from mass flow to funnel flow, with its associated risk of flow problems. Therefore, a 3-deg margin



**FIGURE 5.** This plot shows the theoretical mass-flow hopper angles for hoppers with round or square outlets. Note: A minimum safety factor of 3 deg should be used

of safety with respect to the mass-flow hopper angle given in Figure 5 is recommended.

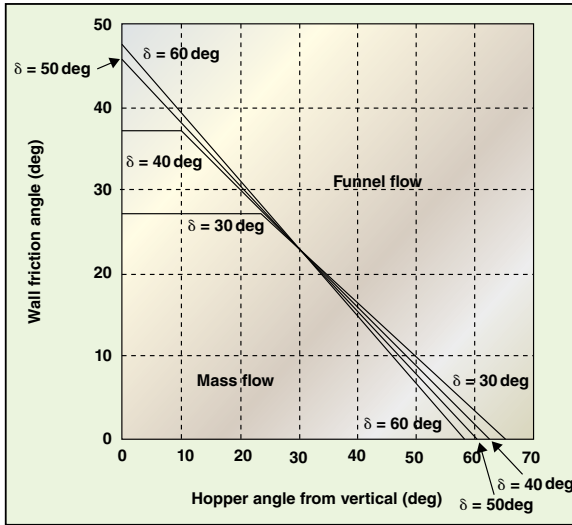
Sloping walls required for mass flow in wedge-shaped hoppers can be 10 to 12 deg less steep than those required to ensure mass flow in conical hoppers. Wedge-shaped hoppers are frequently used for materials that have high wall friction.

## Outlet size

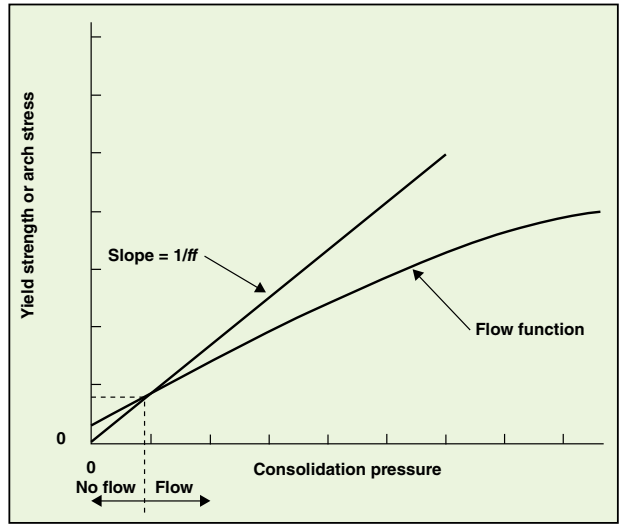
The outlet of the cooler must be large enough to prevent an arch from forming, which would prevent flow completely. In addition, it must be large enough to allow the required discharge rate. The required outlet size is a function of the bulk density, the wall friction, the internal friction, the cohesive strength, and the permeability of the bulk solid.

Cohesive arching will take place if the cohesive strength of the bulk material, which develops as a result of its consolidation in the cooler, is greater than the stresses imparted onto it at the cooler outlet.

The cohesive strength of a powder is measured by shear-cell testing following methods described in ASTM standards [1, 3]. A sample of powder is placed in a split cell and pre-sheared under a normal load until the flow of the moving layer of powder is steady. The sample is then placed under a reduced load and sheared until failure. The pre-shear and shear steps are repeated for a number of normal loads and



**FIGURE 6.** This plot shows the recommended wall angles to ensure mass flow in a hopper with flat walls and a slotted outlet



**FIGURE 7.** The flow function and flow factor are plotted together to determine the minimum outlet size that will prevent cohesive arching

the yield locus is determined from a plot of the failure shear stress against the normal stress, from which the bulk material's cohesive strength can be established. The test is repeated over a range of consolidation pressures to determine the relationship between the major consolidation stress and the cohesive strength of the powder. This relationship is known as the material's flow function. A shear cell test also provides the material's angle of internal friction.

Once a material's flow function has been determined, the minimum outlet width or diameter that will prevent cohesive arching can be calculated using the hopper's flow factor,  $ff$ : Jenike defined the flow factor using the relationship shown in Equation (3):

$$ff = \frac{\sigma_1}{\sigma_1} \quad (3)$$

where:

$\bar{\sigma}$  is the stress acting on the abutments of the arch

The flow factor is a function of the powder's effective angle of internal friction, the hopper angle, and the wall friction angle. Charts that provide flow factors for conical and wedge-shaped hoppers can be found

in Jenike [2].

Superimposing the material's flow function and flow factor on the same graph allows the cohesive strength and arch stress to be compared. There are three possibilities:

- The flow function lies below the flow factor and the two curves do not intersect. When this is the case, the stress imparted on the arch is always greater than the material's cohesive strength, and there is no minimum outlet-dimension requirement to prevent cohesive arching
- The flow function lies above the flow factor and the curves do not intersect. The bulk solid will not flow due to gravity alone, so another means of discharging the powder must be employed
- The flow function and flow factor intersect, as shown in Figure 7. At the point where the two lines intersect, the arch stress and the cohesive strength of the bulk solid are the same and equal to the critical stress,  $\sigma_{cr}$ . The minimum outlet diameter or width to prevent a cohesive arch from developing,  $B_{min}$ , can then be calculated using Equation (4):

$$B_{min} = \frac{H(\theta')\sigma_{cr}}{\rho_{bo}g} \quad (4)$$

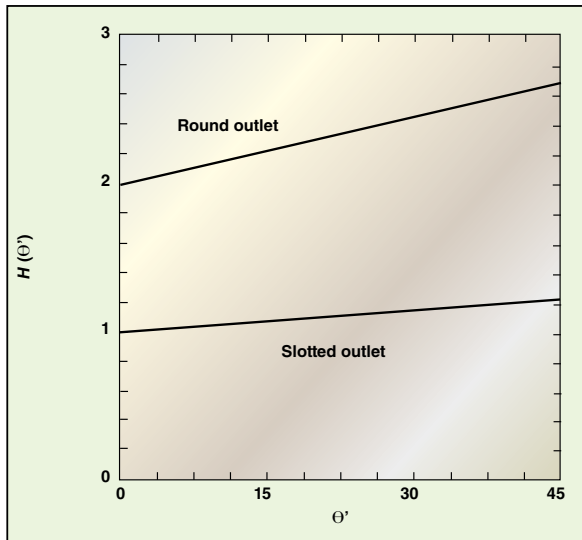
The function  $H(\theta')$  is given by Jenike [2] and is approximately 2 for conical hoppers, and 1 for wedge-shaped hoppers. The function  $H(\theta')$  is shown in Figure 8.

The outlet of the cooler must also be large enough to allow the required discharge rate. For coarse powders, the maximum discharge rate can be calculated from Equation (5):

$$S = \rho_{bo}A_o \sqrt{\frac{Bg}{2(1+m)\tan(\theta')}} \quad (5)$$

The parameter  $m$  is equal to 0 for slotted outlets, and equal to 1 for round or square outlets. The mass discharge rate is equal to the product of the velocity, outlet cross-sectional area, and the material's bulk density at the outlet.

The maximum flowrate of a fine powder can be several orders of magnitude lower than that of coarser materials due to an adverse gas pressure gradient that forms. Because of vacuum that naturally develops above a hopper outlet when the voids in fine powders expand during discharge, the resulting counterflow of gas will hinder solids flow. A limiting condition occurs when compaction in the cylinder section forces too much gas out



**FIGURE 8.** The function  $H(\theta)$  is used to calculate the outlet dimensions that will prevent arching in mass flow hoppers

through the material top surface.

If the permeability and the compressibility (that is, the bulk den-

analysis given by Ref. 4. The permeability of a powder is determined by passing air through a bed of volume



**FIGURE 9.** Improved gas uniformity can be achieved by injecting gas via crossbeams and an annulus, such as those shown here

sity-pressure relationship) of the powder are known, the pressure gradient can be calculated by an

### Gas distribution

and measuring the resultant pressure drop. With direct bulk-solids coolers that operate in counterflow mode, the gas must be distributed evenly throughout the moving bed of solids. Mass flow is essential, otherwise, stagnant material — with a

## MONITOR VISCOSITY SIMPLY SENSE MIXER MOTOR HORSEPOWER WITH UNIVERSAL POWER CELL

### EASY INSTALLATION

- No holes in tanks or pipes
- Away from sensitive processes

### VERSATILE

- One size adjusts to motors, from small up to 150hp
- Works on 3 phase, fixed or variable frequency, DC and single phase power

### SENSITIVE

- 10 times more sensitive than just sensing amps

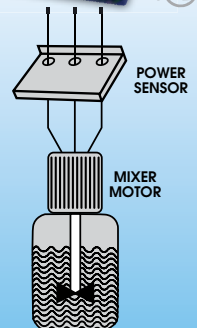
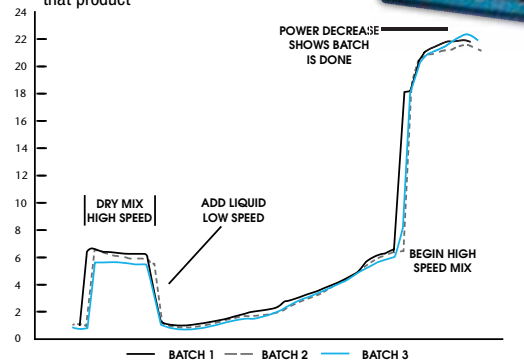
### CONVENIENT OUTPUTS

- For meters, controllers, computers  
4-20 milliamps 0-10 volts



### PROFILING A PROCESS

- Power changes reflect viscosity changes
- Good batches will fit the normal "profile" for that product



**LOAD CONTROLS**  
INCORPORATED  
WWW.LOADCONTROLS.COM

**CALL NOW FOR YOUR FREE 30-DAY TRIAL 888-600-3247**

Circle 20 on p. 180 or go to [adlinks.che.com/50982-20](http://adlinks.che.com/50982-20)



much lower permeability — will have dramatically less contact with the cooling gas. The gas distribution system must be designed such that there are no regions with high gas velocities. Localized fluidization will cause channeling, bypassing of the solids and flow instabilities. Therefore, designs that involve nozzles or perforated plates should be avoided.

Gas uniformity can be improved by injecting the gas into the bed of solids via an annulus and a set of crossbeams located at the intersection of the cylindrical and hopper sections of the cooler. Gas can also be introduced underneath an inverted cone, whereby the air enters the bulk material directly through the free surface that forms. Properly designed gas distribution systems are shown in Figure 9.

The gas velocity in a counter-current direct cooler must be low enough to prevent fluidization of

the bulk solid. Once the required gas-injection rate has been determined based on an energy balance, the cross-sectional area of the cooler that ensures that the superficial gas velocity is well below the powder's permeability throughout the cooler can be specified.

In a cross-current heat exchanger, the cooling gas flows horizontally across the bed of solids through permeable walls. Cross-flow designs are often advantageous because lower pressure drops and greater gas fluxes can be achieved.

For cross-flow designs, the gas velocity must be low enough to prevent pinning or cavity formation. Pinning occurs when the frictional force between the powder and the wall through which the gas exits is high enough to prevent flow along the wall. A cavity can form if the stress caused by the movement of air through the powder along the wall through which the gas enters

causes a gap to form between the powder and wall. As a consequence, gas may flow vertically rather than transversely through the bed.

### Cooler volume

The rate of heat transfer depends on the temperature driving force in the cooler, the heat-transfer coefficient between the gas and solids, and the surface area per unit volume of the bulk material.

The following can be used to calculate the volume of bulk material that must be in contact with the cooling gas in a countercurrent direct-contact heat exchanger.

$$\ln \frac{\bar{T}_{gout} - \bar{T}_{sin}}{\bar{T}_{gin} - \bar{T}_{sout}} = -ha \left( \frac{1}{GC_{pg}} - \frac{1}{SC_{ps}} \right) V \quad (6)$$

The design of cross-flow bulk-solids coolers is somewhat more complicated since the temperature of the solids leaving the heat ex-

I AM REDGUARD AND  
**I CARE.**

Jorge Lopez - Crew Chief

AT REDGUARD, THE WORK WE DO IS MORE THAN A JOB—IT'S A PASSION.  
We go the extra mile every day to ensure your—and our—employees make it home safely every night. That's what makes us the industry's leading manufacturer of successfully tested blast-resistant buildings.

**REDGUARD** 855.REDGUARD | redguard.com

Circle 1 on p. 180 or go to [adlinks.che.com/50982-01](http://adlinks.che.com/50982-01)

Stainless Steel housed  
Ultrasonic Clamp-On Flowmeter

**FLEXIM® F/G 705**  
for Liquids and Gases

- Highly accurate and reliable bidirectional gas and liquid flow measurement over a wide turndown ratio
- For the harshest environments including Offshore (ATEX / IECEx and FM approved)

[www.flexim.com](http://www.flexim.com)

**FLEXIM**

Circle 15 on p. 180 or go to [adlinks.che.com/50982-15](http://adlinks.che.com/50982-15)

changer will vary with location.

An analytical solution exists [5] for the system of equations that can be used to calculate the temperature profile of the solids leaving the cooler, as shown in Equation (7):

$$\frac{T_s - T_{\sin}}{T_{gin} - T_{\sin}} = 1 - \exp\left(-\frac{A_c H a}{SC_{pg}} - \frac{A_s x h a}{GC_{pg}}\right) \sum_{j=0}^{\infty} \frac{\left(\frac{A_s x h a}{GC_{pg}}\right)^j}{j!} \sum_{k=0}^j \frac{\left(\frac{A_c H a}{SC_{ps}}\right)^k}{k!} \quad (7)$$

Equations (6) and (7) are valid provided that heat losses to the surroundings and radiation heat transfer can be neglected and heat transfer by convection dominates.

### Closing thoughts

Hoppers, bins and silos that are used to handle bulk solids can also be used as heat exchangers that heat or cool the materials. The moving-bed processor must allow

uniform flow of solids and gas, and the dimensions of the vessel must ensure that instabilities do not result from high gas velocities. The gas must be injected at a rate high enough to ensure a temperature difference between the solids and gas phases throughout the column and the volume must be great enough to provide the required residence time. Obtaining fundamental, bulk-solid flow properties, including cohesive strength, wall friction, compressibility and permeability, along with thermal properties and heat-transfer rate information, is necessary to ensure that the moving-bed heat exchanger will operate as desired. ■

*Edited by Suzanne Shelley*

### References

1. ASTM D-6128, Standard Test Method for Shear Testing of Bulk Solids Using the Jenike Shear Cell, ASTM International, 2006.
2. Jenike, A.W., Storage and Flow of Solids, Bulletin 123, University of Utah Engineering Station, 1964, Revised 1976.

3. ASTM D-6773, Standard Shear Test Method for Bulk Solids Using the Schulze Ring Shear Tester, ASTM International, 2008.
4. Royal, T.A. and Carson, J.W., Fine Powder Flow Phenomena in Bins, Hoppers, and Processing Vessels, presented at Bulk 2000: Bulk Material Handling Toward the Year 2000, London, 1991.
5. Almendros-Ibáñez, Soria-Verdugo, A., Ruiz-Rivas, U., and Santana, D. Solid conduction effects and design criteria in moving bed heat exchangers, *App. Therm. Engr.*, 31, 1200, 2011.

### Author



**Greg Mehos** is a senior project engineer with Jenike & Johanson, Inc. (400 Business Park Dr., Tyngsboro, Mass.; Phone: 978-649-3300; Email: gmehos@jenike.com), and an adjunct professor at the University of Rhode Island. Mehos has been involved in a wide range of bulk solids handling projects, including designs of hoppers, dryers, gasifiers and moving-bed reactors, as well as analyses of purge and conditioning columns. He received his B.S. and Ph.D. in chemical engineering from the University of Colorado and an M.S.Ch.E. from the University of Delaware. He is a registered Professional Engineer in Colorado and Massachusetts and a member of AIChE. He served on the executive board of AIChE's Particle Technology Forum and is a past chair of the Boston AIChE section.



## Fluorinated Oils, Greases, PTFE Release Agents and Dry Film Lubricants

Miller-Stephenson offers a complete line of inert high performance fluorinated lubricants that include Dupont™ Krytox® Oils and Greases, as well as a family of PTFE Release Agents/Dry Lubricants. They provide superior lubricity, while being thermally stable, non-flammable, non-migrating, and contain no silicone. Krytox® offers extreme pressure, anti-corrosion and anti-wear properties, with oxygen compatibility and low outgassing. Our PTFE creates a superior release for plastics, elastomers and resins with multiple releases between applications. For technical information and sample, call 800-992-2424 or 203-743-4447.



miller-stephenson chemical company, inc.

support@miller-stephenson.com

miller-stephenson.com



## TOLL MANUFACTURE SINCE 1982

- ◆ Custom Catalyst
- ◆ ISO 9001:2008
- ◆ Milling / Grinding
- ◆ Screening
- ◆ Calcining / Drying
- ◆ Vacuum Impregnating
- ◆ Solids or Liquid
- ◆ Metal Reclaim
- ◆ Mixing/Blending/ Packaging
- ◆ Pelletizing

YS Inc.

4531 County Road 458

Collinsville, AL 35961

888-356-3343

www.ys-inc.com

ysinc@ys-inc.com

# CHEMICAL ENGINEERING

November  
2014

[www.chemengonline.com](http://www.chemengonline.com)

# Buyers' Guide 2015

## Featured Product & Service Providers



**UNIFLUX<sup>®</sup> / Exotherm**

## *INSIDE:*

Product & Services Index . . . . .	69
Corporate Profiles . . . . .	83
Company Directory . . . . .	89
Liquid Gas and Air Handling . . . .	101
Solids Handling . . . . .	113
Electrical Power Generation & Transmission . . . . .	118
Instrumentation & Controls . . . .	121
Processing Equipment . . . . .	131
Engineering Materials . . . . .	152
Plant Maintenance . . . . .	162
Design Engineering & Construction . . . . .	165
Information Technology . . . . .	168
Environmental Services . . . . .	171
Process Chemicals . . . . .	174

H	He								
Li	Ne								
Na	Ar								
K	Kr								
Rb	Xe								
Cs	Rn								
Fr	Uuo								
Be	F								
Mg	Cl								
Ca	Br								
Sr	I								
Ba	At								
Ra	Uus								
B	C	N	O						
Al	Si	P	S						
Ga	Ge	As	Se						
In	Sn	Sb	Te						
Tl	Pb	Bi	Po						
Uut	Fl	Uup	Lv						
Zn	Cu	Ni	Co	Fe	Mn	Cr	V	Ti	Sc
Cd	Ag	Pd	Rh	Ru	Tc	Mo	Nb	Zr	Y
Hg	Au	Pt	Ir	Os	Re	W	Ta	Hf	La
Cn	Rg	Ds	Mt	Hs	Bh	Sg	Db	Rf	Ac

Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

# Now Invent.<sup>TM</sup>



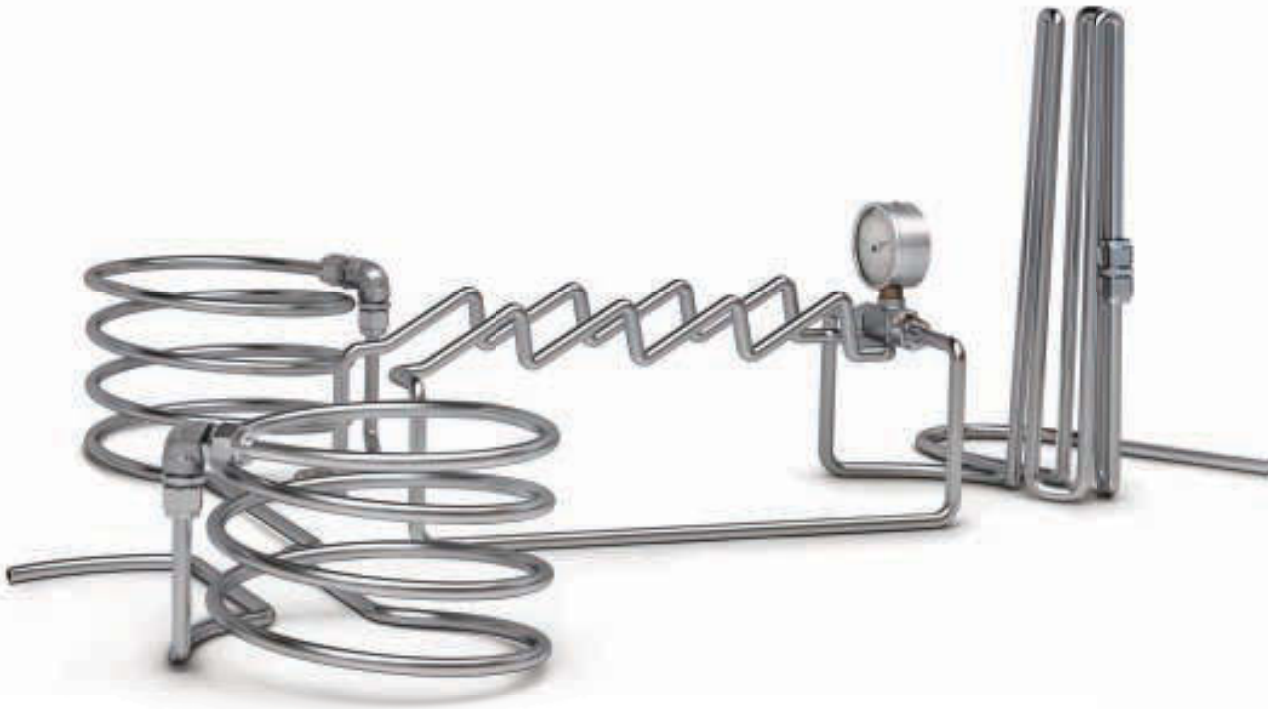
The Materials Science Company<sup>®</sup>

catalog: [americanelements.com](http://americanelements.com)

Circle 38 on p. 180 or go to [adlinks.che.com/50982-38](http://adlinks.che.com/50982-38)



© 2001-2014, American Elements is a U.S. Registered Trademark.



## Our petrochemicals customers expect a higher standard.

*New demands in downstream petrochemical refining are raising the stakes for safer, more reliable hydraulic and instrumentation tubing. Whether it's upgrading an older plant or building a new mega refinery, there is no room for failure.*

Leakage of hydraulic fluid due to corrosion or a faulty fitting could lead to a valve shutdown costing millions. As suppliers to many of the world's largest petrochemical complexes, we see an increasing need for more reliable, leak-free, corrosion-resistant seamless tubing. Just because a tube qualifies for the ASTM standard, doesn't make it the best tube for your purposes. In fact, some tubing grades barely qualify for international standards, while Sandvik is always at the top.

So the question is: Can you risk a half-billion dollar investment on faulty tubes? And does your supplier have the knowledge to help guide you? Our 150-year track record of supplying leading-edge steel materials assures that you always get a solution you can depend on. So if you demand a six-star approach to quality, contact your local Sandvik specialist and find out how we can bring you safer, more reliable performance. We call it the **Peace of Mind Standard**.



# Uniflux<sup>®</sup>

**High quality engineered heaters since 1957**

- Unique forced draft convective heat transfer process heaters.
- The Uniflux high velocity burner's short flame extension prevents flame impingement on the tubes and eliminates tube coking and fluid degradation.
- Uniflux heaters utilize the complete circulation of exhaust gases around the process tubes resulting in uniform flux density around the tube periphery and long tube life.
- Automatic operating and safety controls meet NFPA, API or IEC requirements and are factory assembled and tested.

## **Applications**

- Heat Transfer Fluid
- Regeneration Gas
- Water
- Glycol-water
- Air
- Steam Superheaters
- Cryogenic
- Crude Oil
- Emulsions
- Offshore Production
- Gas Processing
- Natural Gas Liquids
- Vaporizers

## **Specifications**

- 1 million to 70 million Btu/Hr
- 20:1 Turndown Ratios
- High Efficiency Economizers
- Temperatures to 1,500 F
- Carbon Steel, Stainless Steel & High Alloy Heat Transfer Coils
- Natural gas or light oil fuels



# PRODUCT & SERVICE INDEX

## HOW TO USE THIS GUIDE

Using CEBG is simple and straightforward:

1. Look up the product or service under the main noun that describes it in the Product & Service Index; for example, Pumps, rotary, or Analyzers, infrared. Ample cross-referencing is provided for products with several names. Boldface items are general product categories.
2. Turn to the indicated page in the Product & Service Directory, where you will find the names of manufacturers of that product. Companies in boldface and capital letters are display advertisers; page numbers direct you to their product inserts or advertisements.
3. Refer to the Company Directory to find the manufacturers nearest you—your local sources. Call the sources for data, delivery and price. Please be sure to tell them how quickly you found them in CEBG.

## A

Absorbers, vibration .....	163	Adsorbents, polar .....	175	Air separation equipment, cryogenic .....	102
Acid gas removal systems .....	151	Adsorbents, spill control.....	175	Air separation equipment, membrane .....	102
Acid mist/Gas cleaning .....	162	Adsorbents, zeolites.....	175	Air separation equipment, pressure swing adsorption .....	102
Acids, inorganic .....	175	Adsorption systems, carbon .....	171	Air separation equipment, vacuum swing adsorption .....	102
Acids, organic .....	175	Adsorption systems, other.....	171	Alarm Management.....	169
Acrylic copolymers.....	160	Adsorption systems, pressure swing .....	151	Alarms, annunciator .....	125
Acrylics.....	160	Advanced process control .....	169	Alarms, carbon monoxide .....	125
Activated carbon .....	175	Aerators .....	151	Alarms, combustible gases.....	125
Active pharmaceutical ingredients.....	175	Aerators, water pollution.....	173	Alarms, flame .....	126
Actuators .....	122	Afterburners .....	171	Alarms, flow .....	126
Actuators or starters, motor.....	120	Aftercoolers .....	141	Alarms, humidity .....	126
Adhesives.....	160	Agglomerators.....	114	Alarms, liquid level .....	126
Adsorbents, for carbon dioxide.....	175	Air conditioners .....	132	Alarms, motion .....	126
Adsorbents, for hydrocarbons .....	175	Air pollution abatement systems ....	171	Alarms, other .....	126
Adsorbents, for oil .....	175	Air pollution control.....	172		
Adsorbents, for PCBs.....	175	Air preheat systems.....	144		
Adsorbents, nonpolar .....	175	Air purifiers .....	164		

# PRODUCT & SERVICE INDEX

Alarms, portable (gas, vapor) .....	126	Analyzers, water quality .....	123	Blowers, regenerative.....	103
Alarms, pressure .....	126	Antioxidants.....	175	Blowers, rotary piston.....	103
Alarms, solids level .....	126	Antiskid materials .....	164	Blowout doors & panels .....	164
Alarms, temperature.....	126	Aprons .....	164	Boiler accessories.....	119
Alcohols, other.....	175	Arbitration, engineering.....	166	Boiler feedwater systems .....	155
Alkalies .....	175	Argon.....	175	Boilers, automatic, packaged .....	119
Alloy identification equipment .....	127	Arresters, flame deflagration or detonation .....	164	Boilers, carbon monoxide fired .....	119
Alloys, brazing.....	163	Arresters, flame, tank vent, inline ...	164	Boilers, coal fired.....	119
Aluminum.....	158	Arresters, surge.....	164	Boilers, fire tube .....	119
Aluminum alloys .....	158	Ash conditioning systems .....	119	Boilers, fluidized bed.....	119
Anaerobic treatment systems.....	173	Aspiration systems .....	107	Boilers, integral furnace .....	119
Analog process control computers	124	Asset management .....	169	Boilers, natural gas fired .....	119
Analyzers, air quality .....	122	Atomizers.....	151	Boilers, oil fired.....	119
Analyzers, atomic absorption.....	122	Autoclaves.....	149	Boilers, waste heat recovery .....	119
Analyzers, biological .....	122			Boilers, water tube.....	119
Analyzers, BOD .....	122			Boosters, rotary piston .....	103
Analyzers, carbon dioxide or monoxide.....	122	<b>B</b>		Brass .....	158
Analyzers, chlorine .....	122	Bag closing machines.....	116	Breakers .....	153
Analyzers, chlorine, total .....	122	Bag filling machines .....	116	Briquetting systems.....	114
Analyzers, chromatographic .....	122	Bag filling machines, vacuum .....	116	Bronze .....	158
Analyzers, combustible gases .....	122	Bag, empty, handling systems .....	116	Bulk liquid storage services .....	108
Analyzers, combustion .....	122	Bags .....	116	Burners, coal .....	145
Analyzers, concentration.....	122	Baghouses .....	136	Burners, combination fuel .....	145
Analyzers, conductivity .....	122	Bags .....	116	Burners, gas .....	145
Analyzers, emission.....	122	Balers .....	117	Burners, oil .....	145
Analyzers, environmental conditions...	122	Bands, electric heating .....	120	Bushings.....	119
Analyzers, fats & oils .....	122	Bar coding.....	169	Bushings, pump .....	104
Analyzers, flame photometers.....	123	Barrel handling equipment.....	117		
Analyzers, gas density .....	122	Barrels & drums.....	116		
Analyzers, hydrocarbons .....	122	Batch control .....	169		
Analyzers, hydrogen .....	122	Batching & blending systems .....	117		
Analyzers, infrared .....	122	Batching & blending systems .....	148		
Analyzers, mass spectrometer.....	122	Baths, constant temperature .....	144		
Analyzers, moisture content .....	122	Batteries & electrical storage equipment .....	120		
Analyzers, near infrared .....	122	Bearing isolators.....	119		
Analyzers, neutron activation .....	122	Bearings .....	119		
Analyzers, nitrogen.....	122	Bends, pipe.....	103		
Analyzers, nitrogen oxide.....	122	Beryllium & alloys .....	159		
Analyzers, nitrogen, total.....	122	Bin activators.....	114		
Analyzers, oil content .....	122	Bins.....	114		
Analyzers, organic carbon .....	122	Bins, weighing .....	114		
Analyzers, organic carbon, total ....	122	Bio-oxidation units.....	173		
Analyzers, organic halogen, total...	122	Biochemical equipment.....	150		
Analyzers, oxygen content.....	123	Biocides, halogenated .....	175		
Analyzers, oxygen demand.....	123	Biocides, inorganic.....	175		
Analyzers, oxygen, dissolved.....	123	Biocides, phenolics.....	175		
Analyzers, ozone content .....	123	Biofilters.....	139		
Analyzers, particle size .....	123	Biological treatment.....	173		
Analyzers, pH.....	123	Bioreactors .....	150		
Analyzers, phosphorus.....	123	Bioremediation services .....	172		
Analyzers, sodium ion concentration ..	123	Blenders, cone .....	148		
Analyzers, sound.....	123	Blenders, continuous.....	148		
Analyzers, spectrometer .....	123	Blenders, horizontal.....	148		
Analyzers, spectrophotometer .....	123	Blenders, inline.....	148		
Analyzers, stack gases .....	123	Blenders, liquid feed .....	148		
Analyzers, sulfur dioxide .....	123	Blenders, pneumatic .....	148		
Analyzers, sulfur, total .....	123	Blenders, ribbon .....	148		
Analyzers, suspended solids .....	123	Blenders, spiral .....	148		
Analyzers, thermal.....	123	Blenders, tumbling V.....	148		
Analyzers, thin film.....	123	Blinds, pipeline.....	103		
Analyzers, total solids.....	123	Blowers, axial flow .....	102		
Analyzers, ultraviolet .....	123	Blowers, centrifugal, compressor-type .....	102		
Analyzers, vapor pressure .....	123	Blowers, centrifugal, fan-type.....	102		
Analyzers, vibration.....	163	Blowers, positive displacement.....	103		
Analyzers, VOCs .....	123				



# PRODUCT & SERVICE INDEX

Catalysts, polymerization .....	175	Cleaning equipment, mechanical ..	162	Computers, monitors & displays ....	169
Catalysts, polyolefin production .....	175	Cleaning equipment,		Computers, personal .....	169
Catalysts, precious metal .....	175	pharmaceutical .....	162	Computers, printers & plotters .....	169
Catalysts, Raney nickel .....	175	Cleaning equipment, steam .....	162	Condensate return systems .....	141
Catalysts, reforming .....	175	Cleaning equipment, tank cleaning	162	Condensers, air cooled .....	141
Catalysts, rhenium .....	175	Cleaning parts & accessories .....	163	Condensers, barometric .....	141
Catalysts, rhodium .....	175	Climbing safety equipment .....	164	Condensers, evaporative	
Catalysts, ruthenium .....	175	Clothing, chemical resistant .....	164	refrigerant .....	141
Catalysts, urethane production .....	175	Coalescers .....	150	Condensers, fractional .....	141
Catalysts, vinyl production .....	175	Coaters & coating machinery .....	114	Condensers, jet ejector .....	141
Catalysts, zeolite .....	175	Coatings, acrylic .....	160	Condensers, plate .....	141
Centrifuge parts & accessories .....	132	Coatings, ceramic .....	160	Condensers, reflux .....	141
Centrifuges, batch,		Coatings, diffusion .....	160	Condensers, refrigerant .....	141
automatic basket .....	132	Coatings, epoxy .....	160	Condensers, shell & tube .....	141
Centrifuges, batch,		Coatings, fluoropolymer .....	160	Condensers, steam .....	141
perforated basket .....	132	Coatings, metallic .....	160	Condensers, surface .....	141
Centrifuges, continuous,		Coatings, nonstick .....	160	Condensers, tubular .....	142
conical angle, perforated basket ...	132	Coatings, nonskid .....	160	Condensers, vapor .....	142
Centrifuges, continuous,		Coatings, nonslip .....	160	Consultants, corrosion protection ..	166
pusher discharge .....	132	Coatings, nonstick .....	160	Consultants, engineering .....	166
Centrifuges, continuous,		Coatings, plastic .....	160	Consultants, ISO compliance .....	166
solid bowl, scroll discharge .....	132	Coatings, powder .....	160	Consultants, materials .....	166
Centrifuges, disc,		Coatings, PVC .....	160	Consultants, safety & health .....	166
nozzle discharge .....	132	Coatings, refractory .....	160	Consultants, water treatment .....	166
Centrifuges, disc, solid bowl .....	132	Coatings, silicate .....	160	Consultants, Welding .....	166
Centrifuges, disc,		Coatings, urethane .....	160	Containers, hazardous waste .....	173
valve discharge .....	132	Coatings, vinyl ester .....	160	Containers, safety .....	164
Centrifuges, filter, continuous,		Cobalt alloys .....	159	Controllers, air conditioning .....	124
screen bowl, scroll discharge .....	132	Cogeneration systems		Controllers, batching or weighing ..	124
Centrifuges, filter, inverting .....	132	& equipment .....	120	Controllers, bin level .....	124
Centrifuges, laboratory		Coils .....	144	Controllers, boiler .....	124
or pilot plant .....	132	Coils, tubing .....	109	Controllers, combustion .....	124
Centrifuges, liquid-liquid .....	132	Colorimeters .....	128	Controllers, electric .....	125
Centrifuges, other .....	132	Columns, absorption or adsorption ..	155	Controllers, flow & flow ratio .....	125
Centrifuges, solid basket .....	132	Columns, bubble cap .....	155	Controllers, humidity .....	125
Ceramic metals .....	158	Columns, contacting or mixing .....	155	Controllers, liquid level .....	125
Chambers, test .....	128	Columns, custom fabricated .....	155	Controllers,	
Chelating agents .....	175	Columns, fluidized bed .....	155	oxidation-reduction potential .....	125
Chemical equipment design .....	169	Columns, graphite .....	155	Controllers, pH .....	125
Chemical plant design		Columns, packed .....	155	Controllers, pneumatic .....	125
& maintenance .....	169	Columns, thin film .....	155	Controllers, pressure .....	125
Chemical process design .....	169	Columns, vacuum .....	155	Controllers, process .....	125
Chillers, recirculating .....	144	Columns, valve tray .....	155	Controllers, product .....	125
Chimneys, stacks & vents .....	171	Combustors, catalytic .....	171	Controllers, programmable .....	125
Chippers .....	153	Combustors, other .....	171	Controllers, pump .....	125
Chlorinators .....	173	Comminutors .....	153	Controllers, SCR power .....	125
Chromatographs, onstream .....	123	Compactors .....	114	Controllers, sludge level .....	125
Chromatography, production-		Compliance-information		Controllers, temperature .....	125
scale equipment .....	151	management .....	172	Controllers, time cycle .....	125
Chromium & alloys .....	159	Compressor lubrication .....	102	Controllers, vacuum .....	125
Chutes .....	115	Compressors, centrifugal .....	102	Controllers, viscosity .....	125
CIP Spray Nozzles .....	151	Compressors, diaphragm .....	102	Converters, signal .....	129
Circuit breakers .....	120	Compressors, high pressure .....	102	Conveyor accessories .....	115
Clarifiers, flotation .....	132	Compressors, oil-free .....	102	Conveyor belting .....	115
Clarifiers, settling .....	132	Compressors, portable .....	102	Conveyors, apron .....	115
Classifiers, air .....	132	Compressors, reciprocating .....	102	Conveyors, belt .....	115
Classifiers, cyclone .....	132	Compressors, rotary .....	102	Conveyors, bucket .....	115
Classifiers, mechanical, magnetic ..	132	Compressors, rotary liquid ring .....	102	Conveyors, cooling .....	115
Classifiers, mechanical, screening	132	Compressors, rotary screw .....	102	Conveyors, drag .....	115
Classifiers, mechanical, vibrating ..	132	Compressors, rotary sliding vane ..	102	Conveyors, flexible .....	115
Cleaners & refacers, tube .....	162	Compressors, single stage,		Conveyors, flight .....	115
Cleaning chemicals & services .....	162	expander driven .....	102	Conveyors, fluidizing .....	115
Cleaning equipment, blast .....	162	Compressors, turbodynamic .....	102	Conveyors, fluidizing .....	115
Cleaning equipment, chemical .....	162	Computational fluid dynamics .....	169	Conveyors, gravity .....	115
Cleaning equipment, high-pressure		Computer aided design &		Conveyors, magnetic .....	115
liquid .....	162	drafting systems .....	170	Conveyors, other .....	115
		Computers, mainframe .....	169	Conveyors, pneumatic .....	115

# PRODUCT & SERVICE INDEX

Conveyors, portable.....	115	Data logging systems.....	125	Diverters.....	151
Conveyors, roller.....	115	Data Transmission, Wireless.....	129	Drift eliminators, cooling tower.....	133
Conveyors, rotary table.....	115	Data visualization.....	169	Drives, belt.....	119
Conveyors, rotary tubular.....	115	Database services.....	166	Drives, conveyor.....	119
Conveyors, screen.....	115	Deaerators, degasifiers.....	150	Drives, crusher.....	119
Conveyors, screw.....	115	Decanters.....	132	Drives, gear.....	119
Conveyors, slat.....	115	Decking.....	159	Drives, magnetic.....	119
Conveyors, tray.....	115	Defoamers.....	175	Drives, pump.....	119
Conveyors, vacuum.....	115	Defoamers, chemical.....	175	Drives, variable speed, centrifuge.....	119
Conveyors, vertical.....	115	Defoamers, physical.....	137	Drives, variable speed, electrical.....	119
Conveyors, vibrating.....	115	Degreasers.....	175	Drives, variable speed, hydraulic.....	119
Conveyors, weighing.....	115	Dehumidifiers.....	132	Drives, variable speed, mechanical.....	119
Coolers, air cooled.....	142	Deluge systems.....	163	Drives, variable speed, mixer.....	119
Coolers, belt.....	142	Demolition.....	166	Drum filling equipment.....	116
Coolers, brine.....	142	Densifiers.....	114	Drum handling equipment.....	117
Coolers, cascade.....	142	Density-measuring equipment.....	128	Drums & drum liners,	
Coolers, closed circuit.....	142	Deodorizers.....	171	corrosion resistant.....	116
Coolers, coil.....	142	Desalination units.....	156	dryer parts & accessories.....	133
Coolers, drum.....	142	Desiccants.....	175	Dryers, air.....	133
Coolers, evaporative.....	142	Design of experiments.....	169	Dryers, apron.....	133
Coolers, finned tube.....	142	Desuperheaters.....	142	Dryers, batch.....	133
Coolers, flash.....	142	Detectors, dust.....	123	Dryers, belt.....	134
Coolers, plate.....	142	Detectors, explosion.....	123	Dryers, centrifugal.....	134
Coolers, rotary.....	142	Detectors, flame.....	123	Dryers, chamber.....	134
Coolers, screw.....	142	Detectors, gases.....	123	Dryers, closed circuit.....	134
Coolers, spray.....	142	Detectors, gases, combustible.....	123	Dryers, conical, vacuum.....	134
Coolers, water.....	142	Detectors, gases, toxic.....	123	Dryers, continuous.....	134
Cooling towers.....	133	Detectors, interface.....	128	Dryers, conveyor.....	134
Cooling towers,		Detectors, leak.....	128	Dryers, desiccant,	
repair & upgrade.....	133	Detectors, liquid-leak.....	123	disposable cartridge.....	134
Cooling-water treatment, chemical.....	156	Detectors, metal.....	128	Dryers, desiccant, package unit.....	134
Copper.....	158	Detectors, moisture.....	123	Dryers, drum.....	134
Copper alloys, other.....	158	Detectors, other.....	123	Dryers, drum, rotary vacuum.....	134
Corrosion measurement equipment.....	128	Detectors, radiation.....	123	Dryers, electric.....	134
Counters.....	125	Detectors, sludge blanket level.....	123	Dryers, flash.....	134
Couplings, dry-disconnect.....	103	Detectors, vibration.....	123	Dryers, fluidized bed.....	134
Couplings, flexible.....	103	Dewatering agents.....	175	Dryers, freeze.....	134
Couplings, pneumatic conveyors.....	115	Dewatering, mechanical press.....	139	Dryers, gas.....	134
Couplings, quick connect.....	103	Diffusers, spargers.....	151	Dryers, infrared.....	134
Couplings, rigid.....	103	Diffusers, water pollution control.....	173	Dryers, microwave.....	134
Couplings, self aligning.....	103	Digesters, cookers.....	150	Dryers, oxygen-enriched air.....	134
Couplings, shaft.....	119	Digesters, sewage sludge.....	173	Dryers, paddle.....	134
Coveralls.....	164	Digital computers,		Dryers, pan.....	134
Crushers, cone.....	154	data processing.....	169	Dryers, radiant heat.....	135
Crushers, fluid energy.....	154	Direct digital process control		Dryers, refrigerated air.....	135
Crushers, gyratory.....	154	computers.....	124	Dryers, rotary.....	135
Crushers, impact.....	154	Disintegration equipment		Dryers, screw flight.....	135
Crushers, jaw.....	154	parts & accessories.....	154	Dryers, shelf, vacuum.....	135
Crushers, prebreaker.....	154	Dispersing agents, leather.....	175	Dryers, spin flash.....	135
Crushers, rotary.....	154	Dispersing agents, other.....	175	Dryers, spiral screw.....	135
Crushers, rotary blade.....	154	Dispersing agents, pigment.....	175	Dryers, spray.....	135
Crushers, rotary blade.....	154	Dispersing agents, rubber.....	175	Dryers, steam jacketed.....	135
Cryogenic equipment.....	132	Dispersing agents, textile.....	175	Dryers, steam tube.....	136
Crystallizers, cooling.....	137	Displays, liquid-crystal.....	125	Dryers, suspension.....	136
Crystallizers, evaporative.....	137	Disposal units, hazardous waste.....	173	Dryers, tray.....	136
Crystallizers, freeze.....	137	Disposal units, liquid waste.....	173	Dryers, tray, vacuum.....	136
Crystallizers, melt.....	137	Disposal units, sewage.....	173	Dryers, tumble.....	136
Crystallizers, Oslo Krystal.....	137	Distillation columns,		Dryers, tunnel.....	136
Crystallizers, scraped surface.....	137	automatic packaged unit.....	155	Dryers, V cone.....	136
Crystallizers, vacuum.....	137	Distillation columns,		Dryers, vacuum.....	136
Custom processing.....	166	molecular distillation.....	155	Dryers, vacuum pan.....	136
Cylinders, pneumatic.....	122	Distillation columns, sieve tray.....	155	Dryers, vertical.....	136
		Distillation columns,		Dryers, vibrating.....	136
		steam stripping.....	155	Ductile iron.....	159
		Distillation columns,		Ducts, fiberglass-reinforced plastic.....	102
		vapor compression.....	155	Ducts, metallic.....	102

## D

Dampers.....	102
Data acquisition & process control.....	169

# PRODUCT & SERVICE INDEX

Ducts, plastic.....	102
Ducts, rigid.....	102
Dumpers.....	114
Dust collector parts & accessories.....	136
Dust collectors, bag filtering.....	136
Dust collectors, cartridge.....	136
Dust collectors, centrifugal.....	136
Dust collectors, cyclone.....	136
Dust collectors, electrostatic precipitators.....	136
Dust collectors, oil type.....	136
Dust collectors, other.....	136
Dust collectors, pulse jet.....	136
Dust collectors, tray type.....	137
Dust collectors, tubular.....	137
Dust collectors, wet.....	137
Dust removal equipment.....	137

## E

Economizers.....	142
Elbows, pipe.....	103
Electrical equipment, intrinsic safety.....	129
Electrical equipment, other.....	120
Electrodes, ion-sensitive.....	128
Electrodes, pH.....	128
Electrodes: anodes & cathodes.....	137
Electrodialysis units.....	156
Electrolytic cells.....	137
Elevators, belt.....	115
Elevators, belt, vertical.....	116
Elevators, bucket.....	116
Elevators, screw.....	116
Emergency shutdown systems.....	164
Emulsifiers.....	175
Enclosures, instrument.....	128
Engine-generator sets.....	120
Engineering, biochemical & biotech.....	166
Engineering, Welding.....	167
Engineering: blast resistant modules.....	166
Engineering: clean rooms.....	166
Engineering: construction & field erection.....	166
Engineering: cryogenic equipment.....	166
Engineering: equipment inspection & expediting.....	166
Engineering: facilities planning.....	166
Engineering: instrumentation & control systems.....	166
Engineering: modular process systems.....	166
Engineering: packaged pilot plants.....	166
Engineering: pilot plants.....	166
Engineering: plant design.....	166
Engineering: plant modernization.....	166
Engineering: pollution & environmental services.....	167
Engineering: process design.....	167
Engineering: process modeling.....	167
Engineering: procurement.....	167
Engineering: project management.....	167
Engineering: research.....	167
Engines, diesel.....	120
Engines, gasoline.....	120

Engines, LPG.....	120
Engines, natural gas.....	120
Enterprise resource planning.....	169
Environmental consulting.....	172
Environmental laboratories.....	172
Environmental regulations, interpreting.....	172
Environmental-compliance reporting.....	169
Environmental, health & safety.....	169
Epoxies.....	160
Equipment testing.....	167
Equipment, process, custom.....	133
Equipment, process, custom, cryogenic.....	133
Equipment, used: procurement & supply.....	167
Evaporative systems, mechanical recompression.....	137
Evaporative systems, multiple effect.....	137
Evaporative systems, thermal recompression.....	138
Evaporators, agitated film.....	138
Evaporators, climbing film.....	138
Evaporators, coil.....	138
Evaporators, falling film.....	138
Evaporators, flash.....	138
Evaporators, forced circulation.....	138
Evaporators, horizontal tube.....	138
Evaporators, low temperature.....	138
Evaporators, plate type.....	138
Evaporators, short path.....	138
Evaporators, thin film.....	138
Evaporators, vertical long tube.....	138
Evaporators, vertical short tube (calandria).....	138
Evaporators, waste gas.....	138
Evaporators, waste water.....	138
Evaporators, wiped film.....	138
Exhaust systems, clean-room.....	102
Expanders.....	120
Expanders, tube.....	163
Expansion bellows.....	103
Expansion joints, flexible.....	103
Expansion joints, swivel.....	103
Explosion isolation.....	164
Explosion suppression systems.....	164
Explosion Testing.....	164
Explosion vents.....	164
Extraction equipment.....	150
Extractors, centrifugal.....	151
Extruders.....	114
Extrusions, custom.....	133

## F

Face shields.....	164
Failure analysis.....	169
Fans, air cooled.....	103
Fans, axial.....	103
Fans, bisected.....	103
Fans, centrifugal.....	103
Fans, cooling tower.....	103
Fans, corrosion resistant.....	103
Fans, exhaust.....	103
Fans, exhaust or ventilating, general use.....	103

Fans, explosion resistant.....	103
Fans, heavy duty.....	103
Fans, high temperature.....	103
Fans, other.....	103
Fans, portable.....	103
Fans, vane, axial.....	103
Felt, filter.....	138
Fermentation equipment & fermentors.....	150
Fiberglass-epoxy.....	160
Fiberglass-polyester.....	160
Fibers, mineral.....	158
Filter aids, activated carbon.....	139
Filter aids, diatomaceous earth.....	139
Filter aids, zeolite.....	139
Filter bags, acidproof.....	139
Filter bags, alkaliproof.....	139
Filter bags, glass.....	139
Filter bags, natural fiber.....	139
Filter bags, synthetic fiber.....	139
Filter cloth, acidproof.....	139
Filter cloth, alkaliproof.....	139
Filter cloth, cotton.....	139
Filter cloth, glass.....	139
Filter cloth, metallic.....	139
Filter cloth, natural fiber.....	139
Filter cloth, synthetic fiber.....	139
Filter housings.....	139
Filter media, other.....	139
Filter parts & accessories.....	139
Filter presses.....	139
Filter systems.....	139
Filters, activated carbon.....	139
Filters, air.....	139
Filters, bag.....	139
Filters, belt.....	139
Filters, cartridge.....	140
Filters, centrifugal.....	140
Filters, clarifying.....	140
Filters, crossflow.....	140
Filters, disc, pressure.....	140
Filters, disc, vacuum.....	140
Filters, drum, rotary gravity.....	140
Filters, drum, rotary pressure continuous.....	140
Filters, drum, rotary vacuum continuous.....	140
Filters, electromagnetic.....	140
Filters, gas.....	140
Filters, gravity, porous bed.....	140
Filters, HEPA.....	140
Filters, horizontal belt, vacuum.....	140
Filters, hydraulic.....	140
Filters, jacketed.....	140
Filters, leaf, horizontal, pressure.....	140
Filters, leaf, vacuum.....	140
Filters, leaf, vertical, pressure.....	140
Filters, Magnetic.....	140
Filters, membrane.....	140
Filters, microfiltration.....	140
Filters, nanofiltration.....	140
Filters, nutsche.....	140
Filters, oil removal.....	140
Filters, other.....	140
Filters, pipeline.....	140
Filters, plate & frame.....	140

# PRODUCT & SERVICE INDEX

Filters, polymer.....	140	Furnaces, melting.....	146	Heat exchangers, cascade.....	142
Filters, porous metal.....	140	Furnaces, muffle.....	146	Heat exchangers, ceramic.....	142
Filters, portable.....	140	Furnaces, multiple hearth.....	146	Heat exchangers, coil.....	142
Filters, precoat.....	140	Furnaces, radiant heating.....	146	Heat exchangers, direct contact steam.....	142
Filters, pressure.....	141	Furnaces, rotary hearth.....	146	Heat exchangers, double pipe.....	143
Filters, refrigerated.....	141	Furnaces, vacuum.....	146	Heat exchangers, falling film.....	143
Filters, sand.....	141	Furnaces, vertical.....	146	Heat exchangers, finned tube.....	143
Filters, self-cleaning.....	141	Fused silica.....	158	Heat exchangers, glass.....	143
Filters, tubular.....	141			Heat exchangers, graphite.....	143
Filters, ultrafiltration.....	141	<b>G</b>		Heat exchangers, jacketed pipe.....	143
Filters, vibrating.....	141	Gages, density.....	126	Heat exchangers, plate.....	143
Filters, water.....	141	Gages, filter.....	126	Heat exchangers, plate coil.....	143
Fire alarm systems.....	163	Gages, liquid level.....	126	Heat exchangers, plate fin.....	143
Fire detection systems.....	163	Gages, liquid level, sanitary.....	126	Heat exchangers, PTFE tube.....	143
Fire extinguishers, portable.....	163	Gages, mechanical force.....	126	Heat exchangers, scraped surface.....	143
Fire extinguishing systems, carbon dioxide.....	163	Gages, nuclear radiation.....	126	Heat exchangers, screw flight.....	143
Fire extinguishing systems, dry chemical.....	163	Gages, pressure.....	126	Heat exchangers, shell & tube.....	143
Fire extinguishing systems, foam.....	163	Gages, tank.....	126	Heat exchangers, spiral.....	143
Fire extinguishing systems, halogenated hydrocarbon.....	163	Gages, temperature.....	126	Heat exchangers, tantalum.....	143
Fire pumps.....	163	Gages, vacuum & differential pressure.....	126	Heat exchangers, titanium.....	143
Flakers.....	154	Gages, water.....	127	Heat exchangers, U tube.....	143
Flakers, drum.....	138	Gas dilution systems.....	128	Heat transfer fluids, cooling fluids.....	144
Flame retardants.....	175	Gas sampling bags.....	128	Heat transfer fluids, heating fluids.....	144
Flanges.....	103	Gaskets, fluoroplastic.....	108	Heat transfer fluids, other.....	144
Flares, stack & accessories.....	171	Gaskets, molded.....	108	Heat transfer systems.....	143
Flash points, automatic.....	128	Gaskets, O-ring.....	108	Heat-exchange modeling.....	169
Flocculation equipment.....	173	Gaskets, plate heat exchanger.....	144	Heaters, air & gas.....	144
Flooring, acid resistant.....	159	Gaskets, ring.....	108	Heaters, bayonet.....	145
Flooring, aluminum.....	159	Gaskets, rubber.....	108	Heaters, cartridge.....	144
Flooring, carbon.....	159	Gaskets, sheet.....	108	Heaters, direct fired.....	144
Flooring, fiberglass.....	159	Gaskets, silicone.....	108	Heaters, drum.....	144
Flooring, iron & steel.....	159	Gates, hopper.....	114	Heaters, electric immersion.....	120
Flooring, metal grid.....	159	Gears.....	119	Heaters, feedwater.....	144
Flooring, skid resistant.....	159	Generator drives, steam.....	119	Heaters, finned tube.....	144
Flow conditioners.....	103	Generator-turbine sets.....	120	Heaters, gas fired.....	144
Flowmeters, coriolis.....	126	Generators, electrical.....	120	Heaters, helical coil.....	144
Flowmeters, differential pressure.....	126	Generators, hydrogen.....	150	Heaters, immersion.....	144
Flowmeters, electromagnetic.....	126	Generators, nitrogen.....	150	Heaters, indirect fired (waterbath).....	145
Flowmeters, magnetic.....	126	Generators, oxygen.....	150	Heaters, induction.....	145
Flowmeters, mass.....	126	Generators, ozone.....	150	Heaters, infrared.....	145
Flowmeters, orifice plate.....	126	Generators, steam.....	144	Heaters, instantaneous.....	145
Flowmeters, positive displacement.....	126	Generators, synthesis gas.....	150	Heaters, jacketed.....	145
Flowmeters, propeller.....	126	Geotechnical services.....	172	Heaters, microwave.....	143
Flowmeters, rotameters.....	126	Glass.....	158	Heaters, molten salt.....	145
Flowmeters, turbine.....	126	Glasses, furnace.....	127	Heaters, pipeline.....	145
Flowmeters, ultrasonic.....	126	Glasses, gage.....	127	Heaters, plate.....	145
Flowmeters, variable area.....	126	Glasses, sight flow.....	127	Heaters, portable.....	145
Flowmeters, vortex shedding.....	126	Glove boxes.....	164	Heaters, process liquid.....	143
Flowmeters, weirs & flumes.....	126	Gloves.....	164	Heaters, process slurry.....	143
Fluidic systems.....	128	Gold & alloys.....	159	Heaters, sandwich type.....	145
Fluorocarbons.....	160	Granulators & granulating mills.....	114	Heaters, screw flight.....	145
Foams, plastic.....	160	Groundwater remediation.....	172	Heaters, spiral.....	145
Foams, refractory.....	161			Heaters, steam injection.....	145
Freight & Cargo Protection.....	160	<b>H</b>		Heaters, tank car.....	145
Full-service environmental firms.....	172	Hangers, pipe & tube.....	103	Heaters, thermal fluid electric.....	120
Furnaces, annealing.....	145	Harnesses.....	164	Heaters, thermal liquid.....	145
Furnaces, electric.....	146	Hazard audits.....	172	Heaters, tubular.....	145
Furnaces, fluid bed.....	146	Hazardous waste services.....	172	Heaters, unit.....	145
Furnaces, gas burning.....	146	Hazardous-waste management.....	169	Heaters, Water.....	143
Furnaces, hearth.....	146	Heat exchanger parts & accessories.....	142	Helium.....	175
Furnaces, high pressure.....	146	Heat exchangers, air cooled.....	142	High alloy steels.....	161
Furnaces, high temperature.....	146	Heat exchangers, all-welded.....	142	Hogs.....	154
Furnaces, induction.....	146	Heat exchangers, bayonet.....	142	Hoists.....	116

# PRODUCT & SERVICE INDEX

Hoods, fume collectors .....	102	Insulation, refractory.....	159	Load cells .....	128
Hoppers.....	114	Insulation, urethane foam .....	159	Loaders, car .....	114
Hoppers, weighing.....	114	Intermediate bulk containers.....	116	Louvers, noise control .....	163
Hose fittings.....	103	Intermodal bulk containers.....	116	Low alloy steels .....	161
Hose reels .....	163	Ion exchanger equipment .....	156	Lubricants, engine oil .....	159
Hose, air .....	103	Ion measurement or selection .....	128	Lubricants, greases.....	159
Hose, chemically resistant .....	103	ISO certification .....	167	Lubricants, industrial oils.....	159
Hose, electrically heated.....	103	ISO compliance .....	169	Lubricants, process oils .....	159
Hose, high pressure .....	103	<b>J</b>		Lubricating equipment .....	163
Hose, jacketed .....	103	Jacketing, insulation.....	159	Lumpbreakers .....	154
Hose, metallic.....	103	Joints, swivel .....	103	Lumpbreakers for solid &	
Hose, nonmetallic, fluoroplastic .....	103	Joints, universal.....	119	liquid systems.....	154
Hose, pneumatic conveyors.....	116	<b>K</b>		<b>M</b>	
Hose, sanitary .....	103	Kettles, agitated .....	150	Machinery-alignment equipment....	163
Hose, steam .....	103	Kettles, caustic .....	150	Magnesium.....	159
Hose, vacuum .....	103	Kettles, crystallizing .....	150	Maintenance management.....	169
Hose, water .....	103	Kettles, electrically heated .....	150	Manometers.....	128
Hot oils.....	144	Kettles, jacketed.....	150	Manufacturing execution systems..	169
Humidifiers .....	132	Kettles, melting.....	150	Manufacturing execution systems..	169
Hybrid process control computers.	124	Kettles, special metals .....	150	Manways .....	151
Hydrogen.....	175	Kettles, vacuum .....	150	Marking & labeling systems .....	164
Hydrogen generation units.....	151	Kiln, oven & furnace accessories...	146	Material Safety Data Sheet	
Hydrogen peroxide .....	176	Kilns, fluidizing .....	146	(MSDS) management.....	169
Hydrogen sulfide removal systems	171	Kilns, rotary.....	146	Materials handling systems.....	117
Hydrogenation plants.....	150	Kilns, vertical transfer .....	146	Materials management.....	169
Hydrogenation reactors.....	150	<b>L</b>		Mathematics & statistics.....	169
Hypochlorinators .....	156	Laboratory information management..	169	Mechanical Seals and	
<b>I</b>		Lamps, incandescent.....	120	Sealing Material.....	108
Incinerators.....	173	Lamps, infrared .....	120	Medium alloy steels.....	161
Incinerators, gas & liquid .....	173	Lamps, mercury vapor .....	120	Membrane systems for gases .....	151
Indicators, bin level .....	127	Lamps, photochemical.....	120	Membrane systems for liquids .....	151
Indicators, carbon monoxide .....	127	Lamps, sodium vapor.....	120	Meters, air .....	128
Indicators, combustible gases .....	127	Lamps, ultraviolet .....	120	Meters, conductivity .....	128
Indicators, dewpoint or humidity....	127	Laser systems .....	128	Meters, displacement.....	128
Indicators, flow .....	127	Lead & alloys.....	159	Meters, electrical .....	128
Indicators, liquid level .....	127	Leak sealing service.....	163	Meters, gas.....	128
Indicators, mass flow.....	127	Lift tables .....	114	Meters, heat flow .....	128
Indicators, moisture .....	127	Lift trucks.....	114	Meters, oxygen.....	128
Indicators, other .....	127	Lift trucks, explosion proof .....	114	Meters, pH.....	128
Indicators, pressure .....	127	Lighting equipment, emergency ...	120	Meters, recording .....	128
Indicators, solids level.....	127	Lighting, explosion proof.....	120	Meters, salinity.....	128
Indicators, specific gravity .....	127	Lighting: panelboards,		Meters, sludge.....	128
Indicators, temperature .....	127	instruments & gages .....	120	Meters, surface tension.....	128
Indicators, vacuum .....	127	Liners, pond .....	173	Meters, turbidity.....	128
Indicators, valve position.....	127	Lining applications, custom .....	133	Meters, ultrasonic .....	128
Indicators, viscosity.....	127	Linings, basalt .....	160	Meters, ultraviolet .....	129
Indicators, weight .....	127	Linings, cements & mortars .....	160	Meters, vibration.....	129
Indium & alloys .....	159	Linings, ceramic .....	160	Meters, water .....	129
Indoor-air-quality services .....	172	Linings, chlorosulfonated		Meters, zeta potential .....	129
Information management .....	169	polyethylene .....	160	Microfiltration equipment.....	141
Information Services.....	167	Linings, epoxy .....	160	Mills, attrition.....	154
Infrared Thermometer.....	128	Linings, glass .....	160	Mills, ball.....	154
Inhibitors, corrosion.....	176	Linings, glass-reinforced plastic ...	160	Mills, cage.....	154
Input & output equipment,		Linings, polyethylene.....	160	Mills, colloid.....	154
data processing .....	169	Linings, refractory.....	160	Mills, cone .....	154
Input-output equipment.....	124	Linings, urethane.....	160	Mills, disc .....	154
Inserts, heat-exchanger tube .....	143	Linings, vinyl.....	160	Mills, grinding.....	154
Inspection.....	167	Liquid-liquid processing.....	132	Mills, hammer .....	154
Insulation, acoustical.....	163	Liquid-mixer parts & accessories..	146	Mills, homogenizing.....	154
Insulation, asbestos replacement ..	158			Mills, impact .....	154
Insulation, coatings & sealers .....	158			Mills, jacketed ball.....	154
Insulation, glass fiber .....	158			Mills, jet.....	154
Insulation, high temperature.....	159			Mills, other .....	154
Insulation, low temperature .....	159			Mills, pebble.....	154

# PRODUCT & SERVICE INDEX

Mills, pug .....	155
Mills, ring roll .....	155
Mills, rod .....	155
Mills, roller .....	155
Mills, tube .....	155
Mills, tumbling .....	155
Mills, vertical .....	155
Mist eliminators .....	137
Mixer-settlers .....	152
Mixers, air driven .....	146
Mixers, anchor .....	147
Mixers, batch .....	147
Mixers, bottom entering .....	147
Mixers, chilled .....	147
Mixers, cone .....	147
Mixers, continuous .....	147
Mixers, continuous kneaders .....	148
Mixers, disc .....	147
Mixers, double arm kneaders .....	148
Mixers, gas-liquid, high intensity .....	147
Mixers, gate .....	147
Mixers, gravity flow .....	148
Mixers, heated .....	147
Mixers, high shear .....	148
Mixers, jet .....	147
Mixers, magnetically coupled .....	149
Mixers, motionless .....	149
Mixers, other solid-liquid .....	149
Mixers, paddle .....	147
Mixers, pan .....	149
Mixers, pipeline (inline) .....	147
Mixers, planetary .....	149
Mixers, pony .....	148
Mixers, portable .....	148
Mixers, pressure .....	148
Mixers, propeller .....	148
Mixers, ribbon .....	149
Mixers, roller .....	149
Mixers, rotary blade .....	149
Mixers, rotary disc .....	149
Mixers, rotary drum .....	149
Mixers, screw .....	149
Mixers, side entering .....	148
Mixers, slurry .....	148
Mixers, spiral ribbon .....	149
Mixers, spiral screw .....	149
Mixers, static .....	148
Mixers, top entering .....	148
Mixers, turbine .....	148
Mixers, vacuum .....	148
Mixers, vacuum tumble .....	149
Mixers, vertical stationary .....	149
Mixers: barrel, drum, carboy .....	148
Mixing equipment for gas, air .....	148
Molybdenum & alloys .....	159
Monitors, air quality .....	123
Monitors, ammonia .....	123
Monitors, carbon dioxide or monoxide .....	123
Monitors, chlorine .....	124
Monitors, colorimetric .....	124
Monitors, combustible gases, or vapors .....	124
Monitors, composition .....	124
Monitors, conductivity .....	124
Monitors, dispersion .....	124

Monitors, dust .....	124
Monitors, emissions, continuous .....	124
Monitors, humidity .....	124
Monitors, hydrocarbon content .....	124
Monitors, hydrogen cyanide content .....	124
Monitors, hydrogen sulfide content .....	124
Monitors, octane .....	124
Monitors, oil content .....	124
Monitors, organic carbon, total .....	124
Monitors, oxygen content .....	124
Monitors, particle size .....	124
Monitors, pH .....	124
Monitors, stack gases .....	124
Monitors, sulfur .....	124
Monitors, viscosity .....	124
Monitors, VOCs .....	124
Monitors, water quality .....	124
Monomer-recovery systems .....	152
Motors, A.C. .....	120
Motors, D.C. .....	120
Motors, explosion proof .....	120
Motors, submersible .....	120
Motors, variable speed .....	120
Motors, vertical .....	120
Mullers .....	149

## N

Natural gas processing plants .....	152
Neural-network simulation .....	169
Nickel .....	160
Nickel alloys .....	160
Nickel aluminide .....	160
Niobium .....	159
Nitrogen .....	176
Noise enclosures & barriers .....	163
NOx control systems .....	172
Nozzles, atomizing .....	152
Nozzles, fire fog .....	164
Nozzles, mixing .....	152
Nozzles, spray .....	152
Nylon .....	160

## O

Odor-control systems .....	172
Oil purification equipment .....	152
Oil skimmers .....	173
Online diagnostics of columns .....	155
Organic intermediates .....	176
Ovens, drying .....	146
Ovens, electric .....	146
Ovens, infrared .....	146
Ovens, microwave .....	146
Ovens, radiant heating .....	146
Ovens, vacuum .....	146
Oxidation plants .....	150
Oxidation reactors .....	150
Oxidizers, catalytic .....	150
Oxidizers, catalytic .....	173
Oxidizers, regenerative .....	150
Oxidizers, thermal .....	173
Oxygen .....	176
Ozonators .....	156
Ozone .....	176

## P

Packaging equipment, liquids .....	116
Packaging equipment, solids .....	116
Packers, bag .....	116
Packers, drum .....	116
Packers, vibrating .....	116
Packings, carbon .....	108
Packings, cooling tower .....	149
Packings, molded .....	108
Packings, plastic .....	108
Packings, pump .....	108
Packings, ring .....	108
Packings, shaft .....	108
Packings, structured .....	108
Packings, tower & column, ceramic .....	149
Packings, tower & column, metal .....	149
Packings, tower & column, plastic .....	149
Packings, tower & column, random .....	149
Packings, tower & column, structured .....	149
Packings, trays for towers & columns .....	149
Packings, valve stem .....	108
Pads, filter .....	139
Pails & cans .....	116
Paints .....	160
Palladium & alloys .....	159
Pallet trucks .....	114
Palletizers .....	117
Paper, filter .....	139
Particle size control systems .....	132
Particulate removal systems .....	172
Patching compounds .....	163
Pelletizers .....	115
Permeation tubes .....	129
Pervaporation equipment .....	152
Photometers .....	129
Physical properties .....	170
Pigments .....	176
Pilot plant services .....	167
Pipe & pipe systems, custom .....	133
Pipe adapters .....	103
Pipe fittings, emergency repair .....	104
Pipe fittings, graphite .....	104
Pipe fittings, high pressure .....	104
Pipe fittings, jacketed .....	104
Pipe fittings, lined .....	104
Pipe fittings, nonmetallic .....	104
Pipe markers .....	164
Pipe strainers .....	104
Pipe, ABS .....	104
Pipe, aluminum .....	104
Pipe, aluminum alloy .....	104
Pipe, carbon steel, seamless .....	104
Pipe, ceramic lined .....	104
Pipe, ceramic-metal .....	104
Pipe, chlorinated PVC .....	104
Pipe, containment .....	104
Pipe, copper .....	104
Pipe, custom fabricated .....	104
Pipe, fished .....	104
Pipe, flanged .....	104
Pipe, glass .....	104
Pipe, glass lined .....	104
Pipe, graphite .....	104

# PRODUCT & SERVICE INDEX

Pipe, hard rubber .....	104	Pumps, centrifugal, process, medium duty.....	104	Pumps, titanium.....	107
Pipe, high-alloy steel .....	104	Pumps, centrifugal, self-priming ....	104	Pumps, transfer .....	106
Pipe, jacketed.....	104	Pumps, centrifugal, single stage....	105	Pumps, turbine .....	105
Pipe, nickel & nickel alloy.....	104	Pumps, ceramic .....	107	Pumps, vacuum, dry .....	107
Pipe, plastic lined .....	104	Pumps, ceramic lined.....	105	Pumps, vacuum, liquid ring.....	107
Pipe, polyethylene.....	104	Pumps, channel impeller.....	105	Pumps, vacuum, once-through-oil ..	107
Pipe, polypropylene .....	104	Pumps, condensate return.....	105	Pumps, vacuum, other .....	107
Pipe, polyvinylidene fluoride .....	104	Pumps, cryogenic .....	105	Pumps, vacuum, rotary piston.....	107
Pipe, prefabricated.....	104	Pumps, dewatering, submersible... 108		Pumps, vertical centrifugal.....	108
Pipe, PTFE.....	104	Pumps, diaphragm (proportioning) 106		Pumps, vertical inline .....	108
Pipe, rubber.....	104	Pumps, diaphragm (reciprocating) 106		Pumps, vertical turbine .....	108
Pipe, sanitary.....	104	Pumps, disc.....	105	Pumps, water.....	106
Pipe, stainless steel.....	104	Pumps, dry vacuum .....	105	Pumps, zirconium.....	107
Pipe, vinyl ester - glass .....	104	Pumps, explosion proof.....	105	Purge systems.....	164
Pipeline rehabilitation processes ...	163	Pumps, fiberglass-reinforced plastic...107		Pyrometers .....	129
Plant decommissioning and dismantling .....	167	Pumps, flexible impeller .....	105		
Plant documentation services .....	167	Pumps, gas mixing.....	105	<b>Q</b>	
Plant maintenance services .....	163	Pumps, gear .....	106	Quality assurance or control .....	170
Plant optimization .....	170	Pumps, graphite.....	107	Quartz.....	158
Plant relocation .....	167	Pumps, hand.....	105		
Plastic fabrication, custom .....	133	Pumps, helical.....	106	<b>R</b>	
Plastics, other.....	160	Pumps, high pressure .....	105	Radio remote control systems .....	129
Plates, filter .....	139	Pumps, jacketed.....	105	Railroad car spotter, indexer, or positioner.....	114
Platinum & alloys .....	159	Pumps, jet, sanitary .....	107	Railroad safety devices .....	164
Polycarbonates.....	160	Pumps, leakproof .....	105	Reactors, continuous.....	150
Polyesters.....	160	Pumps, lobe .....	106	Reactors, cooled, heated .....	150
Polyethylenes .....	160	Pumps, magnetically driven .....	105	Reactors, fluid bed .....	150
Polymerizers .....	150	Pumps, metering .....	106	Reactors, gas-liquid .....	150
Polypropylenes .....	160	Pumps, mixed flow .....	105	Reactors, hollow flight .....	151
Polytetrafluoroethylene .....	160	Pumps, nickel-based alloy .....	107	Reactors, jacketed .....	151
Porcelain & stoneware, chemical ...	158	Pumps, nonmetallic .....	107	Reactors, jacketed, dimple .....	151
Powder Testing .....	129	Pumps, oil free.....	105	Reactors, jacketed, half-pipe .....	151
Powders, ceramic.....	158	Pumps, open impeller .....	106	Reactors, lined, glass.....	151
Power supplies, emergency.....	120	Pumps, other .....	106	Reactors, lined, metal.....	151
Precipitators, water treating .....	156	Pumps, other lined .....	105	Reactors, loop .....	151
Preheaters .....	143	Pumps, other special materials..... 107		Reactors, pilot plant .....	151
Preservatives .....	176	Pumps, packless .....	108	Reactors, plastic lined.....	151
Pressure Relief .....	164	Pumps, peristaltic.....	106	Reactors, rotary blade.....	151
Pressure vessel design .....	170	Pumps, piston.....	106	Reactors, rotary disc .....	151
Pressure vessel repair .....	163	Pumps, piston-diaphragm.....	106	Reboilers .....	143
Prillers.....	115	Pumps, plastic.....	107	Recorder parts & accessories.....	129
Process control.....	170	Pumps, plastic lined.....	105	Recorders, liquid level.....	129
Process optimization .....	170	Pumps, plunger .....	106	Recorders, mass flow .....	129
Process safety management.....	170	Pumps, plunger .....	106	Recorders, specific gravity .....	129
Process safety management services .....	167	Pumps, pressure powered .....	106	Recorders, temperature .....	129
Process simulation .....	170	Pumps, progressing cavity.....	106	Recorders, viscosity .....	129
Process simulation systems .....	170	Pumps, propeller .....	105	Rectifiers, germanium controlled ...	120
Production scheduling .....	170	Pumps, recessed impeller.....	106	Recuperators.....	145
Project management .....	170	Pumps, rotary helical gear .....	106	Recycling firms.....	172
Proportioners .....	117	Pumps, rotary herringbone.....	106	Refiners, particle size .....	155
Publishing.....	167	Pumps, rotary liquid ring .....	106	Refractometers .....	129
Pultrusion, custom.....	133	Pumps, rotary piston .....	106	Refractories .....	161
Pump repair.....	163	Pumps, rotary positive displacement..106		Refractories, gunning.....	161
Pumps, acid, corrosive.....	105	Pumps, rotary sliding vane.....	107	Refractory mortars & cements .....	161
Pumps, air driven .....	105	Pumps, rubber lined.....	105	Refrigeration equipment & systems ..	132
Pumps, axial flow.....	105	Pumps, screw .....	107	Refrigeration equipment, chillers ...	132
Pumps, battery-powered.....	105	Pumps, screw centrifugal.....	105	Refrigeration equipment, freezers..	132
Pumps, carboy or drum.....	105	Pumps, sealless .....	106	Regulators, air .....	125
Pumps, centrifugal, ANSI .....	104	Pumps, sludge .....	106	Regulators, back pressure .....	125
Pumps, centrifugal, double suction 104		Pumps, slurry .....	106	Regulators, feedwater .....	125
Pumps, centrifugal, dry running.... 104		Pumps, spiral-vane impeller.....	106	Regulators, flow.....	125
Pumps, centrifugal, inline.....	104	Pumps, stainless steel.....	107	Regulators, gas .....	125
Pumps, centrifugal, multistage..... 104		Pumps, submersible.....	108	Regulators, pressure .....	125
		Pumps, sump .....	108		
		Pumps, tantalum.....	107		

# PRODUCT & SERVICE INDEX

Regulators, temperature.....	125	Screens, rotary .....	152	Solids feeders, continuous flow.....	116
Regulators, vacuum .....	125	Screens, stationary.....	152	Solids feeders, gravimetric.....	116
Regulatory compliance .....	170	Screens, synthetic.....	152	Solids feeders, high-pressure .....	116
Reinforced-plastics fabrication, custom...	133	Screens, testing.....	152	Solids feeders, natural frequency ..	116
Relays, time delay .....	129	Screens, vibrating .....	152	Solids feeders, proportioning.....	116
Remote monitoring .....	172	Screens, wire.....	152	Solids feeders, rotary .....	116
Resins, ion exchange.....	156	Screw presses.....	141	Solids feeders, vibrating	
Resins, water-soluble .....	176	Scrubbers, centrifugal.....	152	or oscillating .....	116
Reverse osmosis systems.....	156	Scrubbers, conical.....	152	Solids feeders, volumetric.....	116
Rheometers .....	129	Scrubbers, cyclone .....	152	Solvent extraction systems.....	152
Risk analysis.....	167	Scrubbers, fluidized bed.....	153	Solvent recovery systems.....	152
Roasters, food products.....	146	Scrubbers, fume, gas.....	153	Solvent recycling systems.....	152
Robotic components .....	117	Scrubbers, impingement baffle.....	153	Solvents, alcohols.....	176
Rods, welding.....	163	Scrubbers, jet.....	153	Solvents, drug extracting .....	176
Rubber, acrylic .....	161	Scrubbers, oil mist.....	153	Solvents, electronic .....	176
Rubber, butyl .....	161	Scrubbers, orifice .....	153	Solvents, glycol ether .....	176
Rubber, chlorinated polyethylene ..	161	Scrubbers, packed column.....	153	Solvents, high flash .....	176
Rubber, chlorosulfonated		Scrubbers, plate column.....	153	Solvents, hydrocarbons.....	176
polyethylene.....	161	Scrubbers, rotary.....	153	Solvents, insecticide.....	176
Rubber, ethylene propylene .....	161	Scrubbers, spray.....	153	Solvents, ketones .....	176
Rubber, fluoroelastomers .....	161	Scrubbers, venturi.....	153	Solvents, nontoxic .....	176
Rubber, neoprene.....	161	Scrubbers, wire mesh tray .....	153	Solvents, odorless .....	176
Rubber, nitrile .....	161	Sealants.....	160	Solvents, other.....	176
Rubber, polybutadiene.....	161	Seals, balanced pressure .....	108	Spectrometer accessories	
Rubber, silicone.....	161	Seals, bearing .....	108	or services.....	124
Rubber, styrene butadiene.....	161	Seals, bellows.....	108	Spectrometers .....	124
Rubber, synthetic, other .....	161	Seals, diaphragm.....	108	Speed reducers.....	119
Rubber, urethane.....	161	Seals, mechanical .....	108	Spill collectors, tank car .....	173
Rupture discs .....	164	Seals, noncontacting.....	108	Spill contingency,	
Rupture panels .....	164	Seals, shaft.....	108	emergency response .....	172
		Seals, spring.....	108	Spill control & emergency response	173
		Selenium & alloys .....	159	Spill prevention equipment.....	173
		Separators.....	151	Spill response kits .....	163
		Separators for metals .....	152	Spray equipment, thermal.....	163
		Separators, magnetic .....	152	Spray nozzles, cooling tower .....	133
		Separators, oil-water .....	173	Sprayers .....	152
		Sewage treating units .....	173	Sprinkler systems .....	163
		Shaft-alignment equipment .....	163	Stainless steels, AISI 300 series.....	161
		Shafting .....	119	Stainless steels, AISI 400 series.....	161
		Shoes, safety.....	164	Static detection &	
		Showers, emergency.....	164	elimination systems .....	164
		Shredders.....	155	Static eliminators .....	176
		Sieves.....	152	Steam jet ejectors.....	107
		Sifters, sifting machines .....	152	Steam traps, disc .....	108
		Silencers, exhaust .....	163	Steam traps, float .....	108
		Silencers, inline .....	163	Steam traps, float & thermostatic ...	108
		Silencers, intake .....	163	Steam traps, inverted bucket.....	108
		Silicon carbide.....	158	Steam traps, orifice devices.....	108
		Silicones .....	160	Steam traps, thermostatic .....	108
		Silos .....	114	Sterilizers .....	145
		Silver & alloys .....	159	Storage cabinets .....	164
		Simulators.....	169	Storage systems.....	117
		Sinks, eye or face emergency.....	164	Strainers .....	141
		Sleeves, pump.....	104	Strippers, air .....	152
		Sludge dewaterers .....	173	Strippers, air .....	173
		Sludge dryers.....	173	Strips, electric heating.....	120
		Sludge handling .....	172	Stud tensioners, hydraulic.....	163
		Smoke detection systems .....	163	Sublimers.....	151
		Software development.....	170	Sulfur Recovery .....	172
		Software, other .....	170	Superheaters.....	143
		Soil remediation.....	172	Supervisory process control	
		Solid-liquid-mixer parts		computers .....	124
		& accessories.....	149	Supply chain management .....	170
		Solids feeders, airlock .....	116	Surface active agents, anionic.....	176
		Solids feeders, batch .....	116	Surface active agents, nonionic.....	176
		Solids feeders, constant weight ....	116		

## S

Saddles, polyethylene,	
tower packings.....	149
Safety audits.....	164
Salinometers.....	129
Samplers, automatic.....	123
Samplers, gas, air .....	123
Samplers, liquid.....	123
Samplers, solids .....	123
Scales, automatic weighing .....	117
Scales, bagging, filling.....	117
Scales, checkweight .....	117
Scales, continuous weighing.....	117
Scales, conveying .....	117
Scales, counting.....	117
Scales, floor, platform.....	117
Scales, forklift .....	117
Scales, gas cylinder filling.....	117
Scales, hopper .....	117
Scales, portable .....	117
Scales, railroad car .....	117
Scales, remote indicating.....	117
Scales, tank .....	117
Scales, totalizing .....	117
Scales, truck.....	117
Screening .....	152
Screens, air .....	152
Screens, bar .....	152
Screens, centrifugal .....	152
Screens, cylindrical.....	152
Screens, grizzly .....	152
Screens, gyratory .....	152
Screens, milled slot .....	152
Screens, perforated plate.....	152



# PRODUCT & SERVICE INDEX

Surface active agents, not further specified.....	176
Surface active agents, other .....	176
Surge suppression systems .....	124
Sweepers.....	163
Switches, electrical.....	120
Switchgear & other power distribution equipment .....	120
Syngas generation units.....	152

## T

Tank fittings & accessories.....	108
Tanks, air .....	108
Tanks, aluminum.....	108
Tanks, bladder.....	108
Tanks, carbon steel .....	108
Tanks, cryogenic .....	109
Tanks, cryogenic, vacuum jacketed.....	109
Tanks, custom fabricated .....	109
Tanks, dimple jacketed.....	109
Tanks, dome roof.....	109
Tanks, double containment .....	109
Tanks, epoxy lined.....	109
Tanks, epoxy-fiberglass.....	109
Tanks, field-erected.....	109
Tanks, floating roof .....	109
Tanks, galvanized.....	109
Tanks, glass lined.....	109
Tanks, heated .....	109
Tanks, internal floating deck.....	109
Tanks, mixing.....	109
Tanks, nickel or nickel alloys .....	109
Tanks, other .....	109
Tanks, phenolic lined.....	109
Tanks, polyester-fiberglass.....	109
Tanks, polyethylene .....	109
Tanks, polypropylene .....	109
Tanks, pressurized storage .....	109
Tanks, PVC .....	109
Tanks, rubber lined.....	109
Tanks, settling.....	173
Tanks, stainless steel.....	109
Tanks, stainless steel, lined .....	109
Tanks, tapered wall.....	109
Tanks, vinyl ester - fiberglass .....	109
Tanks, water.....	109
Tantalum & alloys.....	159
Tape, electric heating.....	120
Technology licensing.....	167
Telemetering & data transmission systems .....	129
Tellurium .....	159
Temperature Sensor .....	129
Testers, cloud & pour point, automatic.....	129
Testers, flash point.....	129
Testers, hardness .....	129
Testers, ring & ball.....	129
Testers, tensile strength.....	129
Testing equipment, corrosion .....	163
Testing equipment, dust .....	164
Testing equipment, emergency valves .....	164
Testing equipment, gases & vapors.....	164
Testing equipment, high pressure..	163

Testing equipment, nondestructive .....	163
Testing equipment, other.....	129
Testing instruments, vibration.....	163
Thallium .....	159
Thermal fluids.....	144
Thermistors.....	127
Thermocouples .....	127
Thermometers, bimetallic .....	127
Thermometers, dial .....	127
Thermometers, digital .....	127
Thermometers, electrical.....	127
Thermometers, infrared.....	127
Thermometers, precision.....	127
Thermometers, recording.....	127
Thermometers, resistance temperature detectors.....	127
Thermometers, surface .....	127
Thermoplastic elastomers .....	160
Thermostats.....	127
Thermowells .....	127
Thickeners, cellulose ethers.....	176
Thickeners, centrifugal.....	132
Thickeners, gravity .....	133
Thickeners, other.....	176
Thickeners, rake or sedimentation ..	133
Thickeners, thixotropes .....	176
Tile.....	158
Timers.....	129
Tin & alloys .....	159
Titanium & alloys .....	159
Tools & equipment, other.....	163
Tools, hand.....	163
Totalizers.....	125
Tower parts & accessories .....	155
Tracing, pipe .....	145
Training personnel, maintenance ..	167
Training personnel, pollution control..	167
Training personnel, safety & health ..	167
Training services .....	173
Training systems, plant operators ..	167
Transducers.....	129
Transducers, heat flow .....	129
Transformers.....	120
Transmissions.....	119
Transmitters, level.....	130
Transmitters, mass flow .....	130
Transmitters, pressure .....	130
Transmitters, pressure-critical .....	130
Transmitters, temperature.....	130
Traps, air.....	137
Trays & tower internals .....	149
Troughs, cooled or heated .....	144
Tube fittings.....	109
Tube sheets .....	109
Tubes, filter.....	139
Tubing, boiler.....	109
Tubing, condenser .....	109
Tubing, evaporator .....	109
Tubing, ferrous.....	109
Tubing, finned.....	109
Tubing, flexible metal .....	109
Tubing, heat exchanger .....	109
Tubing, high pressure.....	109
Tubing, high temperature .....	109
Tubing, instrument.....	109
Tubing, nonmetallic .....	110

Tubing, plastic.....	110
Tubing, pneumatic.....	110
Tubing, refractory .....	110
Tubing, rubber .....	110
Tubing, seamless .....	110
Tubing, silicone .....	110
Tubing, vacuum.....	110
Tubing, welded .....	110
Tungsten & alloys .....	159
Turbines, combined steam-gas.....	119
Turbines, mechanical drive, gas ....	119
Turbines, mechanical drive, steam ..	119

## U

U-bends, tube .....	110
Ultrafiltration systems .....	156
Ultraviolet disinfection systems.....	156
Unions, pipe .....	104
Unloaders, barge .....	114
Unloaders, bulk bag.....	114
Unloaders, hopper car .....	114
Unloaders, other.....	114
Unloaders, tank car.....	114
Unloaders, tank truck .....	114

## V

Vacuum cleaning systems.....	163
Vacuum pumping systems .....	108
Valve & flange covers.....	164
Valve operators, diaphragm .....	122
Valve operators, electrohydraulic... ..	122
Valve operators, electropneumatic. .	122
Valve operators, motor operated....	122
Valve operators, piston.....	122
Valve operators, pneumatic.....	122
Valve operators, solenoid.....	122
Valve parts & fittings.....	110
Valve positioners, microprocessor equipped.....	122
Valve positioners, other .....	122
Valve repair.....	163
Valve-locking devices.....	110
Valve, position indicators.....	122
Valves, air .....	110
Valves, airlock flap-gate .....	110
Valves, airlock rotary .....	110
Valves, angle .....	110
Valves, backflow.....	110
Valves, ball .....	110
Valves, bellows sealed .....	110
Valves, butterfly .....	110
Valves, cage.....	110
Valves, ceramic lined .....	110
Valves, check .....	110
Valves, control, electric .....	110
Valves, control, hydraulic .....	110
Valves, control, pneumatic .....	110
Valves, control, regulator.....	110
Valves, control, solenoid.....	111
Valves, cryogenic .....	111
Valves, diaphragm.....	111
Valves, diverter .....	111
Valves, diverter conveyor .....	117
Valves, double block & bleed.....	111

# PRODUCT & SERVICE INDEX

Valves, electrically heated.....	111	Valves, multiport.....	111	Valves, ram.....	112
Valves, flush-bottom tank.....	111	Valves, needle.....	112	Valves, relief.....	112
Valves, gate.....	111	Valves, nuclear.....	112	Valves, rubber lined.....	112
Valves, glass.....	111	Valves, other.....	112	Valves, safety.....	112
Valves, glass lined.....	111	Valves, packless.....	112	Valves, sampling.....	112
Valves, globe.....	111	Valves, pilot operated.....	112	Valves, slide.....	112
Valves, heat actuated, fail safe.....	111	Valves, pinch.....	112	Valves, slurry.....	112
Valves, high pressure.....	111	Valves, plastic.....	112	Valves, tank blanketing.....	112
Valves, high temperature.....	111	Valves, plastic lined.....	112	Valves, tank venting.....	112
Valves, hopper.....	111	Valves, plug.....	112	Valves, titanium.....	112
Valves, iris.....	111	Valves, pneumatic.....	112	Valves, vacuum.....	112
Valves, jacketed.....	111	Valves, powder.....	117	Valves, vacuum relief.....	112
Valves, knife-gate.....	111	Valves, pressure reducing.....	112	Valves, vent, low pressure.....	112
Valves, metal seated.....	111	Valves, proportional.....	112	Valves, zirconium.....	112
Valves, mixing.....	111	Valves, pump protection.....	112	Vapor recovery systems.....	172
Valves, motor operated.....	111	Valves, quick closing.....	112	Vaporizers.....	145



Introducing Corzan® HP, creating piping systems with better

**CORROSION RESISTANCE**  
**AND HIGH-TEMPERATURE PERFORMANCE**  
 for transmission of **CHEMICAL FLUIDS**,  
*all made with LUBRIZOL TECHNOLOGY*  
**TO GIVE YOU MORE INSIDE.™**



Corzan HP is a high-pressure, high-temperature, high-impact-strength piping system engineered with Lubrizol's specially formulated chlorinated polyvinyl chloride (CPVC) compounds that meet the ASTM D1784 certification for 24448 cell class. **It's the first pipe that meets ASTM F441 material classification 4120-06, with a pressure rating 25% higher than standard CPVC at 180°F (82°C).**



Follow us on Twitter @LZ\_CPVC

Choose Corzan HP for Chemical Processing, Semiconductor & Electronics, Water Treatment, Industrial Manufacturing, Mining and Power Generation applications.

See how the details on the inside make all the difference on the outside. Call a piping systems consultant at **1.216.447.7397** or visit **corzancpvc.com** to learn more.

**Lubrizol**

© 2014 The Lubrizol Corporation, all rights reserved. All marks are the property of The Lubrizol Corporation. The Lubrizol Corporation is a Berkshire Hathaway company. GC 140681

Circle 42 on p. 180 or go to [adlinks.che.com/50982-42](http://adlinks.che.com/50982-42)

## W

Wall materials, chemically resistant.....	159
Washers.....	163
Washers, continuous belt.....	151
Washers, horizontal vacuum filter ..	151
Washers, spray.....	151
Waste heat recovery units.....	144
Waste minimization & recycling.....	173
Waste testing & analysis.....	173
Waste transportation.....	173
Waste treatment facilities, other.....	173
Waste-recovery treating systems...	173
Wastewater neutralization systems.....	173
Water pollution systems.....	156
Water treatment chemicals.....	176
Water treatment control equipment.....	156
Water-conditioning package systems.....	156
Water-pollution control services.....	173
Weld heat-treating.....	163
Welding equipment.....	163
Wet Electrostatic precipitators.....	137
Wire cloth.....	152
Wire mesh.....	152
Wrought iron.....	159

## X

X ray & gamma ray equipment.....	129
----------------------------------	-----

## Z

Zeolites.....	176
Zinc & alloys.....	159
Zirconium.....	160

**RECEIVE FULL  
ACCESS**  
to ALL of Chemical Engineering's Facts at Your  
Fingertips articles in one convenient location.

**EACH INFORMATION PACKED PDF ARTICLE**

includes graphs, charts, tables, equations and columns on the full chemical engineering processes you deal with on a daily basis. This is the tool you will come to rely on, referring back to the information again and again with just the click of a mouse.

**Facts at Your Fingertips Topics Include:**

- Conservation Economics: Carbon Pricing Impacts
- Distillation Tray Design
- Burner Operating Characteristics
- Measurement Guide for Replacement Seals
- Steam Tracer Lines and Traps
- Positive Displacement Pumps
- Low-Pressure Measurement for Control Valves
- Creating Installed Gain Graphs
- Aboveground and Underground Storage Tanks
- Chemical Resistance of Thermoplastics
- Heat Transfer: System Design II
- Adsorption
- Flowmeter Selection
- Specialty Metals
- Plus much, much more...

**Receive full access today by visiting  
[store.chemengonline.com/product/facts](http://store.chemengonline.com/product/facts)**

# Paharpur Makes Green Greener



Paharpur has designed and supplied cooling towers for green buildings with approach as low as 1°C, making the air-conditioning plants of these buildings more energy efficient and reducing their energy consumption during the peak Indian summer-monsoon months to lower-than-ever levels.

In addition to reducing the building's carbon footprint, these cooling towers are also more cost-efficient in the long run. The higher price of these towers is more

than offset by the saving in air-conditioning plant energy consumption, in less than 12 months in most cases. And after the payback period, these savings accumulate to the owner for the rest of the plant's life.

So, if you are looking to take your building to the next level of energy efficiency without compromising on life-cycle costs, look to the leader in cooling tower technology – look to... Paharpur.



Your Full-Service Cooling Technologies Company  
[www.paharpur.com](http://www.paharpur.com)

India's largest range of CTI-certified cooling towers – crossflow and counterflow

Paharpur Cooling Towers Ltd, Paharpur House, 8/1/B Diamond Harbour Road, Kolkata - 700 027, INDIA

Phone : +91-33-4013 3000 • Fax : +91-33-4013 3499 • [pctccu@paharpur.com](mailto:pctccu@paharpur.com)

PAHARPUR USA, Inc, Suite 135, 18300 East 71<sup>st</sup> Avenue Denver, CO 80249, USA • Phone : +1-303-989 7200

Fax : +1-720-962 8400 • [info@paharpurusa.com](mailto:info@paharpurusa.com)



AIR-COOLED HEAT EXCHANGERS

COOLING TOWERS

AIR-COOLED STEAM CONDENSERS

# CHEMICAL ENGINEERING



buyers guide corporate capabilities

# American Elements

**American Elements**  
 1093 Broxton Ave. Suite 2000  
 Los Angeles, CA 90024  
 Telephone: 310-208-0551  
 Email: [customerservice@americanelements.com](mailto:customerservice@americanelements.com)  
 Website: [www.americanelements.com](http://www.americanelements.com)



## THE WORLD LEADER IN ADVANCED MATERIALS

American Elements is the world leader in engineered & advanced materials with a catalogue of over 12,000 materials including advanced polymer additives and dopants, high purity metals, chemicals, semiconductors and minerals, nanoparticles, organo-metallics and crystal-grown materials for commercial applications such as plastics, resins, ultra light and ultra strong composites and alloys, ceramics and compounds for automotive, aerospace, military, medical, electronic, green/clean technologies and solar energy applications. American Elements maintains research and laboratory facilities in the U.S. and manufacturing/warehousing in the U.S., Europe, China & Brazil.

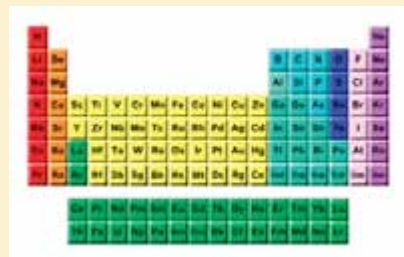
## ENGINEERED MATERIALS ON A COMMERCIAL SCALE

Since our production begins at the mine in our mineral refining and chemical separations operations in China, Mexico and the U.S., your cost will remain as low as your specifications demand. The combination of world class U.S. based research, development, analysis and certification with a fully integrated global



manufacturing operation allows us to both certify to the highest possible U.S. standards and at the same time provide materials at the lowest possible world prices.

The company's 10,850 page online catalog is annually viewed by more than 1.2 million visitors and more than 30,000 Twitter followers.



American Elements' thousands of customers include 30 percent of the Fortune 50 list of America's largest corporations and all U.S. national labs and military branches

## A PASSION FOR SCIENCE

American Elements' Academics & Periodicals Department supports materials science education at the high school, college and graduate school levels. This year the company co-sponsored a four-part PBS series on NOVA titled "Making Stuff" examining the world of materials science. Over the last twelve months alone, American Elements has co-sponsored 74 industry and academic conferences in 25 countries in fields such as electronics, aerospace, medical/pharmaceutical, optics and advanced military technology.

the factory. Smaller heaters are shipped as a complete package. Larger heaters are disassembled into three major components. This makes installation easy and less costly.



# Exotherm Corporation

**Exotherm Corporation**  
**888 Wilcrest Drive**  
**Houston, TX 77042**  
**Phone: 713-981-9100**  
**Fax: 713-981-7081**  
**E-mail: info@exotherm.com**  
**www.exotherm.com**

## UNIFLUX/EXOTHERM

Exotherm Corporation is a leader in providing custom designed fired heaters to the chemical processing and oil and gas processing industries.



## CONVECTION HEAT TRANSFER

Exotherm's Uniflux Convection Heater was developed fifty years ago to overcome the problems of overheating and degrading heat sensitive process fluids

that customers experienced with their existing fired heaters.

The Uniflux Convection Heater is custom designed for processes requiring 100,000 to 70,000,000 Btu/hr absorbed duty. The heater is designed to utilize the circulation of high velocity exhaust gases around the process tubes to produce convective heat transfer. This heat transfer is uniform around the periphery of the process tubes. The result is lower tube wall and film temperatures compared with the radiant heat transfer method used in most heaters.

## NO FLAME IMPINGEMENT

The high velocity Uniflux burner has a very short flame extension, preventing flame impingement on the process tubes. This in turn reduces tube failure and coking.

## EFFICIENCY

The forced draft burner operates at very low excess air. This feature allows the Uniflux Convection Heater to operate at higher efficiencies than can be achieved with conventional radiant, natural draft heaters. Uniflux Convection Heaters equipped with process pre-heat economizers can achieve efficiencies as high as 95% for some processes, and the forced draft design allows the Uniflux heater to maintain the efficiency over the entire operating range.



## TURNDOWN

The normal turndown ratio of the Uniflux Convection Heater is 10:1. Turndown ratios of 40:1 can be achieved with custom designed burner controls.



## SAFETY AND RELIABILITY

Each Uniflux Convection Heater is equipped with a field proven burner management system and safety controls. The heater and all of its controls are completely shop assembled. The control system is tested at the factory to ensure safe and reliable operation when installed.

## LOWER INSTALLATION COSTS

The Uniflux Convection Heater is designed as a package and is completely assembled at the factory. Smaller heaters are shipped as a complete package. Larger heaters are disassembled into three major components. This makes installation easy and less costly.

## FIELD SERVICE

Qualified, experienced technicians are available to assist the customer with start-up, operator training, preventative maintenance programs and trouble shooting.

## APPLICATIONS

Uniflux Convection Heaters are used worldwide in numerous industries for a variety of heating applications. A few are listed below:

- Heat Transfer Fluids
- Cryogenic fluids
- LNG Liquefaction & Vaporization
- Regeneration Gas
- Crude Oil
- Natural Gas Processing
- Glycol-water
- Emulsions
- Offshore Production
- Processing
- Air & Nitrogen
- Vaporizers
- Specialty Chemical Processes



# Paharpur Cooling Towers Ltd.

**Paharpur Cooling Towers Ltd.**  
**Paharpur House**  
**8/1/B Diamond Harbour Road**  
**Kolkata - 700 027**  
**India**  
**Phone: +91-33-4013 3000**  
**Fax: +91-33-4013 3499**  
**Email: [pctccu@paharpur.com](mailto:pctccu@paharpur.com)**  
**Website: [www.paharpur.com](http://www.paharpur.com)**



In a world of water shortage and an increasing awareness of water problems, Paharpur has grown from a small lumber saw mill to one of the largest cooling tower manufacturers in the world.

There are few problems Paharpur cannot solve related to the cooling of water or other liquids. We have a first class Research and Development centre which has consistently produced innovative concepts that have now become industry standards. All components or materials are carefully selected and tested under the adverse conditions applicable in operation. Our engineering and production standards often exceed general



standards, the objective being to supply a prime quality product which will provide low cost and reliable service to our customers over many years.

Major industries such as electricity generating, petroleum refining, chemical processing, sugar, air-conditioning and refrigeration, steel and so on use a vast assortment of cooling towers and air cooled heat exchangers. Whether you wish to cool the centralized air-conditioning plant of your building, dissipate heat from your processing plant or cool the water in your industrial complex, we at Paharpur are at your service.

No matter where you go, Paharpur is on the job to help keep you more comfortable.....to keep plants running profitably..





# Sandvik Materials Technology

## Sandvik Materials Technology

SE-811 81 Sadviken

Sweden

Phone: +46 26 260000

Fax: +46 26 251710

Website: [www.smt.sandvik.com](http://www.smt.sandvik.com)



Sandvik Materials Technology is a world-leading developer and manufacturer of products in advanced stainless steels and special alloys for the most demanding environments, as well as products and systems for industrial heating. Product areas comprise Tube, Strip, Primary Products and Wire and Heating Technology.

## PRODUCTS

Sandvik Materials Technology offers a wide range of highly engineered products as well as premium standard products. The program includes an extensive range of stainless steels, special alloys, titanium and other advanced materials in a variety of product forms.

Examples are:

- Tube
- Strip steel
- Wire-Welding products
- Metal powder
- Near net-shape products made by hot isostatic pressing (HIP)
- Furnace products and heating systems



## APPLICATION AREAS

Sandvik Materials Technology's products are used within the following application areas, among others:

- Aerospace•Automotive
- Chemical processing
- Industrial heating
- Medical devices
- Nuclear power generation•Renewable energy
- Oil and gas upstream
- Oil and gas downstream

## SERVICES

- Material consultations through our worldwide sales network
- Advice in process optimization based on an in-depth applications knowledge
- Joint new product development supported by our extensive R&D program



## R&D and INNOVATION

Sandvik Materials Technology has a long tradition in innovation backed up by significant R&D investments. Our R&D centers have industry-leading track records in the successful commercialization of new products and materials.

As part of the Sandvik Materials Technology's commitment to satisfying the needs of customers, data is systematically collected concerning the new and growing challenges that they face in everyday operations. The business area's engineers and specialists work closely with customers to jointly discover ways of addressing these challenges with new or modified products.

## QUALITY MANGEMENT

High quality has always been the standard for Sandvik's production processes, and Sandvik

Materials Technology consistently meets customer expectations and requirements on its products and services. The business area safeguards



product and material properties throughout the manufacturing processes by using the optimum starting material, advanced production technologies and rigorous quality control. This is made possible by fully integrated production technologies and in-depth experience in the development and manufacture of materials for demanding environments.

## ENVIRONMENT, HEALTH AND SAFETY

Concern for the environment, health and safety is a fundamental consideration in all our operations, whether they involve process changes, new investments or product developments. Within Sandvik Materials Technology all units with production activities fulfills the requirements of ISO 14001 and OHSAS 18001. The company has a global EHS management system for these units.

Sandvik is a high-technology, engineering group with advanced products and a world-leading position within selected areas. Worldwide business activities are conducted through representation in 130 countries.

# TLV

## TLV CORPORATION

13901 South Lakes Drive  
Charlotte, NC 28273  
Phone: 704.597.9070  
Fax: 704.583.1610  
www.tlv.com

# TLV®

Since its debut in 1950 with the first "Trouble-Less Valve", TLV has continued to provide industry leading advancements in steam control technology. Today, TLV is a global company offering a broad range of high performance products which deliver extended service life and improved energy efficiency. Manufacturer TLV CO., LTD. Kakogawa, Japan, is approved to ISO 9001 and ISO 14001 standards.



TLV's PowerDyne® series

### GREATER SIMPLICITY = HIGHER RELIABILITY

**Buying TLV traps and related products means getting longer service life.** Our design philosophy is to reduce the number of moving parts, thereby improving reliability. This principle is demonstrated in both our Free Float® and PowerDyne® traps.

TLV introduced the **Free Float®** concept to the steam industry over 45 years ago. Unlike other designs, there are no levers or linkages. The balanced float itself is the only moving part and can achieve a nearly perfect sphericity, creating an unmatched sealing performance. **PowerDyne®** disc traps include an air vent developed and patented by TLV to enable mirror-finish surfaces. The result is that both series provide exceptional energy efficiency.

TLV Free Float® and PowerDyne® traps are designed for severe service operation. Even at high pressures and temperatures, they provide excellent durability and resistance to water hammer and superheat, ensuring long and reliable operation.



### STEAM SYSTEM MANAGEMENT

TLV offers technical assistance, on-site service, and training to help customers optimize the performance of their steam systems. We also offer diagnostic tools you can use to help ensure proper management of the steam trap population. Such system capabilities help maximize productivity, extend reliability, improve energy efficiency, and fulfill safety/environment requirements.

**The TrapMan® Steam Trap Management System** includes the TMSN portable data collection and measurement unit and Windows®-based TrapManager® software, which is loaded on a personal computer. The TMSN captures both ultrasound and contact temperature measurements from traps at the site. When uploaded to a PC, TrapManager® analyzes the data and makes an automatic judgment of the trap's condition, highlighting steam traps that require attention. TrapManager® provides detailed printed reports including trap logs, histories, and results analysis to effect optimal maintenance budget allocation.



### SERVICES

**TLV also offers Consulting & Engineering Services.** CES engineers, who are certified AEE energy managers and DOE steam system specialists, can provide process recommendations and fully-piped packaged solutions for improving your new or existing steam system. CES services can provide a full steam and condensate balance to enable effective short and mid-term planning.

TLV believes that true customer satisfaction can only be obtained by finding solutions to the various challenges encountered while running businesses and operating steam plants. TLV Consulting & Engineering Services is designed to find the best solutions to increase productivity, maximize energy savings, improve quality and promote environmental conservation. CES activities are the embodiment of a complete customer satisfaction philosophy.

## A

AAAMachine, Inc., 1291 Rand Road, Des Plaines, IL 60016 (18009960070 USA; 18478664535; 18474818264; FAX: 18473763530; e-mail: aaamachine@aaamachine.com; web site: www.aaamachine.com)

AACE International, 209 Prairie Ave., Suite 100, Morgantown, WV 26501 (800-858-2678; 304-296-8444; FAX: 304-291-5728; e-mail: info@aacei.org; web site: www.aacei.org)

Aaron Process Equipment Co., 735 East Green Street, Bensenville, IL 60106-2549 (630-350-2200; FAX: 630-350-9047; e-mail: sales@aaronprocess.com; web site: www.aaronprocess.com)

AA S&K AUTOMATION, Valves, Automated Valves and Control Valves, 3530 Olive Ln N, Plymouth, MN 55447 (763-476-1013; e-mail: sales@sk-automation.com; web site: www.sk-automation.com/)

ABI LTD., 8900 Keele Street, Unit 1, Concord, Ontario, Canada L4K 2N2 (800-297-8666 Canada & USA; 905-738-6070; FAX: 905-738-6085; e-mail: info@abilt.com; web site: www.abilt.com)

A Box 4 U, 4340 S. West Street, Wichita, Kansas KS 67217 (316-554-9000; 1-877-522-6948; FAX: 316-440-1800; web site: www.abox4u.net)

Abresist Kalenborn Corporation, 5541 North State Road 13, P.O. Box 38, Urbana, IN 46990 (800-348-0717; 260-774-3327; FAX: 260-774-3832; e-mail: info@abresist.com; web site: www.abresist.com)

**ABZ, INC., 4451 Brookfield Corp. Dr., Suite 107, Chantilly, VA 20151 (800-747-7401; 703-631-7401; FAX: 703-631-5282; e-mail: sales@abzinc.com; web site: www.abzinc.com)**

Accelerated Technology Laboratories, Inc., 496 Holly Grove School Rd., West End, NC 27376-8412 (800-565-5467 US & Canada; 910-673-8165; FAX: 910-673-8166; e-mail: info@atlab.com; web site: www.atlab.com)

Accusonic Technologies, Inc., 28 Patterson Brook Road, Unit 1, West Wareham, MA 02576 (508-495-6600; FAX: 508-495-6699; e-mail: accusonicsales@dexcop.com; web site: www.accusonic.com)

Acrison Inc., 20 Empire Blvd., Moonachie, NJ 07074 (800-4 acrison; 201-440-8300; FAX: 201-440-4939; e-mail: info@mail@acrison.com; web site: www.acrison.com)

Acromag, Inc., 30765 Wixom Rd., P.O. Box 437, Wixom, MI 48393-7037 (800-881-0268; 248-295-0880; FAX: 248-624-9234; e-mail: sales@acromag.com; web site: www.acromag.com)

Adaptive Research, 2051 Young St. #31, Honolulu, HI 96826 (FAX: 808-356-0128; e-mail: arsales@adaptive-research.com; web site: www.adaptive-research.com)

Adaptive Resources, 104 Broadway Street, Carnegie, PA 15106 (412-431-4662; FAX: 412-431-4104; e-mail: support@adaptiveresource.com; web site: www.adaptiveresources.com)

ADI Systems Inc., 370 Wiley Road, Frederick, New Brunswick, Canada E3B 6E9 (1-800-561-2831 USA/Canada; 1-506-452-7307; FAX: 1-506-452-7308; e-mail: systems@adi.ca; web site: www.adisystemsinc.com)

ADI Systems Inc., PO Box 397, 7 Pointe Seaway Road, Wolfeboro, NH 03894 (800-561-2831 USA/Canada; 603-569-0955; FAX: 603-569-0957; e-mail: systems@adi.ca; web site: www.adisystemsinc.com)

**ADMIX INC., 234 Abby Rd., Manchester, NH 03103 (800-466-2368; 603-627-2340; FAX: 603-627-2019; e-mail: mixing@admix.com; web site: www.admix.com)**

**Admix manufactures sanitary mixing systems and is recognized for innovation and high quality. Admix offers a diverse product line to meet any mixing challenge focused on adding powders into liquid.**

Advance, 14600 21st Av N, Plymouth, MN 55447 (800-850-5559; 800-850-5559; FAX: 800-989-6566; e-mail: info@advance-us.com; web site: www.advance-us.com)

Advance Boiler & Tank Co., 6600 W. Washington St., Ste. 700, West Allis, WI 53214 (414-908-8373; FAX: 414-918-4170; e-mail: dandrea@advanceboiler.com; web site: www.advanceboiler.com)

Advanced GeoServices Corp., 1055 Andrew Drive, Suite A, West Chester, PA 19380-4293 (888-824-3992 Nationwide; 610-840-9100; 610-840-9154; FAX: 610-840-9199; e-mail: agc@agcinfo.com; web site: www.agcinfo.com)

Advanced Industrial Technology Corp., 640 Cambridge Rd., Paramus, NJ 07652 (201 483 7235; FAX: 201-; e-mail: jcw@advantechtechnology.com; web site: www.advantechtechnology.com)

Advanced Air Technologies, Inc., 300 Earl Seeseman Dr., Corunna, MI 48817 (800-295-6583; 989-743-5544; FAX: 989-743-5624; e-mail: mbiondi@advairtech.com; web site: www.advairtech.com)

Advanced Cyclone Systems, S. A., Edifício 450 Scala, Rua de Vilar, 235 3-1 Esq., Porto, Portugal 4200-626 (351 226 003 268; FAX: +351 225 322 096; e-mail: info@acsystems.pt; web site: www.acsystems.pt)

Advanced Heat Recovery, Inc., Division of AQUA Innovations, Inc., PO Box 1102, Baltimore, MD 21146 (410-421-9180; FAX: 410-421-5396; e-mail: info@AdvancedHeatRecovery.com; web site: www.Advanced-HeatRecovery.com)

ADWEST TECHNOLOGIES, a CECO Environmental Company, 1175 North Van Horne Way, Anaheim, CA 92806-2506 ((714) 632-9801; FAX: (714) 632-9812; web site: www.adwestusa.com)

AEGIS Bearing Protection Rings, 31 Winterbrook Road, Mechanic Falls, ME 04256 (866-738-1857; 207-998-5140; FAX: 207-998-5143; e-mail: sales@est-aegis.com; web site: www.est-aegis.com)

Aerzener Maschinenfabrik GmbH, Reherweg 28, D-31855, Aerzen, Germany (+49 (0)5154 810; FAX: +49 (0)5154 81191; e-mail: info@aerzener.de; web site: www.aerzener.com)

Aflex Hose USA, LLC, Unit B, 6111 Keller's Church Road, Pipersville, PA 18947 (215 7661 455; FAX: 215 7661 688; e-mail: greg.evans@aflex-hose.com; web site: www.aflex-hose.com)

AIC, 135 Newbury St, Framingham, MA 01701 (800-238-0001; FAX: 508-270-1800; e-mail: info@aicma.com; web site: www.aicma.com)

Air/Compliance Consultants, Inc., 1050 William Pitt Way, Pittsburgh, PA 15238 (412-826-3636; FAX: 412-826-3640; e-mail: jmerrill@air-comp.com; web site: www.air-comp.com)

Air Products and Chemicals, Inc., 7201 Hamilton Blvd., Allentown, PA 18195-1501 (800-345-3148; 610-481-4911; FAX: 610-481-4381; e-mail: cheminfo@airproducts.com; web site: www.airproducts.com/chemprocessing)

Airflow Sciences Corporation, 12190 Hubbard Street, Livonia, MI 48150-1737 (734) 525-0300; FAX: (734) 525-0303; e-mail: asc@airflowsciences.com; web site: www.airflowsciences.com)

AIRLANCO, 312 S. Highway 73, PO Box 398, Falls City, NE 68355-0398 (800-500-9777; 402-245-2325; FAX: 402-245-5196; e-mail: sales@airlanco.com; web site: www.airlanco.com)

Air Liquide Global E&C Solutions Germany GmbH, Olof-Palme-Str. 35, Frankfurt am Main, Germany 60439 (+49 69 5808-0; FAX: +49 (0) 69-5808-3888; e-mail: communication@lurgi.com; web site: www.engineering-solutions.airliquide.com)

AirSep Corporation, A Chart Industries Company, 260 Creekside Drive, Buffalo, NY 14228-2075 (800-320-0303 USA/Canada; 716-691-0202; FAX: 716-691-1255; e-mail: cpd@airsep.com; web site: www.airsep.com)

AKW Apparate + Verfahren GmbH, Dienhof 26, Hirschau, Bavaria, Germany D-92242 (+49 9622 7039 0; FAX: +49 9622 7039 376; e-mail: akwauv@akwauv.com; web site: www.akwauv.com)

**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alauqa.com)**

Alexanderwerk AG, Kippdorferstr. 6-24, Remscheid, Germany 42857 (49-21-91-795-0; FAX: 49-21-91-795350; e-mail: imaschinen@alexanderwerk.com; web site: www.alexanderwerk.com)

Allweiler GmbH, Allweilerstr. 1, Radolfzell, Germany 78315 (+49 7732 86-0; FAX: +49 7732 86-436; e-mail: service@allweiler.de; web site: www.allweiler.com)

AMACS, 14211 Industry Street, Houston, TX 77053 (800-231-0077; 713-434-0934; FAX: 713-433-6201; e-mail: amacs@amacs.com; web site: www.amacs.com)

AMANDUS KAHLE GmbH & Co. KG, Dieselstr. 5-9, Reinbek, Germany 21465 (49-40-72-7710; FAX: 49-40-72-771100; e-mail: info@amandus-kahl-group.de; web site: www.akahl.de)

Ambient Engineering Inc., 5 Crescent Ave., P.O. Box 279, Rocky Hill, NJ 08553-0279 (609-279-6888; FAX: 609-279-9444; e-mail: george@ambienteng.com; web site: www.ambienteng.com)

American Fabric Filter Co., P.O. Box 7560, Wesley Chapel, FL 33545-0110 (800-367-3591; 813-991-9400; FAX: 813-991-9700; e-mail: info@americanfabricfilter.com; web site: www.americanfabricfilter.com)

American Pulverizer, 1319 Macklind Avenue, St. Louis, MO 63110 (314-781-6100; FAX: 314-781-9209; e-mail: sales@ampulverizer.com; web site: www.ampulverizer.com)

**AMERICAN ELEMENTS, Los Angeles, California 90024 (310-208-0551; FAX: 310-208-0351; e-mail: customer-service@americanelements.com; web site: www.americanelements.com)**

**See our ad on page 66**

Ameridia, Div. of Eurodia Industries, 20 F Worlds Fair Dr., Somerset, NJ 08873 (732-805-4003; FAX: 732-805-4008; e-mail: main@ameridia.com; web site: www.ameridia.com)

Analytical Measurements, 22 Mountain View Drive, Chester, NJ 07930 (800-635-5580; 908-955-7170; FAX: 908-955-7170; e-mail: phmeter@verizon.net; web site: www.analyticalmeasurements.com)

Analytical Systems Int'l / KECO R&D, 9215 Solon Road, Suite A4, Houston, TX 77064 (281-516-3950; FAX: 281-351-8925; e-mail: customerservice@askceco.com; web site: www.Liquidgasanalyzers.com)

ANDRITZ Gouda, Coeneoep 88, Waddinxveen, Netherlands 2741 PD (+31.182.623.723; FAX: +31.182.619.217; e-mail: gouda@andritz.com; web site: www.andritzgouda.com)

Anguil Environmental Systems, Inc., 8855 N. 55th St., Milwaukee, WI 53223 (800-488-0230; 414-365-6400; FAX: 414-365-6410; e-mail: sales@anguil.com; web site: www.anguil.com)

Anton PAAR GmbH, Anton Paar Strasse 20, Graz, Austria 8054 (43-316-257-0; FAX: 43-316-257-257; e-mail: info@anton-paar.com; web site: www.anton-paar.com)

Anton PAAR USA, 10215 Timber Ridge Dr., Ashland, VA 23005 (800-722-7556; 804-550-1051; FAX: 804-550-1057; e-mail: info.us@anton-paar.com; web site: www.anton-paar.com)



**AOC RESINS, 955 Highway 57 East, Collierville, TN 38017 (800-238-7536; 901-854-2800; FAX: 901-854-1183; e-mail: sales@aoc-resin.com; web site: www.aoc-resins.com)**

Apollo Valves, 701 Matthews Mint Hill Road, Matthews, North Carolina 28105 ((770) 841-6000; FAX: (704) 841-6021; web site: www.apollovalves.com)

Apple Rubber Products, 310 Erie St, Lancaster, NY 14086 (716-684-6560; FAX: 716 684-8302; e-mail: info@apple-rubber.com; web site: www.apple-rubber.com)

Applied Porous Technologies, Inc., 2 Tunxis Road, P.O. Box 569, Tariffville, CT 06081 (860-408-9793; FAX: 860-651-6749; e-mail: info@appliedporous.com; web site: www.appliedporous.com)

Applus RTD USA, 11801 S. Sam Houston Parkway W, Houston, TX 77031 (832 295 5000; FAX: 832 295 5001; e-mail: info.usa@applusrtd.com; web site: www.applusrtd.com)

ARCA Regler GmbH, Kempener Str. 18, Toenisvorst, Germany 47918 (49-2156-7709-0; FAX: 49-2156-770955; e-mail: sale@arca-valve.com; web site: www.arca-valve.com)

Arch City Steel, 310 Axminister Dr., Fonten, Missouri 63026 (636-343-3004; FAX: 636-343-8680; web site: www.archcitysteel.com)

Argonide Corporation, 291 Power Court, Sanford, FL 32771 (407-322-2500; e-mail: sales@argonide.com; web site: www.argonide.com)

Arkema Inc., 900 First Avenue, King of Prussia, PA 19406 (800-225-7788; 610-205-7000; FAX: 610-205-7913; web site: www.arkema-inc.com)

Armstrong International, 816 Maple Street, Three Rivers, MI 49093 (269-273-1415; FAX: 269-279-6555; e-mail: marketing@armstronginternational.com; web site: www.armstronginternational.com)

ASDQMS, PO Box 23757, Chagrin Falls, OH 44023 (248-370-9919; FAX: 248-370-9921; e-mail: info@spcanywhere.com; web site: www.spcanywhere.com)

Ashcroft Inc., 250 East Main Street, Stratford, CT 06614-5145 (800/328-8258; FAX: 203-385-0408; e-mail: info@ashcroft.com; web site: www.ashcroft.com)

Assmann Corp. of America, 300 N. Taylor Rd., Garrett, IN 46738 (888-357-3181; 260-357-3181; FAX: 260-357-3738; e-mail: info@assmann-usa.com; web site: www.assmann-usa.com)

Associated Bag Company, 400 W. Borden Street, Milwaukee, WI 53207 (800-926-6100; 414-769-1000; FAX: 414-769-6530; e-mail: customerservice@associatedbag.com; web site: www.associatedbag.com)

Atlas Material Testing Technology LLC, 1500 Bishop Court, Mount Prospect, IL 60056 (7733274520; FAX: 773-327-5787; e-mail: atlas.info@ametec.com; web site: www.atlas-mts.com)

ATS RheoSystems, Cannon Instrument Company, 231 Creekside Road, Suite 8, Bordentown, NJ 08505-2405 (609-298-2522; FAX: 609-298-2795; e-mail: info@atsrheosystems.com; web site: www.atsrheosystems.com)

Auburn Systems, LLC, 8 Electronics Ave, Danvers, MA 01923 (800-255-5008; 978-777-2460; FAX: 978-777-8620; e-mail: sales@auburnsys.com; web site: www.auburnsys.com)

Auma Actuators Inc., 100 Southpointe Blvd, Cannonsburg, PA 15317 (724 743-AUMA (2862); FAX: 724 743-4711; e-mail: mailbox@auma-usa.com; web site: www.auma-usa.com)

AUMA Riester GmbH & Co. KG, Aumastrasse 1, P.O. Box 1362, Muelheim, Germany 79379 (+49 7631 8090; FAX: +49 7631 809250; e-mail: riester@auma.com; web site: www.auma.com)

Aumund Fordertechnik GmbH, Saalhofer Str. 17, Rheinberg, Germany 47495 (49-2843-72-0; FAX: 49-2843-60270; e-mail: info@aumund.de)

Automation Products Inc. (Dynatrol Div.), 3030 Maxroy St., Houston, TX 77008 (800-231-2062 USA & Canada; 713-869-0361; FAX: 713-869-7332; e-mail: sales@dynatrol-usa.com; web site: www.DynatrolUSA.com)

AWA-Huep GmbH u.Co.KG, Heinestr. 5, Herrsching, Germany 82211 (49 0 8152 93920; FAX: 490 8152 939291; e-mail: info@ava-huep.com; web site: www.ava-huep.com)

AVA-Americas, LLC c/o GreerWalker, The Carillon, 227 West Trade St., Suite 1100, Charlotte, NC 28202 (e-mail: info@ava-americas.com; web site: www.ava-americas.com)  
 AVEVA Inc., 10370 Richmond Ave., Ste. 400, Houston, TX 77042 (713 977 1225; e-mail: sales.us@aveva.com; web site: www.aveva.com/chemical)  
 AW-Lake Company, Lake Monitors & AW Gear Meters, 8809 Industrial Drive, Franksville, WI 53126 (800-850-6110; 262-884-9800; FAX: 262-884-9810; e-mail: marketing@aw-lake.com; web site: www.aw-lake.com)  
 AWT World Trade Inc., 4321 N. Knox, Chicago, IL 60641 (773 777 7100; FAX: 773 777 0909; e-mail: sales@awt-gpi.com; web site: www.awt-gpi.com)

## B

Badger Meter Europa GmbH, Nueringer Strasse 76, Neuffen, Germany 72639 (0049(0)7025-9208-0; FAX: 0049(0)7025-9208-15; e-mail: badger@badgermeter.de; web site: www.badgermeter.de)  
 Badger Meter, Inc., P.O. Box 245036, Milwaukee, WI 53224-9536 (800-876-3837; 414-355-0400; FAX: 414-371-5932; e-mail: info@central@badgermeter.com; web site: www.badgermeter.com)  
 Badger Meter, Inc., 6116 E. 15th St., Tulsa, OK 74112 (800-364-9876; 918-836-8411; FAX: 918-832-9962; e-mail: rcv@badgermeter.com; web site: www.badgermeter.com)  
 BARTEC GmbH, Max-Eyth-Strasse 16, Bad Mergentheim, Germany D-97980 (+49 7931 597 0; FAX: 49 7931 597 119; e-mail: info@bartec.de; web site: www.bartec.de)  
 Bascale Company, Inc., P.O. Box 157, Houston, TX 77410-0157 (713-996-0303; FAX: 713-456-2352; e-mail: sales@bascale.com; web site: www.bascale.com)  
 BASF Corporation, Catalysts & Adsorbents, 25 Middlesex/Essex Turnpike, Iselin, NJ 08830 (1-800-889-9845; 732-205-5000; e-mail: chemical-catalysts@basf.com; web site: www.catalysts.basf.com)  
 Bayer MaterialScience LLC, 100 Bayer Rd., Pittsburgh, PA 15205-9741 (800-662-2927; 412-777-2000; FAX: 412-777-3899; web site: www.bmsnafta.com)  
 Bayer Technology Services GmbH, Leverkusen, Germany D-51368 (49-214-30-1; e-mail: info@bayertech.com; web site: www.bayertech.com)  
 Beamex, Inc., 2152 Northwest Parkway, Suite A, Marietta, GA 30067 (800-888-9892; 770-951-1927; FAX: 770-951-1928; e-mail: beamex.inc@beamex.com; web site: www.beamex.com)



**BELTRAN TECHNOLOGIES, INC., 1133 East 35 Street, Brooklyn, New York 11210 (718-338-3311; FAX: 718-253-9028; e-mail: info@beltrantech.com; web site: www.beltrantech.com)**

Beltran Technologies has become the first name in advanced gas cleaning and air pollution emission control for a broad spectrum of industrial processes, metallurgical and sulphuric acid production. Our reputation rests upon more than 50 years of developing our Wet and Dry Electrostatic Precipitator technology. These multistage, tubular-design systems are singularly able to control emissions at the submicron level, including acid gas mist, submicron particulates and condensed organics.

Bematek Systems, Inc., 96 Swampscott Rd Unit 7, Salem, MA 01970 (877-BEMATEK (262-2835); US: 978-744-5816; FAX: 978-744-2531; e-mail: bematek@bematek.com; web site: www.bematek.com)  
 Bepex International LLC, 333 N.E. Taff St., Minneapolis, MN 55413-2810 (800-607-2470; 612-331-4370; FAX: 612-627-1444; e-mail: info@bepex.com; web site: www.bepex.com)  
 Berndorf Band GmbH, Leobersdorferstr. 26, Berndorf, Austria 2560 (43-2672-800-0; FAX: 43-2672-84176; e-mail: band@berndorf.at; web site: www.berndorf-band.at)  
 beroplan GmbH Membran- und Prozesstechnik, Zur Schnappphahner Dell 8a, St. Ingbert, Germany 66386 (+49 6894 8950600; FAX: +49 6894 8950601; e-mail: info@beroplan.de; web site: www.beroplan.de)  
 Berthold Technologies GmbH & Co. KG, Calmbacher Str. 22, Bad Wildbad 75323 (+49) 7081 177 0; FAX: (+49) 7081 177 100; e-mail: info@berthold.com; web site: www.berthold.com)  
**BEUMER GROUP GMBH & CO. KG, Oelder Str. 40, Beckum, Germany 59269 (+49 2521 240; FAX: +49 2521 24280; e-mail: beumer@beumergroup.com; web site: www.beumergroup.com)**  
 BHS-Sonthofen GmbH, An der Eisenschmelze 47, Sonthofen, Deutschland 87527 (08321 6099-0; FAX: 08321 6099-220; e-mail: info@bhs-sonthofen.de; web site: www.bhs-sonthofen.de)

BHS-Sonthofen Inc., 14300 South Lakes Drive, Charlotte, NC 28273 (704-845-1190; FAX: 704-845-1902; e-mail: info@bhs-filtration.com; web site: www.bhs-filtration.com)  
 BIAR Sampling Systems, 2506 S. Philippe Avenue, Gonzales, LA 70737 (225-647-4300; FAX: 225-647-4309; e-mail: sales@biar.com; web site: www.biar.com)  
 Biazzi SA, 25 ch de la Tavallaz, P.O. Box 84, Chailly/Montreux, Switzerland 1816 (41-21-989-2121; FAX: 41-21-989-2120; e-mail: marketing@biazzi.com; web site: www.biazzi.com)  
 BIC Alliance, 381 Columbia Memorial Parkway, Kemah, TX 77565 ((800) 460-4242; (281) 538-9996; FAX: (281) 538-9991; e-mail: lbrokeo@bicalliance.com; web site: www.bicalliance.com)  
 Bioengineering AG, Sagenrainstrasse 7, Wald, Switzerland 8636 (41-55-256-81-11; FAX: 41-55-256-82-56; e-mail: info@bioengineering.ch; web site: www.bioengineering.ch)  
 Bioengineering Inc., 35 Medford Street, Suite 213, Somerville, MA 02143 (001 617 996 1212; FAX: 001 617 996 1213; e-mail: info@bioengineering-inc.com; web site: www.bioengineering-inc.com; www.bioengineering.ch)



**BIONOMIC INDUSTRIES INC., 777 Corporate Dr., Mahwah, NJ 07430-2058 (800-311-6767; 201-529-1094; FAX: 201-529-0282; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)**

Biowater Technology, 2145 Diamond Hill Road, Suite 4B, Cumberland, Rhode Island 02864 (401-305-3622; FAX: 401-305-3677; e-mail: sales@biowatertechnology.com; web site: www.biowatertechnology.com)  
 BJM Pumps, LLC, 123 Spencer Plain Rd., PO Box 1138, Old Saybrook, CT 06475 (800-442-2562 877-BJM-PUMP; 860-399-5937; FAX: 860-399-7784; e-mail: sales@bjmpumps.com; web site: www.bjmpumps.com)  
 Boerger GmbH, Benningweg 24, Borken-Wesek, Germany 46325 (49-2862-91030; FAX: 49-2862-910346; e-mail: info@boerger.com; web site: www.boerger.com)  
 Boerger Pumps Asia Pte. Ltd., 16 Boon Lay Way, #01-48 TradeHub21, Singapore, Singapore 609965 (65-6562-9540; FAX: 65-6562-9542; e-mail: asia@boerger.com; web site: www.boerger.com)  
 Boerger Pumps, 2880 Water Tower Place, Chanhassen, MN 55317 (877-726-3743; 612-435-7300; FAX: 612-435-7301; e-mail: america@boerger.com; web site: www.boerger.com)  
 BORSIG GmbH, Egellsstrasse 21, Berlin, Germany 13507 (49 (0) 30 4301-01; FAX: 49 (0) 30 4301-2236; e-mail: info@borsig.de; web site: www.borsig.de)  
 B & P Process Equipment, 1000 Hess Ave., Saginaw, MI 48601 (989-757-1300; FAX: 989-757-1301; e-mail: sales@bpprocess.com; web site: www.bpprocess.com)  
 Brabender Technologie GmbH & Co. KG, Kulturstrasse 55-73, Duisburg, Germany 47055 (+49 203 9984-0; FAX: +49 203 9984-155; e-mail: email@brabender-technologie.com; web site: www.brabender-technologie.com)  
 Branch Environmental Corp., P.O. Box 5265, 3461 Route 22 East, Somerville, NJ 08876-1303 (908-526-1114; FAX: 908-526-2881; e-mail: sales@branchenv.com; web site: www.branchenv.com)  
 Bronkhorst High-Tech BV, Nijverheidsstraat 1A, Ruurlo, Netherlands NL-7261AK (+31 573458800; FAX: +31 573458808; e-mail: info@bronkhorst.com; web site: www.bronkhorst.com)  
 Bronkhorst USA Inc., 57 S. Commerce Way, Suite 120, Bethlehem, Pennsylvania 18017 (610) 866-6750; FAX: (610) 866-9212; e-mail: sales@bronkhorstusa.com; web site: www.bronkhorstusa.com)  
 Brookfield Engineering Laboratories, Inc., 11 Commerce Blvd., Middleboro, MA 02346 (800-628-8139 (Not MA); 508-946-6200; FAX: 508-946-6262; e-mail: info@brookfieldengineering.com; web site: www.brookfieldengineering.com)  
 Brooks Instruments, 407 W. Vine St., Hatfield, PA 19440 (888-554-FLOW; 215-362-3500; FAX: 215-362-3745; e-mail: info@brooksinstrument.com; web site: www.brooksinstrument.com)  
 Bryan Steam LLC, 783 North Chili Avenue, Peru, IN 46970 (765-473-6651; FAX: 765-473-3074; e-mail: inquiry@bryansteam.com; web site: www.bryanboilers.com)  
 BS & B Safety Systems, Inc., 7455 E. 46th St., Tulsa, OK 74147 (1-800-BSS-DISK; 918-622-5950; FAX: 918-665-3904; e-mail: sales@tul.bsbsystems.com; web site: www.bsbsystems.com)  
 Buertek Fluid Control Systems, Christian-Buertek-Str. 13-17, Ingelfingen 74653 (+49 7940 10-0; FAX: +49 7940 10-91 204; e-mail: info@buertek.com; web site: www.buertek.com)  
 Buhler Inc., 13105 12th Ave N., Plymouth MN 55441, PO Box 9497, Minneapolis, MN 55440-9497 (763-847-9900; FAX: 763-847-9911; e-mail: buhler.minneapolis@buhler-group.com; web site: www.buhlergroup.com/us)  
 Burkert Fluid Control Systems, 2915 Whitehall Park Suite 650, Charlotte, NC 28273 (800-325-1405; 704-504-4440; FAX: 949-223-3198; e-mail: marketing-usa@burkert.com; web site: www.burkert-usa.com)

Buschjost GmbH, Detmolder Str. 256, Bad Oeynhausen, Germany 32545 (+49 5731 791-0; FAX: +49 5731 791-179; e-mail: mail@buschjost.de; web site: www.buschjost.com)  
 Busch LLC, 516 Viking Dr., Virginia Beach, VA 23452 (800-USA-PUMP; 757-463-7800; FAX: 757-463-7407; e-mail: marketing@buschusa.com; web site: www.buschusa.com)  
 BUSS ChemTech AG BUSS ChemTech AG, Hohenrainstrasse 12A, Pratteln 1, Switzerland CH-4133 (+41 (0)61 825 64 62; FAX: +41 (0)61 825 67 37; e-mail: info@buss-ct.com; web site: www.buss-ct.com)  
 Buss-SMS-Canzler GmbH, Kaiserstr. 13-15, Butzbach, Germany 35510 (49-6033-85-0; FAX: 49-6033-85-249; e-mail: info@sms-vt.com; web site: www.sms-vt.com)  
 Bustin Industrial Products, 401 Oak St., East Stroudsburg, PA 18301-1493 (800-933-5166; 570-424-6500; FAX: 570-424-6453; e-mail: slukas@bustin-usa.com; web site: www.bustin-usa.com)  
 Butterworth Inc., 16737 West Hardy Rd., Houston, TX 77060 (281.821.7300; FAX: 281.821.5550; e-mail: sales@butterworth.com; web site: www.butterworth.com)  
 BWB Technologies UK Ltd, Unit 8, The Galloway Centre, Hambridge Lane, Newbury, United Kingdom RG14 5TL (800 608 9870; 441787273 451; FAX: 441787274 870; e-mail: sales@bwbttech.com; web site: www.bwbttech.com)

## C

Cachat, M. F. Co., Headquarters, 14725 Detroit Ave., Suite 300, Lakewood, OH 44107 (800-729-8900; 216-228-8900; FAX: 216-228-9141; e-mail: info@mfcachat.com; web site: www.mfcachat.com)  
 CAI Catalysts, 881 Sunnyside Pike, Gwynedd Square, PA 19446-5303 (610-547-7399; e-mail: info@caicatalysts.com; web site: www.caicatalysts.com)



**CALORIS ENGINEERING, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: info@caloris.com; web site: www.caloris.com)**

Caloris offers decades of engineering experience in evaporation and drying, including pre-engineered compact MVR evaporators, innovative solutions for new systems and troubleshooting with emphasis on energy savings and process improvements.  
 CAMO Software, Nedre Vollgate 8, Oslo, Norway 0158 ((+47) 22 39 63 00; FAX: (+47) 22 36 93 22; e-mail: info@camo.com; web site: www.camo.com)  
 Cashco, Inc., P.O. Box 6, 607 W. 15th, Ellsworth, KS 67439-0006 (785-472-4461; FAX: 785-472-3539; e-mail: sales@cashco.com; web site: www.cashco.com)  
 Cass Polymers, Inc., 311 NW 122 St., Oklahoma City, OK 73114 (405-755-8448; FAX: 405-755-8450; e-mail: casspolymers@casspolymers.com; web site: www.casspolymers.com)  
 Cat Pumps, 1681 94th Lane NE, Minneapolis, MN 55449 (763-780-5440; FAX: 763-780-2958; e-mail: info@catpumps.com; web site: www.catpumps.com)  
 CECO Filters, a CECO Environmental Company, 700 Ermlen Way, Telford, PA 18969 (800-220-8021; FAX: 610-825-3108; e-mail: sales@cecofilters.com; web site: www.cecofilters.com)  
 CEJN Industrial Corp., 212 Ambrogio Dr., Gurnee, Illinois 60031 (847-263-7200; FAX: 847-263-7200; e-mail: customer.service@cejnusa.com; web site: www.cejnusa.com)  
 CellMark Deutschland GmbH, Hamborner Strasse 53, Duesseldorf, Germany 40472 (0049-211-5238-0; e-mail: chemicals-europe@cellmark.com; web site: www.cellmark.com/our-divisions/cellmark-chemicals)  
 CG Thermal LLC, 8950 Dutton Drive, Twinsburg, Ohio 44087 (330) 405-0844; FAX: (330) 487-0304; e-mail: gregb@cgthermal.com; web site: cgthermal.com)  
 Charles Ross & Son Co., 710 Old Willets Path, P.O. Box 12308, Hauppauge, NY 11788-0615 (800-243-7677; 631-234-0500; FAX: 631-234-0691; e-mail: sales@mixers.com; web site: www.mixers.com)  
 Chattanooga Boiler and Tank Co., 1011 E. Main St., P.O. Box 110, Chattanooga, TN 37401 (423-266-7118; FAX: 423-755-6708; e-mail: sales@cbtank.com; web site: www.cbtank.com)  
 Chematur Ecoplaning OY, P.O. Box 78, Pori, Finland 28101 (358-2-6242020; FAX: 358-2-6242020; e-mail: info@ecoplaning.fi; web site: www.ecoplaning.fi)  
 Chemical Information Services, 9101 LBJ Frwy., Suite 310, Dallas, Texas 75243 ((214) 349-6200; FAX: (214) 349-6286; e-mail: sales@chemicalinfo.com; web site: www.chemicalinfo.com)  
 Chemir, A Division of Evans Analytical Group, 2672 Metro Blvd., Maryland Heights, MO 63043 (800-659-7659; 314-261-6620; FAX: 314-291-6630; e-mail: info.chemir@eag.com; web site: www.chemir.com)





**GEA WESTFALIA SEPARATOR GROUP GMBH, Werner-Habig-Str. 1, Oelde, Germany 59302 (+ 49-2522-77-0; FAX: + 49-2522-77-2488; e-mail: ws.info@gea.com; web site: www.gea.com)**

Gebrueder Loedige Maschinenbau GmbH, Elsenher Str. 7-9, Paderborn, Germany 33102 (05251-3090; FAX: 05251-309123; e-mail: info@loedige.de; web site: www.loedige.de)

Gekko Engineering, 1210 E. 223rd, Suite 301, Carson, CA 90745-4215 (310.513.0000; e-mail: info@gekkoeng.com; web site: www.gekkoeng.com)

General Monitors, 26776 Simpatica Circle, Lake Forest, CA 92630 (866-686-0741; 949-581-4464; FAX: 949-581-1151; e-mail: info@generalmonitors.com; web site: www.generalmonitors.com)

Georg Fischer Piping Systems Ltd., Schaffhausen, Switzerland 8201 (41-52-631-11-11; FAX: 41-52-631-28-75; e-mail: info.ps@georgfischer.com; web site: www.gfps.com)

GIG Instrumentation, Inc., 1194 Oak Valley Dr., Suite 20, Ann Arbor, MI 48108 (800-959-0329; FAX: 734-769-1888; e-mail: info@gfg-inc.com; web site: www.gfg-inc.com)

Gharpure Consulting Engineers Pvt Ltd, 402, Manish Plaza, NIBM Road, Pune, India 411048 (020-26831234; FAX: 020-40094017; e-mail: mails\_0102@yahoo.com; web site: www.gharconeng.com)

GIC Thermodynamics, 12575 US 31 North, Charlevoix, MI 49720 (800-876-4442; 248-280-1648; 231-237-7000; FAX: 248-280-0998; e-mail: sales@gicthermodynamics.com; web site: www.gicthermodynamics.com)

**GIG KARASEK GMBH, Neusiedlerstrasse 15-19, Gloggnitz-Steppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: office@gigkarasek.at; web site: www.gigkarasek.com)**

IL, GIG Karasek LLC, 3955 Commerce Drive, St. Charles 60174 (+1 630 305 8556)

International, Erun Information & Technology Co. Ltd, Room 810, National Offshore Oil Tower, Shanghai, Peoples Rep. of China 200030 (+86 21 6487 7678; FAX: +86 21 6487 3722)

International, MediBalt Ltd, Priedaines Str. 13-1, Riga-Latvija, Russia 1029 (+371 67373144; FAX: +371 67373143)

International, CHEMETEK PROCESS TECHNOLOGY Inc., 3FI, No.99 Jingye 1st Road, Taipei City, Taiwan 104 (0886/2 8501 2895; FAX: 0886/2 8501 2875)

Gilbert Industries, 8150 State Hwy 14 East, Sparta, MO 65753 (417) 581-1163; FAX: (417) 581-9253; e-mail: shanen@gilbertindustries.com; web site: gilbertindustries.com)

Glasslined Technology, Inc, P O Box 7, Greensboro, Georgia 30642 (706) 347-2121; FAX: (706) 454-5905; e-mail: info@glasslined.us; web site: www.glasslined.us)

Goel Scientific Glass Works, C-31, Sarder Estate, Ajwa Rd., Baroda, India 390019 (0091-265-2561595; 0091-9825318944; FAX: 0091-265-2561124; e-mail: info@goelscientific.com; web site: www.goelscientific.com)

Goodway Technologies Corp., 420 West Ave., Stamford, CT 06902-6384 (800-333-7467; 203-359-4708; FAX: 203-359-9601; e-mail: goodway@goodway.com; web site: www.goodway.com)

Gore / W. L. Gore & Associates GmbH, Hermann-Oberth-Strasse 26, Putzbrunn, Bavaria, Germany 85640 (49-0-89-46-12-22-11; FAX: 49-0-89-46-12-23-00; e-mail: ipd-deutschland@wlgore.com; web site: www.gore.com)



**GORMAN-RUPP CO., 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: g-sales@gormanrupp.com; web site: www.GRPumps.com)**

GOW-MAC Instrument Co., 277 Broadhead Road, Bethlehem, PA 18017 (610-954-9000; FAX: 610-954-0599; e-mail: sales@gow-mac.com; web site: www.gow-mac.com)

G.R. Sprenger Engineering, Inc., 12930 West 6th Place, Golden, CO 80401 (303-525-9924; FAX: 303-665-5346; e-mail: Glenn@GRSEI.com; web site: www.GRSEI.com)

Great Western Mfg. Co., 2017 S. Fourth St., P.O. Box 149, Leavenworth, KS 66048 (800-682-3121; 913-682-2291; FAX: 913-682-1431; e-mail: sifter@gwmfg.com; web site: www.gwmfg.com)

Greene, Tweed & Co., P.O. Box 305, 2075 Detwiler Rd., Kulpville, PA 19443 (1-800-220-4733; 215-256-9521; FAX: 215-256-0189; web site: www.gtweed.com)

Greene, Tweed & Co. Ltd., Ruddington Fields, Nottingham, Notts, United Kingdom NG11 6JS (0-115-99315-777; web site: www.gtweed.com)

Greenwood Engineering Inc., P.O. Box 179, Excelsior, MN 55331 (952-474-0415; FAX: 952-474-8988; e-mail: sales@greenwoodengineering.com; web site: www.greenwoodengineering.com)

GRI Pumps, 180 Hines Ave., Bellville, OH 44813 (419-886-3001; FAX: 419-886-2338; e-mail: grisales@gripumps.com; web site: www.gripumps.com)

**H**

Haldor Topsoe A/S, Nymollevvej 55, Lyngby, Denmark DK-2800 (45-45-272000; FAX: 45-45-272999; e-mail: info@topsoe.dk; web site: www.topsoe.dk)

Hammelmann Corp., 436 Southpointe Dr, Miamisburg, OH 45342 (800-783-4935; 937-859-8777; FAX: 937-859-9188; e-mail: mail@hammelmann.com; web site: www.hammelmann.com)

Hampshire Controls Corp., P.O. Box 516, Dover, NH 03821-0516 (866-496-9424 U.S. & Canada; 603-749-9424; FAX: 603-749-9433; e-mail: sales@hampshirecontrols.com; web site: www.hampshirecontrols.com)

Hannay Reels Inc., 553 State Rte. 143, Westerloo, NY 12193-0159 (877-GO-REELS; 518-797-3791; FAX: 800-733-5464; e-mail: reels@hannay.com; web site: www.hannay.com)

Hans Turck GmbH & Co. KG, Witzlebenstr. 7, Muelheim an der Ruhr, Germany 45472 (+49 208 4952-0; FAX: +49 208 4952-264; e-mail: more@turck.com; web site: www.turck.com)

Hanwha Hardy Process Solutions, Inc., Industrial Weighing, 9440 Carroll Park Dr, San Diego, CA 92121 (800-821-5831; 858-278-2900; FAX: 858-278-6700; e-mail: hardyinfo@hardysolutions.com; web site: www.hardysolutions.com)

Harper International, 4455 Genesee St, Suite 123, Buffalo, NY 14225 (716-276-9900; FAX: 716-810-9460; e-mail: info@harperintl.com; web site: www.harperintl.com)

Harpur Industries, Inc., 3470 E. Fifth Ave., Columbus, OH 43219-1787 (614-231-3621; FAX: 614-235-3699; e-mail: info@harpurusa.com; web site: www.harpurusa.com)

HAVER & BOECKER OHG, Wire Weaving and Machinery Division, Carl-Haver-Platz 3, Oelde, Germany 59302 (+49-2522-300; FAX: 49 2522 30-403; e-mail: haver@haverboecker.com; web site: www.haverboecker.com)

Heat Transfer Research, Inc. (HTRI), 150 Venture Dr., College Station, TX 77845 (+1-979-690.5050; FAX: +1-979-690.3250; e-mail: htri@htri.net; web site: www.htri.net)

Heinkel Filtering Systems Inc., 520 Shartown Rd., Swedesboro, NJ 08085 (856-467-3399; FAX: 856-467-1010; e-mail: info@heinkelusa.com; web site: www.heinkelusa.com)

Heinrichs Messtechnik GmbH, Robert-Perthel Str. 9, Koeln, Germany 50739 (+49(0)221-497080; FAX: +49(0)221-49708178; e-mail: info@heinrichs.eu; web site: www.heinrichs.eu)

**HEMCO CORPORATION, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemccorp.com; web site: www.HEMCOcorp.com)**

**UniFlow laboratory fume hoods, laboratory furniture, laboratory countertops, plumbing fixtures, & electrical service options. Large floor mount hoods, ventilation equipment, emergency shower decontamination booths. HEPA filtered Enclosures. www.HEMCOcorp.com 800-779-4362**

Henderson Industrial Specialties, 22 Flanders Dr., S55, Watford, Ontario, Canada L0R 2H7 (905-690-0425; FAX: 905-690-0426; e-mail: sales@hendersonindustrial.com; web site: www.hendersonindustrial.com)

Hepa Corporation, 3071 E. Coronado St., Anaheim, CA 92806-2698 (714-630-5700; FAX: 714-630-2894; e-mail: info@hepa.com; web site: www.hepa.com)

Herbold Meckesheim USA, Resource Recycling Systems Inc., P.O. Box 239, Slatersville, RI 02876 (888-612-7774; 401-597-5500; FAX: 401-597-5535; e-mail: info@herboldusa.com; web site: www.herboldusa.com)

Hermetic-Pumpen GmbH, Gewerbestr. 51, Gundelfingen, Germany 79194 (49-761-58-300; FAX: 49-761-58-30280; e-mail: hermetic@hermetic-pumpen.com; web site: www.hermetic-pumpen.com)



**HEYL & PATTERSON INC., RENNENBURG DIVISION, PO Box 36, Pittsburg, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heylpatterson.com)**

HiLco, 100 W Fourth St, Elmira, New York 14901 (607) 733-7121; FAX: (607) 735-0946; e-mail: hilliard@hilliardcorp.com; web site: www.hilliardcorp.com)

Hilliard Corp., 100 W. Fourth St., Elmira, NY 14902-1504 (607-733-7121; FAX: 607-737-1108; e-mail: hilliard@hilliardcorp.com; web site: www.hilliardcorp.com)

HIMA Paul Hildebrandt GmbH & Co KG, Albert-Bassermann-Strasse 28, Bruehl, Germany 68782 (+49 6202 709-0; FAX: +49 6202 709-107; e-mail: info@hima.com; web site: www.hima.com)

HOERBIGER Kompressorstechnik Holding GmbH, Donau-City-Strasse 1, Vienna, Austria A-1220 (+43 1 22 440-0; FAX: +43 1 22 440 990; e-mail: info-hkth@hoerbiger.com; web site: www.hoerbiger.com)

Hoover Container Solutions, 2135 HWY 6 S, Houston, TX 77077 (800-844-8683; 281-870-8402; e-mail: INFO@HOOVERSOLUTIONS.COM; web site: www.hooversolutions.com)

Hosokawa Micron B.V., Mixing, Drying & Agglomeration, P.O. Box 98, Gildenstraat 26, Doetinchem, Netherlands 7000 AB (+31(0)314-373333; e-mail: info@hmbv-hosokawa.com; web site: www.hosokawamicron.nl)

Houston PolyTank, LLC, 208 Craig Street, Hopkins, Missouri 64461 ((660) 778-3393; FAX: (660)-778-3446; e-mail: sales@houstonpolytank.com; web site: www.houstonpolytank.com)

HRS Process Systems Ltd., 201/202, Karan Selene, 851, Bhandarkar Road, Pune, India 411004 (+91 20 2566 3581; +91 20 66047894; FAX: +91 20 2566 3583; e-mail: mkctcm@hrsasia.co.in; web site: www.hrsasia.co.in)

HTT Energy GmbH, Fullenbruchstr. 183, Herford, Germany 32051 (0049-5221-385-0; FAX: 0049-5221385-12; e-mail: sales@ht.de; web site: www.htt.de)

Hudson Products Corp., P.O. Box 36100, Houston, TX 77236-6100 (800-634-9160; 713-914-5700; FAX: 713-914-5991; e-mail: hudsonproducts@hudsonproducts.com; web site: www.hudsonproducts.com)

Hydramotion Ltd, 1 York Road Industrial Park, Seven Street, Malton, United Kingdom YO17 6YA (+44 (0) 1653 600294; FAX: +44 (0) 1653 693446; e-mail: sales@hydramotion.com; web site: www.hydramotion.com)

Hydro-Thermal Corp., 400 Pilot Ct., Waukesha, WI 53188 (800-952-0121; 262-548-8900; FAX: 262-548-8908; e-mail: info@hydro-thermal.com; web site: www.hydro-thermal.com)

HydroPro Inc., Engineering & Manufacturing, 2631 Highway J, Bourbon 65441 (573.732.3318; FAX: 573.732.9408; e-mail: Sales@hpro.com; web site: www.hpro.com)

HydroTec Systems Co., Inc., 145 East Main Street, Tiskilwa, IL 61368 (815-624-6644; 815-646-4488; FAX: 815-986-4973; e-mail: warren@purehts.com; web site: www.purehts.com)

Hypercat Advanced Catalyst Products, 1075 Andrew Drive, Suite C, West Chester, PA 19380 (610-692-3490; FAX: 610-692-3971; e-mail: info@hypercat-acp.com; web site: www.hypercat-acp.com)

Hyspan Precision Prod. Inc., 1685 Brandwynne Ave., Chula Vista, CA 91911 (619-421-1355; FAX: 619-421-1702; e-mail: websales@hyspan.com; web site: www.hyspan.com)

Idealab Inc., 305 Union Street, P. O. Box 427, Franklin, MA 02038 (508 528 9260; e-mail: info@idealab.us; web site: www.idealab.us)

IGW - IG Wattleuw International nv, Headquarters, Kampveldstraat 51, Oostkamp, Belgium 8020 (+32 50 82 69 07; +1 740 588 1722; FAX: +32 50 82 69 74; e-mail: info@igwpower.com; web site: www.igwpower.com)

IKA-Werke GmbH & Co.KG, Janke & Kunkel-Str. 10, Staufen, Germany 79219 (+49 7633 831-0; FAX: +49 7633 831-907; e-mail: process@ika.de; web site: www.ikaprocess.com)

Illinois Instruments, 2401 Hiller Ridge Rd., Johnsburg, IL 60051 (815-344-6212; FAX: 815-344-6332; e-mail: sales.usa@stystechillinois.com; web site: www.stystechillinois.com)

IMPICO, Inc., 27 Dexter Road, P.O. Box 14666, East Providence, RI 02914 (800-779-2491; 401-521-2490; FAX: 401-521-5690; e-mail: mail@impico-inc.com; web site: www.impico-inc.com)



**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

Industrial Magnetics, Inc., 01385 M-75 S., Boyne City, MI 49712 (888-582-0821; 231-582-3100; FAX: 231-582-0622; e-mail: imi@magnetics.com; web site: www.magnetics.com)

Innovative Processing Solutions, PO Box 299, Aurora, IN 47001 (877-926-0040; FAX: 812-926-3482; e-mail: info@innovative-processing.com; web site: www.innovative-processing.com)

INOX-TECH INC., 6705 Route 132, Ste. Catherine, Canada J5C1B6 (800-361-0319 North America; 450-638-5441; FAX: 450-638-2865; e-mail: info@inox-tech.com; web site: www.inox-tech.com)

Interdevelopment, Inc., POB 15249, Arlington, VA 22215 (01 202 508 1459; e-mail: info@interdev.com; web site: www.interdevelopment.com)

Intergraph Benelux BV, Sirkusdreef 2, Hoofddorp, Netherlands 2132 WF (+31 20 5666 666; FAX: +31 23 5666 665; e-mail: information-europe@intergraph.com; web site: www.intergraph.com/global/nl/)

Intergraph Corporation, 7840 N. Sam Houston Pkwy W., Suite 200, Houston, Texas 77064 (281) 671-1528; FAX: (281) 671-1556; web site: www.intergraph.com

Intergraph Corporation Corporate Headquarters, 19 Interpro Road, Madison, AL 35758 (800.345.4856; 256-730-2000; FAX: 256.730.2048 ; web site: www.intergraph.com/contact/contact\_form.asp)

Invensys Systems (UK) Ltd, Manor Royal, Crawley, United Kingdom RH10 7QU (+44 1293643200; FAX: +44 1293 541312; e-mail: invensys.ion.uk@invensys.com; web site: www.ion.invensys.com)

Iron, Inc., 1201 Shaffer Rd, Bldg. 2, Santa Cruz, CA 95060 (800-323-7660; 847-967-5151; FAX: 831-458-1497; e-mail: sales@iron.com; web site: www.iron.com)

Iris Inspection Services, Inc., 5400 Decker Dr., Baytown, Texas 77520-1448 (281) 424-3200; FAX: (281) 424-3223; e-mail: bill@iris-inspection.com; web site: www.iris-inspection.com)

Isotech, Inc. 777 Schwab Rd., Suite T, Hatfield, PA 19440 (800-314-3332; 267-663-555; FAX: 215-631-9148; e-mail: info@isotechinc.com; web site: www.isotechinc.com)

ITT, Engineered Valves, 33 Centerville Rd., Lancaster, PA 17603 (800-366-1111; 717-509-2000; FAX: 717-509-2336; e-mail: engvalves.custserv@itt.com; web site: www.engvalves.com)

ITW Polymers Adhesives, North America, 30 Endicott St., Danvers, MA 01923 (800-933-8266; 978-777-1100; FAX: 978-774-0516; e-mail: info@devcon.com; web site: www.itwadhesives.com)

Iwak America, 5 Boynton Rd., Holliston, MA 01746 (508-429-1440; FAX: 508-429-1386; e-mail: info@iwakiamerica.com; web site: www.iwakiamerica.com)

## J

Jacobi Carbons, Inc., 432 McCormick Blvd., Columbus, OH 43213 (215 546-3900; FAX: 215 546-9921; e-mail: info@jacobi.net; web site: www.jacobi.net)



**JAYGO, INC., 7 Emery Ave., Randolph, NJ 07869 (1-888-811-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)**

JLS International, Inc., PO Box 240948, Charlotte, NC 28224-0948 (704-679-9575; FAX: 704-679-9574; e-mail: info@jlsintl.com; web site: www.jlsintl.com)

Johnson Matthey Davy Technologies Ltd., 10 Eastbourne Terrace, London, United Kingdom W2 6LG (44-207-957-4120; FAX: 44-207-957-3535; e-mail: dp@davyprotech.com; web site: www.davyprotech.com)

John Zink Hamworthy Combustion, 11920 East Apache Street, Tulsa, OK 74116 (918.234.2800; FAX: 918.234.1800; e-mail: info@johnzink.com; web site: www.johnzinkhamworthy.com)

Jumo Process Control Inc., 6733 Myers Road, East Syracuse, NY 13057 (800-554-5866; 315-437-5866; FAX: 315-437-5860; e-mail: info.us@jumousa.com; web site: www.jumousa.com)

JUMO GmbH & Co. KG, Moritz-Juchheim-Strasse 1, Fulda, Germany 36039 (49 661 6003-0; FAX: 49 661 6003-500; e-mail: mail@jumo.net; web site: www.jumo.net)

## K

K-Patents, Inc., 1804 Centre Point Circle, Ste. 106, Naperville, IL 60563 (630-955-1545; FAX: 630-955-1585; e-mail: info@kpatents.com; web site: www.kpatents.com)

KAP Project Services, 1200 Highway 146 South, #260, La Porte, Texas 77571 ((281) 842-8333; FAX: (281) 842-8335; web site: www.kaprojectservices.com)

Kason Corp., 67-71 E. Willow St., Millburn, NJ 07041-1416 (973-467-8140; FAX: 973-258-9533; e-mail: info@kason.com; web site: www.kason.com)

KDF Fluid Treatment, Inc., 1500 KDF Dr., Three Rivers, MI 49093-9287 (800-437-2745; 269-273-3300; FAX: 269-273-4400; e-mail: info@kdfllc.com; web site: www.kdfllc.com)

Kemutec Group, Inc., 130 Wharton Rd., Keystone Industrial Park, Bristol, PA 19007 (215-788-8013; FAX: 215-788-5113; e-mail: Sales@KemutecUSA.com; web site: www.KemutecUSA.com)

Keystone Filter, a CECO Environmental Company, 700 Emlen Way, Telford, PA 18969 (800-822-1963; 215-822-1963; FAX: 215-997-1839; e-mail: filters@keystonefilter.com; web site: www.keystonefilter.com)

**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33003 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)**

Kinergy Corp., 7310 Grade Lane, Louisville, KY 40219 (502-366-5685; FAX: 502-366-3701; e-mail: kinergy@kinergy.com; web site: www.kinergy.com)

KIRK Process Solutions Ltd, Kirk House, 161 Park Close, Walton-on-Thames, United Kingdom KT12 1EW (01932 250300; e-mail: info@kirkprocess.com; web site: www.kirkprocess.com)

Kloepfer-Therm GmbH & Co. KG, Unterste-Wilms-Str. 21, Dortmund, Germany D-44143 (+49 231 5178 0; FAX: +49 231 5178 333; e-mail: sales@kloepfer-therm.de; web site: www.kloepfer-therm.de)

Knighthawk Engineering, 17625 El Camino Real, Suite 412, Houston, TX 77058 ((281) 282-9200; FAX: (281) 282-9333; e-mail: hawkwork@knighthawk.com; web site: www.knighthawk.com/)

**KOERTING HANNOVER AG, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)**

**See our ad on page 107**  
Koflo Corp., 309 Cary Point Dr., Cary, IL 60013 (800-782-8427 U.S., Canada; 847-516-3700; FAX: 847-516-3724; e-mail: info@koflo.com; web site: www.koflo.com)

**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North America; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**

**See our ad on page 135**  
NJ, Komline-Sanderson, 12 Holland Ave., Peapack 07977 (800-225-5457 North America; 908-234-1000; FAX: 908-234-9487)

Konica Minolta Sensing America, 101 Williams Drive, Ramsey, NJ 07466 (1-888-473-2656; 201-818-3526; e-mail: marketing.SUS@konamicinolta.com; web site: sensing.konamicinolta.us)



**KRAISSL CO. INC., 299 Williams Ave., Hackensack, NJ 07601-5225 (800-572-4775; 201-342-0008; FAX: 201-342-0025; e-mail: kraissl@aol.com; web site: www.strainers.com)**

KREISEL GmbH & Co. KG, Muehlenstrasse 38, Krauschwitz, Germany 02957 (+49 35771 98-0; FAX: +49 35771 60798; e-mail: info@kreisel.eu; web site: www.kreisel.eu)

KRUSS GmbH, Marketing, Borsteler Chaussee 85, Hamburg, Germany 22453 (+49/40/514401-0; FAX: +49/40/514401-98; e-mail: info@kruss.de; web site: www.kruss.de)

K-Sun Corporation, 370 SMC Drive, PO Box 309, Somerset, WI 54025 (800-622-6312 USA; 715-247-4440; FAX: 715-247-4003; e-mail: info@ksun.com; web site: www.ksun.com)

kubit USA, 401 Studewood, Suite 205, Houston, Texas 77007 ((800)-259-4014; FAX: (800) 313-1391; e-mail: info@kubitusa.com; web site: www.kubitusa.com)

Kubota Corporation, 79 Robinson Road, #20-06, Singapore, Singapore 068897 (6562241919; FAX: 6562245213; e-mail: kubota@singnet.com.sg; web site: www.kubota-feeders.com)

Kurz Instruments Inc., 2411 Garden Road, Monterey, CA 93940 (800)4247356; 831-646-5911; 800)4247356; e-mail: sales@kurzinstuments.com; web site: www.kurzinstuments.com/)

**L**  
LA-MAN Corp., PO Box 328, Mazeppa, MN 55956 (800-348-2463; 507-843-4800; FAX: 888-905-2626; e-mail: info@laman.com; web site: www.laman.com)

**LANXESS CORPORATION, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

LAR Process Analysers AG, Neukoellnische Allee 134, Berlin, Germany 12057 (+49 30 278958-40; FAX: +49 30 278958-703; e-mail: sales@lar.com; web site: www.lar.com)



**LAUDA DR. R. WOBSE GMBH & CO. KG, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 (0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)**

**With more than 400 employees, more than EUR 60 million in annual turnover and eight foreign subsidiaries, LAUDA is the global leader in the manufacture of innovative constant temperature equipment.**

LECO Corporation, 3000 Lakeview Ave., St. Joseph, MI 49085 (800-292-6141; 269-985-5496; FAX: 269-982-8977; e-mail: info@leco.com; web site: www.leco.com)

Lectrodryer, P.O. Box 2500, Richmond, KY 40476-2602 (859-624-2091; FAX: 859-623-2436; e-mail: info@lectrodryer.com; web site: www.lectrodryer.com)

Lectrus, 2215-C Olan Mills Drive, Chattanooga, TN 37421 (800-445-8791 US; 423-894-9268; FAX: 423-553-6166; e-mail: info@lectrus.com; web site: www.lectrus.com)

Leister Technologies AG, Gallieo-Strasse 10, Kaegiswil, Switzerland CH-6056 (41-41-66274-74; FAX: 41-41-662-74-16; e-mail: leister@leister.com; web site: www.leister.com)

Leistriz Extrusion, 169 Meister Avenue, Somerville, NJ 08876 (908-685-2333; FAX: 908-685-0247; e-mail: sales@alec-usa.com; web site: www.leistriz-extrusion.com)

LESER LLC, 10615 Texland Blvd., Ste. 100, Charlotte, NC 28273 (e-mail: www.leser.com/)

Levellese, Inc., 326 Steele St, Denver, Colorado 80206 (3035861425; e-mail: sales@levelese.com; web site: www.levellese.com)

**LEWA GMBH, Ulmer Str. 10, Leonberg, Germany 71229 (49-7152-14-0; FAX: 49-7152-14-1303; e-mail: lewa@lewa.de; web site: www.lewa.com)**

MA, AMERICAN LEWA, Inc., 132 Hopping Brook Road, Holliston 01746 ((888) 539-2123; +1 508 4297 403; FAX: +1 508 4298 615)

International, LEWA Herbert Ott KG, Diefenbachgasse 35/39, Wien, Austria 1150 (+43 1 8773 0400; FAX: +43 1 8773 04029)

International, LEWA SULAMERICANA Ltda., Rua George Rexroth 609, Bloco E Conj. 2, Diadema, Brazil 09951-970 (+55 11 4075 9999; FAX: +55 11 4071 9920)

International, POMPES LEWA S.A.R.L., 5-9 Rue d'Estienne d'Orves, Z. A. des Sureau, Sartrouville, France 78500 (+33 1 3086 7480; FAX: +33 1 308674-97)

International, POMPE LEWA S.R.L., Via Vincenzo Monti 52, Mazza di Rho, Italy 20017 (+39 02 93468-61; FAX: +39 02 93468-62)

International, NIKKISO CO. LTD, Yebisu Garden Place Tower 22nd Floor, 20-3, Ebisu 4-Chome, Shibuya-ku, Tokyo, Japan 150-6022 (+81 3 3443-3711; FAX: +81 3 3473-4963)

International, Welhavens vei 1, Sandnes, Norway 4319 (+47 529091-00; FAX: +47 529091-01)

International, LEWA Pumps (Dalian) Co., Ltd., No. 86 Liahedong Road, DD Port, Dalian, Peoples Rep of China 11 6600 (+86 41 81758-1477; FAX: +86 41 8758-1478)

International, Bolschaya Poljanka 44/2 office 344, Moscow, Russia 119180 (+7 495 64027-73; FAX: +7 495 64027-75)

International, LEWA ASIA HERBERT OTT PTE. LTD., Blk 1 Clementi Loop, Clementi West Logistics Park #02-06, Singapore, Singapore 129808 (+65 6861 7127; FAX: +65 6861 6506)

International, LEWA Herbert Ott Espay, S.A., Consejo de Ciento 295, 4-1/2, Barcelona, Spain 08007 (+34 93 2247 740; FAX: +34 93 2247 741)

International, Herbert Ott AG, Nenzlingerweg 5, Reinach 1, Switzerland 4153 (+41 61 7179 400; FAX: +41 61 7179 401)

International, P. O. Box 261900, Jebel Ali Free Zone, Dubai, United Arab Emirates RA8COE (+971 4 8870999; FAX: +971 4 8870998)

LEWCO, Inc., 706 Lane St., Sandusky, OH 44870 (419-625-4014; FAX: 419-625-1247; e-mail: sales@Lewcoinc.com; web site: www.lewcoinc.com)

Lightning Eliminators & Consultants, Inc., 6687 Arapahoe Rd., Boulder, CO 80303 (800-521-6101; 303-447-2828; FAX: 303-447-8122; e-mail: info@lightningprotection.com)

Linde AG, Engineering Division, Dr.-Carl-von-Linde-Str. 6-14, Pullach, Germany 82049 (+49.89.7445-0; FAX: +49.89.7445-4908; e-mail: info@linde-le.com; web site: www.linde-engineering.com)



Liquid Process Systems, inc., 1025 Technology Drive, Suite A, Indian Trail, NC 28079 (704-821-1115; FAX: 704-821-1190; e-mail: info@lps-filtration.com; web site: www.lps-filtration.com)

LIST AG, Berstelstrasse 24, Arisdorf, Switzerland 4422 (41-61-815-30-00; FAX: 41-61-815-30-01; e-mail: info@list.ch)

Lloyd's Register Quality Assurance Ltd., 1401 Enclave Parkway, Ste. 200, Houston, TX 77077 (281-398-7370; FAX: 281-398-7337; web site: www.renergy.org/)

L&L Special Furnace Co., Inc., 20 Kent Road, Aston, PA 19014 (877-846-7628; 610-459-9216; FAX: 610-459-3689; e-mail: sales@hotfurnace.com; web site: www.hotfurnace.com)

Logical Technology, Inc., 6907 N. Knoxville Ave., Peoria, IL 61614 (800-266-7591; 309-689-2900; FAX: 309-689-2911; e-mail: logical@comply1.com; web site: www.comply1.com)

LOTUS MIXERS INC., 3448 TECHNOLOGY DRIVE - #201, North Venice, FL 34275 (941-966-1885; e-mail: info@lotusmixers.com; web site: www.lotusmixers.com)

Lucifer Furnaces Inc., 2048 Bunnell Rd., Warrington, PA 18976 (800-378-0095; 215-343-0411; FAX: 215-343-7388; e-mail: info@luciferfurnaces.com; web site: www.luciferfurnaces.com)

LUDECA, INC., 1425 NW 88th Ave, Doral, FL 33172 (305-591-8935; FAX: 305-591-1537; e-mail: info@ludeca.com; web site: www.ludeca.com)

Ludman Industries, 4810 North 124th Street, Milwaukee, WI 53225 (414-431-3500; FAX: 414-431-1850; e-mail: sales@ludman.net; web site: www.ludman.net)

Lumaco Sanitary Valves, 9-11 E. Broadway, Hackensack, NJ 07601-6821 (800-735-VALV (8258) US & Canada; 201-342-5119; FAX: 201-342-8898; e-mail: valvinfo@lumaco.com; web site: www.lumaco.com)

Luma Comfort, 3419 E. Chapman Ave. Suite 190, Orange, CA 92669 (714-266-3678; e-mail: sales@lumacomfort.com; web site: www.lumacomfort.com)

Lyntek, Inc., 1550 Dover Street, Lakewood, CO 80215 (303-623-8365; 303-623-0623; FAX: 303-623-0342; e-mail: information@lyntek.com; web site: www.lyntek.com)

## M

Madison Co., 27 Business Park Dr., Branford, CT 06405-2931 (800-466-5383 (US & Canada) (US & Canada); 203-488-4477; FAX: 203-481-5036; e-mail: info@madisonco.com; web site: www.madisonco.com)

Magnatrol Valve Corp., 67 Fifth Ave., P.O. Box 17, PO Box 17, Hawthorne, NJ 07507 (800-711-0017; 973-427-4341; 973-427-4341; FAX: 973-427-7611; e-mail: info@magnatrol.com; web site: www.magnatrol.com)

Magnetic Products, Inc., P.O. Box 529, 683 Town Center Dr., Highland, MI 48357 (800-544-5930; 248-887-5600; FAX: 248-887-6100; e-mail: info@mpimagnet.com; web site: www.mpimagnet.com)

Mallard Creek Polymers, Inc., 8901 Research Drive, Charlotte, NC 28262 (1-877-240-0171; 1-877-240-0171; 1-704-547-0622; FAX: 1-704-503-5054; e-mail: bharr@mc-polymers.com; web site: www.mc-polymers.com)

MAN Diesel & Turbo SE, Stadtbachstrasse 1, Augsburg, Germany 86153 (+49 (0)821-3220; FAX: 49 (0)821-3223382; e-mail: turbomachinery@mandieselturbo.com; web site: www.mandieselturbo.com)

manning&lewis div rubicon industries corp, 848 East 43rd Street, Brooklyn, New York 11210 (800-662-6999; 718-434-4700, 908-687-2400; e-mail: sales@manninglewis.com)

Markland Specialty Engineering Ltd., 305 Armstrong Avenue, Unit 9, Georgetown, Ontario, Canada L7G 4X6 (1-855-873-7791 North America; 905-873-7791; 905-873-9426; FAX: 905-873-6012; e-mail: markland@sludgecontrols.com; web site: www.sludgecontrols.com)

Martin Engineering, One Martin Place, Neponset, IL 61345 (800-544-2947; 309-852-2384; FAX: 800-814-1553; e-mail: info@martin-eng.com; web site: www.martin-eng.com)

Martin Vibration Systems, 990 Degurse Ave., Marine City, MI 48039 (800) 474-4538; (810) 765-7460; FAX: (810) 474-4538; e-mail: mikel@shake-it.com; web site: www.Shake-it.com)

Material Transfer & Storage Inc., 1214 Lincoln Rd., P.O. Box 218, Allegan, MI 49010-0218 (800-836-7068; 669-673-2125; FAX: 269-673-4883; e-mail: sales@material-transfer.com; web site: www.materialtransfer.com)

Matsushima Measure Tech, c/o AAAMachine, 1291 Rand Rd., Des Plaines, IL 60016 (800-996-0070 USA, Canada; 847-841-8264; FAX: 847-376-3530; e-mail: matsushima-m700@aaamachine.com; web site: www.aaamachine.com/partner/matsushima/matsushima-usa.html)

McGill AirClean LLC, 1777 Refugee Road, Columbus, OH 43207-2119 (614-829-1200; FAX: 614-445-8759; e-mail: sales@mcgillairclean.com; web site: www.mcgillairclean.com)

McGill AirFlow LLC, One Mission Park, Groveport, OH 43125 (614-829-1200; FAX: 614-829-1291; e-mail: marketing@mcgillairflow.com; web site: www.mcgillairflow.com)

McGill AirPressure LLC, 1777 Refugee Road, Columbus, OH 43207 (614-829-1200; FAX: 614-445-8759; e-mail: sales@mcgillairpressure.com; web site: www.mcgillairpressure.com)

McGill AirSilence LLC, 2400 Fairwood Avenue, Columbus, OH 43207-2700 (614-829-1200; FAX: 614-829-1488; e-mail: sales@mcgillairsilence.com; web site: www.mcgillairsilence.com)

M&C TechGroup, 6019 Olivas Park Drive, Ste G, Ventura, CA 93003 ((805) 654 6970; FAX: (805) 654 6971; e-mail: info@mc-techgroup.com; web site: www.mc-techgroup.com)

McWane and Associates, P.O. Box 5516, San Jose, CA 95150 (559-230-1442; e-mail: omwane@materialsite.com; web site: www.materialsite.com)

Mefiag, a CECCO Environmental Company, 1550 Industrial Drive, Owosso, MI 48867 (989 725 8184; FAX: 989 729 1013; e-mail: mefiag@ceccoenviro.com; web site: www.mefiag.com)

Mehrer Compression GmbH, Rosenfelder Str. 35, Balingen, Germany D-72336 (+49 7433 26 05 0; FAX: +49 7433 26 05 41; e-mail: sales@mehrer.de; web site: www.mehrer.de)

Membrana, 13800 South Lakes Dr., Charlotte, NC 28273 (704-587-8888; FAX: 704-587-8610; e-mail: info@liquicel.com or info@liqui-flux.com; web site: www.liqui-cel.com or www.liqui-flux.com)

Metano IBC Services, Inc., 2 Merkin Drive, Perrineville, NJ 08535 (800-634-4128; 732-566-9600; FAX: 732-792-2402; e-mail: info@metanousa.com; web site: www.metanousa.com)

Met-Pro Global Pump Solutions, a CECCO Environmental Company, 700 Emlien Way, Telford, PA 18969 (800-392-7621; 215-723-8155; FAX: 215-723-2197; e-mail: info@mp-gps.com; web site: www.mp-gps.com)

Metsu Minerals Industries, Inc., 215 Pleasant Valley Road (Zip 17402), P.O. Box 15043, York, PA 17405 (717-843-8671; 800-479-0362; FAX: 717-845-5154; e-mail: minerals.info@metsu.com; web site: www.metsu.com)

Meyer Tool & Mfg., Inc., 4601 w. southwest highway, oaklawn, IL 60453 (70842529080; 7732308168; FAX: 7084252612; e-mail: m.parr@mtm-inc.com)

Microdyn Technologies, Inc., C/O Box 98269, Raleigh, NC 27616 (919-341-5936; FAX: 919-341-5935; e-mail: info@microdyn-nadir.com; web site: www.microdyntech.com)

MICRODYN-NADIR GmbH, Kasteler Str. 45, Wiesbaden, Germany D-65203 (+49 (0)611-962-6001; FAX: +49 (0)611-962-9237; e-mail: info@microdyn-nadir.de; web site: www.microdyn-nadir.de)

Microfluidics, 30 Ossipee Rd., Newton, MA 02464-9101 (800-370-5452; 617-969-5452; FAX: 617-965-1213; e-mail: mixinginfo@dexcorp.com; web site: www.microfluidicscorp.com)

MICROMO, 14881 Evergreen Ave., Clearwater, FL 33762-3008 (800-807-9166; 727-572-0131; FAX: 727-573-5918; e-mail: info@micromoc.com; web site: www.micromoc.com)

MIDAC Corp., 6 Coleman Ave, Westfield, MA 01085 (e-mail: info@midac.com; web site: www.midac.com)

Midwesco Filter Resources, Inc., P.O. Box 2075 (22604), 385 Bataille Dr., Winchester, VA 22601 (800-336-7300; 540-667-8500; FAX: 540-667-9074; e-mail: sales@midwescofilter.com; web site: www.midwescofilter.com)

Midwest Steel Company Inc, 9825 Moers Road, Houston, Texas 77075 (713) 991-7843; FAX: (713) 991-4745; web site: www.midwest-steel.com)

Milamar Coatings L.L.C., 311 NW 122 St. Suite 100, Oklahoma City, OK 73114 (800-459-7659; 405-755-8448; FAX: 405-755-8450; e-mail: milamar@casspolymers.com; web site: www.milamar.com)

Mil-Ram Technology, Inc., 4135 Business Center Drive, Fremont, CA 94538 (888-464-5726; 510-656-2001; FAX: 510-656-2004; e-mail: sls@mil-ram.com; web site: www.mil-ram.com)

Milward Alloys, 500 Mill Street, Lockport, NY 14094 (800-833-6600; 716-434-5536; FAX: 716-434-3257; e-mail: Milward@milward.com; web site: www.milward.com)

Mars Mineral, P.O. Box 719, Mars, PA 16046 (724-538-3000; FAX: 724-538-5078; e-mail: info@marsmineral.com; web site: www.marsmineral.com)

MM Industries, Inc., Vorti-Siv, 36135 Salem Grange Rd., PO Box 720, Salem, OH 44460 (800-227-7487 USA; 330-332-4958; 330-332-0545; FAX: 330-332-1543; e-mail: info@vorti-siv.com; web site: www.vorti-siv.com)

M. O. Industries, 9 Whippary Rd, Unit B1-2, Whippary, NJ 07981 (973-386-9228; FAX: 973-428-0221; e-mail: sales@moindustry.com; web site: www.moindustry.com)

Mobile Modular, 4445 East Sam Houston Pkwy South, Pasadena, Texas 77505 ((866) 361-1888; (281) 487-9222; FAX: (281) 487-1289; web site: www.mobilemodularrents.com)

Modern Process Equipment, Inc., 3125 S. Kolin Ave., Chicago, IL 60623 (773-254-3929; FAX: 773-254-3935; e-mail: solution@mpechicago.com; web site: www.mpechicago.com)

MoistTech Corp., 1283 Tallevast Rd, Sarasota, FL 34243 (9413517870; 9413517870; FAX: 9413517870; e-mail: afordham@moisttech.com)

Mokon, 2150 Elmwood Ave., Buffalo, NY 14207 (716-876-9951; FAX: 716-874-8048; e-mail: sales@mokon.com; web site: www.mokon.com)

Momentive Performance Materials Inc., 260 Hudson River Road, Waterford, NY 12188 (888-443-9466; 614-986-2497; 614-986-2496; e-mail: dinfo@momentive.com; web site: www.momentive.com)

Momentive Specialty Chemicals, Epoxy, Phenolic & Coating Resins Division, 180 East Broad Street, Columbus, OH 43215 (888-443-9466; 614-225-4000; FAX: 614-986-2496; e-mail: dinfo@momentive.com; web site: www.momentive.com)

Monitor Technologies LLC, 44W320 Keslinger Rd., Elburn, IL 60119 (800-601-6204 US & Canada; 630-365-9403; FAX: 630-365-5646; e-mail: monitor@monitortech.com; web site: www.monitortech.com)

Moore Industries International, Inc., 16650 Schoenborn St., North Hills, CA 91343 (800-999-2900 Within United States; 818-894-7111; FAX: 818-891-2816; e-mail: info@miinet.com; web site: www.miinet.com)

Mott Corporation, 84 Spring Lane, Farmington, CT 06032-3159 (800-289-6688; 860-747-6333; FAX: 860-747-6739; e-mail: quest@mottcorp.com; web site: www.mottcorp.com)

MTR Software, 77 Carlton Street, Suite 808, Toronto, Ontario, Canada M5S 2S6 (416-596-1499; e-mail: support@ftal.com; web site: www.ftal.com)

MUELLER GMBH, P.O. Box 1409, Rheinfelden, Germany 79604 (+49-7623-9630; FAX: +49-7623-96969; e-mail: info@mueller-gmbh.com; web site: www.mueller-gmbh.com)

MULTITHERM LLC, PO Box 579, Devault, PA 19432 (800-225-7440; 610-408-8361; FAX: 610-408-8365; e-mail: techinfo@multitherm.com; web site: www.Multitherm.com)

Munson Machinery Company, Inc., 210 Seward Avenue, Utica, NY 13502-5750 (800-944-6644; 315-797-0090; FAX: 315-797-5582; e-mail: info@munsonmachinery.com; web site: www.munsonmachinery.com)

Munters Corporation, 225 S. Magnolia Avenue, Buena Vista, VA 24416 (800-843-5360; 540-291-1111; FAX: 540-291-3333; e-mail: dinfo@munters.com; web site: www.munters.com)

Munters Corporation, Air Treatment, 79 Monroe St., P.O. Box 640, Amesbury, MA 01913-0640 (800-843-5360; 978-241-1100; FAX: 978-241-1214; e-mail: dinfo@munters.com; web site: www.munters.us)

Munters Corporation, Zeol, 79 Monroe Street, Amesbury, MA 01913-0600 (800-843-5360; 978-241-1100; FAX: 978-241-1220; e-mail: dinfo@munters.com; web site: www.munters.us)

Musco Engineering Associates, 375 Morgan Lane, Unit 307, West Haven, CT 06516 (203-932-1901; FAX: 203-931-1550; e-mail: musco@muscoengineering.com)

Myron L Company, 2250 Impala Drive, Carlsbad, CA 92010 (760-438-2021; FAX: 760-931-9189; e-mail: sales@myronl.com; web site: www.myronl.com)

## N

Nantong Fareast Chemical Equipment Co. LTD, International Trading, Yuanqiao Industrial Park, Qinzao Town, Nantong, Peoples Rep. of China 226011 (+86 813 85956297; FAX: +86 513 83564755; e-mail: sales@graphitequip.com; web site: www.graphiteequip.com)

Nash Europe Ltd., Road One, Industrial Estate, Winsford, Cheshire, United Kingdom CW7 3PL (44-1606-542400; FAX: 44-1606-542434; e-mail: nash@gardnerdenver.com; web site: www.GDNash.com)

Nash, a Gardner Denver Product, PO Box 130, Bentleyville, PA 15314 (800-553-NASH; 7242391500; 7242391500; FAX: 724-239-1502; e-mail: nash@gardnerdenver.com; web site: www.GDNash.com)

National Pump Company, 7706 N. 71st Ave., Glendale, AZ 85303 (800-966-5240; 623-979-3560; FAX: 623-979-2177; e-mail: info@natlump.com; web site: www.nationalpumpcompany.com)

NETZSCH Pumpen & Systeme GmbH, Geretsrieder Str. 1, Waldkraiburg, Germany 84478 (+49 8638 63 0; FAX: +49 8638 67981; e-mail: info.nps@netzsch.com; web site: www.netzsch.com)

NEUHAUS NEOTECH Maschinen- und Anlagenbau GmbH, Dieselstrasse 5-9, Germany D-21465 Reinbeck (+49-40-72771-500; FAX: +49-40-72771-550; e-mail: sales@neuhau-neotech.de; web site: www.neuhau-neotech.de)

NewAge Industries, Inc., 145 James Way, Southampton, PA 18966 (800-506-3924 US Only; 215-526-2300; FAX: 215-526-2190; e-mail: info@newageindustries.com; web site: www.newageindustries.com)

Newman Regency Group, 12705 S. Kirkwood, Stafford, TX 77429 ((281) 980-7448; FAX: (281) 980-7447; e-mail: jeff@newmanregency.com; web site: www.newmanregencygroup.com)

Newson Gale Ltd, Omega House, Private Road 8, Colwick, Nottingham, United Kingdom NG4 2JX (44-115-940-7500; FAX: 44-115-940-7501; e-mail: groundit@newson-gale.co.uk; web site: www.newson-gale.com)

NexGen Enviro Systems Inc., 190 East Hoffman Avenue, Lindenhurst, NY 11757 (800-842-1630; 631-226-2930; FAX: 631-226-3125; e-mail: info@nexgenenviro.com; web site: www.nexgenenviro.com)

Nier Systems Inc, 6678 Newport Lake Circl, Boca Raton, Florida 33496 (1-561-989-0049; FAX: 1-561-995-6763; e-mail: nierstys@bellsouth.net; web site: www.nierstys-tems.com)

Niles Steel Tank, 725 Talamore Drive, Ambler, PA 19002 (215-641-2114; FAX: 215-646-7984; e-mail: info@nilesst.com; web site: www.nilesst.com)



**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**

Nordson SEALANT EQUIPMENT, 45677 Helm St., P.O. Box 701460, Plymouth, MI 48170 (734-459-8600; FAX: 734-459-8686; e-mail: sales@sealantequipment.com; web site: www.sealantequipment.com)

Northwest Analytics, Inc., 111 SW Fifth Avenue #800, Portland, OR 97204 (888-692-7638; 503-224-7727; FAX: 503-224-5236; e-mail: nwa@nwasoft.com; web site: www.nwasoft.com)

## O

Obetego, PO Box 487, 100 Gradyville Road, Glen Mills, Pennsylvania 19342 ((610) 459-1631; e-mail: obetego@gmail.com; web site: www.obetego.com)

OHL Guterthum Industrial Valves GmbH, Helmershauser Strasse 9 + 12, Altendatt, Germany 63674 (+49 6047 8006 0; FAX: +49 6047 8006 29; e-mail: og@ohl-guterthum.de; web site: www.ohl-guterthum.de)

Omnii-Lift, Inc., 1485 S. 300 W., Salt Lake City, UT 84115-5137 (801-486-3776; FAX: 801-486-3780; e-mail: omniibelt@aol.com; web site: www.omni-lift.com)

ONLY Technology LTD, wuhan, China, Chile (e-mail: info@onlywhdf.com; web site: www.onlywhdf.com)

optek-Danulat, Inc., N118W18748 Bunsen Drive, Germantown, WI 53022 (888-864-4288; e-mail: chem@optek.com; web site: www.optek.com)

**ORIVAL WATER FILTERS, 213 S Van Brunt St., Englewood, NJ 07631-9902 (800-567-9767; 201-568-3311; FAX: 201-568-1916; e-mail: sales@orival.com; web site: www.orival.com)**

Oseco, 1701 W. Tacoma, P.O. Box 1327, Broken Arrow, OK 74013-1327 (800-395-3475; 918-258-5626; FAX: 918-251-2809; e-mail: sales@oseco.com; web site: www.oseco.com)

Osram Sylvania, 100 Endicott St., Danvers, MA 01923-3623 (800-544-4828; 978-777-1900; FAX: 978-750-2152; web site: www.sylvania.com)

Oxotec  
Oxford Lasers, Inc., 2 Shaker Road, Unit B104, Shirley, MA 01464 (800-222-3632; 978-425-0755; FAX: 978-425-4487; e-mail: oxford.inc@oxfordlasers.com; web site: www.oxfordlasers.com)

## P

P-Ker Engineering, 1880 Waterport Rd., PO Box 26, Waterport, NY 14571 (716-845-6398; FAX: 716-845-6479; e-mail: info@kerengineering.com; web site: www.pkerengineering.com)

Pacific Scale Co., Inc., 16002 S.E. 106, P.O. Box 1606, Clackamas, OR 97015 (800-537-1886; 503-657-7500; FAX: 503-657-5561; e-mail: pscoc@pacifier.com; web site: www.pacificscale.com)

**PAHARPUR COOLING TOWERS LTD, Paharpur House, 8/1/B Diamond Harbour Road, Kolkata, India 700027 (+913340133000; FAX: +913340133499; e-mail: pccoc@paharpur.com; web site: www.paharpur.com)**

See our ad on page 82

Palmer Wahl Temperature Instruments, 234 Old Weaverille Road, Asheville, NC 28804-1260 (800-421-2853; 828-658-3131; FAX: 828-658-0728; e-mail: info@palmerwahl.com; web site: www.palmerwahl.com)

PANalytical BV, Lelyweg 1, P.O. Box 13, Almelo, Netherlands 7600 AA (800-279 7297; 31-546-534-444; FAX: 31-546-534-598; e-mail: info@panalytical.com; web site: www.panalytical.com)

Parker Hannifin Corp., Parker Fluid Control Division, 95 Edgewood Ave., New Britain, CT 06051 (800-Valve05; 860-827-2300; FAX: 860-827-2384; e-mail: skinner-valve@parker.com; web site: www.parker.com/fcd)

Parker Hannifin O-Ring Division, 2360 Palumbo Drive, Lexington, KY 40509 ((859) 269-2351; FAX: (859) 335-5123; e-mail: ordmailbox@parker.com; web site: www.parker.com/orings)

Parsec, Inc., 180 North Riverview, No. 300, Anaheim, CA 92808 (714-996-5302; FAX: 714-996-1845; e-mail: info@parsec-corp.com; web site: www.parsec-corp.com)

Particle Reduction Service, 65 Scott St., Elk Grove Village, IL 60007 (847-593-2025; FAX: 847-593-2046; e-mail: particlereuction@att.net)

Patterson Ind. Canada, of All-Weld Company Limited, 49 Passmore Ave., Scarborough, Ontario, Canada M1V 4T1 (800-336-1110; 416-694-3381; FAX: 416-691-2768; e-mail: process@pattersonindustries.com; web site: www.pattersonindustries.com)

Paul O. Abbe, 735 East Green St., Bensenville, IL 60106 (800-524-2188 US; 630-350-3012; FAX: 630-238-7584; e-mail: sales@pauloabbe.com; web site: www.pauloabbe.com)

PBM Valves Inc., 1070 Sandy Hill Rd., Irwin, PA 15642 (800-967-4726; 724-863-0550; FAX: 724-864-9255; e-mail: info@pbmvalve.com; web site: www.pbmvalve.com)

PCA GmbH, Lebacher Strasse 60, Building 60, Heusweiler, Germany 66265 (49 6806 60330; FAX: 49 6806 603731; e-mail: s.mueller\_z@pca-gmbh.com; web site: www.pca-gmbh.com)

PCE Instruments, Units 12/13 Southpoint Business Park, Ensign Way, Hamble, Southampton, United Kingdom SO31 4RF (+44 (0) 2380 98703 0; FAX: +44 (0) 2380 98703 9; e-mail: info@industrial-needs.com; web site: www.industrial-needs.com/)

PDC Machines, Inc., Warwick Commons, 1875 Stout Dr., P.O. Box 2733, Warminster, PA 18974 (215-443-9442; FAX: 215-443-8530; e-mail: info@pdcmachines.com; web site: www.pdcmachines.com)

PDR-Separations LLC, 3 Old Meadow Way, Palm Beach Gardens, FL 33418 (561 818-8445; FAX: 561 429-4541; e-mail: info@pdr-separations.com; web site: www.pdr-separations.com)

PENTA Engineering, P.A., 13835 S. Lakes Dr., Charlotte, NC 28273-6738 (704-588-8877; FAX: 704-588-9006; e-mail: scommision@pentaengr.com; web site: www.pentaengr.com)

Pepperl + Fuchs GmbH, Lilienthalstrasse 200, Mannheim, Germany 68307 (0621-776-0; FAX: 0621-776-1000; e-mail: info@de.pepperl-fuchs.com; web site: www.pepperl-fuchs.com)

Petron Plus Global, Inc., PO Box 644, Hutchinson, Kansas 67504-0644 (200-663-8559; e-mail: gary.clark@ppxformula7.com; web site: www.petronplusglobal.com)

Pfaltz & Bauer, Inc., 172 E. Aurora St., Waterbury, CT 06708 (800-225-5172; 203-574-0075; FAX: 203-574-3181; e-mail: sales@pfaltzandbauer.com; web site: www.pfaltzandbauer.com)

Pfeiffer Vacuum, Inc., 24 Trafalgar Square, Nashua, NH 03063 (800-248-8254; 603-578-6500; FAX: 603-578-6550; e-mail: contact@pfeiffer-vacuum.com; web site: www.pfeiffer-vacuum.com)

**PFEIFFER VACUUM GMBH, Berliner Strasse 43, Asslar, Germany 35614 (+49-6441-802 0; FAX: +49-6441-802 1202; e-mail: info@pfeiffer-vacuum.de; web site: www.pfeiffer-vacuum.com)**

Phoenix Contact, 586 Fulming Mill Road, Middletown, PA 17057 (800-888-7388; 717-944-1300; FAX: 717-944-1625; e-mail: info@phoenixcon.com; web site: www.phoenixcontact.com)

Phoenix Contact GmbH & Co KG, Flachmarktstr. 8, Blomberg, Germany 32825 (+49 (0)5235-300; FAX: +49 (0)5235-341200; e-mail: info@phoenixcontact.com; web site: www.phoenixcontact.com)

PHOENIX Conveyor Belt Systems GmbH, Hannoversche Strasse 88, Hamburg, Germany 21079 (+49 40 7667 -03; FAX: +49 40 7667 2413; e-mail: info@phoenix-cbs.com; web site: www.phoenix-conveyor-belts.com)

Pick Heaters Inc., 730 S. Indiana Ave., P.O. Box 516, West Bend, WI 53095 (800-233-9030; 262-338-1191; FAX: 262-338-8489; e-mail: info1@pickheaters.com; web site: www.pickheaters.com)

PISC "CONCERN STIROL"  
Pneumatech, Inc., 1800 Overview Dr, Rock Hill, SC 29730 (800-336-2285; 262-658-4300; FAX: 803-817-7211; e-mail: Jon.Sanders@pneumatech.com; web site: www.pneumatech.com)

PNR AMERICA, LLC, One Civic Center Plaza, Suite 303, Poughkeepsie, NY 12601 (845-483-7770; FAX: 845-483-7755; e-mail: info@pnramerica.com; web site: www.pnramerica.com)

Pollution Control Systems, Inc., 5827 Happy Hollow Rd., Suite 1B, Milford, OH 45150-1839 (513-831-1165; FAX: 513-965-4812; e-mail: polconsys@aol.com; web site: www.pollutioncontrolsystem.com)

Polyguard Products, Inc., P.O. Box 755, Ennis, TX 75120-0755 (800-541-4994; 972-875-9425; FAX: 972-875-9425; e-mail: polyguard@polyguardproducts.com; web site: www.polyguardproducts.com)

Polytec, Inc., Process Analytics, East Coast Office, 25 South Street, Suite A, Hopkinton 01748 ((508) 417-1035; FAX: (508) 281-4725; e-mail: analytics@polytec.com; web site: www.analytics-online.com)

Pope Scientific, Inc., P.O. Box 80018, 351 N. Dekora Woods Blvd., Saukville, WI 53080 (262-268-9300; FAX: 262-268-9400; e-mail: info@popeinc.com; web site: www.popeinc.com)

Porvair Filtration Group Inc, 10190 Maple Leaf Court, Ashland, VA 23005 (804 550 1600; FAX: 804 550 3262; e-mail: info@porvairfiltration.com; web site: www.porvairfiltration.com)

Posi-Plate, 1125 Willow Lake Blvd., St. Paul, MN 55110-5193 (651-484-5800; FAX: 651-484-7015; e-mail: info@posiplate.com; web site: www.posiplate.com)

Powder Systems Ltd, Estuary Business Park, Liverpool, United Kingdom L24 8RG (+44 151 448 7700; FAX: +44 151 448 7702; e-mail: info@powdersystems.com; web site: www.powdersystems.com)

PP PUBLICO Publications, Julienstr. 40, Essen, NRW, Germany D-45130 (49-201-79-12-12; FAX: 49-201-79-88-278; e-mail: pp-publico@online.de; web site: www.pp-publico.de)

PQ Systems, 2108 E Spring Valley Rd, Dayton, OH 45458 (8007773020; 9378134700; FAX: 9378134701; e-mail: sales@pqsystems.com; web site: www.pqsystems.com)



**PRAJ INDUSTRIES LIMITED, Praj Tower\* 274 & 275, Bhumkar Chowk-Hinjewadi Road, Hinjewadi, Pune, India 411057. (+912022951511; FAX: +912022951718; e-mail: info@praj.net; web site: www.praj.net)**

Prater-Sterling, 2 Sammons Court, Bollingbrook, IL 60440 (800-323-5735; 630-759-9595; FAX: 630-759-6099; e-mail: info@prater-sterling.com; web site: www.prater-sterling.com)

Presto Lifts Inc., 50 Commerce Way, Norton, MA 02766 (800-343-9322; 508-222-0177; FAX: 508-222-2996; e-mail: sales@prestolifts.com; web site: www.prestolifts.com)

Primera Technology, 2 Carlson Parkway North, Plymouth, Minnesota 55447 (763) 475-6676; FAX: (763) 475-6677; e-mail: sales@primera.com; web site: www.primeralabel.com)

Procedyne Corp., 11 Industrial Dr., New Brunswick, NJ 08901 (732-249-8347; FAX: 732-249-7220; e-mail: mail@procedyne.com; web site: www.procedyne.com)

Process Combination Corp., 5460 Horning Rd., Pittsburgh, PA 15236 (412-655-0955; FAX: 412-655-0961; e-mail: pcc@pcc-sterling.com; web site: www.pcc-sterling.com)

Process Systems Enterprise Limited, 5th Floor East, 26-28 Hamersmith Grove, London, United Kingdom W6 7HA (44-20-8563-0888; FAX: 44-20-8563-0999; e-mail: info@psenterprise.com; web site: www.psenenterprise.com)

Proco Products, Inc., 2431 N. Wigwam Dr., 95205, P.O. Box 590, Stockton, CA 95201-0590 (800-344-3246 USA & Canada; 209-943-6088; FAX: 209-943-0242; e-mail: sales@procoproducts.com; web site: www.procoproducts.com)

Progressive Recovery Inc., 700 Industrial Dr., Dupo, IL 62239-0126 (800-732-3793; 618-286-5000; FAX: 618-286-5009; e-mail: sales@progressive-recovery.com; web site: www.progressive-recovery.com)

ProSim SA, Immeuble Stratège A, 51, rue Ampère, LABEGE, France 31670 (+33(0)5 62 88 24 39; FAX: +33 (0)5 62 88 24 39; e-mail: info@prosim.net; web site: www.prosim.net)

ProSonic LLC, P.O. Box 26676, Milwaukee, WI 53226 (800-849-1130 North America; 800-849-1130; FAX: 414-755-7177; e-mail: info@pro-sonic.com; web site: www.pro-sonic.com)

PRUEFTECHNIK, Oskar-Messter-Str. 19-21, Postfach 1263, Ismaning, Germany 85730 (89-90616-0; FAX: 89-99616-200; e-mail: info@prueftechnik.com; web site: www.prueftechnik.com)

PSG Dover Europe GmbH, Aspstrasse 12, Oberglatt / ZH, Switzerland 8154 (0041-44-278-83 49; FAX: 0041-44-278-8319; e-mail: welcome@maag.com; web site: www.maag.com)

PSL USA, Cliffside Research Park, 3944 North Mountain View Drive, STE. 100, Boise, ID 83704 (208 376 7008; FAX: 208-378-7008; e-mail: pslusa@powdersystems.com; web site: www.powdersystems.com)

Psychsoftpc, Rte 53, Quincy, MA 02171 (617-417-8733; e-mail: sales@psychsoftpc.com; web site: www.psychsoftpc.com)

Pump Solutions Group, 22069 Van Buren Street, Grand Terrace, California 92313 ((909) 422-1739; FAX: (909) 512-1209; e-mail: info@psgdover.com; web site: www.pumpsog.com)

PureAir Monitoring Systems, Inc., 557 Capital Dr., Lake Zurich, IL 60047-6711 (888-788-8050 USA & Canada; 847-726-6000; FAX: 847-726-6051; e-mail: info@pureaire.net; web site: www.pureairemonitoring.com)

Puritan Magnetics, Inc., 900 S. Glaspie Street, Oxford, MI 48371 (800-787-3624; 248-628-3808; FAX: 248-628-3844; e-mail: magnet@puritanmagnetics.com; web site: www.puritanmagnetics.com)

## Q

Q-Lab Corporation, 800 Canterbury Rd., Westlake, OH 44145 (+1-440-835-8700; FAX: +1-440-835-8738; e-mail: info@q-lab.com; web site: www.q-lab.com)  
 Qosina, 150-Q Executive Dr., Edgewood, NY 11717-8329 (631-242-3000; FAX: 631-242-3230; e-mail: info@qosina.com; web site: www.qosina.com)  
 Quadro Engineering Corp., 613 Colby Drive, WATERLOO, Ontario, Canada N2V 1A1 (519-884-9660; FAX: 519-884-0253; e-mail: quadrosales@dexcop.com; web site: www.quadro.com)  
 Quality America, Inc., PO Box 30591, Tucson, AZ 85751 (800-722-6154 US; 520-722-6154; FAX: 520-722-6705; e-mail: sales@qualityamerica.com; web site: www.qualityamerica.com)

## R

RAS Process Equipment Inc., 324 Meadowbrook Rd., Robbinsville, NJ 08691 (609-371-1000; FAX: 609-371-1200; e-mail: sales@ras-inc.com; web site: www.ras-inc.com)  
 Raytek Corp., 1201 Shaffer Rd., Bldg. #2, Santa Cruz, CA 95060 (800-227-8074; 831-458-3900; FAX: 831-458-1497; e-mail: solutions@raytek.com; web site: www.raytek.com)  
 Raytek GmbH, Blankenburger Str. 135, Berlin, Germany 13127 (+49304780080; FAX: +49304710251; e-mail: raytek@raytek.de; web site: www.ircon.de)  
 Red Dog Services LLC, 207 West Main Street, Allen, TX 75013 (214.707.5809; e-mail: tom@reddogservices.com; web site: www.reddogservices.com)  
 Red Seal Measurement, 1310 Emerald Rd., Greenwood, SC 29646 (800-833-3357; 864-223-1212; FAX: 800-833-6971; e-mail: support@redsealmeasurement.com; web site: www.redsealmeasurement.com)  
 Regal Industries, Inc., 857 Richmond Rd, Painesville, OH 44077 (888-910-9400; 440-352-9600; FAX: 440-352-9682; e-mail: regalindus@scbglobal.net; web site: www.regal-industries.com)  
**REMBE GMBH, SAFETY-CONTROL, Gallbergweg 21, Brilon, Germany 59929 (49-2961-7405-0; FAX: 49-2961-50-714; e-mail: sales@rembe.de; web site: www.rembe.com)**  
**REMBE, INC., 3809 Beam Road Ste K, Charlotte, NC 28217 (704.716.7022; FAX: 704.716.7025; e-mail: info@rembe.us; web site: www.rembe.us)**  
 RF Valves, Inc., 1342 Charwood Road, Hanover, MD 21076 (410-850-4404; FAX: 410-850-4464; e-mail: rfvalves@rfvalve.com; web site: www.rfvalve.com)  
 Richman Chemical, 768 North Bethlehem Pike, Ste 204, Lower Gwynedd, PA 19002 (215) 628-2946; e-mail: dl@richmanchemical.com; web site: www.richmanchemical.com)  
 Richter Chemie-Technik GmbH, Otto-Schott-Str. 2, P.O. Box 100609, Kempen, Germany 47906 (+49-2152-146-0; FAX: +49-2152-146-190; e-mail: richter-info@dexcop.com; web site: www.richter-ct.com)  
 River Consulting, 650 Smithfield St., Suite 300, Pittsburgh, PA 15222 (412.471.5900; FAX: 412.471.2988; web site: riverconsulting.com)  
 RKI Instruments, Inc., 33248 Central Avenue, Union City, CA 94587-2010 (800-754-5165; 510 441-5656; FAX: 510 441-5650; e-mail: orders@rkiinstruments.com)  
 Rockwell Automation, Inc., 1201 South Second Street., Milwaukee, WI 53204-2496 (414-382-2000; 800-223-5354; FAX: 414-382-4444; e-mail: webmaster@rockwellautomation.com; web site: www.rockwellautomation.com)  
 Rockwell Software Brand, Rockwell Automation, Inc., 1201 South Second Street, Milwaukee, WI 53204-2496 (800-223-5354; 414-382-2000; FAX: 414-382-4444; e-mail: webmaster@rockwellautomation.com; web site: www.rockwellautomation.com)  
 Roto-Disc, 514 Enterprise Dr., Unit A, Erlanger, KY 41017 (513-871-2600; FAX: 513-871-9013; e-mail: info@rotodisc.com; web site: www.rotodisc.com)  
 RPS Engineering, Inc., 1300 Crispin Drive, PO Box 5186, Elgin, IL 60123 (800-931-1950 usa/canada; 847-931-1950; FAX: 847-931-4274; e-mail: rpstans@rpsengineering.com; web site: www.rpsengineering.com)  
 R. STAHL, Am Bahnhof 30, Waldenburg, Germany 74638 (+49 (0) 7942-943-0; FAX: +49 (0) 7942-943-4333; e-mail: info@stahl.de; web site: www.stahl.de)  
 Rupture Pin Technology, 8230 SW 8th Street, Oklahoma City, OK 73128 (405-789-1884; FAX: 405-789-1942; e-mail: sales@rupturepin.com; web site: www.rupturepin.com)  
 Russelectric Inc., South Shore Park, Hingham, MA 02043-4387 (800-225-5250; 781-749-6000; FAX: 781-749-4205; e-mail: info@russelectric.com; web site: www.russelectric.com)

RVT Process Equipment, Inc., 9047 Executive Park Drive, Suite 222, Knoxville, TN 37923 ((865)694-2089; FAX: (865)560-3115; e-mail: info@rvtpe.net; web site: www.rvtpe.net)

## S

S-Products Inc., 141 Kings Highway E., Fairfield, CT 06825 (203-331-9346; FAX: 203-335-2733; e-mail: s-products@usa.net; web site: www.s-products.com)  
**SAINT-GOBAIN CERAMICS/STRUCTURAL CERAMICS, 23 Acheson Dr., Niagara Falls, NY 14303 (716-278-6233; FAX: 716-278-2373; e-mail: scd.sales@saint-gobain.com; web site: www.hexoloy.com)**  
**See our ad on page 158**  
 Samco Technologies Inc, One River Rock Drive, Buffalo, New York 14207 ((716) 743-9000; FAX: (716) 743-1220; e-mail: sales@samcotech.com; web site: www.samcotech.com)  
 SAMSON Controls, Inc., 4111 Cedar Blvd., Baytown, TX 77523-5888 (281-383-3677; FAX: 281-383-3690; e-mail: samson@samson-usa.com; web site: www.samson-usa.com)  
**SANDVIK PROCESS SYSTEMS, INC., 21 Campus Rd., Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: info@sandvik.com; web site: www.process-systems.sandvik.com)**  
**SANDVIK MATERIALS TECHNOLOGY, TUBULAR PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-755-8825; 570-585-7500; FAX: 570-585-7642; web site: www.smt.sandvik.com)**  
**See our ad on page 67**  
 Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Salierstr. 35, Postfach 4262, Fellbach, Germany 70719 (49-711-5105-0; FAX: 49-711-5105-152; e-mail: info.spds@sandvik.com; web site: www.processsystems.sandvik.com)  
 Sauereisen, 160 Gamma Dr., Pittsburg, PA 15238-2989 (412-963-0303; FAX: 412-963-7620; e-mail: questions@sauereisen.com; web site: www.sauereisen.com)  
 S&C Electric Company, 6601 N. Ridge Blvd., Chicago, IL 60626-3997 (773-338-1000; FAX: 773-338-5102; e-mail: steven.strand@sandc.com; web site: www.sandc.com)  
 Scenic Precise Element Inc., No. 5, Sin-Jhan Rd., Chian-Jhen District., Kaohsiung City, Taiwan 80672 ((886-7)811-1359; ext: 220; FAX: (886-7)822-1033; e-mail: scenic@scenic-seals.com; web site: www.scenic-seals.com)  
 Schenck Process, 7901 NW 107th Terrace, Kansas City, MO 64153 (888-657-3094; FAX: 816-891-8336; e-mail: mktg@schenckprocess.com; web site: www.macprocessinc.com)  
 Schenck Process GmbH, Pallaswiesenstr. 100, Darmstadt, Germany 64293 (0049 (0) 6151 1531-0; FAX: 0049 (0) 6151 1531-66; e-mail: info@schenckprocess.com; web site: www.schenckprocess.com)  
 Schurter, Inc., 447 Aviation Blvd., Santa Rosa, CA 95403 ((707) 636-3000; FAX: (707) 636-3033; e-mail: info@schurterinc.com; web site: www.schurterinc.com)  
 Schutte & Koerting, 2510 Metropolitan Drive, Treviso, PA 19053 (800-752-8558; 215-639-0900; FAX: 215-639-1597; e-mail: sales@sk-us.com; web site: www.sk-us.com)  
 Scientific Dust Collectors, 4101 W. 126th St., Sisk, IL 60803-1901 (708-597-7090; FAX: 708-597-0313; e-mail: scidustcollectors@scientificdust.com; web site: www.scientificdustcollectors.com)  
 Security Engineered Machinery, P.O. Box 1045, Westboro, MA 01581 (800-225-9293; 508-366-1488; FAX: 508-366-6814; e-mail: info@semshred.com; web site: www.semshred.com)  
 seepep GmbH, Scharnhoeizstr. 344, Bottrop, Germany D-46240 (+49.2041.996-0; FAX: +49.2041.996-400; e-mail: info@seepep.com; web site: www.seepep.com)  
 seepep Inc., 511 Speedway Dr., Enon, OH 45523 (800-695-3659; 937-864-7150; FAX: 937-864-7157; e-mail: sales@seepep.net; web site: www.seepep.com)  
 Sefar Inc., 111 Calumet St., Buffalo, NY 14043 (800-995-0531; 800-995-0531; FAX: 716-683-4053; e-mail: sales@sefar.us; web site: www.sefar.us)  
 Sensor Electronics Corp., 5500 Lincoln Dr., Minneapolis, MN 55436 (800-285-3651; 952-938-9486; FAX: 952-938-9617; e-mail: sales@sensorelectronic.com; web site: www.sensorelectronic.com)  
 Sensor Electronics Corporation, 12730 Creek View Avenue, Savage, MN 55378 (800.285.3651; 952.938.9486; FAX: 952.938.9617; e-mail: sales@sensorelectronic.com; web site: www.sensorelectronic.com)  
 Sensor Technology Ltd, Apollo Park, Ironstone Lane, Wroxton, Banbury, United Kingdom OX15 6AY (44 1869 238400; FAX: 44 1869 238401; e-mail: info@sensors.co.uk; web site: www.sensors.co.uk)  
 SensoTech GmbH, Steinfeldstr. 1, Magdeburg-Barleben, Germany 39179 (+49 39203 514 100; FAX: +49 39203 514 109; e-mail: info@sensotech.com; web site: www.sensotech.com)  
 SensoTech Inc., 1341 Hamburg Turnpike, Suite 2-3, Wayne, NJ 07093 (973 832 4575; FAX: 973 832 4576; e-mail: sales-usa@sensotech.com; web site: www.sensotech.com)

Sentry Equipment Corp, 966 Blue Ribbon Circle North, Oconomowoc, WI 53066 (262-567-7256; FAX: 262-567-4523; e-mail: sales@sentry-equip.com; web site: www.sentry-equip.com)  
 sera ComPress GmbH, sera-Str. 1, Immenhausen, Germany 34376 (+49 (0)5673 999-04; FAX: +49 (0)5673 999-05; e-mail: info-compress@sera-web.com)  
 sera ProDos GmbH, sera-Str. 1, Immenhausen, Germany D-34376 (+49 (0)5673 999-02; FAX: +49 (0)5673 999-03; e-mail: info-prodos@sera-web.com)  
 SGB GmbH, Hofstr. 10, Siegen, Germany 57076 (+49 271 48964-0; FAX: +49 271 48964-6; e-mail: sgb@sgb.de; web site: www.sgb.de)  
 Sharpex Filters (I) Pvt. Ltd., Sales, R-664, Rabale MIDC., Rabale, NaviMumbai, India 400086 (91-22-27696339; 912227696322; FAX: 91-22-27696325; e-mail: sharpex@vsni.com; web site: www.sharpex.com)  
 Shimadzu Scientific Instruments, 7102 Riverwood Dr., Columbia, MD 21046 (800-477-1227; 410-381-1271; FAX: 410-381-1222; e-mail: webmaster@shimadzu.com; web site: www.ssi.shimadzu.com)  
 Shiv Shakti Process Equipment P. Ltd., International Marketing & Sales, 407, Shivam Chambers, S V Road, Goregaon West., Mumbai, India 400104 (9870646500; 9821633589; FAX: 912226798284; e-mail: sales@shivshaktiequipments.com; web site: www.shivshaktiequipments.com)  
 SIAD Macchine Impianti, Via Canovine, 2/4, Bergamo, Italy 24126 (0039 035 327611; FAX: 0039 035 316131; e-mail: siadmi@siad.eu; web site: www.siadmi.com)  
 Sias, Churchmans Center, 11A Parkway Circle, New Castle, DE 19720 (302-326-0433; FAX: 302-326-0492; e-mail: info@sias.biz; web site: www.sias.biz)  
 Siemens AG, A&D GC 3, Siemensallee 84, Karlsruhe, Germany 76187 (+49(0)721/595-4706; web site: www.siemens.com)  
 Siemens Industry, Inc., Applied Automation, 408 U.S. Highway 60, Bartlesville, OK 74003 (800-241-4453; 918-662-7000; FAX: 918-662-7052; e-mail: helpline.sii@sea.siemens.com; web site: www.usa.siemens.com/industry)  
 Siemens Industry, Inc., Process Instrumentation & Analytics, 1201 Sunnymeadow Pike, Spring House, PA 19477 (800-241-4453; 215-646-7400; e-mail: helpline.sii@siemens.com; web site: www.usa.siemens.com/industry)  
 Siemens Industry, Inc., Solutions, Automation and Drive Technologies, 5300 Triangle Pkwy., Norcross, GA 30092 (770-871-3800 800-241-4453; 770-871-3968; FAX: 770-871-3999; e-mail: helpline.sii@siemens.com; web site: www.usa.siemens.com/industry)  
 Siemens Industry, Inc. - Water Technologies, 4800 North Point Parkway, Suite 250, Alpharetta, GA 30022 (866.926.8420 USA, 978.614.7111; FAX: 978-970-2465; e-mail: information.water@siemens.com; web site: www.siemens.com/water)  
 Siemens, Industry USA, Solutions, Automation and Drives Technologies, 3333 Old Milton Parkway, Alpharetta, GA 30005-4437 (800-241-4453; 770-751-2000; FAX: 678-297-8316; e-mail: helpline.sii@siemens.com; web site: www.usa.siemens.com/industry)  
**SIERRA INSTRUMENTS, INC., 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)**  
 Sierra Monitor Corp., 1991 Tarob Ct., Milpitas, CA 95035 (800-727-4377; 408-262-6611; FAX: 408-262-9042; e-mail: sales@sierramonitor.com; web site: www.sieramonitor.com)  
 Sigrist Photometer AG, Hofurlistr. 1, Ennetbuergen, Switzerland 6373 (41-41-624-5454; FAX: 41-41-624-5455; e-mail: info@photometer.com; web site: www.photometer.com)  
 Singleton Corp., 3280 W. 67th Place, Cleveland, OH 44102 (216-651-7800; FAX: 216-651-4237; e-mail: info@singletoncorp.com; web site: www.singletoncorp.com)  
 Solutia Inc., A subsidiary of Eastman Chemical Co., 575 Maryville Centre Dr., St. Louis, MO 63141 (800-426-2463; (314) 674-1000; 800-433-6997; FAX: (314) 674-7433; e-mail: team.therminol@eastman.com; web site: www.therminol.com)  
 Southworth Products Corp., P.O. Box 1380, Portland, ME 04104-1380 (800-743-1000; 207-878-0700; FAX: 207-797-4734; e-mail: salesinfo@southworthproducts.com; web site: www.southworthproducts.com)  
 Spaltech International Inc., 37 Charles Street, Halton Hills, Ontario, Canada L7G 2Z4 (905-877-2771; e-mail: info@spaltech.com; web site: www.spaltech.com)  
 Spartan Chemical Services Inc., P.O. Box 4207, Jersey City, NJ 07304-0207 (917-975-2268; FAX: 845-583-8062; e-mail: spartancsi@aol.com)  
 Spee Dee Packaging Machinery, 1360 Grandview Parkway, Sturtevant, WI 53177 (877-375-2121; 262-886-4402; FAX: 262-886-5502; e-mail: info@spee-dee.com; web site: www.spee-dee.com)  
 Spencer Strainer Systems, 6205 Gheens Mill Rd., Jeffersonville, IN 47130 (800-801-4977; 812-282-6300; FAX: 812-282-7272; e-mail: spencer256@aol.com; web site: www.spencerstrainer.com)  
 Spill Containment Direct, 208 Capital Dr., Buffalo, MN 55313 (7637623453; 7637623453; e-mail: sales@spillcontainmentdirect.com)

Sporian Microsystems, Inc., 515 Courtney Way - Suite B, Lafayette, CO 80026 (303-516-9075 X 19; e-mail: info@sporian.com; web site: www.sporian.com)

Spray Drying Systems, Inc., 5320 Enterprise Street Suite J, Eldersburg, MD 21784 (410-549-8090; FAX: 410-549-8091; e-mail: sales@spraydrysys.com; web site: www.spraydrysys.com)

Spraying Systems Co., North Ave. at Schmale Rd., Wheaton, IL 60187-7901 (800-957-7729; 630-665-5000; FAX: 630-260-9727; e-mail: info@spray.com; web site: www.spray.com)

SPX Cooling Technologies, 7401 W 129 St., Overland Park, KS 66213 (913-664-7400; FAX: 913-664-7439; e-mail: spxcooling@spx.com; web site: spxcooling.com)

SPX Flow Technology, 4647 S.W. 40th Ave., Ocala, FL 34474 (352-237-1220; FAX: 352-873-5770; e-mail: pneumatic.sales.com; web site: www.pneumaticproducts.com)

StatPoint Technologies Inc., 560 Broadview Avenue, Suite 201, Warrenton, WA 20186 (800-232-7828; 540-428-0084; FAX: 540-428-0089; e-mail: info@statpoint.com; web site: www.statgraphics.com)

Stedman, 129 Franklin Ave., Aurora, IL 47001 (800-262-5401; 812-926-0038; FAX: 812-926-3482; e-mail: sales@stedman-machine.com; web site: www.stedman-machine.com)

Steri Technologies Inc., 857 Lincoln Ave., Bohemia, NY 11716 (800-253-7140; 631-563-8300; FAX: 631-563-8378; e-mail: sti@steri.com; web site: www.steri.com)

Strobic Air, a CECO Environmental Company, 700 Emlen Way, Telford, PA 18969 (800-722-3267; 215-723-4700; FAX: 215-723-7401; e-mail: tristack@strobicair.com; web site: www.strobicair.com)

Sulzer Chemtech USA, Inc., 1 Sulzer Way, Tulsa, OK 74107 (918 446 6672; FAX: 918 446 5321; e-mail: rodney.alario@sulzer.com; web site: www.sulzer.com)

**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

OK, Sulzer Chemtech USA, Inc., 1 Sulzer Way, Tulsa 74107 (918 446 6672; FAX: 918 446 5321)

International, Sulzer Chemtech Pte. Ltd., 10 Benoi Sector, Singapore, Singapore 629845 (+65 6515 5500; FAX: +65 6862 7563)

International, Sulzer Chemtech, 19F Hong Jia Tower, No. 388 Fushan Road, Pudong New District, Shanghai 200 122 (+86 21 6036 5100; FAX: 86 21 6036 5100 100)

Summit Industrial Products, P.O. Box 131359, Tyler, TX 75713 (1-800-749-5823; 903.534.8021; e-mail: TonyD@klsummit.com; web site: www.klsummit.com/www.sublimedescaler.com)

Sumter Transport Company, 170 S Lafayette Dr, Sumter, SC 29150 (803-775-1002; FAX: 803-778-0118; e-mail: rfamilia@sumtertransport.com; web site: www.sumter-transport.com)

Sur-Loc Inc., 501 E. Swager Dr., P.O. Box 750, Fremont, IL 46737 (800-223-7517; 260-495-4065; FAX: 260-495-4205; e-mail: sales@swager.com; web site: www.surloc.com)

Swagelok Co., 31500 Aurora Rd., Solon, OH 44139-2764 (440-349-5934; FAX: 440-349-5843; e-mail: publicrelations@swagelok.com; web site: www.swagelok.com)

Swager Communications, 501 E. Swager Dr., PO Box 656, Fremont, IL 46737 (800-968-5601; 260-495-2515; FAX: 800-882-3414; e-mail: sales@swager.com; web site: www.swager.com)

Sweet Manufacturing Company, P.O. Box 1086, 2000 E. Leffel Lane, Springfield, OH 45501 (800-334-7254; 937-325-1511; FAX: 937-322-1963; e-mail: sales@sweetmfg.com; web site: www.sweetmfg.com)

Symmetric Research, 9101 W Sahara Ave Ste 105 PMB 209, Las Vegas, NV 89117 (702-341-9325; e-mail: info@symres.com; web site: www.symres.com)

Sympatec GmbH, System | Partikel | Technik | Am Pulverhaus 1, Clausthal-Zellerfeld, Germany 38678 (+49 5323 717 0; FAX: +49 5323 717 229; e-mail: sales@sympatec.com; web site: www.sympatec.com)

Sympatec, Inc., System | Partikel | Technik, 1600, Reed Rd., Suite C, Pennington, NJ 08534 (609-303-0066; FAX: 609-303-0365; e-mail: usa@sympatec.com; web site: www.sympatec.com)

SYN-TEX, 102 E Peck Blvd, Lafayette, LA

Synthetic Surfaces Inc., P.O. Box 241, Scotch Plains, NJ 07076 (908-233-6803; FAX: 908-233-6844; e-mail: info@nordot.com; web site: www.nordot.com)

Systech Instruments Ltd (Systech Illinois), 17 Thame Park Business Centre, Wenman Road, Thame, United Kingdom OX9 3XA (+44 (0) 1844 216838; FAX: +44 (0) 1844 217220; e-mail: sales.uk@systechillinois.com; web site: www.systechillinois.com)

Team Industrial Services, Inc., 200 Hermann Dr., Alvin, TX 77511 (800-662-8326; 800-662-8326; FAX: 281-331-4107; e-mail: contact@teaminc.com; web site: www.teamindustrialservices.com)

Team Industries, Inc., 1200 Maloney Rd., P.O. Box 350, Kaukauna, WI 54130 (800-819-9353 (Nationwide); 920-766-7977; FAX: 920-766-0486; e-mail: jkreisle@teamind.com; web site: www.teamind.com)

Technical Database Services, Inc. (TDS), Planetarium Station, P.O. Box 45, New York, NY 10024-1755 (646-669-8900; FAX: 646-669-7478; e-mail: info@tds-tds.com; web site: www.tds-tds.com)

Technical Glass Products, 881 Callender Blvd, Painesville, OH 44077 (440-639-6399; FAX: 440-639-1292; e-mail: tgp@tgpohio.com; web site: www.technicalglass.com)

tec5USA, 80 Skyline Dr., Plainview, NY 11803 (516-653-2000; FAX: 516-939-0555; e-mail: info@tec5usa.com; web site: www.tec5usa.com)

Tel-Tru Manufacturing Co., 408 St. Paul St., Rochester, NY 14605 (800-232-5355; 585-232-1440; 585 295-0235; FAX: 585-232-3857; e-mail: info@teltru.com; web site: www.teltru.com)

Tema Systems, Inc., 7806 Redsky Dr., Cincinnati, OH 45249 (513-489-7811; FAX: 513-489-4817; e-mail: sales@tema.net; web site: www.tema.net)

Temp-Pro Inc., 200 Industrial Dr., PO Box 89, Northampton, MA 01061-0089 (800-991-9093; 413-584-3165; FAX: 413-586-3625; e-mail: sales@temp-pro.com; web site: www.temp-pro.com)

Texas Rope Rescue, PO Box 206, Nordheim, TX 78141 (855-820-3058; 361-938-7080; FAX: 866-964-4741; e-mail: info@texasroperescue.com; web site: www.texasroperescue.com)

Tex-Fin, Inc., 19115 Aldine Westfield, Houston, Texas 77073 (1-800-932-8471; (281) 821-7150; FAX: (281) 821-1220; e-mail: sales@tex-fin.com; web site: www.tex-fin.com)

Thermal Spray Solutions, Inc., 1105 International Plaza, Suite B, Chesapeake, Virginia 23263 (757-673-2468; FAX: 757-673-3128; e-mail: info@thermalsprayusa.com; web site: www.thermalsprayusa.com/)

Thermonics Corp, 41 Hampden Rd., Mansfield, MA 02048 (800-628-4722; 781-688-2300; e-mail: sales@thermonics.com; web site: www.thermonics.com)

Thermotron, 291 Kollen Park Dr., Holland, MI 49423 (616-393-4580; FAX: 616-392-5643; e-mail: info@thermotron.com; web site: www.thermotron.com)

ThyssenKrupp Industrial Solutions AG, Business Unit Process Technologies, Friedrich-Uhde-Str. 15, Dortmund, Germany 44141 (49-231-547-0; FAX: 49-231-547-3032; e-mail: process-technologies@thyssenkrupp.com; web site: www.thyssenkrupp-industrial-solutions.com)

TIGG Corporation, 1 Willow Avenue, Oakdale, PA 15071 (800-925-0011 USA; 724-703-3020; FAX: 724-703-3020; e-mail: info@tigg.com; web site: www.tigg.com)

TITAN Metal Fabricators, Engineered Products, 352 Balboa Circle, Camarillo, CA 93012 (805 487 5050; FAX: 805 487 5050; e-mail: info@titanmf.com; web site: www.titanmf.com)

**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)**

**See our ad on page 100**

TMTS Associates, Inc., Combustion/Air Pollution Control, 399 Pavilion St., Atlanta, GA 30315-1452 (404-627-4722; e-mail: tlmcgowan@mindspring.com; web site: www.tmtsassociates.com)

Topog-E Gasket Co., 1224 North Utica, Tulsa, OK 74110 (800-587-7123; 918-587-6649; FAX: 918-587-6961; e-mail: sales@topog-e.com; web site: www.topog-e.com)

Topp Industries, Inc., 420 State Highway 25 North, Rochester, IL 46975 (800-354-4534; 574-223-3681; FAX: 574-223-6106; e-mail: toppindustries@toppindustries.com; web site: www.toppindustries.com)

TowerScan, 3560 Pine Grove Ave., Ste. 497, Port Huron, MI 48060 (888-724-1798; 888-724-1798; FAX: 281-966-6983; e-mail: info@towerscan.com; web site: www.towerscan.com)

TowerScan, 834 Upper Canada Dr., Sarnia, Ontario, Canada N7W1A4 (888 724-1798; 519 344-7132; FAX: 519 336-8340; e-mail: info@towerscan.com; web site: www.towerscan.com)

Trans Environmental Systems, Inc., PO Box 657, Greencastle, PA 17225 (800-220-2466; 724-980-4534; FAX: 434-975-2872; e-mail: TESproducts@gmail.com; web site: www.transenvsys.com)

Transene Co. Inc., 10 Electronics Ave., Danvers, MA 01923-1011 (978-777-7860; FAX: 978-739-5640; e-mail: sales@transene.com; web site: www.transene.com)

Tranter Ltd., Unit 50, Monckton Rd. Industrial Estate, Wakefield, United Kingdom WF7 2AL (44-1924-298393; FAX: 44-1924-291596; e-mail: info@se.tranter.com; web site: www.tranter.com)

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: lredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

ts-systemfilter gmbh, Gaensaecker 9, Ahorn-Berolzeim, Germany 74744 (+49 06296880; FAX: +49 06296885; e-mail: info@ts-systemfilter.de; web site: www.ts-systemfilter.de)

Tuf-Lok International, P.O. Box 5078, Madison, WI 53705 (608-270-9478; FAX: 608-270-2080; e-mail: info@tuflok.com; web site: www.tuflok.com)

Turner EnviroLogic, Inc., 1140 S.W. 34th Avenue, Deerfield Beach, FL 33442 (800-933-8385; 954-422-9787; FAX: 954-422-9723; e-mail: sales@tenviro.com; web site: www.tenviro.com)

Turner Designs Hydrocarbon Instruments, Inc., 2023 N. Gateway Blvd., Ste. 101, Fresno, CA 93727 (559-253-1414; FAX: 559-253-1090; e-mail: medwards@oilinwatermonitors.com; web site: www.oilinwatermonitors.com)

Tuthill Vacuum & Blower Systems, 4840 W. Kearney Street, Springfield, MO 65803-8702 (800-825-6937; 417-865-8715; FAX: 417-865-2950; e-mail: vacuum@tuthill.com; web site: vacuum.tuthill.com)

TW Metals, 760 Constitution Dr., Ste. 204, Exton, PA 19341 (800-545-5000; 610-458-1300; FAX: 610-458-1399; e-mail: sales@twmetals.com; web site: www.twmetals.com)

## U

UIC Inc., 1225 Channahon Rd., P.O. Box 863, Joliet, IL 60434-0863 (800-342-5842 (Not IL); 815-744-4477; FAX: 815-744-1561; e-mail: warmstrong@uicinc.com; web site: www.uicinc.com)

Ultrachem, Inc., 900 Centerpoint Blvd, New Castle, DE 19720 (302-325-9880; FAX: 302-325-0335; e-mail: info@ultrachem.com; web site: ultracheminc.com/)

UNIBLOC-PUMP, Inc, Flowtech Div., 1701 Spinks Dr., SE, Marietta, GA 30067-8925 (770-218-8900; FAX: 770-218-8442; e-mail: info@uniblocpump.com; web site: www.uniblocpump.com)



**UNIFLUX / EXOTHERM CORP., 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)**

**See our ad on page 68**

Union Special, LLC, One Union Special Plaza, Huntley, IL 60142 (800-344-9698; 847-669-4500; FAX: 847-669-4239; e-mail: sales@unionspecial.com; web site: www.unionspecial.com)

United Filtration Systems, Inc, 6558 Diplomat Dr, Sterling Heights, MI 48314 (1-800-311-5561; 586-802-5561; FAX: 586-802-5562; web site: www.unitedfiltration.com)

United Manufacturing International 2000, 820 Kimball Road, Ste. 1002, Red Bluff, CA 96080 (530-528-1361; FAX: 530-528-1361; e-mail: activecarb@jps.net; web site: uni20001.tripod.com/)

United Performance Metals, 12223 F.M. 529, Houston, TX 77041 (866.588.3637; 832.243.0008; FAX: 832.243.9432; e-mail: sales@upmet.com; web site: www.upmet.com)

Universal Flow Meters, Inc., P.O. Box 249, Hazel Park, MI 48030 (888-569-3090; 248-542-9635; FAX: 248-398-4274; e-mail: ufm@flowmeters.com; web site: www.flowmeters.com)

Universal Tank & Fabrication, 8025 Chavenelle Road, Dubuque, IA 52002 (563-556-5889; FAX: 563-556-5870; e-mail: red@universaltank.com; web site: www.universaltank.com)

Uraica GmbH & Co. KG, Sirchinger Str. 15, Bad Urach, Germany 72574 (07125-133-0; FAX: 07125-133-202; e-mail: info@uraica.de; web site: www.uraica.com)

**T**ankLink, a wholly-owned subsidiary of Telular Corporation, 311 S Wacker Drive #4300, Chicago, IL 60606 (800) 835-8527; FAX: (312) 379-8310; e-mail: pbarron@telular.com; web site: www.TankLink.com)



**USA INDUSTRIES, INC., 302 State Street, S. Houston, TX 77587 (800-456-8721; 713-941-3797; FAX: 713-941-1086; e-mail: info@usaindustries.com; web site: www.usaindustries.com)**

**Manufacturer of all sizes and alloys of tube plugs to include our mechanical Snap It® Jr and Sr plugs. Also manufacturers Spining Isolation and Flow Measurement products. Phones answered 24/7.**

US Underwater Services, 101 Northeast Haskew, Burleson, Texas 76028 (800) 860-2178; 817-447-7321; FAX: (817) 447-0021; web site: www.usunderwaterservices.com)

## V

VanDeMark Chemical Inc., One North Transit Road, Lockport, NY 14094 (800-836-8253; 716-433-6764; FAX: 716-433-2850; e-mail: sales@vdmchemical.com; web site: www.vdmchemical.com)

Van London-pHoenix Co., 6103 Glenmont Drive, Houston, TX 77081 (800-522-7920; 713-772-6641; FAX: 713-772-4671; e-mail: info@VL-PC.com; web site: www.VL-PC.com)

VDM Metals GmbH, Plettenberger Str. 2, P.O. Box 1820, Werdohl, NRW, Germany D-58778 (49-2392-55-0; FAX: 49-2392-55-2217; e-mail: vdm@vdm-metals.com; web site: www.vdm-metals.com)

Vector Technologies Ltd., 6820 N. 43rd St., Milwaukee, WI 53209 (800-832-4010; 414-247-7100; FAX: 414-247-7110; e-mail: sales@vector-vacuums.com; web site: www.vector-vacuums.com)

VEGA Grieshaber KG, Am Hohenstein 113, Schiltach, Germany 77761 (49-78-36-50-0; FAX: 49-78-36-50-201; e-mail: info.de@vega.com; web site: www.vega.com)

VEGA Americas, Inc., 4170 Rosslyn Drive, Cincinnati, OH 45209 (513 2720131; FAX: 513 2720133; e-mail: americas@vega.com; web site: www.vega-americas.com)

Vent-A-Fume, 51 Botsford Place, Buffalo, NY 14216 (877-876-8368; 716-876-2023; FAX: 716-876-4383; e-mail: info@ventafume.com; web site: www.VentAKiln.com)

Veolia Environmental Services, 200 E. Randolph, Ste. 7900, Chicago, Illinois 60601 (312) 552-2800; FAX: (312) 552-2837; web site: www.veoliaes.com)

Veolia Water Solutions & Technologies, 250 Airside Drive, Airside Business Park, Moon Township, PA 15108 (412-809-6000; FAX: 412-809-6512; e-mail: water.info@veoliawater.com; web site: www.veoliawaterina.com)

Vibra-Metries, div. of Mistras Holdings, 195 Clarksville Rd, Princeton Junction, NJ 08550 (609-716-4000; FAX: 609-716-0706; e-mail: sales@mistrasgroup.com; web site: www.mistrasgroup.com)

Vibra Screw Inc., 755 Union Blvd., P.O. Box 229, Totowa, NJ 07511 (973-256-7410; FAX: 973-256-7567; e-mail: info@vibrascrowinc.com; web site: www.vibrascrow.com)

Viega, 301 N. Main, 9th Floor, Wichita, Kansas 67202 ((316) 425-7400; FAX: (316) 425-7618; e-mail: inside-sales@viega.com; web site: www.viega.com)

Vista Control Systems, Inc., 2101 Trinity Drive, Ste Q, Los Alamos, NM 87544 (505-662-2484; FAX: 505-662-3956; e-mail: clout@vista-control.com; web site: www.vista-control.com)

Voith Turbo GmbH & Co. KG, Voithstr. 1, Crailsheim, Germany 74564 (+49 7951 32-0; FAX: +49 7951 32-500; e-mail: info.voithturbo@voith.com; web site: www.voith.com)

Vortab Company, 1755 La Costa Meadows Drive, San Marcos, CA 92078 (800) 854-9959; (760) 736-6114; FAX: (760) 736-6250; e-mail: FClmarcom@fluidcomponents.com; web site: www.vortab.com)

Vortex, 1725 Vortex Avenue, Salina, KS 67401-1768 (785-825-7177; FAX: 785-825-7194; e-mail: vortex@vortex-valves.com; web site: www.vortexvalves.com)

## W



**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

Walchem, IWAKI America, Inc., 5 Boynton Rd., Holliston, MA 01746 (508-429-1110; FAX: 508-429-7433; e-mail: info@walchem.com; web site: www.walchem.com)

Walker Magnetics, P.O. Box 20911, Milwaukee, WI 53228 (414-321-9739; FAX: 414-321-9756; e-mail: mormag@earthlink.net; web site: www.walkermagnet.com)

Wall Colmonoy Corporation, 101 W. Girard Ave., Madison Heights, MI 48071 (800-521-2412; 248-585-6400; FAX: 248-585-7960; e-mail: wcc@wallcolmonoy.com; web site: www.wallcolmonoy.com)

WaterProfessionals, 2004 Highway 75, P.O. Box 1037 TCAS, Blountville, TN 37617 (1-800-999-4195; 18009994195; 18009994195; e-mail: waterprofessionals@gmail.com; web site: www.waterprofessionals.com)

Watersaver Co., a division of CDI, 5870 E 56th Avenue, Commerce City, CO 80022-3932 (800-525-2424; 303-289-1818; FAX: 303-287-3136; e-mail: sales@watersaver.com; web site: www.watersaver.com)

Watlow, 12001 Lackland Rd., St. Louis, MO 63146 (1-800-928-5692; 314-878-4600; FAX: 314-878-6814; e-mail: inquiry@watlow.com; web site: www.watlow.com)

Weir Specialty Pumps, 440 W. 800 S., P.O. Box 209, Salt Lake City, UT 84101-0209 (801-359-8731; FAX: 801-355-9303; e-mail: info@weirsp.com; web site: www.weirpowerindustrial.com)

Werum Software & Systems AG, Wulf-Werum Strasse 3, Lueneburg, Germany 21337 (49-4131-8900-0; FAX: 49-4131-8900-20; e-mail: info@werum.com; web site: www.werum.com)

Werum Software & Systems America, Inc., 5 Sylvan Way, Parsippany, NJ 07054 (973-644-4000; FAX: 973-644-4600; e-mail: info@werum-america.com; web site: www.werum-america.com)

Westchester Germicide Co., 292 Alpha Dr., Pittsburgh, PA 15238 (800-556-0111; 412-252-7000; FAX: 412-252-1005)

Westech Engineering Inc., 3665 S. West Temple, Salt Lake City, UT 84115-4409 (801-265-1000; FAX: 801-265-1080; e-mail: info@westech-inc.com; web site: www.westech-inc.com)

Western States Machine Co., P.O. Box 327, Hamilton, OH 45012-0327 (513-863-4758; FAX: 513-863-3846; e-mail: sales@westernstates.com; web site: www.westernstates.com)

WIK-A Instrument, LP, 1000 Wiegand Blvd., Lawrenceville, GA 30043 (888-WIKA-USA; 770-513-8200; FAX: 770-338-5118; e-mail: info@wika.com; web site: www.wika.com)

Wilhelm Siefer GmbH & Co. KG, Bahnhofstr. 114, Velbert, Germany 42551 (02051/9575-0; FAX: 02051/9575-16; e-mail: info@siefer-trigonal.de; web site: www.siefer-trigonal.de)

Willbros Tank Company, 411 Bayou Dr., Channeleview, TX 77530 (713-403-6880; FAX: 281-457-1063; e-mail: david.murchie@willbros.com; web site: www.willbros.com)

William Grant Tank & Vessel, Inc., P.O. Box 1191, Henderson, Texas 75653 (903) 657-6100; FAX: (903) 657-6200; e-mail: sales@wgtandv.com; web site: www.wgtandv.com)

Williamson Corporation, 70 Domino Dr., Concord, MA 01742 (800-300-8367; 978-369-9607; FAX: 978-369-5485; e-mail: sales@williamsoncorp.com; web site: www.williamsoncorp.com)

WinSim Inc., 8653 FM 2759 Rd, Richmond, TX 77469 (281-545-9200; FAX: 281-545-8820; e-mail: sales@winsim.com; web site: www.winsim.com)

Wintek Corp., 230 State Hwy. 206, Suite 401, Flanders, NJ 07836 (973-252-8200; FAX: 973-252-8233; e-mail: Sales@Wintek-Corp.Com; web site: www.wintek-corp.com)

Winter Walking a Jordan David Company, 400 Babylon Road, Horsham, PA 19044 (888-667-5477; 215-441-9595; FAX: 215-441-9642; e-mail: info@winterwalking.com; web site: www.winterwalking.com)

WITTE PUMPS & TECHNOLOGY GmbH, Lise-Meitner-Allee 20, 25436 Tornesch, Germany (04120 706590; FAX: 04120 7065949; e-mail: info@witte-pumps.de; web site: www.witte-pumps.de)

Witzenmann GmbH, Postfach 101280, Pforzheim, Germany 75112 (49-7231-581-0; FAX: 49-7231-581-820; e-mail: wi@wizenmann.com; web site: www.witzenmann.de)

Wolseley Industrial Group, 12500 Jefferson Avenue, Newport News, VA 23602 ((757) 989-2555; e-mail: WNA.IndustrialSupport@Wolseley.com; web site: www.wolseleyindustrialgroup.com)

WOMA Corp., 95 Newfield Ave., Suite K, P.O. Box 6793, Edison, NJ 08818-6793 (800-258-5530; FAX: 732-417-0015; e-mail: womacorp@frontier.com; web site: www.womacorp.com)

WSF Industries, P O Box 400, Kenmore Branch, Buffalo, NY 14217 (800-874-8265; 716-692-4930; e-mail: sales@wsf-inc.com; web site: www.wsf-industries.com)

**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

**See our ad on page 133**

CA, Szalmay Sales, Inc., P.O. Box 461340, Los Angeles 90046 (310-275-2909; FAX: 310-275-2909)

CA, Acrodyne Corp., 2750 S. Shoshone, Ste. 3110, Englewood 80110 (303-783-5548; FAX: 303-783-57522)

FL, Savage Associates, 1211 Gulf of Mexico Dr., Longboat Key 34228 (941-387-0673; FAX: 941-387-2502)

FL, Conner Process Equipment Co., P.O. Box 9377, Pensacola 32513 (904-478-0517; FAX: 904-478-0528)

GA, Xandra Co., Inc., 2803 Shallowford Rd., N.E., Atlanta 30341 (770-458-7235; FAX: 770-451-2584)

IL, Pneutech Engineering Inc., 445 W. Jackson, Suite 207A, Naperville 60540 (708-983-6111; FAX: 708-983-0329)

LA, Mark I Equipment, P.O. Box 45121, Baton Rouge 70895 (504-291-5234; FAX: 504-291-5258)

MA, Chamberland Engineering, P.O. Box 310, Sheltonville 02070 (800-687-1136; FAX: 508-883-9978)

MO, Pro-Mark Systems, Inc., 16149 Westwood Business Park, Ellisville 63021 (636-394-8161; FAX: 636-920-1911)

NC, Alternate Systems, 121 Glencurry Dr., Charlotte 28214 (704-399-3000; FAX: 704-399-8896)

NJ, Cino Equipment, P.O. Box 157, Berkeley Heights 07922 (908-377-6837; FAX: 908-665-9457)

NJ, Process Equipment Co., 146 Lakeview Dr., Gibbsboro 08026 (609-435-4500; FAX: 609-435-2466)

NY, Boutell Co., P.O. Box 10430, Rochester 14610 (716-473-7848; FAX: 716-473-2971)

OH, Scheel & Co., Inc., P.O. Box 512, Medina 44258 (330-725-4505; FAX: 330-722-0079)

OH, Scheel & Co., P.O. Box 512, Medina 44258 (330-725-4505; FAX: 330-722-0079)

PA, Daco Tech Sales, P.O. Box 527, Morgan 15064 (412-257-1810; FAX: 412-257-0672)

PA, Ventura Process Equipment Co., 927 Rte. 910, Cheswick 15024 (412-83-6934; FAX: 412-833-5638)

SC, Alternate Systems, P.O. Box 382, Taylors 29687-0382 (864-609-5453; FAX: 864-609-5453)

TN, Harding-Pickren Co., P.O. Box 38326, Memphis 38183-0326 (901-377-1416; FAX: 901-377-6515)

TX, Hargett Process Equipment, 6401 Bingle, Houston 77092 (713-690-2620; FAX: 713-896-4328)

VA, Commonwealth Engineering & Sales, P.O. Box 8560, Richmond 23226 (804-282-2100; FAX: 804-282-4084)

WV, Daco Tech Sales, 1647 Oakhurst Dr., Charleston 25314 (304-744-1389; FAX: 304-744-0510)

ON, Stening & Associates, 1641 Spruce Dr., Caledon, Canada L0N 1C0 (519-927-5237; FAX: 519-927-9471)

International, Super Agent, PVT. Ltd., 7 Jantar Mantar Rd., New Delhi, India 110001 (91-11-336-7866; FAX: 91-11-336-4633)

International, Petrus Technical Supplies, P.O. Box 12566, Herzlia, Israel 46766 (972-9-9587-670; FAX: 972-9-748-2103)

International, Polatecna, S.A. DE C.V., Azahares 26-102-A, Mexico, D.F., Mexico 06340 (52-5-597-1396; FAX: 52-5-583-8797)

International, Chamberland Engineering, P.O. Box 111-041, Taipei, Taiwan (201-410-8275; FAX: 908-665-9457)

International, Habip, D. Hakan, Yilidiz Cicegi Sokak 35/1, Etiler, Istanbul, Turkey 80630 (90-212-287-80-51; FAX: 90-212-287-80-52)

International, Smith, Gavin, 7 Church Walk, Thames Ditton, Surrey KT7 0NP (44-208-398-3960; FAX: 44-208-224-3350)

## X

Xiril AG, Garstigweg 2, Hombrechtikon, Switzerland CH-8634 (+41 55 254 77 77; FAX: +41 55 254 77 99; e-mail: info@xiril.com; web site: www.xiril.com)

## Z

ZCL Dualam, Inc., 1420 Parsons Road (Southwest), Edmonton, Alberta, Canada T6X 1M5 (800-661-8265; 780-466-6648; FAX: 780-466-6126; e-mail: webmaster@zcl.com; web site: www.zcl.com)

Zecco, Inc., 22151 E. 91st St., Broken Arrow, OK 74014 (918-258-8551; FAX: 918-251-5519; e-mail: sales@zecco.com; web site: www.zecco.com)

Zetion Inc., 740 Oval Court, Burlington, Ontario, Canada L7L 6A9 (877-299-3866; 905-632-3123; FAX: 905-632-0301; e-mail: pilotplants@zetion.com; web site: www.zetion.com)

ZIRCAR Refractory Composites, Inc., P.O. Box 489, Florida, NY 10921 (845-651-2200; FAX: 845-651-1515; e-mail: sales@zrci.com; web site: www.zrci.com)

# TLV STEAM TRAPS

LONG LIFE, ENERGY EFFICIENCY, & MAXIMUM PROCESS PRODUCTION

## Free Float® and Float-Dynamic® Steam Traps

Free Float and Float-Dynamic steam traps are designed for drip, tracer, clean steam, and process service to 1,740 psig. Capacities of Float-Dynamic models are as high as 350,000 lb/hr with drain trap leakage rating equivalent to Class 6. Free Float stainless steel ball float serves as main valve and responds instantly to condensate flow. Entire surface of ball serves as main valve. No hinges or linkages are used. Separate thermostatic element removes any air present in the system. TLV's Float-Dynamic steam traps utilize a Free Float ball valve to actuate a piston operated main valve to provide a high condensate drainage capacity. Traps provide reduced maintenance, lower operating costs, and long service life.

### SST Series

Stainless steel traps, all stainless steel internals. For drip, tracer, and clean steam applications to 650 psig. Connection NPT, S.W. or flanged. ½ - 1" horizontal & vertical configurations.



### SJ, J, JL Series

Cast steel and cast iron float traps, stainless steel internals for all applications to 300 psig, capacities to 131,850 lb/hr. NPT, flanged connections ½ - 4" straight through horizontal or same side parallel sizes.



### SH, JH(R)(L) Series

Carbon steel or chrome moly traps, all stainless steel internals. Steam tight even under low condensate flow conditions for high pressure superheat applications to 1,740 psig, capacities to 350,000 lb/hr. NPT, S.W., or flanged connections. ½ - 1" in horizontal or vertical configurations.

## PowerTrap® Non-Electric Pumps: GP & GT Series

TLV's unique, patented, non-electric pumps permit the return of condensate or other fluids by using the motive force of steam or compressed air. TLV pumps eliminate the problems associated with electric pumps (leaking seals, faulty motor controls, cavitation, failed motors, and hazardous locations). The patented float operated mechanism uses an Inconel spring which compresses rather than stretches to activate the pump. Other internals are stainless steel with critical wearing parts first heat treated, then an additional super hard coating is applied to deliver the most reliable non-electric pump available. Cast iron, carbon steel, or stainless steel non-electric pumps with capacities exceeding 80,000 lb/hr. Available in pump or pump/trap combinations for wide range of applications. NPT or S.W. connections from 1 - 3".



## PowerDyne™ Steam Traps

TLV's PowerDyne steam traps offer the widest pressure range of any thermodynamic steam trap available and combine both a thermodynamic disc and a thermostatic air vent to provide fast, efficient removal of condensate and air. PowerDyne steam traps are available with in-line replacement modules for ease of maintenance.

### P Series

Carbon steel and stainless steel traps, all stainless steel internals. For drip, tracer, and light processes to 1,400 psig, capacities to 4,550 lb/hr. NPT, S.W., or flanged connection in ¼ - 1" horizontal configurations.



### QuickTrap® Series

Two-bolt replacement system enables installation in minutes. Universal flange design permits correct installation in any configuration. Choose from Free Float, Thermodynamic or Thermostatic up to 650 psig. ½ - 1" available in NPT, S.W. or flanged.



### HR Series

Chrome moly traps with in-line replacement modules for high pressure drip applications to 3,700 psig, capacities to 1,050 lb/hr. NPT, S.W. or flanged Connections ½ - 1" horizontal configurations.



## Thermostatic Steam Traps

TLV's thermostatic steam traps deliver the benefits of efficient operation and long service life. Design of stainless steel internal components, bimetallic elements or patented balanced pressure capsule, along with high temperature rating (572°F) make traps suitable for use on all applications.

### L Series

Maintainable carbon or stainless steel traps with patented "fail-open" design for drip, tracer, and clean steam, to 650 psig, capacities to 1,700 lb/hr. NPT, S.W., or flanged in ½ - 1" horizontal or vertical configurations.



## TrapMan®

Computerized Steam Trap Management System. Complete measurement and analysis consisting of Trapman hardware, a precise ultrasonic and temperature testing instrument, and TrapManager® software, a comprehensive Windows 7 program designed to enable extensive data analysis and database management of the entire trap population.



**TLV**

TLV CORPORATION  
13901 South Lakes Drive  
Charlotte, NC 28273-6790  
Tel: 704-597-9070 Fax: 704-583-1610  
www.tlv.com

FOR TECHNICAL ASSISTANCE CALL:

**1-800-TLV-TRAP**

Circle 46 on p. 180 or go to [adlinks.che.com/50982-46](http://adlinks.che.com/50982-46)

# 1

# LIQUID, GAS, AND AIR HANDLING

- |            |  |            |   |
|------------|--|------------|---|
| <b>102</b> | <b>Air separation equipment</b>                                      | <b>104</b> | <b>Pump parts &amp; fittings</b>                                  |
| <b>102</b> | <b>Compressors</b>   | <b>104</b> | <b>Pumps, centrifugal</b>   |
| <b>102</b> | <b>Ducts &amp; ventilation systems</b>                               | <b>105</b> | <b>Pumps, lined</b>   |
| <b>102</b> | <b>Fans &amp; blowers</b>  | <b>105</b> | <b>Pumps, other</b>   |
| <b>103</b> | <b>Flexible hose, metallic<br/>&amp; nonmetallic</b>                 | <b>106</b> | <b>Pumps, proportioning</b>                                       |
| <b>103</b> | <b>Pipe fittings &amp; couplings,<br/>metallic &amp; nonmetallic</b> | <b>106</b> | <b>Pumps, reciprocating</b>                                       |
| <b>104</b> | <b>Pipe, alloy steel</b>   | <b>106</b> | <b>Pumps, rotary</b>  |
| <b>104</b> | <b>Pipe, aluminum &amp;<br/>aluminum alloys</b>                      | <b>107</b> | <b>Pumps, special materials</b>                                   |
| <b>104</b> | <b>Pipe, carbon steel</b>  | <b>107</b> | <b>Pumps, vacuum &amp; ejector</b>                                |
| <b>104</b> | <b>Pipe, copper &amp; copper alloys</b>                              | <b>108</b> | <b>Pumps, vertical &amp; deep well</b>                            |
| <b>104</b> | <b>Pipe, lined</b>   | <b>108</b> | <b>Seals, gaskets &amp;<br/>packing materials</b>                 |
| <b>104</b> | <b>Pipe, nonmetallic</b>   | <b>108</b> | <b>Steam traps</b>  |
| <b>104</b> | <b>Pipe, other</b>   | <b>108</b> | <b>Tanks &amp; other liquid<br/>storage vessels</b>               |
| <b>104</b> | <b>Pipe, other nonferrous metals</b>                                 | <b>109</b> | <b>Tubing &amp; tube fittings,<br/>metallic &amp; nonmetallic</b> |
| <b>104</b> | <b>Pipe, plastic</b>   | <b>110</b> | <b>Valves</b>   |

---

## DISPLAY ADVERTISERS IN THIS SECTION

Körting Hannover AG

107

## AIR SEPARATION EQUIPMENT

### Air separation equipment, cryogenic

Air Products and Chemicals, Inc., Allentown, PA  
Linde AG, Engineering Division, Pullach, Germany  
ONLY Technology LTD, wuhan, China, Chile  
SIAD Macchine Impianti, Bergamo, Italy

### Air separation equipment, membrane

Air Products and Chemicals, Inc., Allentown, PA  
Linde AG, Engineering Division, Pullach, Germany

### Air separation equipment, pressure swing adsorption

Air Products and Chemicals, Inc., Allentown, PA  
AirSep Corporation, A Chart Industries Company, Buffalo, NY  
Electrodryer, Richmond, KY  
Linde AG, Engineering Division, Pullach, Germany

### Air separation equipment, vacuum swing adsorption

AirSep Corporation, A Chart Industries Company, Buffalo, NY  
Linde AG, Engineering Division, Pullach, Germany

## COMPRESSORS

### Compressor lubrication

Aerzener Maschinenfabrik GmbH, Aerzen, Germany  
Compressor Products International, Stafford, TX  
Petron Plus Global, Inc., Hutchinson, Kansas  
Summit Industrial Products, Tyler, TX

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

### Compressors, centrifugal

BORSIG GmbH, Berlin, Germany  
Dresser-Rand, Corporate Headquarters, Houston, TX  
EDWARDS US HEADQUARTERS, Sanborn, NY  
FPZ Inc., Saukville, WI  
GARO S.P.A., Monza (MB), Italy  
MAN Diesel & Turbo SE, Augsburg, Germany

### Compressors, diaphragm

Fluitron, Inc., Ivyland, PA  
Mehrer Compression GmbH, Balingen, Germany  
PDC Machines, Inc., Warminster, PA  
sera ComPress GmbH, Immenhausen, Germany

### Compressors, high pressure

Aerzener Maschinenfabrik GmbH, Aerzen, Germany  
Fluitron, Inc., Ivyland, PA

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

Mehrer Compression GmbH, Balingen, Germany  
PDC Machines, Inc., Warminster, PA  
sera ComPress GmbH, Immenhausen, Germany  
SIAD Macchine Impianti, Bergamo, Italy

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

### Compressors, oil-free

Aerzener Maschinenfabrik GmbH, Aerzen, Germany  
Busch LLC, Virginia Beach, VA  
EDWARDS US HEADQUARTERS, Sanborn, NY  
FPZ Inc., Saukville, WI

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

MAN Diesel & Turbo SE, Augsburg, Germany  
Mehrer Compression GmbH, Balingen, Germany  
Nash, a Gardner Denver Product, Bentleyville, PA  
PDC Machines, Inc., Warminster, PA  
sera ComPress GmbH, Immenhausen, Germany  
SIAD Macchine Impianti, Bergamo, Italy

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

### Compressors, portable

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

sera ComPress GmbH, Immenhausen, Germany

### Compressors, reciprocating

BORSIG GmbH, Berlin, Germany  
Compressor Products International, Stafford, TX  
Dresser-Rand, Corporate Headquarters, Houston, TX  
GEA Refrigeration North America, York, PA  
HOERBIGER Kompressortechnik Holding GmbH, Vienna, Austria

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

Mehrer Compression GmbH, Balingen, Germany  
Midwest Steel Company Inc, Houston, Texas  
PDC Machines, Inc., Warminster, PA  
SIAD Macchine Impianti, Bergamo, Italy

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

### Compressors, rotary

Aerzener Maschinenfabrik GmbH, Aerzen, Germany  
Busch LLC, Virginia Beach, VA

EDWARDS US HEADQUARTERS, Sanborn, NY

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

MAN Diesel & Turbo SE, Augsburg, Germany

### Compressors, rotary liquid ring

EDWARDS US HEADQUARTERS, Sanborn, NY  
GARO S.P.A., Monza (MB), Italy  
Nash Europe Ltd., Winsford, Cheshire  
Nash, a Gardner Denver Product, Bentleyville, PA

### Compressors, rotary screw

Aerzener Maschinenfabrik GmbH, Aerzen, Germany  
EDWARDS US HEADQUARTERS, Sanborn, NY  
GEA Refrigeration North America, York, PA  
MAN Diesel & Turbo SE, Augsburg, Germany  
Mehrer Compression GmbH, Balingen, Germany  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

### Compressors, rotary sliding vane

EDWARDS US HEADQUARTERS, Sanborn, NY  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

### Compressors, single stage, expander driven

Aerzener Maschinenfabrik GmbH, Aerzen, Germany  
MAN Diesel & Turbo SE, Augsburg, Germany

### Compressors, turbodynamic

Aerzener Maschinenfabrik GmbH, Aerzen, Germany  
FPZ Inc., Saukville, WI

## DUCTS & VENTILATION SYSTEMS

### Dampers

Henderson Industrial Specialties, Waterdown, Ontario, Canada

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

McGill AirFlow LLC, Groveport, OH

### Ducts, fiberglass-reinforced plastic

Dual/HEE, a CECO Environmental Company, Owosso, MI  
McGill AirFlow LLC, Groveport, OH

ZCL Dualam, Inc., Edmonton, Alberta, Canada

### Ducts, metallic

Fr. Jacob Soehne GmbH & Co. KG, Porta Westfalica, NRW, Germany  
McGill AirFlow LLC, Groveport, OH

### Ducts, plastic

**CORZAN INDUSTRIAL SYSTEMS, 9911 Brecksville Road, Cleveland, OH 44141 (888-234-2436; 216-447-7397; FAX: 216-447-6211; e-mail: Corzan@lubrizol.com; web site: www.corzancpvc.com)**

See our ad on page 81

Dual/HEE, a CECO Environmental Company, Owosso, MI  
McGill AirFlow LLC, Groveport, OH

### Ducts, rigid

McGill AirFlow LLC, Groveport, OH

### Exhaust systems, clean-room

**HEMCO CORPORATION, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemccorp.com; web site: www.HEMCOcorp.com)**

McGill AirFlow LLC, Groveport, OH

Strobic Air, a CECO Environmental Company, Telford, PA

### Hoods, fume collectors

Dual/HEE, a CECO Environmental Company, Owosso, MI



**HEMCO CORPORATION, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemccorp.com; web site: www.HEMCOcorp.com)**

McGill AirFlow LLC, Groveport, OH

Turner EnviroLogic, Inc., Deerfield Beach, FL  
Vent-A-Fume, Buffalo, NY

### Ventilation systems

Dual/HEE, a CECO Environmental Company, Owosso, MI  
**HEMCO CORPORATION, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemccorp.com; web site: www.HEMCOcorp.com)**

McGill AirFlow LLC, Groveport, OH

Strobic Air, a CECO Environmental Company, Telford, PA  
Vent-A-Fume, Buffalo, NY

## FANS & BLOWERS

### Blowers, axial flow

Chicago Blower Corp., Glendale Heights, IL  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

### Blowers, centrifugal, compressor-type

Aerzener Maschinenfabrik GmbH, Aerzen, Germany  
EDWARDS US HEADQUARTERS, Sanborn, NY  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

Tuthill Vacuum & Blower Systems, Springfield, MO

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

### Blowers, centrifugal, fan-type

Chicago Blower Corp., Glendale Heights, IL  
Dual/HEE, a CECO Environmental Company, Owosso, MI



**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## Blowers, positive displacement

Aerzener Maschinenfabrik GmbH, Aerzen, Germany  
EDWARDS US HEADQUARTERS, Sanborn, NY  
Tuthill Vacuum & Blower Systems, Springfield, MO

## Blowers, regenerative

FPZ Inc., Saukville, WI

## Blowers, rotary piston

Aerzener Maschinenfabrik GmbH, Aerzen, Germany  
EDWARDS US HEADQUARTERS, Sanborn, NY  
Tuthill Vacuum & Blower Systems, Springfield, MO

## Boosters, rotary piston

EDWARDS US HEADQUARTERS, Sanborn, NY  
Tuthill Vacuum & Blower Systems, Springfield, MO

## Fans, air cooled

Chicago Blower Corp., Glendale Heights, IL  
FPZ Inc., Saukville, WI

Hudson Products Corp., Houston, TX

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

## Fans, axial

AIRLANCO, 312 S. Highway 73, PO Box 398, Falls City, NE 68355-0398 (800-500-9777; 402-245-2325; FAX: 402-245-5196; e-mail: sales@airlanco.com; web site: www.airlanco.com)

Chicago Blower Corp., Glendale Heights, IL  
Hudson Products Corp., Houston, TX

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

Strobic Air, a CECO Environmental Company, Telford, PA  
**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## Fans, bisected

Strobic Air, a CECO Environmental Company, Telford, PA

## Fans, centrifugal

AIRLANCO, 312 S. Highway 73, PO Box 398, Falls City, NE 68355-0398 (800-500-9777; 402-245-2325; FAX: 402-245-5196; e-mail: sales@airlanco.com; web site: www.airlanco.com)

Chicago Blower Corp., Glendale Heights, IL  
Dual/HEE, a CECO Environmental Company, Owosso, MI  
Strobic Air, a CECO Environmental Company, Telford, PA  
**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## Fans, cooling tower

Hudson Products Corp., Houston, TX

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

SPX Cooling Technologies, Overland Park, KS

## Fans, corrosion resistant

Chicago Blower Corp., Glendale Heights, IL  
Creative Pulltrusions, Inc., Alum Bank, PA  
Dual/HEE, a CECO Environmental Company, Owosso, MI  
**HEMCO CORPORATION**, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemccorp.com; web site: www.HEMCOcorp.com)  
Hudson Products Corp., Houston, TX  
Strobic Air, a CECO Environmental Company, Telford, PA

## Fans, exhaust

Chicago Blower Corp., Glendale Heights, IL  
Dual/HEE, a CECO Environmental Company, Owosso, MI  
**HEMCO CORPORATION**, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemccorp.com; web site: www.HEMCOcorp.com)

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

Strobic Air, a CECO Environmental Company, Telford, PA  
Vent-A-Fume, Buffalo, NY

## Fans, exhaust or ventilating, general use

Chicago Blower Corp., Glendale Heights, IL  
Dual/HEE, a CECO Environmental Company, Owosso, MI  
Hepa Corporation, Anaheim, CA  
**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)  
Strobic Air, a CECO Environmental Company, Telford, PA

## Fans, explosion resistant

**HEMCO CORPORATION**, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemccorp.com; web site: www.HEMCOcorp.com)  
Strobic Air, a CECO Environmental Company, Telford, PA

## Fans, heavy duty

Chicago Blower Corp., Glendale Heights, IL  
FPZ Inc., Saukville, WI  
**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)  
Luma Comfort, Orange, CA  
Strobic Air, a CECO Environmental Company, Telford, PA  
**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## Fans, high temperature

Chicago Blower Corp., Glendale Heights, IL  
Strobic Air, a CECO Environmental Company, Telford, PA  
**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## Fans, other

Luma Comfort, Orange, CA  
Strobic Air, a CECO Environmental Company, Telford, PA

## Fans, portable

Vent-A-Fume, Buffalo, NY

## Fans, vane, axial

Strobic Air, a CECO Environmental Company, Telford, PA

## FLEXIBLE HOSE, METALLIC & NONMETALLIC

### Hose, air

Aflex Hose USA, LLC, Pipersville, PA  
NewAge Industries, Inc., Southampton, PA  
PHOENIX Conveyor Belt Systems GmbH, Hamburg, Germany

### Hose, chemically resistant

Aflex Hose USA, LLC, Pipersville, PA  
ELAFLEX - Gummi Ehlers GmbH, Hamburg, Germany  
NewAge Industries, Inc., Southampton, PA  
PHOENIX Conveyor Belt Systems GmbH, Hamburg, Germany

### Hose, electrically heated

Aflex Hose USA, LLC, Pipersville, PA  
Clean Air Express Equipment, Palatine, IL  
Clean Air Instrument Rental, Palatine, IL

### Hose fittings

Aflex Hose USA, LLC, Pipersville, PA  
ELAFLEX - Gummi Ehlers GmbH, Hamburg, Germany  
NewAge Industries, Inc., Southampton, PA

### Hose, high pressure

ELAFLEX - Gummi Ehlers GmbH, Hamburg, Germany  
PHOENIX Conveyor Belt Systems GmbH, Hamburg, Germany  
Witzenmann GmbH, Pforzheim, Germany

### Hose, jacketed

Aflex Hose USA, LLC, Pipersville, PA

### Hose, metallic

Hyspan Precision Prod. Inc., Chula Vista, CA  
Proco Products, Inc., Stockton, CA  
Witzenmann GmbH, Pforzheim, Germany

### Hose, nonmetallic, fluoroplastic

Aflex Hose USA, LLC, Pipersville, PA

Proco Products, Inc., Stockton, CA

## Hose, sanitary

Aflex Hose USA, LLC, Pipersville, PA

## Hose, steam

Aflex Hose USA, LLC, Pipersville, PA  
PHOENIX Conveyor Belt Systems GmbH, Hamburg, Germany  
Witzenmann GmbH, Pforzheim, Germany

## Hose, vacuum

Escitec, Mesa, AZ  
Flowrox Oy, Lappeenranta, Finland  
NewAge Industries, Inc., Southampton, PA  
Vector Technologies Ltd., Milwaukee, WI  
Witzenmann GmbH, Pforzheim, Germany

## Hose, water

NewAge Industries, Inc., Southampton, PA  
PHOENIX Conveyor Belt Systems GmbH, Hamburg, Germany  
Witzenmann GmbH, Pforzheim, Germany

## PIPE FITTINGS & COUPLINGS, METALLIC & NONMETALLIC

### Bends, pipe

Fr. Jacob Soehne GmbH & Co. KG, Porta Westfalica, NRW, Germany  
Viega, Wichita, Kansas

### Blinds, pipeline

**USA INDUSTRIES, INC.**, 302 State Street, S. Houston, TX 77587 (800-456-8721; 713-941-3797; FAX: 713-941-1086; e-mail: info@usaindustries.com; web site: www.usaindustries.com)

### Couplings, dry-disconnect

ELAFLEX - Gummi Ehlers GmbH, Hamburg, Germany

### Couplings, flexible

Voith Turbo GmbH & Co. KG, Crailsheim, Germany

### Couplings, quick connect

CEJN Industrial Corp., Gurnee, Illinois  
ELAFLEX - Gummi Ehlers GmbH, Hamburg, Germany  
Tuf-Lok International, Madison, WI

### Couplings, rigid

Tuf-Lok International, Madison, WI

### Couplings, self aligning

Tuf-Lok International, Madison, WI

### Elbows, pipe

Viega, Wichita, Kansas

### Expansion bellows

ELAFLEX - Gummi Ehlers GmbH, Hamburg, Germany

### Expansion joints, flexible

ELAFLEX - Gummi Ehlers GmbH, Hamburg, Germany  
Henderson Industrial Specialties, Waterdown, Ontario, Canada  
Hyspan Precision Prod. Inc., Chula Vista, CA  
Proco Products, Inc., Stockton, CA  
Witzenmann GmbH, Pforzheim, Germany

### Expansion joints, swivel

ELAFLEX - Gummi Ehlers GmbH, Hamburg, Germany

### Flanges

ELAFLEX - Gummi Ehlers GmbH, Hamburg, Germany  
**USA INDUSTRIES, INC.**, 302 State Street, S. Houston, TX 77587 (800-456-8721; 713-941-3797; FAX: 713-941-1086; e-mail: info@usaindustries.com; web site: www.usaindustries.com)  
Viega, Wichita, Kansas

### Flow conditioners

Vortab Company, San Marcos, CA

### Hangers, pipe & tube

Tuf-Lok International, Madison, WI  
Witzenmann GmbH, Pforzheim, Germany

### Joints, swivel

ELAFLEX - Gummi Ehlers GmbH, Hamburg, Germany

### Pipe adapters

Aflex Hose USA, LLC, Pipersville, PA

# PRODUCT DIRECTORY

Fr. Jacob Soehne GmbH & Co. KG, Porta Westfalica, NRW, Germany

Viega, Wichita, Kansas

## Pipe fittings, emergency repair

Team Industrial Services, Inc., Alvin, TX  
Viega, Wichita, Kansas

## Pipe fittings, graphite

Nantong Fareast Chemical Equipment Co. LTD, International Trading, Nantong, Peoples Rep. of China

## Pipe fittings, high pressure

KRAISSL CO. INC., 299 Williams Ave., Hackensack, NJ 07601-5225 (800-572-4775; 201-342-0008; FAX: 201-342-0025; e-mail: kraissl@aol.com; web site: www.strainers.com)

Tuf-Lok International, Madison, WI

## Pipe fittings, jacketed

Dueker GmbH & Co. KGaA, Laufach, Germany

KRAISSL CO. INC., 299 Williams Ave., Hackensack, NJ 07601-5225 (800-572-4775; 201-342-0008; FAX: 201-342-0025; e-mail: kraissl@aol.com; web site: www.strainers.com)

## Pipe fittings, lined

Abresist Kalenborn Corporation, Urbana, IN  
Afflex Hose USA, LLC, Pipersville, PA  
ZCL Dualam, Inc., Edmonton, Alberta, Canada

## Pipe fittings, nonmetallic

CORZAN INDUSTRIAL SYSTEMS, 9911 Brecksville Road, Cleveland, OH 44141 (888-234-2436; 216-447-7397; FAX: 216-447-6211; e-mail: Corzan@lubrizol.com; web site: www.corzancpvc.com)  
See our ad on page 81

Proco Products, Inc., Stockton, CA

## Pipe strainers

Armstrong International, Three Rivers, MI

KRAISSL CO. INC., 299 Williams Ave., Hackensack, NJ 07601-5225 (800-572-4775; 201-342-0008; FAX: 201-342-0025; e-mail: kraissl@aol.com; web site: www.strainers.com)

## Unions, pipe

Viega, Wichita, Kansas

## PIPE, ALLOY STEEL

### Pipe, high-alloy steel

TW Metals, Exton, PA

### Pipe, nickel & nickel alloy

Arch City Steel, Fenton, Missouri

Corrosion Materials, Baker, LA

Regal Industries, Inc., Painesville, OH

SANDVIK MATERIALS TECHNOLOGY, TUBULAR PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-755-8823; 570-585-7500; FAX: 570-585-7642; web site: www.smt.sandvik.com)

See our ad on page 67

TW Metals, Exton, PA

Viega, Wichita, Kansas

### Pipe, stainless steel

Arch City Steel, Fenton, Missouri

Fr. Jacob Soehne GmbH & Co. KG, Porta Westfalica, NRW, Germany

Regal Industries, Inc., Painesville, OH

SANDVIK MATERIALS TECHNOLOGY, TUBULAR PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-755-8823; 570-585-7500; FAX: 570-585-7642; web site: www.smt.sandvik.com)

See our ad on page 67

TW Metals, Exton, PA

Viega, Wichita, Kansas

Wolseley Industrial Group, Newport News, VA

## PIPE, ALUMINUM & ALUMINUM ALLOYS

### Pipe, aluminum

TW Metals, Exton, PA

### Pipe, aluminum alloy

TW Metals, Exton, PA

## PIPE, CARBON STEEL

### Pipe, carbon steel, seamless

Wolseley Industrial Group, Newport News, VA

## PIPE, COPPER & COPPER ALLOYS

### Pipe, copper

Regal Industries, Inc., Painesville, OH

## PIPE, LINED

### Pipe, ceramic lined

Abresist Kalenborn Corporation, Urbana, IN

### Pipe, glass lined

Dueker GmbH & Co. KGaA, Laufach, Germany

### Pipe, plastic lined

FABRICATED PLASTICS LIMITED, MAPLE, Canada  
Wolseley Industrial Group, Newport News, VA

## PIPE, NONMETALLIC

### Pipe, glass

Technical Glass Products, Painesville, OH

### Pipe, graphite

CG Thermal LLC, Twinsburg, Ohio  
Nantong Fareast Chemical Equipment Co. LTD, International Trading, Nantong, Peoples Rep. of China

### Pipe, hard rubber

Proco Products, Inc., Stockton, CA

### Pipe, rubber

Proco Products, Inc., Stockton, CA

## PIPE, OTHER

### Pipe, ceramic-metal

Abresist Kalenborn Corporation, Urbana, IN

### Pipe, containment

Team Industries, Inc., Kaukauna, WI

### Pipe, custom fabricated

Abresist Kalenborn Corporation, Urbana, IN  
FABRICATED PLASTICS LIMITED, MAPLE, Canada  
Team Industries, Inc., Kaukauna, WI  
ZCL Dualam, Inc., Edmonton, Alberta, Canada

### Pipe, finned

FIN TUBE PRODUCTS, INC., 188 S Lyman St., Suite 100, Wadsworth, OH 44281 (800-334-3736; 330-334-3736; FAX: 330-334-3848; e-mail: mb@fintube.com; web site: www.fintube.com)

### Pipe, flanged

Abresist Kalenborn Corporation, Urbana, IN  
Fr. Jacob Soehne GmbH & Co. KG, Porta Westfalica, NRW, Germany  
Team Industries, Inc., Kaukauna, WI

### Pipe, jacketed

Dueker GmbH & Co. KGaA, Laufach, Germany  
Team Industries, Inc., Kaukauna, WI

### Pipe, prefabricated

Team Industries, Inc., Kaukauna, WI

## PIPE, OTHER NONFERROUS METALS

### Pipe, sanitary

Team Industries, Inc., Kaukauna, WI

## PIPE, PLASTIC

### Pipe, ABS

Georg Fischer Piping Systems Ltd., Schaffhausen, Switzerland

## Liquid, gas, and air handling

### Pipe, chlorinated PVC

CORZAN INDUSTRIAL SYSTEMS, 9911 Brecksville Road, Cleveland, OH 44141 (888-234-2436; 216-447-7397; FAX: 216-447-6211; e-mail: Corzan@lubrizol.com; web site: www.corzancpvc.com)

See our ad on page 81

Georg Fischer Piping Systems Ltd., Schaffhausen, Switzerland

### Pipe, polyethylene

Georg Fischer Piping Systems Ltd., Schaffhausen, Switzerland

### Pipe, polypropylene

Georg Fischer Piping Systems Ltd., Schaffhausen, Switzerland

### Pipe, polyvinylidene fluoride

Georg Fischer Piping Systems Ltd., Schaffhausen, Switzerland

### Pipe, PTFE

Proco Products, Inc., Stockton, CA

### Pipe, vinyl ester - glass

ZCL Dualam, Inc., Edmonton, Alberta, Canada

## PUMP PARTS & FITTINGS

### Bushings, pump

Iwaki America, Holliston, MA  
Scenic Precise Element Inc., Kaohsiung City, Taiwan

### Sleeves, pump

Thermal Spray Solutions, Inc., Chesapeake, Virginia

## PUMPS, CENTRIFUGAL

### Pumps, centrifugal, ANSI

Allweiler GmbH, Radolfzell, Germany  
Flowsolve Corp., Irving, TX  
GRI Pumps, Bellville, OH  
Hermetic-Pumpen GmbH, Gundelfingen, Germany  
INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

Iwaki America, Holliston, MA  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
National Pump Company, Glendale, AZ  
Richter Chemie-Technik GmbH, Kempen, Germany

### Pumps, centrifugal, double suction

Flowsolve Corp., Irving, TX  
WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Pumps, centrifugal, dry running

Iwaki America, Holliston, MA  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA

### Pumps, centrifugal, inline

Flowsolve Corp., Irving, TX  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA

### Pumps, centrifugal, multistage

Dickow Pump Co., Marietta, GA  
Flowsolve Corp., Irving, TX

### Pumps, centrifugal, process, medium duty

Flowsolve Corp., Irving, TX  
GORMAN-RUPP CO., 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: g-sales@gormanrupp.com; web site: www.GRpumps.com)

Iwaki America, Holliston, MA  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA

### Pumps, centrifugal, self-priming

Dickow Pump Co., Marietta, GA  
Flowsolve Corp., Irving, TX

**GORMAN-RUPP CO.**, 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: [gr-sales@gormanrupp.com](mailto:gr-sales@gormanrupp.com); web site: [www.GRpumps.com](http://www.GRpumps.com))

Hermetic-Pumpen GmbH, Gundelfingen, Germany  
Iwaki America, Holliston, MA  
Mefiag, a CECO Environmental Company, Owosso, MI  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
National Pump Company, Glendale, AZ

## Pumps, centrifugal, single stage

Dickow Pump Co., Marietta, GA  
Flowsolve Corp., Irving, TX  
FLUX-GERAETE GMBH, Maulbronn, Germany  
**GORMAN-RUPP CO.**, 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: [gr-sales@gormanrupp.com](mailto:gr-sales@gormanrupp.com); web site: [www.GRpumps.com](http://www.GRpumps.com))

GRI Pumps, Bellville, OH  
Mefiag, a CECO Environmental Company, Owosso, MI  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
Weir Specialty Pumps, Salt Lake City, UT

## Pumps, leakproof

Dickow Pump Co., Marietta, GA  
FELUWA Pumpen GmbH, Muerlenbach, Germany  
Flowsolve Corp., Irving, TX  
Hermetic-Pumpen GmbH, Gundelfingen, Germany  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA

## Pumps, propeller

Allweiler GmbH, Radolfzell, Germany  
Flowsolve Corp., Irving, TX  
Friatec AG Division Rheinhuette Pumpen, Wiesbaden, Germany  
National Pump Company, Glendale, AZ

## Pumps, screw centrifugal

Allweiler GmbH, Radolfzell, Germany  
Busch LLC, Virginia Beach, VA  
**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: [info@wabashpower.com](mailto:info@wabashpower.com); web site: [www.wabashpower.com](http://www.wabashpower.com))

Weir Specialty Pumps, Salt Lake City, UT

## Pumps, turbine

Flowsolve Corp., Irving, TX  
Iwaki America, Holliston, MA  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
National Pump Company, Glendale, AZ  
**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: [info@wabashpower.com](mailto:info@wabashpower.com); web site: [www.wabashpower.com](http://www.wabashpower.com))

## PUMPS, LINED

### Pumps, ceramic lined

Abresist Kalenborn Corporation, Urbana, IN  
Fluid Metering, Inc., Syosset, NY

### Pumps, other lined

Boerger Pumps, Chanhassen, MN

### Pumps, plastic lined

Flowsolve Corp., Irving, TX  
Fluid Metering, Inc., Syosset, NY  
Friatec AG Division Rheinhuette Pumpen, Wiesbaden, Germany  
Iwaki America, Holliston, MA  
Richter Chemie-Technik GmbH, Kempen, Germany

### Pumps, rubber lined

Flowrox Oy, Lappeenranta, Finland  
NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany

## PUMPS, OTHER

### Pumps, acid, corrosive

BJM Pumps, LLC, Old Saybrook, CT  
Boerger Pumps, Chanhassen, MN  
Dickow Pump Co., Marietta, GA  
Flowsolve Corp., Irving, TX  
Fluid Metering, Inc., Syosset, NY  
Friatec AG Division Rheinhuette Pumpen, Wiesbaden, Germany

**GORMAN-RUPP CO.**, 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: [gr-sales@gormanrupp.com](mailto:gr-sales@gormanrupp.com); web site: [www.GRpumps.com](http://www.GRpumps.com))

GRI Pumps, Bellville, OH  
Hermetic-Pumpen GmbH, Gundelfingen, Germany  
JLS International, Inc., Charlotte, NC  
**LEWA GMBH, Ulmer Str. 10, Leonberg, Germany 71229** (49-7152-14-0; FAX: 49-7152-14-1303; e-mail: [lewa@lewa.de](mailto:lewa@lewa.de); web site: [www.lewa.com](http://www.lewa.com))  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany  
Richter Chemie-Technik GmbH, Kempen, Germany  
seepeX GmbH, Bolltopf, Germany  
sera ProDos GmbH, Immenhausen, Germany  
Uraca GmbH & Co. KG, Bad Urach, Germany  
Weir Specialty Pumps, Salt Lake City, UT  
WITTE PUMPS & TECHNOLOGY GmbH, 25436 Tornesch, Germany

## Pumps, air driven

Boerger Pumps, Chanhassen, MN  
**CROLL-REYNOLDS CO. INC.**, Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: [info@croll.com](mailto:info@croll.com); web site: [www.croll.com](http://www.croll.com))  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA

## Pumps, axial flow

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: [info@wabashpower.com](mailto:info@wabashpower.com); web site: [www.wabashpower.com](http://www.wabashpower.com))

## Pumps, battery-powered

Fluid Metering, Inc., Syosset, NY  
FLUX-GERAETE GMBH, Maulbronn, Germany

## Pumps, carboy or drum

Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany

## Pumps, channel impeller

BJM Pumps, LLC, Old Saybrook, CT

## Pumps, condensate return

Armstrong International, Three Rivers, MI  
Flowsolve Corp., Irving, TX  
**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))  
**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: [www.tlv.com](http://www.tlv.com))

See our ad on page 100

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: [info@wabashpower.com](mailto:info@wabashpower.com); web site: [www.wabashpower.com](http://www.wabashpower.com))

## Pumps, cryogenic

Busch LLC, Virginia Beach, VA  
Flowsolve Corp., Irving, TX

## Pumps, disc

Boerger Pumps, Chanhassen, MN

## Pumps, dry vacuum

EDWARDS US HEADQUARTERS, Sanborn, NY  
E-Vac Technologies, LLC, McMurray, PA  
GEA Process Engineering, Columbia, MD  
Pfeiffer Vacuum, Inc., Nashua, NH  
**PFEIFFER VACUUM GMBH, Berliner Strasse 43, Aslar, Germany 35614** (+49-6441-802 0; FAX: +49-6441-802 1202; e-mail: [info@pfeiffer-vacuum.de](mailto:info@pfeiffer-vacuum.de); web site: [www.pfeiffer-vacuum.com](http://www.pfeiffer-vacuum.com))  
Tuthill Vacuum & Blower Systems, Springfield, MO

## Pumps, explosion proof

Allweiler GmbH, Radolfzell, Germany  
BJM Pumps, LLC, Old Saybrook, CT  
Boerger GmbH, Borken-Weske, Germany  
Boerger Pumps Asia Pte. Ltd., Singapore, Singapore  
Boerger Pumps, Chanhassen, MN  
EDWARDS US HEADQUARTERS, Sanborn, NY  
Fluid Metering, Inc., Syosset, NY  
FLUX-GERAETE GMBH, Maulbronn, Germany  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
Nash, a Gardner Denver Product, Bentleyville, PA  
WITTE PUMPS & TECHNOLOGY GmbH, 25436 Tornesch, Germany

## Pumps, flexible impeller

Cole-Parmer, Vernon Hills, IL

## Pumps, gas mixing

GEA Process Engineering, Columbia, MD  
Schutte & Koertling, Treviso, PA

## Pumps, hand

Beamex, Inc., Marietta, GA  
**GORMAN-RUPP CO.**, 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: [gr-sales@gormanrupp.com](mailto:gr-sales@gormanrupp.com); web site: [www.GRpumps.com](http://www.GRpumps.com))

## Pumps, high pressure

Allweiler GmbH, Radolfzell, Germany  
Beamex, Inc., Marietta, GA  
Cat Pumps, Minneapolis, MN  
Compressor Products International, Stafford, TX  
Dickow Pump Co., Marietta, GA  
FELUWA Pumpen GmbH, Muerlenbach, Germany  
Flowsolve Corp., Irving, TX  
Fluitron, Inc., Iyland, PA  
Hammelmann Corp., Miamisburg, OH  
JLS International, Inc., Charlotte, NC  
**LEWA GMBH, Ulmer Str. 10, Leonberg, Germany 71229** (49-7152-14-0; FAX: 49-7152-14-1303; e-mail: [lewa@lewa.de](mailto:lewa@lewa.de); web site: [www.lewa.com](http://www.lewa.com))  
NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany  
PSG Dover Europe GmbH, Oberglatt / ZH, Switzerland  
Uraca GmbH & Co. KG, Bad Urach, Germany  
**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: [info@wabashpower.com](mailto:info@wabashpower.com); web site: [www.wabashpower.com](http://www.wabashpower.com))  
Weir Specialty Pumps, Salt Lake City, UT  
WITTE PUMPS & TECHNOLOGY GmbH, 25436 Tornesch, Germany  
WOMA Corp., Edison, NJ

## Pumps, jacketed

Boerger Pumps, Chanhassen, MN  
Dickow Pump Co., Marietta, GA  
Flowsolve Corp., Irving, TX  
Hermetic-Pumpen GmbH, Gundelfingen, Germany  
**LEWA GMBH, Ulmer Str. 10, Leonberg, Germany 71229** (49-7152-14-0; FAX: 49-7152-14-1303; e-mail: [lewa@lewa.de](mailto:lewa@lewa.de); web site: [www.lewa.com](http://www.lewa.com))  
NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany  
UNIBLOC-PUMP, Inc, Flowtech Div., Marietta, GA  
WITTE PUMPS & TECHNOLOGY GmbH, 25436 Tornesch, Germany

## Pumps, magnetically driven

Allweiler GmbH, Radolfzell, Germany  
Dickow Pump Co., Marietta, GA  
Flowsolve Corp., Irving, TX  
Friatec AG Division Rheinhuette Pumpen, Wiesbaden, Germany  
GRI Pumps, Bellville, OH  
Iwaki America, Holliston, MA  
JLS International, Inc., Charlotte, NC  
Mefiag, a CECO Environmental Company, Owosso, MI  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany  
**PFEIFFER VACUUM GMBH, Berliner Strasse 43, Aslar, Germany 35614** (+49-6441-802 0; FAX: +49-6441-802 1202; e-mail: [info@pfeiffer-vacuum.de](mailto:info@pfeiffer-vacuum.de); web site: [www.pfeiffer-vacuum.com](http://www.pfeiffer-vacuum.com))  
PSG Dover Europe GmbH, Oberglatt / ZH, Switzerland  
sera ProDos GmbH, Immenhausen, Germany  
WITTE PUMPS & TECHNOLOGY GmbH, 25436 Tornesch, Germany

## Pumps, mixed flow

Boerger Pumps, Chanhassen, MN  
Fluid Metering, Inc., Syosset, NY  
GEA Process Engineering, Columbia, MD  
National Pump Company, Glendale, AZ

## Pumps, oil free

Busch LLC, Virginia Beach, VA  
EDWARDS US HEADQUARTERS, Sanborn, NY  
Nash, a Gardner Denver Product, Bentleyville, PA  
Pfeiffer Vacuum, Inc., Nashua, NH  
**PFEIFFER VACUUM GMBH, Berliner Strasse 43, Aslar, Germany 35614** (+49-6441-802 0; FAX: +49-6441-802 1202; e-mail: [info@pfeiffer-vacuum.de](mailto:info@pfeiffer-vacuum.de); web site: [www.pfeiffer-vacuum.com](http://www.pfeiffer-vacuum.com))  
Siemens, Industry USA, Solutions, Automation and Drives Technologies, Alpharetta, GA  
Tuthill Vacuum & Blower Systems, Springfield, MO

## Pumps, open impeller

Flowsolve Corp., Irving, TX  
GRI Pumps, Bellville, OH  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
Weir Specialty Pumps, Salt Lake City, UT

## Pumps, other

Boerger Pumps, Chanhassen, MN  
Elmridge Inc., Livonia, MI  
**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)**

Hermetic-Pumpen GmbH, Gundelfingen, Germany  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
Nash, a Gardner Denver Product, Bentleyville, PA  
UNIBLOC-PUMP, Inc, Flowtech Div., Marietta, GA

## Pumps, peristaltic

Allweiler GmbH, Radolfzell, Germany  
Bioengineering Inc., Somerville, MA  
Cole-Parmer, Vernon Hills, IL  
Flowrox Oy, Lappeenranta, Finland  
GRI Pumps, Bellville, OH  
Sias, New Castle, DE

## Pumps, pressure powered

**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)**  
See our ad on page 100

## Pumps, recessed impeller

Flowsolve Corp., Irving, TX  
GRI Pumps, Bellville, OH  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
Weir Specialty Pumps, Salt Lake City, UT

## Pumps, sealless

Flowsolve Corp., Irving, TX  
FLUX-GERAETE GMBH, Maulbronn, Germany  
Friatec AG Division Rheinhuette Pumpen, Wiesbaden, Germany  
GRI Pumps, Bellville, OH  
Iwaki America, Holliston, MA  
JLS International, Inc., Charlotte, NC  
**LEWA GMBH, Ulmer Str. 10, Leonberg, Germany 71229 (49-7152-14-0; FAX: 49-7152-14-1303; e-mail: lewa@lewa.de; web site: www.lewa.com)**  
Mefiag, a CECO Environmental Company, Owosso, MI  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
Richter Chemie-Technik GmbH, Kempen, Germany

## Pumps, sludge

Boerger GmbH, Borken-Weseke, Germany  
Boerger Pumps Asia Pte. Ltd., Singapore, Singapore  
Boerger Pumps, Chanhassen, MN  
FELUWA Pumpen GmbH, Muerlenbach, Germany  
Flowrox Oy, Lappeenranta, Finland  
Flowsolve Corp., Irving, TX  
**GORMAN-RUPP CO., 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: g-sales@gormanrupp.com; web site: www.GRpumps.com)**  
**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**  
See our ad on page 135

Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany  
Newman Regency Group, Stafford, TX  
seepex GmbH, Botrop, Germany  
seepex Inc., Enon, OH  
Weir Specialty Pumps, Salt Lake City, UT

## Pumps, slurry

BJM Pumps, LLC, Old Saybrook, CT  
Boerger GmbH, Borken-Weseke, Germany  
Boerger Pumps Asia Pte. Ltd., Singapore, Singapore  
Boerger Pumps, Chanhassen, MN  
FELUWA Pumpen GmbH, Muerlenbach, Germany  
Flowrox Oy, Lappeenranta, Finland  
Flowsolve Corp., Irving, TX  
Fluid Metering, Inc., Syosset, NY  
**GORMAN-RUPP CO., 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: g-sales@gormanrupp.com; web site: www.GRpumps.com)**  
GRI Pumps, Bellville, OH

**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**

See our ad on page 135

Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
Metsu Minerals Industries, Inc., York, PA  
NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany  
seepex GmbH, Botrop, Germany  
seepex Inc., Enon, OH  
Uraca GmbH & Co. KG, Bad Urach, Germany

## Pumps, spiral-vane impeller

Boerger Pumps, Chanhassen, MN

## Pumps, transfer

GRI Pumps, Bellville, OH  
Hermetic-Pumpen GmbH, Gundelfingen, Germany  
JLS International, Inc., Charlotte, NC  
**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**  
See our ad on page 135  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
PSG Dover Europe GmbH, Oberglatt / ZH, Switzerland

## Pumps, water

Boerger Pumps, Chanhassen, MN  
Cat Pumps, Minneapolis, MN  
Dickow Pump Co., Marietta, GA  
Fluid Metering, Inc., Syosset, NY  
**GORMAN-RUPP CO., 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: g-sales@gormanrupp.com; web site: www.GRpumps.com)**  
GRI Pumps, Bellville, OH  
Hammelmann Corp., Miami Springs, OH  
Hermetic-Pumpen GmbH, Gundelfingen, Germany  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
National Pump Company, Glendale, AZ  
NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany  
seepex Inc., Enon, OH  
Uraca GmbH & Co. KG, Bad Urach, Germany

## PUMPS, PROPORTIONING

### Pumps, diaphragm (proportioning)

GRI Pumps, Bellville, OH  
Walchem, IWAKI America, Inc., Holliston, MA

### Pumps, metering

Allweiler GmbH, Radolfzell, Germany  
Analytical Measurements, Chester, NJ  
Cole-Parmer, Vernon Hills, IL  
Fluid Metering, Inc., Syosset, NY  
GRI Pumps, Bellville, OH  
JLS International, Inc., Charlotte, NC  
**LEWA GMBH, Ulmer Str. 10, Leonberg, Germany 71229 (49-7152-14-0; FAX: 49-7152-14-1303; e-mail: lewa@lewa.de; web site: www.lewa.com)**  
Nordson SEALANT EQUIPMENT, Plymouth, MI  
PDC Machines, Inc., Warminster, PA  
seepex GmbH, Botrop, Germany  
seepex Inc., Enon, OH  
Walchem, IWAKI America, Inc., Holliston, MA  
WITTE PUMPS & TECHNOLOGY GmbH, 25436 Tornesch, Germany

### Pumps, plunger

Cat Pumps, Minneapolis, MN  
Fluid Metering, Inc., Syosset, NY

## PUMPS, RECIPROCATING

### Pumps, diaphragm (reciprocating)

Cat Pumps, Minneapolis, MN  
Cole-Parmer, Vernon Hills, IL  
FLUX-GERAETE GMBH, Maulbronn, Germany  
GRI Pumps, Bellville, OH  
**LEWA GMBH, Ulmer Str. 10, Leonberg, Germany 71229 (49-7152-14-0; FAX: 49-7152-14-1303; e-mail: lewa@lewa.de; web site: www.lewa.com)**  
**PFEIFFER VACUUM GMBH, Berliner Strasse 43, Asslar, Germany 35614 (+49-6441-802 0; FAX: +49-6441-802 1202; e-mail: info@pfeiffer-vacuum.de; web site: www.pfeiffer-vacuum.com)**  
sera ProDos GmbH, Immenhausen, Germany

## Pumps, piston

Cat Pumps, Minneapolis, MN  
Compressor Products International, Stafford, TX  
EDWARDS US HEADQUARTERS, Sanborn, NY  
Fluid Metering, Inc., Syosset, NY  
Nordson SEALANT EQUIPMENT, Plymouth, MI  
sera ProDos GmbH, Immenhausen, Germany  
Uraca GmbH & Co. KG, Bad Urach, Germany

## Pumps, piston-diaphragm

FELUWA Pumpen GmbH, Muerlenbach, Germany  
**LEWA GMBH, Ulmer Str. 10, Leonberg, Germany 71229 (49-7152-14-0; FAX: 49-7152-14-1303; e-mail: lewa@lewa.de; web site: www.lewa.com)**  
sera ProDos GmbH, Immenhausen, Germany

## Pumps, plunger

Hammelmann Corp., Miami Springs, OH  
**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**  
See our ad on page 135

**LEWA GMBH, Ulmer Str. 10, Leonberg, Germany 71229 (49-7152-14-0; FAX: 49-7152-14-1303; e-mail: lewa@lewa.de; web site: www.lewa.com)**  
Uraca GmbH & Co. KG, Bad Urach, Germany  
WOMA Corp., Edison, NJ

## PUMPS, ROTARY

### Pumps, gear

Allweiler GmbH, Radolfzell, Germany  
Boerger Pumps Asia Pte. Ltd., Singapore, Singapore  
Boerger Pumps, Chanhassen, MN  
**GORMAN-RUPP CO., 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: g-sales@gormanrupp.com; web site: www.GRpumps.com)**  
GRI Pumps, Bellville, OH  
IGW - IG Watteeuw International nv, Headquarters, Oostkamp, Belgium  
JLS International, Inc., Charlotte, NC  
Nordson SEALANT EQUIPMENT, Plymouth, MI  
PSG Dover Europe GmbH, Oberglatt / ZH, Switzerland  
UNIBLOC-PUMP, Inc, Flowtech Div., Marietta, GA  
WITTE PUMPS & TECHNOLOGY GmbH, 25436 Tornesch, Germany

### Pumps, helical

Boerger Pumps, Chanhassen, MN

### Pumps, lobe

Boerger GmbH, Borken-Weseke, Germany  
Boerger Pumps Asia Pte. Ltd., Singapore, Singapore  
Boerger Pumps, Chanhassen, MN  
EDWARDS US HEADQUARTERS, Sanborn, NY  
E-Vac Technologies, LLC, McMurray, PA  
UNIBLOC-PUMP, Inc, Flowtech Div., Marietta, GA

### Pumps, progressing cavity

Boerger Pumps Asia Pte. Ltd., Singapore, Singapore  
Boerger Pumps, Chanhassen, MN  
EDWARDS US HEADQUARTERS, Sanborn, NY  
NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany  
seepex GmbH, Botrop, Germany  
seepex Inc., Enon, OH

### Pumps, rotary helical gear

Boerger GmbH, Borken-Weseke, Germany  
Boerger Pumps Asia Pte. Ltd., Singapore, Singapore  
Boerger Pumps, Chanhassen, MN  
IGW - IG Watteeuw International nv, Headquarters, Oostkamp, Belgium  
JLS International, Inc., Charlotte, NC

### Pumps, rotary herringbone

JLS International, Inc., Charlotte, NC

### Pumps, rotary liquid ring

EDWARDS US HEADQUARTERS, Sanborn, NY  
GARO S.P.A., Monza (MB), Italy  
Nash, a Gardner Denver Product, Bentleyville, PA  
Wintek Corp., Flanders, NJ

### Pumps, rotary piston

Boerger GmbH, Borken-Weseke, Germany  
Boerger Pumps Asia Pte. Ltd., Singapore, Singapore  
Boerger Pumps, Chanhassen, MN  
EDWARDS US HEADQUARTERS, Sanborn, NY  
E-Vac Technologies, LLC, McMurray, PA

### Pumps, rotary positive displacement

Boerger GmbH, Borken-Weseke, Germany

Boerger Pumps Asia Pte. Ltd., Singapore, Singapore  
 Boerger Pumps, Chanhassen, MN  
 Cat Pumps, Minneapolis, MN  
 EDWARDS US HEADQUARTERS, Sanborn, NY  
 FLUX-GERAETE GMBH, Maulbronn, Germany  
**GORMAN-RUPP CO., 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: g-sales@gormanrupp.com; web site: www.GRpumps.com)**  
**KRAISSL CO. INC., 299 Williams Ave., Hackensack, NJ 07601-5225 (800-572-4775; 201-342-0008; FAX: 201-342-0025; e-mail: kraissl@aol.com; web site: www.strainers.com)**

Nordson SEALANT EQUIPMENT, Plymouth, MI  
 Pfeiffer Vacuum, Inc., Nashua, NH  
**PFEIFFER VACUUM GMBH, Berliner Strasse 43, Asslar, Germany 35614 (+49-6441-802 0; FAX: +49-6441-802 1202; e-mail: info@pfeiffer-vacuum.de; web site: www.pfeiffer-vacuum.com)**  
 PSG Dover Europe GmbH, Oberglatt / ZH, Switzerland  
 seepeex GmbH, Bottrop, Germany  
 UNIBLOC-PUMP, Inc, Flowtech Div., Marietta, GA  
 WITTE PUMPS & TECHNOLOGY GmbH, 25436 Tornesch, Germany

## Pumps, rotary sliding vane

Boerger Pumps, Chanhassen, MN  
 EDWARDS US HEADQUARTERS, Sanborn, NY  
 Wintek Corp., Flanders, NJ

## Pumps, screw

Boerger Pumps Asia Pte. Ltd., Singapore, Singapore  
 Boerger Pumps, Chanhassen, MN  
 EDWARDS US HEADQUARTERS, Sanborn, NY  
 E-Vac Technologies, LLC, McMurray, PA  
 Newman Regency Group, Stafford, TX

## PUMPS, SPECIAL MATERIALS

### Pumps, ceramic

Fluid Metering, Inc., Syosset, NY  
 Friatec AG Division Rheinhuette Pumpen, Wiesbaden, Germany  
 WITTE PUMPS & TECHNOLOGY GmbH, 25436 Tornesch, Germany

### Pumps, fiberglass-reinforced plastic

BJM Pumps, LLC, Old Saybrook, CT  
 Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA

### Pumps, graphite

Nantong Fareast Chemical Equipment Co. LTD, International Trading, Nantong, Peoples Rep. of China

### Pumps, nickel-based alloy

Dickow Pump Co., Marietta, GA  
 Flowserve Corp., Irving, TX  
 JLS International, Inc., Charlotte, NC  
 NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany  
 seepeex Inc., Enon, OH

### Pumps, nonmetallic

Flowserve Corp., Irving, TX  
 Iwaki America, Holliston, MA  
 Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA

### Pumps, other special materials

Boerger GmbH, Borken-Weseke, Germany  
 Boerger Pumps, Chanhassen, MN  
 FLUX-GERAETE GMBH, Maulbronn, Germany  
 Friatec AG Division Rheinhuette Pumpen, Wiesbaden, Germany  
**GORMAN-RUPP CO., 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: g-sales@gormanrupp.com; web site: www.GRpumps.com)**

GRI Pumps, Bellville, OH  
 Hermetic-Pumpen GmbH, Gundelfingen, Germany  
 JLS International, Inc., Charlotte, NC  
 Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
 NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany  
 seepeex Inc., Enon, OH

### Pumps, plastic

BJM Pumps, LLC, Old Saybrook, CT  
 Flowserve Corp., Irving, TX  
 Fluid Metering, Inc., Syosset, NY  
 FLUX-GERAETE GMBH, Maulbronn, Germany  
 Friatec AG Division Rheinhuette Pumpen, Wiesbaden, Germany  
 GRI Pumps, Bellville, OH

Mefiag, a CECO Environmental Company, Owosso, MI  
 Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA

### Pumps, stainless steel

BJM Pumps, LLC, Old Saybrook, CT  
 Boerger GmbH, Borken-Weseke, Germany  
 Boerger Pumps, Chanhassen, MN  
 Cat Pumps, Minneapolis, MN  
 Dickow Pump Co., Marietta, GA  
 Flowserve Corp., Irving, TX  
 Fluid Metering, Inc., Syosset, NY  
 FLUX-GERAETE GMBH, Maulbronn, Germany  
**GORMAN-RUPP CO., 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: g-sales@gormanrupp.com; web site: www.GRpumps.com)**

GRI Pumps, Bellville, OH  
 Hermetic-Pumpen GmbH, Gundelfingen, Germany  
 JLS International, Inc., Charlotte, NC  
**LEWA GMBH, Ulmer Str. 10, Leonberg, Germany 71229 (49-7152-14-0; FAX: 49-7152-14-1303; e-mail: lewa@lewa.de; web site: www.lewa.com)**

Nash, a Gardner Denver Product, Bentleyville, PA  
 National Pump Company, Glendale, AZ  
 NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany  
 Nordson SEALANT EQUIPMENT, Plymouth, MI  
 seepeex Inc., Enon, OH  
 UNIBLOC-PUMP, Inc, Flowtech Div., Marietta, GA  
 Uraca GmbH & Co. KG, Bad Urach, Germany  
 Weir Specialty Pumps, Salt Lake City, UT  
 WITTE PUMPS & TECHNOLOGY GmbH, 25436 Tornesch, Germany

### Pumps, tantalum

JLS International, Inc., Charlotte, NC

### Pumps, titanium

Flowserve Corp., Irving, TX  
 Hermetic-Pumpen GmbH, Gundelfingen, Germany  
 JLS International, Inc., Charlotte, NC  
 Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
 NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany  
 seepeex Inc., Enon, OH

### Pumps, zirconium

JLS International, Inc., Charlotte, NC

## PUMPS, VACUUM & EJECTOR

### Aspiration systems

Advanced Cyclone Systems, S. A., Porto, Portugal

### Pumps, jet, sanitary

GEA Process Engineering, Columbia, MD

### Pumps, vacuum, dry

Busch LLC, Virginia Beach, VA  
 EDWARDS US HEADQUARTERS, Sanborn, NY  
 Escitec, Mesa, AZ  
 E-Vac Technologies, LLC, McMurray, PA  
 GEA Process Engineering, Columbia, MD  
**PFEIFFER VACUUM GMBH, Berliner Strasse 43, Asslar, Germany 35614 (+49-6441-802 0; FAX: +49-6441-802 1202; e-mail: info@pfeiffer-vacuum.de; web site: www.pfeiffer-vacuum.com)**

Schutte & Koerting, Treviso, PA  
 Tuthill Vacuum & Blower Systems, Springfield, MO

### Pumps, vacuum, liquid ring

Busch LLC, Virginia Beach, VA  
 EDWARDS US HEADQUARTERS, Sanborn, NY  
 E-Vac Technologies, LLC, McMurray, PA  
 GARO S.P.A., Monza (MB), Italy  
 Nash Europe Ltd., Winsford, Cheshire  
 Nash, a Gardner Denver Product, Bentleyville, PA  
 Tuthill Vacuum & Blower Systems, Springfield, MO  
 Wintek Corp., Flanders, NJ

### Pumps, vacuum, once-through-oil

Busch LLC, Virginia Beach, VA

### Pumps, vacuum, other

Busch LLC, Virginia Beach, VA  
 Compressor Products International, Stafford, TX  
**CROLL-REYNOLDS CO. INC., Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: info@croll.com; web site: www.croll.com)**  
 EDWARDS US HEADQUARTERS, Sanborn, NY  
 E-Vac Technologies, LLC, McMurray, PA  
 FPZ Inc., Saukville, WI  
 Friatec AG Division Rheinhuette Pumpen, Wiesbaden, Germany

**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)**

**KOERTING HANNOVER AG, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)**

See our ad on page 107

Pfeiffer Vacuum, Inc., Nashua, NH  
**PFEIFFER VACUUM GMBH, Berliner Strasse 43, Asslar, Germany 35614 (+49-6441-802 0; FAX: +49-6441-802 1202; e-mail: info@pfeiffer-vacuum.de; web site: www.pfeiffer-vacuum.com)**

**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)**

See our ad on page 100

Tuthill Vacuum & Blower Systems, Springfield, MO  
 Vector Technologies Ltd., Milwaukee, WI  
 Wintek Corp., Flanders, NJ

### Pumps, vacuum, rotary piston

Aerzener Maschinenfabrik GmbH, Aerzen, Germany  
 EDWARDS US HEADQUARTERS, Sanborn, NY  
 E-Vac Technologies, LLC, McMurray, PA  
 Tuthill Vacuum & Blower Systems, Springfield, MO

### Steam jet ejectors





**CROLL-REYNOLDS CO. INC., Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: info@croll.com; web site: www.croll.com)**

EDWARDS US HEADQUARTERS, Sanborn, NY  
 Elmridge Inc., Livonia, MI  
**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)**  
 GEA Process Engineering, Columbia, MD

## Leading Technologies in Vacuum and Environmental Engineering

- Jet Ejectors
- Vacuum Systems
- Condensation Systems
- Jet- and Venturi Scrubbers
- Evaporation Plants
- Steam Jet Heaters
- Jet Mixers





**Körting Hannover AG**  
 30453 Hannover/Germany  
 Tel.: +49 511 2129-0  
 st@koerting.de  
[www.koerting.de](http://www.koerting.de)

Circle 41 on p. 180 or go to [adlinks.che.com/50982-41](http://adlinks.che.com/50982-41)

**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: [st@koerting.de](mailto:st@koerting.de); web site: [www.koerting.de](http://www.koerting.de))

See our ad on page 107

Nash Europe Ltd., Winsford, Cheshire  
Nash, a Gardner Denver Product, Bentleyville, PA  
Schutte & Koerting, Treviso, PA

## Vacuum pumping systems

Busch LLC, Virginia Beach, VA

**CROLL-REYNOLDS CO. INC.**, Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: [info@croll.com](mailto:info@croll.com); web site: [www.croll.com](http://www.croll.com))

EDWARDS US HEADQUARTERS, Sanborn, NY  
E-Vac Technologies, LLC, McMurray, PA

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: [gea-wiegand.info@gea.com](mailto:gea-wiegand.info@gea.com); web site: [www.gea.com](http://www.gea.com))

GEA Process Engineering, Columbia, MD

**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: [st@koerting.de](mailto:st@koerting.de); web site: [www.koerting.de](http://www.koerting.de))

See our ad on page 107

Nash Europe Ltd., Winsford, Cheshire

Pfeiffer Vacuum, Inc., Nashua, NH  
Schutte & Koerting, Treviso, PA  
Tuthill Vacuum & Blower Systems, Springfield, MO  
Vector Technologies Ltd., Milwaukee, WI  
Wintek Corp., Flanders, NJ

## PUMPS, VERTICAL & DEEP WELL

### Pumps, dewatering, submersible

BJM Pumps, LLC, Old Saybrook, CT

### Pumps, packless

Flowsolve Corp., Irving, TX

### Pumps, submersible

Allweiler GmbH, Radolfzell, Germany  
BJM Pumps, LLC, Old Saybrook, CT  
Boerger GmbH, Borken-Weseke, Germany  
Boerger Pumps, Chanhassen, MN  
Flowsolve Corp., Irving, TX

**GORMAN-RUPP CO.**, 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: [gr-sales@gormanrupp.com](mailto:gr-sales@gormanrupp.com); web site: [www.GRpumps.com](http://www.GRpumps.com))

National Pump Company, Glendale, AZ  
NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany

seepex GmbH, Bottrop, Germany  
Weir Specialty Pumps, Salt Lake City, UT

### Pumps, sump

BJM Pumps, LLC, Old Saybrook, CT  
Flowsolve Corp., Irving, TX

**GORMAN-RUPP CO.**, 600 S. Airport Rd., Mansfield, OH 44903 (419-755-1011; FAX: 419-755-1251; e-mail: [gr-sales@gormanrupp.com](mailto:gr-sales@gormanrupp.com); web site: [www.GRpumps.com](http://www.GRpumps.com))

Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA

NETZSCH Pumpen & Systeme GmbH, Waldkraiburg, Germany

### Pumps, vertical centrifugal

Flowsolve Corp., Irving, TX  
FLUX-GERAETE GMBH, Maulbronn, Germany  
Friatec AG Division Rheinhuette Pumpen, Wiesbaden, Germany

GRI Pumps, Bellville, OH

Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA

Weir Specialty Pumps, Salt Lake City, UT

### Pumps, vertical inline

Boerger Pumps, Chanhassen, MN  
Greene, Tweed & Co. Ltd., Nottingham, Notts  
National Pump Company, Glendale, AZ  
seepex Inc., Enon, OH

### Pumps, vertical turbine

National Pump Company, Glendale, AZ

## SEALS, GASKETS & PACKING MATERIALS

### Gaskets, fluoroplastic

Proco Products, Inc., Stockton, CA

### Gaskets, molded

Apple Rubber Products, Lancaster, NY  
Topog-E Gasket Co., Tulsa, OK

### Gaskets, O-ring

Apple Rubber Products, Lancaster, NY

### Gaskets, ring

Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany

### Gaskets, rubber

Apple Rubber Products, Lancaster, NY  
Proco Products, Inc., Stockton, CA  
Topog-E Gasket Co., Tulsa, OK

### Gaskets, sheet

Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany  
Topog-E Gasket Co., Tulsa, OK

### Gaskets, silicone

Apple Rubber Products, Lancaster, NY  
Dymax Corp., Torrington, CT

## Mechanical Seals and Sealing Material

Scenic Precise Element Inc., Kaohsiung City, Taiwan

### Packings, carbon

HOERBIGER Kompressortechnik Holding GmbH, Vienna, Austria

### Packings, molded

Compressor Products International, Stafford, TX

### Packings, plastic

HOERBIGER Kompressortechnik Holding GmbH, Vienna, Austria

### Packings, pump

Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany  
ZCL Dualam, Inc., Edmonton, Alberta, Canada

### Packings, ring

Compressor Products International, Stafford, TX  
HOERBIGER Kompressortechnik Holding GmbH, Vienna, Austria

### Packings, shaft

Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany

### Packings, structured

Sulzer Chemtech USA, Inc., Tulsa, OK

### Packings, valve stem

Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany

### Seals, balanced pressure

Scenic Precise Element Inc., Kaohsiung City, Taiwan

### Seals, bearing

AEgis Bearing Protection Rings, Mechanic Falls, ME  
Greene, Tweed & Co., Kulpville, PA  
Greene, Tweed & Co. Ltd., Nottingham, Notts  
Scenic Precise Element Inc., Kaohsiung City, Taiwan

### Seals, bellows

Scenic Precise Element Inc., Kaohsiung City, Taiwan

### Seals, diaphragm

WIKa Instrument, LP, Lawrenceville, GA

### Seals, mechanical

Compressor Products International, Stafford, TX  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: [info@ekato.com](mailto:info@ekato.com); web site: [www.ekato.com](http://www.ekato.com))**

See our ad on page 147

Scenic Precise Element Inc., Kaohsiung City, Taiwan

### Seals, noncontacting

Scenic Precise Element Inc., Kaohsiung City, Taiwan

## Seals, shaft

Dresser-Rand, Corporate Headquarters, Houston, TX  
Greene, Tweed & Co., Kulpville, PA  
Greene, Tweed & Co. Ltd., Nottingham, Notts  
Scenic Precise Element Inc., Kaohsiung City, Taiwan

## Seals, spring

Greene, Tweed & Co., Kulpville, PA  
Greene, Tweed & Co. Ltd., Nottingham, Notts

## STEAM TRAPS

### Steam traps, disc

Armstrong International, Three Rivers, MI  
**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: [www.tlv.com](http://www.tlv.com))**  
See our ad on page 100

### Steam traps, float

Armstrong International, Three Rivers, MI  
**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: [www.tlv.com](http://www.tlv.com))**  
See our ad on page 100

### Steam traps, float & thermostatic

Armstrong International, Three Rivers, MI  
**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: [www.tlv.com](http://www.tlv.com))**  
See our ad on page 100

### Steam traps, inverted bucket

Armstrong International, Three Rivers, MI  
**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: [www.tlv.com](http://www.tlv.com))**  
See our ad on page 100

### Steam traps, orifice devices

CU Services LLC, Elk Grove Village, IL

### Steam traps, thermostatic

Armstrong International, Three Rivers, MI  
**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: [www.tlv.com](http://www.tlv.com))**  
See our ad on page 100

## TANKS & OTHER LIQUID STORAGE VESSELS

### Bulk liquid storage services

Chattanooga Boiler and Tank Co., Chattanooga, TN  
Gilbert Industries, Sparta, MO  
TankLink, a wholly-owned subsidiary of Telular Corporation, Chicago, IL

### Tank fittings & accessories

Assmann Corp. of America, Garrett, IN  
BS & B Safety Systems, Inc., Tulsa, OK  
Fisher Tank Co., Chester, PA  
ZCL Dualam, Inc., Edmonton, Alberta, Canada

### Tanks, air

Advance Boiler & Tank Co., West Allis, WI  
Team Industries, Inc., Kaukauna, WI  
Universal Tank & Fabrication, Dubuque, IA

### Tanks, aluminum

Chattanooga Boiler and Tank Co., Chattanooga, TN

### Tanks, bladder

Nier Systems Inc., Boca Raton, Florida  
Universal Tank & Fabrication, Dubuque, IA

### Tanks, carbon steel

Advance Boiler & Tank Co., West Allis, WI  
Bascale Company, Inc., Houston, TX  
Charles Ross & Son Co., Hauppauge, NY  
Chattanooga Boiler and Tank Co., Chattanooga, TN  
Fisher Tank Co., Chester, PA  
Gilbert Industries, Sparta, MO  
Hoover Container Solutions, Houston, TX  
Metano IBC Services, Inc., Perrineville, NJ  
Midwest Steel Company Inc., Houston, Texas  
Niles Steel Tank, Ambler, PA  
Team Industries, Inc., Kaukauna, WI  
Universal Tank & Fabrication, Dubuque, IA  
Willbros Tank Company, Channelview, TX

## Tanks, cryogenic

Gilbert Industries, Sparta, MO  
Linde AG, Engineering Division, Pullach, Germany  
Pope Scientific, Inc., Saukville, WI  
SIAD Macchine Impianti, Bergamo, Italy

## Tanks, cryogenic, vacuum jacketed

Charles Ross & Son Co., Hauppauge, NY  
Meyer Tool & Mfg., Inc., oaklawn, IL  
Pope Scientific, Inc., Saukville, WI  
SIAD Macchine Impianti, Bergamo, Italy

## Tanks, custom fabricated

Advance Boiler & Tank Co., West Allis, WI  
Assmann Corp. of America, Garrett, IN  
Bascale Company, Inc., Houston, TX  
Charles Ross & Son Co., Hauppauge, NY  
Chattanooga Boiler and Tank Co., Chattanooga, TN  
Dual/HEE, a CECO Environmental Company, Owosso, MI  
Fisher Tank Co., Chester, PA  
Gilbert Industries, Sparta, MO  
INOX-TECH INC., Ste. Catherine, Canada  
Niles Steel Tank, Ambler, PA  
Pope Scientific, Inc., Saukville, WI  
Team Industries, Inc., Kaukauna, WI  
Universal Tank & Fabrication, Dubuque, IA  
Willbros Tank Company, Channelview, TX  
ZCL Dualam, Inc., Edmonton, Alberta, Canada

## Tanks, dimple jacketed

Charles Ross & Son Co., Hauppauge, NY  
Chattanooga Boiler and Tank Co., Chattanooga, TN  
Pope Scientific, Inc., Saukville, WI  
Team Industries, Inc., Kaukauna, WI

## Tanks, dome roof

Dual/HEE, a CECO Environmental Company, Owosso, MI  
Fisher Tank Co., Chester, PA  
Willbros Tank Company, Channelview, TX

## Tanks, double containment

Assmann Corp. of America, Garrett, IN  
Chattanooga Boiler and Tank Co., Chattanooga, TN  
Fisher Tank Co., Chester, PA  
Team Industries, Inc., Kaukauna, WI  
Universal Tank & Fabrication, Dubuque, IA  
Willbros Tank Company, Channelview, TX

## Tanks, epoxy-fiberglass

Topp Industries, Inc., Rochester, IN

## Tanks, epoxy lined

Advance Boiler & Tank Co., West Allis, WI  
Chattanooga Boiler and Tank Co., Chattanooga, TN  
Dudick Inc., Streetsboro, OH  
Universal Tank & Fabrication, Dubuque, IA

## Tanks, field-erected

Assmann Corp. of America, Garrett, IN  
Fisher Tank Co., Chester, PA  
Gilbert Industries, Sparta, MO  
INOX-TECH INC., Ste. Catherine, Canada  
Topp Industries, Inc., Rochester, IN  
Willbros Tank Company, Channelview, TX

## Tanks, floating roof

Fisher Tank Co., Chester, PA

## Tanks, galvanized

Hoover Container Solutions, Houston, TX  
Willbros Tank Company, Channelview, TX

## Tanks, glass lined

EquipNet, Inc., Canton, MA  
Glasslined Technology, Inc., Greensboro, Georgia  
Niles Steel Tank, Ambler, PA  
Willbros Tank Company, Channelview, TX

## Tanks, heated

Assmann Corp. of America, Garrett, IN  
INOX-TECH INC., Ste. Catherine, Canada  
Klopper-Therm GmbH & Co. KG, Dortmund, Germany  
Pope Scientific, Inc., Saukville, WI  
Willbros Tank Company, Channelview, TX

## Tanks, internal floating deck

Willbros Tank Company, Channelview, TX

## Tanks, mixing

Assmann Corp. of America, Garrett, IN  
Bascale Company, Inc., Houston, TX  
Charles Ross & Son Co., Hauppauge, NY  
Chattanooga Boiler and Tank Co., Chattanooga, TN  
EquipNet, Inc., Canton, MA  
Gilbert Industries, Sparta, MO  
Hoover Container Solutions, Houston, TX

LOTUS MIXERS INC., North Venice, FL  
Metano IBC Services, Inc., Perrineville, NJ  
Pope Scientific, Inc., Saukville, WI

## Tanks, nickel or nickel alloys

Chattanooga Boiler and Tank Co., Chattanooga, TN  
Team Industries, Inc., Kaukauna, WI  
United Performance Metals, Houston, TX  
Willbros Tank Company, Channelview, TX

## Tanks, other

Fisher Tank Co., Chester, PA

## Tanks, phenolic lined

Advance Boiler & Tank Co., West Allis, WI  
Chattanooga Boiler and Tank Co., Chattanooga, TN

## Tanks, polyester-fiberglass

ZCL Dualam, Inc., Edmonton, Alberta, Canada

## Tanks, polyethylene

Assmann Corp. of America, Garrett, IN  
DELTA COOLING TOWERS INC., 185 US Highway 206,  
Roxbury Township, NJ 07836 (973-586-2201; FAX: 973-  
586-2243; e-mail: info@deltacooling.com; web site: www.  
deltacooling.com)

Hoover Container Solutions, Houston, TX  
Metano IBC Services, Inc., Perrineville, NJ  
Nier Systems Inc, Boca Raton, Florida

## Tanks, polypropylene

Dual/HEE, a CECO Environmental Company, Owosso, MI  
Nier Systems Inc, Boca Raton, Florida  
Singleton Corp., Cleveland, OH

## Tanks, pressurized storage

Advance Boiler & Tank Co., West Allis, WI  
Charles Ross & Son Co., Hauppauge, NY  
Chattanooga Boiler and Tank Co., Chattanooga, TN  
Gilbert Industries, Sparta, MO  
Meyer Tool & Mfg., Inc., oaklawn, IL  
Pope Scientific, Inc., Saukville, WI  
Universal Tank & Fabrication, Dubuque, IA

## Tanks, PVC

Dual/HEE, a CECO Environmental Company, Owosso, MI

## Tanks, rubber lined

Advance Boiler & Tank Co., West Allis, WI  
Chattanooga Boiler and Tank Co., Chattanooga, TN  
Universal Tank & Fabrication, Dubuque, IA

## Tanks, stainless steel

Aaron Process Equipment Co., Bensenville, IL  
Advance Boiler & Tank Co., West Allis, WI  
Bascale Company, Inc., Houston, TX  
Charles Ross & Son Co., Hauppauge, NY  
Chattanooga Boiler and Tank Co., Chattanooga, TN  
Enerquip, LLC, Medford, WI  
Fisher Tank Co., Chester, PA  
Gilbert Industries, Sparta, MO  
Hoover Container Solutions, Houston, TX  
Metano IBC Services, Inc., Perrineville, NJ  
Midwest Steel Company Inc, Houston, Texas  
**MUELLER GMBH, P.O. Box 1409, Rheinfelden, Germany  
79604 (+49-76-23-9690; FAX: +49-7623-96969; e-mail:  
info@mueller-gmbh.com; web site: www.mueller-  
gmbh.com)**

Niles Steel Tank, Ambler, PA  
Pope Scientific, Inc., Saukville, WI  
Team Industries, Inc., Kaukauna, WI  
United Performance Metals, Houston, TX  
Universal Tank & Fabrication, Dubuque, IA

## Tanks, stainless steel, lined

Chattanooga Boiler and Tank Co., Chattanooga, TN  
Pope Scientific, Inc., Saukville, WI  
Team Industries, Inc., Kaukauna, WI

## Tanks, tapered wall

Charles Ross & Son Co., Hauppauge, NY

## Tanks, vinyl ester - fiberglass

Topp Industries, Inc., Rochester, IN

## Tanks, water

Assmann Corp. of America, Garrett, IN  
Bascale Company, Inc., Houston, TX  
**DELTA COOLING TOWERS INC., 185 US Highway 206,  
Roxbury Township, NJ 07836 (973-586-2201; FAX:  
973-586-2243; e-mail: info@deltacooling.com; web  
site: www.deltacooling.com)**  
Fisher Tank Co., Chester, PA  
Nier Systems Inc, Boca Raton, Florida  
Universal Tank & Fabrication, Dubuque, IA

## TUBING & TUBE FITTINGS, METALLIC & NONMETALLIC

### Coils, tubing

Arch City Steel, Fenton, Missouri  
Qosina, Edgewood, NY

### Tube fittings

CPI Wirecloth & Screens Inc, Pearland, TX  
Dockweiler AG, Neustadt-Glewe, Germany  
Fluid Line Products Inc., Willoughby, OH  
Fr. Jacob Soehne GmbH & Co. KG, Porta Westfalica, NRW,  
Germany  
NewAge Industries, Inc., Southampton, PA  
Qosina, Edgewood, NY  
Swagelok Co., Solon, OH  
**USA INDUSTRIES, INC., 302 State Street, S. Houston,  
TX 77587 (800-456-8721; 713-941-3797; FAX: 713-  
941-1086; e-mail: info@usaindustries.com; web site:  
www.usaindustries.com)**  
Viega, Wichita, Kansas

### Tube sheets

Arch City Steel, Fenton, Missouri  
United Performance Metals, Houston, TX

### Tubing, boiler

**SANDVIK MATERIALS TECHNOLOGY, TUBULAR  
PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-  
755-8823; 570-585-7500; FAX: 570-585-7642; web  
site: www.smt.sandvik.com)**  
See our ad on page 67

### Tubing, condenser

Hudson Products Corp., Houston, TX  
**SANDVIK MATERIALS TECHNOLOGY, TUBULAR  
PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-  
755-8823; 570-585-7500; FAX: 570-585-7642; web  
site: www.smt.sandvik.com)**  
See our ad on page 67

### Tubing, evaporator

**SANDVIK MATERIALS TECHNOLOGY, TUBULAR  
PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-  
755-8823; 570-585-7500; FAX: 570-585-7642; web  
site: www.smt.sandvik.com)**  
See our ad on page 67

### Tubing, ferrous

**SANDVIK MATERIALS TECHNOLOGY, TUBULAR  
PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-  
755-8823; 570-585-7500; FAX: 570-585-7642; web  
site: www.smt.sandvik.com)**  
See our ad on page 67

### Tubing, finned

**FIN TUBE PRODUCTS, INC., 188 S Lyman St., Suite  
100, Wadsworth, OH 44281 (800-334-3736; 330-334-  
3736; FAX: 330-334-3848; e-mail: mb@fintube.com;  
web site: www.fintube.com)**  
Hudson Products Corp., Houston, TX

### Tubing, flexible metal

Hyspan Precision Prod. Inc., Chula Vista, CA

### Tubing, heat exchanger

**FIN TUBE PRODUCTS, INC., 188 S Lyman St., Suite  
100, Wadsworth, OH 44281 (800-334-3736; 330-334-  
3736; FAX: 330-334-3848; e-mail: mb@fintube.com;  
web site: www.fintube.com)**  
Hudson Products Corp., Houston, TX  
Klopper-Therm GmbH & Co. KG, Dortmund, Germany  
Saint-Gobain Ceramics/Structural Ceramics, Niagara Falls,  
NY

**SANDVIK MATERIALS TECHNOLOGY, TUBULAR  
PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-  
755-8823; 570-585-7500; FAX: 570-585-7642; web  
site: www.smt.sandvik.com)**  
See our ad on page 67

### Tubing, high pressure

**SANDVIK MATERIALS TECHNOLOGY, TUBULAR  
PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-  
755-8823; 570-585-7500; FAX: 570-585-7642; web  
site: www.smt.sandvik.com)**  
See our ad on page 67

### Tubing, high temperature

NewAge Industries, Inc., Southampton, PA  
Regal Industries, Inc., Painesville, OH

### Tubing, instrument

Arch City Steel, Fenton, Missouri

**SANDVIK MATERIALS TECHNOLOGY, TUBULAR PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-755-8823; 570-585-7500; FAX: 570-585-7642; web site: [www.smt.sandvik.com](http://www.smt.sandvik.com))**  
See our ad on page 67

## Tubing, nonmetallic

Creative Pulltrusions, Inc., Alum Bank, PA  
**SAINT-GOBAIN CERAMICS/STRUCTURAL CERAMICS, 23 Acheson Dr., Niagara Falls, NY 14303 (716-278-6233; FAX: 716-278-2373; e-mail: [scd.sales@saint-gobain.com](mailto:scd.sales@saint-gobain.com); web site: [www.hexoloy.com](http://www.hexoloy.com))**  
See our ad on page 158

## Tubing, plastic

Associated Bag Company, Milwaukee, WI  
NewAge Industries, Inc., Southampton, PA  
Qosina, Edgewood, NY

## Tubing, pneumatic

**SANDVIK MATERIALS TECHNOLOGY, TUBULAR PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-755-8823; 570-585-7500; FAX: 570-585-7642; web site: [www.smt.sandvik.com](http://www.smt.sandvik.com))**  
See our ad on page 67

## Tubing, refractory

Saint-Gobain Ceramics/Structural Ceramics, Niagara Falls, NY

## Tubing, rubber

NewAge Industries, Inc., Southampton, PA

## Tubing, seamless

Arch City Steel, Fenton, Missouri  
Dockweiler AG, Neustadt-Glewe, Germany  
**SANDVIK MATERIALS TECHNOLOGY, TUBULAR PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-755-8823; 570-585-7500; FAX: 570-585-7642; web site: [www.smt.sandvik.com](http://www.smt.sandvik.com))**  
See our ad on page 67

TW Metals, Exton, PA

## Tubing, silicone

NewAge Industries, Inc., Southampton, PA  
Qosina, Edgewood, NY

## Tubing, vacuum

Escitec, Mesa, AZ

## Tubing, welded

Arch City Steel, Fenton, Missouri  
Dockweiler AG, Neustadt-Glewe, Germany  
Fr. Jacob Soehne GmbH & Co. KG, Porta Westfalica, NRW, Germany  
TW Metals, Exton, PA

## U-bends, tube

Fr. Jacob Soehne GmbH & Co. KG, Porta Westfalica, NRW, Germany

## VALVES

### Valve-locking devices

Apollo Valves, Matthews, North Carolina  
Conbraco Industries, Inc., Matthews, NC

### Valve parts & fittings

Badger Meter, Inc., Tulsa, OK  
Dueker GmbH & Co. KGaA, Laufach, Germany  
Emerson Process Management, Austin, TX  
Flowsolve Corp., Irving, TX  
HOERBIGER Kompressorstechnik Holding GmbH, Vienna, Austria  
PBM Valves Inc., Irwin, PA

### Valves, air

Apollo Valves, Matthews, North Carolina  
Conbraco Industries, Inc., Matthews, NC  
Magnatrol Valve Corp., Hawthorne, NJ  
Parker Hannifin Corp., Parker Fluid Control Division, New Britain, CT  
SAMSON Controls, Inc., Baytown, TX

### Valves, airlock flap-gate

GEA Process Engineering, Columbia, MD  
Roto-Disc, Erlanger, KY

### Valves, airlock rotary

AIRLANCO, 312 S. Highway 73, PO Box 398, Falls City, NE 68355-0398 (800-500-9777; 402-245-2325; FAX: 402-245-5196; e-mail: [sales@airlanco.com](mailto:sales@airlanco.com); web site: [www.airlanco.com](http://www.airlanco.com))

Buhler Inc., Minneapolis, MN  
Coperion GmbH, Weingarten, Wuertt., Germany  
GEA Process Engineering, Columbia, MD

**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: [sales@nol-tec.com](mailto:sales@nol-tec.com); web site: [www.nol-tec.com](http://www.nol-tec.com))**  
Prater-Sterling, Bollingbrook, IL

### Valves, angle

ARCA Regler GmbH, Toenisvorst, Germany  
Badger Meter, Inc., Tulsa, OK  
Buerkert Fluid Control Systems, Ingelfingen  
Burkert Fluid Control Systems, Charlotte, NC  
Buschjost GmbH, Bad Oeynhausen, Germany  
Cashco, Inc., Ellsworth, KS  
Emerson Process Management, Austin, TX  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))**  
OHL Gutermuth Industrial Valves GmbH, Altenstadt, Germany  
Parker Hannifin Corp., Parker Fluid Control Division, New Britain, CT  
SAMSON Controls, Inc., Baytown, TX

### Valves, backflow

Apollo Valves, Matthews, North Carolina  
Conbraco Industries, Inc., Matthews, NC

### Valves, ball

AA S&K AUTOMATION, Valves, Automated Valves and Control Valves, Plymouth, MN  
Apollo Valves, Matthews, North Carolina  
Conbraco Industries, Inc., Matthews, NC  
EDWARDS US HEADQUARTERS, Sanborn, NY  
Emerson Process Management, Austin, TX  
Ernst Flow Industries, Farmingdale, NJ  
Flodyne Controls Inc., Murray Hill, NJ  
Flowsolve Corp., Flow Control Div., Cookeville, TN  
Flowsolve Corp., Irving, TX  
Fluid Line Products Inc., Willoughby, OH  
Forum - Valve Solutions, Stafford, TX  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))**  
ITT, Engineered Valves, Lancaster, PA  
Lumaco Sanitary Valves, Hackensack, NJ  
PBM Valves Inc., Irwin, PA  
Richter Chemie-Technik GmbH, Kempen, Germany  
SAMSON Controls, Inc., Baytown, TX  
Swagelok Co., Solon, OH  
Viega, Wichita, Kansas  
Wolsey Industrial Group, Newport News, VA

### Valves, bellows sealed

ARCA Regler GmbH, Toenisvorst, Germany  
BIAR Sampling Systems, Gonzales, LA  
Cashco, Inc., Ellsworth, KS  
**CONVAL, INC., 265 Field Rd., Somers, CT 06071 (860-749-0761; FAX: 860-763-3557; e-mail: [mhendrick@conval.com](mailto:mhendrick@conval.com); web site: [www.conval.com](http://www.conval.com))**  
Richter Chemie-Technik GmbH, Kempen, Germany  
SAMSON Controls, Inc., Baytown, TX  
Steri Technologies Inc., Bohemia, NY

### Valves, butterfly

AA S&K AUTOMATION, Valves, Automated Valves and Control Valves, Plymouth, MN  
Apollo Valves, Matthews, North Carolina  
Cashco, Inc., Ellsworth, KS  
Conbraco Industries, Inc., Matthews, NC  
EDWARDS US HEADQUARTERS, Sanborn, NY  
Emerson Process Management, Austin, TX  
Flowsolve Corp., Flow Control Div., Cookeville, TN  
Flowsolve Corp., Irving, TX  
Forum - Valve Solutions, Stafford, TX  
Henderson Industrial Specialties, Waterdown, Ontario, Canada  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))**  
ITT, Engineered Valves, Lancaster, PA  
Lumaco Sanitary Valves, Hackensack, NJ  
Met-Pro Global Pump Solutions, a CECCO Environmental Company, Telford, PA  
M. O. Industries, Whippany, NJ  
**MUELLER GMBH, P.O. Box 1409, Rheinfelden, Germany 79604 (+49-76-23-9690; FAX: +49-7623-96969; e-mail: [info@mueller-gmbh.com](mailto:info@mueller-gmbh.com); web site: [www.mueller-gmbh.com](http://www.mueller-gmbh.com))**  
OHL Gutermuth Industrial Valves GmbH, Altenstadt, Germany  
Posi-flate, St. Paul, MN  
Richter Chemie-Technik GmbH, Kempen, Germany  
SAMSON Controls, Inc., Baytown, TX  
UNIBLOC-PUMP, Inc., Flowtech Div., Marietta, GA  
Wolsey Industrial Group, Newport News, VA

### Valves, cage

Cashco, Inc., Ellsworth, KS

Emerson Process Management, Austin, TX  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))**

### Valves, ceramic lined

Flowsolve Corp., Irving, TX  
SAMSON Controls, Inc., Baytown, TX

### Valves, check

**CONVAL, INC., 265 Field Rd., Somers, CT 06071 (860-749-0761; FAX: 860-763-3557; e-mail: [mhendrick@conval.com](mailto:mhendrick@conval.com); web site: [www.conval.com](http://www.conval.com))**  
CPI Wirecloth & Screens Inc., Pearland, TX  
Flowsolve Corp., Irving, TX  
Fluid Line Products Inc., Willoughby, OH  
Forum - Valve Solutions, Stafford, TX  
GRI Pumps, Bellville, OH  
Henderson Industrial Specialties, Waterdown, Ontario, Canada  
HOERBIGER Kompressorstechnik Holding GmbH, Vienna, Austria  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))**  
ITT, Engineered Valves, Lancaster, PA  
**KRAISSL CO. INC., 299 Williams Ave., Hackensack, NJ 07601-5225 (800-572-4775; 201-342-0008; FAX: 201-342-0025; e-mail: [kraissl@aol.com](mailto:kraissl@aol.com); web site: [www.strainers.com](http://www.strainers.com))**  
Lumaco Sanitary Valves, Hackensack, NJ  
Qosina, Edgewood, NY  
Schutte & Koerling, Treviso, PA  
**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: [www.tlv.com](http://www.tlv.com))**  
See our ad on page 100

UNIBLOC-PUMP, Inc., Flowtech Div., Marietta, GA  
Wolsey Industrial Group, Newport News, VA

### Valves, control, electric

AA S&K AUTOMATION, Valves, Automated Valves and Control Valves, Plymouth, MN  
Auma Actuators Inc., Cannonsburg, PA  
AUMA Riester GmbH & Co. KG, Muellheim, Germany  
Badger Meter, Inc., Tulsa, OK  
Buschjost GmbH, Bad Oeynhausen, Germany  
Cashco, Inc., Ellsworth, KS  
Flowsolve Corp., Irving, TX  
Henderson Industrial Specialties, Waterdown, Ontario, Canada  
Magnatrol Valve Corp., Hawthorne, NJ  
RF Valves, Inc., Hanover, MD  
SAMSON Controls, Inc., Baytown, TX

### Valves, control, hydraulic

Parker Hannifin Corp., Parker Fluid Control Division, New Britain, CT  
RF Valves, Inc., Hanover, MD  
SAMSON Controls, Inc., Baytown, TX

### Valves, control, pneumatic

AA S&K AUTOMATION, Valves, Automated Valves and Control Valves, Plymouth, MN  
ARCA Regler GmbH, Toenisvorst, Germany  
Armstrong International, Three Rivers, MI  
Badger Meter, Inc., Tulsa, OK  
Badger Meter, Inc., Milwaukee, WI  
Buerkert Fluid Control Systems, Ingelfingen  
Burkert Fluid Control Systems, Charlotte, NC  
Cashco, Inc., Ellsworth, KS  
Emerson Process Management, Austin, TX  
Flowrox Oy, Lappeenranta, Finland  
Flowsolve Corp., Irving, TX  
Henderson Industrial Specialties, Waterdown, Ontario, Canada  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))**  
LA-MAN Corp., Mazaepa, MN  
Parker Hannifin Corp., Parker Fluid Control Division, New Britain, CT  
Posi-flate, St. Paul, MN  
RF Valves, Inc., Hanover, MD  
Roto-Disc, Erlanger, KY  
SAMSON Controls, Inc., Baytown, TX  
Wolsey Industrial Group, Newport News, VA

### Valves, control, regulator

Cashco, Inc., Ellsworth, KS  
CPI Wirecloth & Screens Inc., Pearland, TX  
Emerson Process Management, Austin, TX  
Flowsolve Corp., Irving, TX  
SAMSON Controls, Inc., Baytown, TX



**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: [www.tlv.com](http://www.tlv.com))

See our ad on page 100

## Valves, control, solenoid

Buerkert Fluid Control Systems, Ingelfingen  
Burkert Fluid Control Systems, Charlotte, NC  
Buschjost GmbH, Bad Oeynhausen, Germany  
Flowsolve Corp., Irving, TX  
Magnatrol Valve Corp., Hawthorne, NJ  
Parker Hannifin Corp., Parker Fluid Control Division, New Britain, CT  
SAMSON Controls, Inc., Baytown, TX

## Valves, cryogenic

Badger Meter Europa GmbH, Neuffen, Germany  
Badger Meter, Inc., Milwaukee, WI  
Cashco, Inc., Ellsworth, KS

**CONVAL, INC.**, 265 Field Rd., Somers, CT 06071 (860-749-0761; FAX: 860-763-3557; e-mail: [mhendrick@conval.com](mailto:mhendrick@conval.com); web site: [www.conval.com](http://www.conval.com))

Floodyne Controls Inc., Murray Hill, NJ  
Flowsolve Corp., Irving, TX  
Forum - Valve Solutions, Stafford, TX  
Magnatrol Valve Corp., Hawthorne, NJ  
SAMSON Controls, Inc., Baytown, TX

## Valves, diaphragm

Buerkert Fluid Control Systems, Ingelfingen  
Burkert Fluid Control Systems, Charlotte, NC  
Buschjost GmbH, Bad Oeynhausen, Germany  
Emerson Process Management, Austin, TX  
Georg Fischer Piping Systems Ltd., Schaffhausen, Switzerland

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))

ITT, Engineered Valves, Lancaster, PA  
Kemutec Group, Inc., Bristol, PA  
Midwesco Filter Resources, Inc., Winchester, VA  
RF Valves, Inc., Hanover, MD  
Richter Chemie-Technik GmbH, Kempen, Germany  
SAMSON Controls, Inc., Baytown, TX

## Valves, diverter

AA S&K AUTOMATION, Valves, Automated Valves and Control Valves, Plymouth, MN  
ARCA Regler GmbH, Toenisvorst, Germany  
Bascale Company, Inc., Houston, TX  
Emerson Process Management, Austin, TX  
Floodyne Controls Inc., Murray Hill, NJ  
Flowsolve Corp., Irving, TX  
GEA Process Engineering, Columbia, MD  
JLS International, Inc., Charlotte, NC  
Lumaco Sanitary Valves, Hackensack, NJ

**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: [sales@nol-tec.com](mailto:sales@nol-tec.com); web site: [www.nol-tec.com](http://www.nol-tec.com))

OHL Gutermuth Industrial Valves GmbH, Altenstadt, Germany  
PSG Dover Europe GmbH, Oberglatt / ZH, Switzerland  
RF Valves, Inc., Hanover, MD  
Roto-Disc, Erlanger, KY  
SAMSON Controls, Inc., Baytown, TX  
Vortex, Salina, KS

## Valves, double block & bleed

Flowsolve Corp., Irving, TX  
OHL Gutermuth Industrial Valves GmbH, Altenstadt, Germany

SAMSON Controls, Inc., Baytown, TX

Swagelok Co., Solon, OH

**USA INDUSTRIES, INC.**, 302 State Street, S. Houston, TX 77587 (800-456-8721; 713-941-3797; FAX: 713-941-1086; e-mail: [info@usaindustries.com](mailto:info@usaindustries.com); web site: [www.usaindustries.com](http://www.usaindustries.com))

Wolseley Industrial Group, Newport News, VA

## Valves, electrically heated

Kloepper-Therm GmbH & Co. KG, Dortmund, Germany

## Valves, flush-bottom tank

Dueker GmbH & Co. KGaA, Laufach, Germany  
Flowsolve Corp., Irving, TX  
JLS International, Inc., Charlotte, NC  
PBM Valves Inc., Irwin, PA

## Valves, gate

Bascale Company, Inc., Houston, TX  
**CONVAL, INC.**, 265 Field Rd., Somers, CT 06071 (860-749-0761; FAX: 860-763-3557; e-mail: [mhendrick@conval.com](mailto:mhendrick@conval.com); web site: [www.conval.com](http://www.conval.com))

Coperion GmbH, Weingarten, Wuertt., Germany  
Flowsolve Corp., Raleigh, North Carolina  
Forum - Valve Solutions, Stafford, TX  
GEA Process Engineering, Columbia, MD

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))

Vortex, Salina, KS  
Wolseley Industrial Group, Newport News, VA

## Valves, glass

De Dietrich Process Systems GmbH, Mainz, Germany  
**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))

## Valves, glass lined

Dueker GmbH & Co. KGaA, Laufach, Germany  
Glasslined Technology, Inc., Greensboro, Georgia  
ITT, Engineered Valves, Lancaster, PA

## Valves, globe

AA S&K AUTOMATION, Valves, Automated Valves and Control Valves, Plymouth, MN  
ARCA Regler GmbH, Toenisvorst, Germany  
Cashco, Inc., Ellsworth, KS

**CONVAL, INC.**, 265 Field Rd., Somers, CT 06071 (860-749-0761; FAX: 860-763-3557; e-mail: [mhendrick@conval.com](mailto:mhendrick@conval.com); web site: [www.conval.com](http://www.conval.com))

Emerson Process Management, Austin, TX  
Flowsolve Corp., Raleigh, North Carolina  
**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))

Magnatrol Valve Corp., Hawthorne, NJ  
SAMSON Controls, Inc., Baytown, TX

## Valves, heat actuated, fail safe

OHL Gutermuth Industrial Valves GmbH, Altenstadt, Germany

## Valves, high pressure

ARCA Regler GmbH, Toenisvorst, Germany  
Badger Meter Europa GmbH, Neuffen, Germany  
Badger Meter, Inc., Tulsa, OK  
Badger Meter, Inc., Milwaukee, WI  
**CONVAL, INC.**, 265 Field Rd., Somers, CT 06071 (860-749-0761; FAX: 860-763-3557; e-mail: [mhendrick@conval.com](mailto:mhendrick@conval.com); web site: [www.conval.com](http://www.conval.com))  
Coperion GmbH, Weingarten, Wuertt., Germany  
CPI Wirecloth & Screens Inc., Pearland, TX  
Emerson Process Management, Austin, TX  
**FIKE**, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: [industrialprotection@fike.com](mailto:industrialprotection@fike.com); web site: [www.fike.com](http://www.fike.com))

Floodyne Controls Inc., Murray Hill, NJ  
Flowsolve Corp., Irving, TX  
Fluid Line Products Inc., Willoughby, OH  
Forum - Valve Solutions, Stafford, TX  
HOERBIGER Kompressortechnik Holding GmbH, Vienna, Austria

JLS International, Inc., Charlotte, NC  
Nordson SEALANT EQUIPMENT, Plymouth, MI

Posi-plate, St. Paul, MN

RF Valves, Inc., Hanover, MD

Roto-Disc, Erlanger, KY

SAMSON Controls, Inc., Baytown, TX

Schutte & Koerting, Treviso, PA

Santry Equipment Corp., Oconomowoc, WI

Swagelok Co., Solon, OH

**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: [www.tlv.com](http://www.tlv.com))

See our ad on page 100

Vortex, Salina, KS

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: [info@wabashpower.com](mailto:info@wabashpower.com); web site: [www.wabashpower.com](http://www.wabashpower.com))

## Valves, high temperature

ARCA Regler GmbH, Toenisvorst, Germany  
Badger Meter, Inc., Tulsa, OK  
Buschjost GmbH, Bad Oeynhausen, Germany  
**CONVAL, INC.**, 265 Field Rd., Somers, CT 06071 (860-749-0761; FAX: 860-763-3557; e-mail: [mhendrick@conval.com](mailto:mhendrick@conval.com); web site: [www.conval.com](http://www.conval.com))  
Emerson Process Management, Austin, TX  
Flowsolve Corp., Irving, TX  
Forum - Valve Solutions, Stafford, TX  
HOERBIGER Kompressortechnik Holding GmbH, Vienna, Austria

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))

JLS International, Inc., Charlotte, NC  
Parker Hannifin Corp., Parker Fluid Control Division, New Britain, CT

Roto-Disc, Erlanger, KY  
SAMSON Controls, Inc., Baytown, TX  
Swagelok Co., Solon, OH

**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: [www.tlv.com](http://www.tlv.com))

See our ad on page 100

Vortex, Salina, KS

## Valves, hopper

Bascale Company, Inc., Houston, TX  
Posi-plate, St. Paul, MN  
RF Valves, Inc., Hanover, MD  
Roto-Disc, Erlanger, KY

## Valves, iris

Kemutec Group, Inc., Bristol, PA  
Vortex, Salina, KS

## Valves, jacketed

Apollo Valves, Matthews, North Carolina  
Conbraco Industries, Inc., Matthews, NC  
Flowsolve Corp., Irving, TX  
JLS International, Inc., Charlotte, NC  
OHL Gutermuth Industrial Valves GmbH, Altenstadt, Germany

Roto-Disc, Erlanger, KY  
SAMSON Controls, Inc., Baytown, TX

## Valves, knife-gate

Bascale Company, Inc., Houston, TX  
ITT, Engineered Valves, Lancaster, PA  
Vortex, Salina, KS

## Valves, metal seated

Cashco, Inc., Ellsworth, KS  
**CONVAL, INC.**, 265 Field Rd., Somers, CT 06071 (860-749-0761; FAX: 860-763-3557; e-mail: [mhendrick@conval.com](mailto:mhendrick@conval.com); web site: [www.conval.com](http://www.conval.com))

Flowsolve Corp., Flow Control Div., Cookeville, TN

Flowsolve Corp., Irving, TX

Forum - Valve Solutions, Stafford, TX

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))

JLS International, Inc., Charlotte, NC  
OHL Gutermuth Industrial Valves GmbH, Altenstadt, Germany

Posi-plate, St. Paul, MN

Roto-Disc, Erlanger, KY

SAMSON Controls, Inc., Baytown, TX

Wolseley Industrial Group, Newport News, VA

## Valves, mixing

AA S&K AUTOMATION, Valves, Automated Valves and Control Valves, Plymouth, MN  
ARCA Regler GmbH, Toenisvorst, Germany  
Flowsolve Corp., Irving, TX  
Nordson SEALANT EQUIPMENT, Plymouth, MI  
OHL Gutermuth Industrial Valves GmbH, Altenstadt, Germany  
PBM Valves Inc., Irwin, PA  
SAMSON Controls, Inc., Baytown, TX

## Valves, motor operated

AA S&K AUTOMATION, Valves, Automated Valves and Control Valves, Plymouth, MN  
Badger Meter, Inc., Tulsa, OK  
**CONVAL, INC.**, 265 Field Rd., Somers, CT 06071 (860-749-0761; FAX: 860-763-3557; e-mail: [mhendrick@conval.com](mailto:mhendrick@conval.com); web site: [www.conval.com](http://www.conval.com))

Floodyne Controls Inc., Murray Hill, NJ

Flowsolve Corp., Raleigh, North Carolina

PBM Valves Inc., Irwin, PA

**SAMSON CONTROLS, INC.**, Baytown, TX  
**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: [www.tlv.com](http://www.tlv.com))

See our ad on page 100

## Valves, multiport

AA S&K AUTOMATION, Valves, Automated Valves and Control Valves, Plymouth, MN  
Floodyne Controls Inc., Murray Hill, NJ  
Flowsolve Corp., Flow Control Div., Cookeville, TN  
Flowsolve Corp., Irving, TX  
Fluid Line Products Inc., Willoughby, OH  
Hilliard Corp., Elmira, NY  
**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))

JLS International, Inc., Charlotte, NC

**KRAISSL CO. INC.**, 299 Williams Ave., Hackensack, NJ 07610-5225 (800-572-4775; 201-342-0008; FAX: 201-342-0025; e-mail: [kraissl@aol.com](mailto:kraissl@aol.com); web site: [www.strainers.com](http://www.strainers.com))

Lumaco Sanitary Valves, Hackensack, NJ

PBM Valves Inc., Irwin, PA  
SAMSON Controls, Inc., Baytown, TX  
Vortex, Salina, KS

## Valves, needle

CPI Wirecloth & Screens Inc., Pearland, TX  
Fluid Line Products Inc., Willoughby, OH  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave.**  
(CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

Qosina, Edgewood, NY  
SAMSON Controls, Inc., Baytown, TX  
Swagelok Co., Solon, OH

## Valves, nuclear

Emerson Process Management, Austin, TX  
Flowsolve Corp., Raleigh, North Carolina  
ITT, Engineered Valves, Lancaster, PA

## Valves, other

BIAR Sampling Systems, Gonzales, LA  
Buschjost GmbH, Bad Oeynhausen, Germany  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave.**  
(CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)  
Magnatrol Valve Corp., Hawthorne, NJ  
RF Valves, Inc., Hanover, MD  
SAMSON Controls, Inc., Baytown, TX

## Valves, packless

Cashco, Inc., Ellsworth, KS  
Flowsolve Corp., Flow Control Div., Cookeville, TN  
Flowsolve Corp., Irving, TX  
Magnatrol Valve Corp., Hawthorne, NJ  
SAMSON Controls, Inc., Baytown, TX

## Valves, pilot operated

Buschjost GmbH, Bad Oeynhausen, Germany  
Cashco, Inc., Ellsworth, KS  
Flodyne Controls Inc., Murray Hill, NJ  
Fluid Line Products Inc., Willoughby, OH  
Magnatrol Valve Corp., Hawthorne, NJ  
Parker Hannifin Corp., Parker Fluid Control Division, New Britain, CT  
SAMSON Controls, Inc., Baytown, TX

## Valves, pinch

Flowrox Oy, Lappeenranta, Finland  
Qosina, Edgewood, NY  
RF Valves, Inc., Hanover, MD  
SAMSON Controls, Inc., Baytown, TX

## Valves, plastic

**CORZAN INDUSTRIAL SYSTEMS, 9911 Brecksville Road, Cleveland, OH 44141 (888-234-2436; 216-447-7397; FAX: 216-447-6211; e-mail: Corzan@lubrizol.com; web site: www.corzancpvc.com)**

See our ad on page 81

Georg Fischer Piping Systems Ltd., Schaffhausen, Switzerland  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA

## Valves, plastic lined

Emerson Process Management, Austin, TX  
Flowsolve Corp., Flow Control Div., Cookeville, TN  
Flowsolve Corp., Irving, TX  
ITT, Engineered Valves, Lancaster, PA  
Richter Chemie-Technik GmbH, Kempen, Germany  
SAMSON Controls, Inc., Baytown, TX

## Valves, plug

Emerson Process Management, Austin, TX  
Flowsolve Corp., Flow Control Div., Cookeville, TN  
Flowsolve Corp., Irving, TX  
Hilliard Corp., Elmira, NY  
JLS International, Inc., Charlotte, NC  
**KRAISSL CO. INC., 299 Williams Ave., Hackensack, NJ 07601-5225 (800-572-4775; 201-342-0008; FAX: 201-342-0025; e-mail: kraissl@aol.com; web site: www.strainers.com)**

SAMSON Controls, Inc., Baytown, TX  
Schutte & Koerting, Trevose, PA

## Valves, pneumatic

AA S&K AUTOMATION, Valves, Automated Valves and Control Valves, Plymouth, MN  
Buerkert Fluid Control Systems, Ingelfingen  
Burkert Fluid Control Systems, Charlotte, NC  
Cashco, Inc., Ellsworth, KS  
**CONVAL, INC., 265 Field Rd., Somers, CT 06071 (860-749-0761; FAX: 860-763-3557; e-mail: mhendrick@conval.com; web site: www.conval.com)**  
Dueker GmbH & Co. KGaA, Laufach, Germany  
EDWARDS US HEADQUARTERS, Sanborn, NY  
Emerson Process Management, Austin, TX  
Flodyne Controls Inc., Murray Hill, NJ

Flowrox Oy, Lappeenranta, Finland  
LA-MAN Corp., Mazeppa, MN  
Lumaco Sanitary Valves, Hackensack, NJ  
Parker Hannifin Corp., Parker Fluid Control Division, New Britain, CT  
PBM Valves Inc., Irwin, PA  
RF Valves, Inc., Hanover, MD  
SAMSON Controls, Inc., Baytown, TX

## Valves, pressure reducing

Armstrong International, Three Rivers, MI  
Cashco, Inc., Ellsworth, KS  
Emerson Process Management, Austin, TX  
**FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)**

Fluid Line Products Inc., Willoughby, OH  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave.**  
(CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

Lumaco Sanitary Valves, Hackensack, NJ  
Oseco, Broken Arrow, OK  
SAMSON Controls, Inc., Baytown, TX  
Sentry Equipment Corp., Oconomowoc, WI  
**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8272; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)**

See our ad on page 100

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

## Valves, proportional

SAMSON Controls, Inc., Baytown, TX

## Valves, pump protection

EDWARDS US HEADQUARTERS, Sanborn, NY

## Valves, quick closing

Flodyne Controls Inc., Murray Hill, NJ  
Flowsolve Corp., Irving, TX  
Magnatrol Valve Corp., Hawthorne, NJ  
SAMSON Controls, Inc., Baytown, TX  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

## Valves, ram

JLS International, Inc., Charlotte, NC

## Valves, relief

Cashco, Inc., Ellsworth, KS  
EDWARDS US HEADQUARTERS, Sanborn, NY  
Emerson Process Management, Austin, TX  
Fluid Line Products Inc., Willoughby, OH  
Lumaco Sanitary Valves, Hackensack, NJ  
Parker Hannifin Corp., Parker Fluid Control Division, New Britain, CT

**REMBE GMBH, SAFETY+CONTROL, Gallbergweg 21, Brilon, Germany 59929 (49-2961-7405-0; FAX: 49-2961-50-714; e-mail: sales@rembe.de; web site: www.rembe.com)**

**REMBE, INC., 3809 Beam Road Ste K, Charlotte, NC 28217 (704.716.7022; FAX: 704.716.7025; e-mail: info@rembe.us; web site: www.rembe.us)**  
UNIBLOC-PUMP, Inc., Flowtech Div., Marietta, GA

## Valves, rubber lined

Flowrox Oy, Lappeenranta, Finland  
ITT, Engineered Valves, Lancaster, PA  
SAMSON Controls, Inc., Baytown, TX

## Valves, safety

Apollo Valves, Matthews, North Carolina  
Conbraco Industries, Inc., Matthews, NC  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave.**  
(CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)  
Oseco, Broken Arrow, OK  
Parker Hannifin Corp., Parker Fluid Control Division, New Britain, CT

**REMBE GMBH, SAFETY+CONTROL, Gallbergweg 21, Brilon, Germany 59929 (49-2961-7405-0; FAX: 49-2961-50-714; e-mail: sales@rembe.de; web site: www.rembe.com)**  
**REMBE, INC., 3809 Beam Road Ste K, Charlotte, NC 28217 (704.716.7022; FAX: 704.716.7025; e-mail: info@rembe.us; web site: www.rembe.us)**

Richter Chemie-Technik GmbH, Kempen, Germany

## Valves, sampling

BIAR Sampling Systems, Gonzales, LA

Flowsolve Corp., Irving, TX  
Fluid Line Products Inc., Willoughby, OH  
**JAYGO, INC., 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)**  
SAMSON Controls, Inc., Baytown, TX  
Sentry Equipment Corp., Oconomowoc, WI  
Swagelok Co., Solon, OH

## Valves, slide

Bascale Company, Inc., Houston, TX  
Emerson Process Management, Austin, TX  
Vortex, Salina, KS

## Valves, slurry

Apollo Valves, Matthews, North Carolina  
Conbraco Industries, Inc., Matthews, NC  
Emerson Process Management, Austin, TX  
Flowrox Oy, Lappeenranta, Finland  
ITT, Engineered Valves, Lancaster, PA  
Posi-flate, St. Paul, MN  
RF Valves, Inc., Hanover, MD  
Roto-Disc, Erlanger, KY  
SAMSON Controls, Inc., Baytown, TX

## Valves, tank blanketing

SAMSON Controls, Inc., Baytown, TX

## Valves, tank venting

Cashco, Inc., Ellsworth, KS  
JLS International, Inc., Charlotte, NC  
Oseco, Broken Arrow, OK  
**REMBE GMBH, SAFETY+CONTROL, Gallbergweg 21, Brilon, Germany 59929 (49-2961-7405-0; FAX: 49-2961-50-714; e-mail: sales@rembe.de; web site: www.rembe.com)**  
**REMBE, INC., 3809 Beam Road Ste K, Charlotte, NC 28217 (704.716.7022; FAX: 704.716.7025; e-mail: info@rembe.us; web site: www.rembe.us)**

## Valves, titanium

Apollo Valves, Matthews, North Carolina  
Conbraco Industries, Inc., Matthews, NC  
Flodyne Controls Inc., Murray Hill, NJ  
Flowsolve Corp., Flow Control Div., Cookeville, TN  
Flowsolve Corp., Irving, TX  
OHL Gutermuth Industrial Valves GmbH, Altenstadt, Germany  
PBM Valves Inc., Irwin, PA  
SAMSON Controls, Inc., Baytown, TX

## Valves, vacuum

EDWARDS US HEADQUARTERS, Sanborn, NY  
Magnatrol Valve Corp., Hawthorne, NJ  
Pfeiffer Vacuum, Inc., Nashua, NH  
**PFEIFFER VACUUM GMBH, Berliner Strasse 43, Asslar, Germany 35614 (+49-6441-802 0; FAX: +49-6441-802 1202; e-mail: info@pfeiffer-vacuum.de; web site: www.pfeiffer-vacuum.com)**

Posi-flate, St. Paul, MN  
RF Valves, Inc., Hanover, MD  
Roto-Disc, Erlanger, KY  
SAMSON Controls, Inc., Baytown, TX

## Valves, vacuum relief

EDWARDS US HEADQUARTERS, Sanborn, NY  
Oseco, Broken Arrow, OK  
**REMBE GMBH, SAFETY+CONTROL, Gallbergweg 21, Brilon, Germany 59929 (49-2961-7405-0; FAX: 49-2961-50-714; e-mail: sales@rembe.de; web site: www.rembe.com)**  
**REMBE, INC., 3809 Beam Road Ste K, Charlotte, NC 28217 (704.716.7022; FAX: 704.716.7025; e-mail: info@rembe.us; web site: www.rembe.us)**

## Valves, vent, low pressure

Cashco, Inc., Ellsworth, KS  
JLS International, Inc., Charlotte, NC  
Oseco, Broken Arrow, OK  
**REMBE GMBH, SAFETY+CONTROL, Gallbergweg 21, Brilon, Germany 59929 (49-2961-7405-0; FAX: 49-2961-50-714; e-mail: sales@rembe.de; web site: www.rembe.com)**  
**REMBE, INC., 3809 Beam Road Ste K, Charlotte, NC 28217 (704.716.7022; FAX: 704.716.7025; e-mail: info@rembe.us; web site: www.rembe.us)**

## Valves, zirconium

Flowsolve Corp., Flow Control Div., Cookeville, TN  
Flowsolve Corp., Irving, TX  
OHL Gutermuth Industrial Valves GmbH, Altenstadt, Germany  
SAMSON Controls, Inc., Baytown, TX

# **2**

# **SOLIDS HANDLING**

- 114 Bins & other dry storage equipment**
- 114 Bulk carriers, loading & unloading equipment**
- 114 Coating, forming & agglomeration equipment**
- 115 Conveyors & elevators for bulk materials**
- 116 Lifting equipment**
- 116 Packaging containers**
- 116 Packaging equipment**
- 117 Solids handling equipment & systems, other**
- 117 Weighing, feeding & proportioning equipment**

## BINS & OTHER DRY STORAGE EQUIPMENT

### Bin activators

Acrison Inc., Moonachie, NJ  
 Bascale Company, Inc., Houston, TX  
 Brabender Technologie GmbH & Co. KG, Duisburg, Germany  
 Dynamic Air Inc., St. Paul, MN  
 Kinergy Corp., Louisville, KY  
 Martin Engineering, Neponset, IL  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**  
 Vibra Screw Inc., Totowa, NJ

### Bins

Acrison Inc., Moonachie, NJ  
 Bascale Company, Inc., Houston, TX  
 Charles Ross & Son Co., Hauppauge, NY  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**  
 Flexicon Corp., Bethlehem, PA  
**MUELLER GMBH, P.O. Box 1409, Rheinfelden, Germany 79604 (+49-76-23-9690; FAX: +49-7623-96969; e-mail: info@mueller-gmbh.com; web site: www.mueller-gmbh.com)**  
 Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
 Vibra Screw Inc., Totowa, NJ

### Bins, weighing

Bascale Company, Inc., Houston, TX  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**  
 Flexicon Corp., Bethlehem, PA  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**  
 Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
 Schenck Process GmbH, Darmstadt, Germany  
 Vibra Screw Inc., Totowa, NJ

### Gates, hopper

Bascale Company, Inc., Houston, TX  
 Vibra Screw Inc., Totowa, NJ

### Hoppers

Acrison Inc., Moonachie, NJ  
 Bascale Company, Inc., Houston, TX  
 Charles Ross & Son Co., Hauppauge, NY  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**  
 Filtra-Systems Co., Farmington Hills, MI  
 Flexicon Corp., Bethlehem, PA  
 Martin Vibration Systems, Marine City, MI  
 M. O. Industries, Whippany, NJ  
**MUELLER GMBH, P.O. Box 1409, Rheinfelden, Germany 79604 (+49-76-23-9690; FAX: +49-7623-96969; e-mail: info@mueller-gmbh.com; web site: www.mueller-gmbh.com)**  
 Puritan Magnetics, Inc., Oxford, MI  
 Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
 Vibra Screw Inc., Totowa, NJ

### Hoppers, weighing

Acrison Inc., Moonachie, NJ  
 Bascale Company, Inc., Houston, TX  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**  
 Flexicon Corp., Bethlehem, PA  
 Martin Vibration Systems, Marine City, MI  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**  
 Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
 Schenck Process GmbH, Darmstadt, Germany  
 Vibra Screw Inc., Totowa, NJ

### Silos

Aumund Fordertechnik GmbH, Rheinberg, Germany  
 Bascale Company, Inc., Houston, TX  
 Gilbert Industries, Sparta, MO  
 INOX-TECH INC., Ste. Catherine, Canada

**MUELLER GMBH, P.O. Box 1409, Rheinfelden, Germany 79604 (+49-76-23-9690; FAX: +49-7623-96969; e-mail: info@mueller-gmbh.com; web site: www.mueller-gmbh.com)**  
 Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany

## BULK CARRIERS, LOADING & UNLOADING EQUIPMENT

### Dumpers

Bascale Company, Inc., Houston, TX  
 Flexicon Corp., Bethlehem, PA  
 Material Transfer & Storage Inc., Allegan, MI  
 M. O. Industries, Whippany, NJ

### Lift tables

Presto Lifts Inc., Norton, MA  
 Southworth Products Corp., Portland, ME

### Lift trucks

M. O. Industries, Whippany, NJ  
 Presto Lifts Inc., Norton, MA  
 Southworth Products Corp., Portland, ME

### Lift trucks, explosion proof

M. O. Industries, Whippany, NJ

### Loaders, car

Buhler Inc., Minneapolis, MN  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**

### Pallet trucks

M. O. Industries, Whippany, NJ  
 Presto Lifts Inc., Norton, MA  
 Southworth Products Corp., Portland, ME

### Railroad car spotter, indexer, or positioner

**HEYL & PATTERSON INC., RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heyhpatterson.com)**

### Unloaders, barge

Buhler Inc., Minneapolis, MN  
**HEYL & PATTERSON INC., RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heyhpatterson.com)**  
 Vector Technologies Ltd., Milwaukee, WI

### Unloaders, bulk bag

AIRLANCO, 312 S. Highway 73, PO Box 398, Falls City, NE 68355-0398 (800-500-9777; 402-245-2325; FAX: 402-245-5196; e-mail: sales@airlanco.com; web site: www.airlanco.com)  
 Bascale Company, Inc., Houston, TX  
**BEUMER GROUP GMBH & CO. KG, Oelder Str. 40, Becum, Germany 59269 (+49 2521 240; FAX: +49 2521 24280; e-mail: beumer@beumergroup.com; web site: www.beumergroup.com)**  
 Brabender Technologie GmbH & Co. KG, Duisburg, Germany  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**

Dynamic Air Inc., St. Paul, MN  
 Flexicon Corp., Bethlehem, PA  
 Material Transfer & Storage Inc., Allegan, MI  
 NEUHAUS NEOTEC Maschinen- und Anlagenbau GmbH, Germany  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**  
 Schenck Process, Kansas City, MO

### Unloaders, hopper car

**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**  
 Flexicon Corp., Bethlehem, PA  
 Kinergy Corp., Louisville, KY  
 Martin Vibration Systems, Marine City, MI  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**  
 Vector Technologies Ltd., Milwaukee, WI

## Unloaders, other

Aumund Fordertechnik GmbH, Rheinberg, Germany  
 Buhler Inc., Minneapolis, MN  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**

Flexicon Corp., Bethlehem, PA  
 Omni-Lift, Inc., Salt Lake City, UT

## Unloaders, tank car

Vector Technologies Ltd., Milwaukee, WI

## Unloaders, tank truck

Buhler Inc., Minneapolis, MN  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**

## COATING, FORMING & AGGLOMERATION EQUIPMENT

### Agglomerators

Alexanderwerk AG, Remscheid, Germany  
 AMANDUS KAHL GmbH & Co. KG, Reinbek, Germany  
 Bepex International LLC, Minneapolis, MN  
 GE A Process Engineering, Columbia, MD  
**HEYL & PATTERSON INC., RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heyhpatterson.com)**  
 Hosokawa Micron B.V., Mixing, Drying & Agglomeration, Doetinchem, Netherlands  
 Ludman Industries, Milwaukee, WI  
 Mars Mineral, Mars, PA  
**SANDVIK PROCESS SYSTEMS, INC., 21 Campus Rd., Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: info@sandvik.com; web site: www.process-systems.sandvik.com)**  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

### Briquetting systems

Bepex International LLC, Minneapolis, MN  
 Ludman Industries, Milwaukee, WI  
 Security Engineered Machinery, Westboro, MA

### Calenders

Davis-Standard, LLC, Pawcatuck, CT  
 Thermal Spray Solutions, Inc., Chesapeake, Virginia

### Coaters & coating machinery

Bepex International LLC, Minneapolis, MN  
 Davis-Standard, LLC, Pawcatuck, CT  
 GE A Process Engineering, Columbia, MD  
 Greubredner Loedige Maschinenbau GmbH, Paderborn, Germany  
 Thermal Spray Solutions, Inc., Chesapeake, Virginia

### Compactors

Alexanderwerk AG, Remscheid, Germany  
 AMANDUS KAHL GmbH & Co. KG, Reinbek, Germany  
 Bepex International LLC, Minneapolis, MN  
 GE A Process Engineering, Columbia, MD  
 Ludman Industries, Milwaukee, WI  
 Prater-Sterling, Bollingbrook, IL

### Densifiers

Bascale Company, Inc., Houston, TX  
 Bepex International LLC, Minneapolis, MN  
 Mars Mineral, Mars, PA

### Extruders

Bepex International LLC, Minneapolis, MN  
 B & P Process Equipment, Saginaw, MI  
 BUSS ChemTech AG BUSS ChemTech AG  
 Pratteln 1, Switzerland  
 Davis-Standard, LLC, Pawcatuck, CT  
**JAYGO, INC., 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)**  
 Paul O. Abbe, Bensenville, IL

### Granulators & granulating mills

Alexanderwerk AG, Remscheid, Germany  
 AMANDUS KAHL GmbH & Co. KG, Reinbek, Germany  
 Bepex International LLC, Minneapolis, MN  
 GE A Process Engineering, Columbia, MD

Gebrueder Loedige Maschinenbau GmbH, Paderborn, Germany  
 Herbold Meckesheim USA, Resource Recycling Systems Inc., Slattersville, RI  
 Kemutec Group, Inc., Bristol, PA  
 Ludman Industries, Milwaukee, WI  
 Modern Process Equipment, Inc., Chicago, IL  
 NEUHAUS NEOTECH Maschinen- und Anlagenbau GmbH, Germany  
**SANDVIK PROCESS SYSTEMS, INC., 21 Campus Rd., Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: info@sandvik.com; web site: www.process-systems.sandvik.com)**  
 Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Pelletizers

AMANDUS KAHL GmbH & Co. KG, Reinbek, Germany  
 Bepex International LLC, Minneapolis, MN  
 BUSS ChemTech AG, BUSS ChemTech AG, Pratteln 1, Switzerland  
 Davis-Standard, LLC, Pawcatuck, CT  
 GEA Process Engineering, Columbia, MD  
 Mars Mineral, Mars, PA  
 PSG Dover Europe GmbH, Oberglatt / ZH, Switzerland  
**SANDVIK PROCESS SYSTEMS, INC., 21 Campus Rd., Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: info@sandvik.com; web site: www.process-systems.sandvik.com)**

## Prillers

GEA Process Engineering, Columbia, MD

## CONVEYORS & ELEVATORS FOR BULK MATERIALS

### Chutes

Bascale Company, Inc., Houston, TX  
 Flexicon Corp., Bethlehem, PA  
 Puritan Magnetics, Inc., Oxford, MI

### Conveyor accessories

Bascale Company, Inc., Houston, TX  
 Flexicon Corp., Bethlehem, PA  
 LEWCO, Inc., Sandusky, OH  
 Martin Engineering, Neponset, IL  
 Puritan Magnetics, Inc., Oxford, MI  
 RPS Engineering, Inc., Elgin, IL  
 Sweet Manufacturing Company, Springfield, OH

### Conveyor belting

AWT World Trade Inc., Chicago, IL  
 Bascale Company, Inc., Houston, TX  
 Berndorf Band GmbH, Berndorf, Austria  
 LEWCO, Inc., Sandusky, OH  
 Omni-Lift, Inc., Salt Lake City, UT

### Conveyors, apron

Aumund Fordertechnik GmbH, Rheinberg, Germany  
 Dematic Corp., Grand Rapids, MI  
 Stedman, Aurora, IN

### Conveyors, belt

ABI LTD., Concord, Ontario, Canada  
 Aumund Fordertechnik GmbH, Rheinberg, Germany  
 AWT World Trade Inc., Chicago, IL  
 Bascale Company, Inc., Houston, TX  
 Berndorf Band GmbH, Berndorf, Austria  
 Berthold Technologies GmbH & Co. KG, Bad Wildbad  
**BEUMER GROUP GMBH & CO. KG, Oelder Str. 40, Beckum, Germany 59269 (+49 2521 240; FAX: +49 2521 24280; e-mail: beumer@beumergroup.com; web site: www.beumergroup.com)**  
 Industrial Magnetics, Inc., Boyne City, MI  
 Magnetic Products, Inc., Highland, MI  
 Martin Engineering, Neponset, IL  
 Omni-Lift, Inc., Salt Lake City, UT  
**SANDVIK PROCESS SYSTEMS, INC., 21 Campus Rd., Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: info@sandvik.com; web site: www.process-systems.sandvik.com)**  
 Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
 Stedman, Aurora, IN  
 Sweet Manufacturing Company, Springfield, OH  
 Union Special, LLC, Huntley, IL  
 Vibra Screw Inc., Totowa, NJ

### Conveyors, bucket

Aumund Fordertechnik GmbH, Rheinberg, Germany  
 Bascale Company, Inc., Houston, TX  
 Flexicon Corp., Bethlehem, PA

Omni-Lift, Inc., Salt Lake City, UT

### Conveyors, cooling

ABI LTD., Concord, Ontario, Canada  
**SANDVIK PROCESS SYSTEMS, INC., 21 Campus Rd., Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: info@sandvik.com; web site: www.process-systems.sandvik.com)**

### Conveyors, drag

Aumund Fordertechnik GmbH, Rheinberg, Germany  
 Bascale Company, Inc., Houston, TX  
 Buhler Inc., Minneapolis, MN  
 Filtra-Systems Co., Farmington Hills, MI  
 Flexicon Corp., Bethlehem, PA  
 Modern Process Equipment, Inc., Chicago, IL  
 Sweet Manufacturing Company, Springfield, OH

### Conveyors, flexible

Flexicon Corp., Bethlehem, PA

### Conveyors, flight

Buhler Inc., Minneapolis, MN  
 Flexicon Corp., Bethlehem, PA

### Conveyors, fluidizing

CPFD-Software, Albuquerque, New Mexico  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**

### Conveyors, gravity

Bascale Company, Inc., Houston, TX  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**  
 Flexicon Corp., Bethlehem, PA  
 Fr. Jacob Soehne GmbH & Co. KG, Porta Westfalica, NRW, Germany

### Conveyors, magnetic

Industrial Magnetics, Inc., Boyne City, MI  
 Magnetic Products, Inc., Highland, MI  
 Puritan Magnetics, Inc., Oxford, MI

### Conveyors, other

ABI LTD., Concord, Ontario, Canada  
 Aumund Fordertechnik GmbH, Rheinberg, Germany  
 Conveyor Components Co., Material Control, Inc., Crosswell, MI  
 Dymax Corp., Torrington, CT  
 Flexicon Corp., Bethlehem, PA  
**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)**  
 Modern Process Equipment, Inc., Chicago, IL

### Conveyors, pneumatic

AIRLANCO, 312 S. Highway 73, PO Box 398, Falls City, NE 68355-0398 (800-500-9777; 402-245-2325; FAX: 402-245-5196; e-mail: sales@airlanco.com; web site: www.airlanco.com)

Buhler Inc., Minneapolis, MN  
 Coperion GmbH, Weingarten, Wuertt., Germany



**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**

Dematic Corp., Grand Rapids, MI  
 Dynamic Air Inc., St. Paul, MN  
 Elmridge Inc., Livonia, MI  
 Filtra-Systems Co., Farmington Hills, MI  
 Flexicon Corp., Bethlehem, PA  
 GEA Process Engineering, Columbia, MD  
 NEUHAUS NEOTECH Maschinen- und Anlagenbau GmbH, Germany  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**  
 Schenck Process, Kansas City, MO  
 Vector Technologies Ltd., Milwaukee, WI

### Conveyors, portable

**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**  
 Flexicon Corp., Bethlehem, PA

Omni-Lift, Inc., Salt Lake City, UT  
 Vibra Screw Inc., Totowa, NJ

### Conveyors, roller

Bascale Company, Inc., Houston, TX  
 LEWCO, Inc., Sandusky, OH

### Conveyors, rotary table

Bascale Company, Inc., Houston, TX

### Conveyors, rotary tubular

Flexicon Corp., Bethlehem, PA

### Conveyors, screen

Kinergy Corp., Louisville, KY

### Conveyors, screw

Bascale Company, Inc., Houston, TX  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**  
 Flexicon Corp., Bethlehem, PA  
 INOX-TECH INC., Ste. Catherine, Canada  
 Stedman, Aurora, IN  
 Vibra Screw Inc., Totowa, NJ

**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

### Conveyors, slat

LEWCO, Inc., Sandusky, OH

### Conveyors, tray

ABI LTD., Concord, Ontario, Canada  
 Bascale Company, Inc., Houston, TX

### Conveyors, vacuum

Buhler Inc., Minneapolis, MN  
**CROLL-REYNOLDS CO. INC., Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: info@croll.com; web site: www.croll.com)**  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**  
 Dec Group - Dietrich Engineering Consultants sa, Ecublens, Switzerland  
 Flexicon Corp., Bethlehem, PA  
 GEA Process Engineering, Columbia, MD  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**  
 Quadro Engineering Corp., WATERLOO, Ontario, Canada  
 Schenck Process, Kansas City, MO  
 Schutte & Koerting, Treviso, PA  
 Vector Technologies Ltd., Milwaukee, WI

Dec Group - Dietrich Engineering Consultants sa, Ecublens, Switzerland  
 Flexicon Corp., Bethlehem, PA  
 GEA Process Engineering, Columbia, MD

**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**

Quadro Engineering Corp., WATERLOO, Ontario, Canada  
 Schenck Process, Kansas City, MO  
 Schutte & Koerting, Treviso, PA  
 Vector Technologies Ltd., Milwaukee, WI

### Conveyors, vertical

Flexicon Corp., Bethlehem, PA  
 Omni-Lift, Inc., Salt Lake City, UT

### Conveyors, vibrating

Bascale Company, Inc., Houston, TX  
 GEA Process Engineering, Columbia, MD  
 Kinergy Corp., Louisville, KY  
 Magnetic Products, Inc., Highland, MI  
 Schenck Process GmbH, Darmstadt, Germany  
 Stedman, Aurora, IN  
 Vibra Screw Inc., Totowa, NJ

### Conveyors, weighing

**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467 (800-445-0730; 402-362-2000; FAX: 402-362-2001; e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)**  
 Flexicon Corp., Bethlehem, PA  
**REMBE GMBH, SAFETY+CONTROL, Gallbergweg 21, Brilon, Germany 99929 (49-2961-7405-0; FAX: 49-2961-50-714; e-mail: sales@rembe.de; web site: www.rembe.com)**  
**REMBE, INC., 3809 Beam Road Ste K, Charlotte, NC 28217 (704.716.7022; FAX: 704.716.7025; e-mail: info@rembe.us; web site: www.rembe.us)**  
 Siemens Industry, Inc., Process Instrumentation & Analytics, Spring House, PA  
 Vibra Screw Inc., Totowa, NJ

### Couplings, pneumatic conveyors

Bascale Company, Inc., Houston, TX  
 Flexicon Corp., Bethlehem, PA  
 Tuf-Lok International, Madison, WI  
 Vector Technologies Ltd., Milwaukee, WI

### Elevators, belt

Aumund Fordertechnik GmbH, Rheinberg, Germany

Bascale Company, Inc., Houston, TX  
Omni-Lift, Inc., Salt Lake City, UT  
Sweet Manufacturing Company, Springfield, OH

## Elevators, belt, vertical

Bascale Company, Inc., Houston, TX

## Elevators, bucket

Aumund Fordertechnik GmbH, Rheinberg, Germany  
Bascale Company, Inc., Houston, TX

**BEUMER GROUP GMBH & CO. KG, Oelder Str. 40, Beckum, Germany 59269 (+49 2521 240; FAX: +49 2521 24280; e-mail: beumer@beumergroup.com; web site: www.beumergroup.com)**

Flexicon Corp., Bethlehem, PA  
Sweet Manufacturing Company, Springfield, OH

## Elevators, screw

Flexicon Corp., Bethlehem, PA

## Hose, pneumatic conveyors

Vector Technologies Ltd., Milwaukee, WI

## Solids feeders, airlock

Buhler Inc., Minneapolis, MN  
GEA Process Engineering, Columbia, MD  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Solids feeders, batch

Acriston Inc., Moonachie, NJ  
Bascale Company, Inc., Houston, TX  
Bioengineering Inc., Somerville, MA  
Brabender Technologie GmbH & Co. KG, Duisburg, Germany  
Flexicon Corp., Bethlehem, PA  
Kubota Corporation, Singapore, Singapore  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**  
Schenck Process, Kansas City, MO  
Siemens Industry, Inc., Process Instrumentation & Analytics, Spring House, PA  
Vibra Screw Inc., Totowa, NJ

## Solids feeders, constant weight

Brabender Technologie GmbH & Co. KG, Duisburg, Germany  
Kubota Corporation, Singapore, Singapore  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**  
Vibra Screw Inc., Totowa, NJ

## Solids feeders, continuous flow

Bascale Company, Inc., Houston, TX  
Brabender Technologie GmbH & Co. KG, Duisburg, Germany  
Kubota Corporation, Singapore, Singapore  
**REMBE GMBH, SAFETY & CONTROL, Gallbergweg 21, Brilon, Germany 59929 (49-2961-7405-0; FAX: 49-2961-50-714; e-mail: sales@rembe.de; web site: www.rembe.com)**  
**REMBE, INC., 3809 Beam Road Ste K, Charlotte, NC 28217 (704.716.7022; FAX: 704.716.7025; e-mail: info@rembe.us; web site: www.rembe.us)**  
Siemens Industry, Inc., Process Instrumentation & Analytics, Spring House, PA  
Vibra Screw Inc., Totowa, NJ  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Solids feeders, gravimetric

Acriston Inc., Moonachie, NJ  
Bascale Company, Inc., Houston, TX  
Brabender Technologie GmbH & Co. KG, Duisburg, Germany  
Dec Group - Dietrich Engineering Consultants sa, Ecublens, Switzerland  
Kubota Corporation, Singapore, Singapore  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**  
Schenck Process, Kansas City, MO  
Vibra Screw Inc., Totowa, NJ

## Solids feeders, high-pressure

Acriston Inc., Moonachie, NJ

## Solids feeders, natural frequency

Bascale Company, Inc., Houston, TX

## Solids feeders, proportioning

Acriston Inc., Moonachie, NJ  
Bascale Company, Inc., Houston, TX  
Brabender Technologie GmbH & Co. KG, Duisburg, Germany  
Kubota Corporation, Singapore, Singapore  
Vibra Screw Inc., Totowa, NJ

## Solids feeders, rotary

Buhler Inc., Minneapolis, MN  
GEA Process Engineering, Columbia, MD  
Prater-Sterling, Bollingbrook, IL  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Solids feeders, vibrating or oscillating

Bascale Company, Inc., Houston, TX  
Brabender Technologie GmbH & Co. KG, Duisburg, Germany  
Dec Group - Dietrich Engineering Consultants sa, Ecublens, Switzerland  
Kubota Corporation, Singapore, Singapore  
Magnetic Products, Inc., Highland, MI  
Martin Engineering, Neponset, IL  
Martin Vibration Systems, Marine City, MI  
Stedman, Aurora, IN  
Vibra Screw Inc., Totowa, NJ

## Solids feeders, volumetric

Acriston Inc., Moonachie, NJ  
Bascale Company, Inc., Houston, TX  
Brabender Technologie GmbH & Co. KG, Duisburg, Germany  
Buhler Inc., Minneapolis, MN  
Dec Group - Dietrich Engineering Consultants sa, Ecublens, Switzerland  
Flexicon Corp., Bethlehem, PA  
Kubota Corporation, Singapore, Singapore  
Schenck Process, Kansas City, MO  
Vibra Screw Inc., Totowa, NJ  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## LIFTING EQUIPMENT

### Hoists

Material Transfer & Storage Inc., Allegan, MI  
M. O. Industries, Whippany, NJ  
**MUELLER GMBH, P.O. Box 1409, Rheinfelden, Germany 79604 (+49-76-23-9690; FAX: +49-7623-96969; e-mail: info@mueller-gmbh.com; web site: www.mueller-gmbh.com)**

## PACKAGING CONTAINERS

### Bags

Associated Bag Company, Milwaukee, WI  
Cortec Corp., St. Paul, MN  
HAVER & BOECKER OHG, Wire Weaving and Machinery Division, OELDE, Germany  
Nier Systems Inc, Boca Raton, Florida  
Union Special, LLC, Huntley, IL

### Barrels & drums

HAVER & BOECKER OHG, Wire Weaving and Machinery Division, OELDE, Germany  
M. O. Industries, Whippany, NJ  
**MUELLER GMBH, P.O. Box 1409, Rheinfelden, Germany 79604 (+49-76-23-9690; FAX: +49-7623-96969; e-mail: info@mueller-gmbh.com; web site: www.mueller-gmbh.com)**

### Cartons

Associated Bag Company, Milwaukee, WI

### Drums & drum liners, corrosion resistant

Associated Bag Company, Milwaukee, WI

### Intermediate bulk containers

GEA Process Engineering, Columbia, MD  
Hoover Container Solutions, Houston, TX  
Metano IBC Services, Inc., Perrineville, NJ  
Nier Systems Inc, Boca Raton, Florida

### Intermodal bulk containers

Nier Systems Inc, Boca Raton, Florida

## Pails & cans

HAVER & BOECKER OHG, Wire Weaving and Machinery Division, OELDE, Germany

## PACKAGING EQUIPMENT

### Bag closing machines

Associated Bag Company, Milwaukee, WI  
Bascale Company, Inc., Houston, TX  
GEA Process Engineering, Columbia, MD  
HAVER & BOECKER OHG, Wire Weaving and Machinery Division, OELDE, Germany  
Union Special, LLC, Huntley, IL

### Bag, empty, handling systems

**BEUMER GROUP GMBH & CO. KG, Oelder Str. 40, Beckum, Germany 59269 (+49 2521 240; FAX: +49 2521 24280; e-mail: beumer@beumergroup.com; web site: www.beumergroup.com)**  
Dec Group - Dietrich Engineering Consultants sa, Ecublens, Switzerland  
Flexicon Corp., Bethlehem, PA  
GEA Process Engineering, Columbia, MD

### Bag filling machines

Bascale Company, Inc., Houston, TX  
**BEUMER GROUP GMBH & CO. KG, Oelder Str. 40, Beckum, Germany 59269 (+49 2521 240; FAX: +49 2521 24280; e-mail: beumer@beumergroup.com; web site: www.beumergroup.com)**  
Coperion GmbH, Weingarten, Wuertt., Germany  
Flexicon Corp., Bethlehem, PA  
GEA Process Engineering, Columbia, MD  
HAVER & BOECKER OHG, Wire Weaving and Machinery Division, OELDE, Germany  
Material Transfer & Storage Inc., Allegan, MI  
Spee Dee Packaging Machinery, Sturtevant, WI  
Vibra Screw Inc., Totowa, NJ

### Bag filling machines, vacuum

Dec Group - Dietrich Engineering Consultants sa, Ecublens, Switzerland  
Vector Technologies Ltd., Milwaukee, WI

### Drum filling equipment

Bascale Company, Inc., Houston, TX  
Dec Group - Dietrich Engineering Consultants sa, Ecublens, Switzerland  
Flexicon Corp., Bethlehem, PA  
GEA Process Engineering, Columbia, MD  
HAVER & BOECKER OHG, Wire Weaving and Machinery Division, OELDE, Germany  
Material Transfer & Storage Inc., Allegan, MI  
**MUELLER GMBH, P.O. Box 1409, Rheinfelden, Germany 79604 (+49-76-23-9690; FAX: +49-7623-96969; e-mail: info@mueller-gmbh.com; web site: www.mueller-gmbh.com)**  
Powder Systems Ltd, Liverpool  
PSL USA, Boise, ID  
Vector Technologies Ltd., Milwaukee, WI

### Packaging equipment, liquids

Bascale Company, Inc., Houston, TX  
EquipNet, Inc., Canton, MA  
HAVER & BOECKER OHG, Wire Weaving and Machinery Division, OELDE, Germany

### Packaging equipment, solids

Bascale Company, Inc., Houston, TX  
EquipNet, Inc., Canton, MA  
Flexicon Corp., Bethlehem, PA  
GEA Process Engineering, Columbia, MD  
G.R. Sprenger Engineering, Inc., Golden, CO  
HAVER & BOECKER OHG, Wire Weaving and Machinery Division, OELDE, Germany  
Spee Dee Packaging Machinery, Sturtevant, WI  
Union Special, LLC, Huntley, IL

### Packers, bag

Bascale Company, Inc., Houston, TX  
**BEUMER GROUP GMBH & CO. KG, Oelder Str. 40, Beckum, Germany 59269 (+49 2521 240; FAX: +49 2521 24280; e-mail: beumer@beumergroup.com; web site: www.beumergroup.com)**

GEA Process Engineering, Columbia, MD  
HAVER & BOECKER OHG, Wire Weaving and Machinery Division, OELDE, Germany

### Packers, drum

Bascale Company, Inc., Houston, TX  
GEA Process Engineering, Columbia, MD  
HAVER & BOECKER OHG, Wire Weaving and Machinery Division, OELDE, Germany

### Packers, vibrating

Bascale Company, Inc., Houston, TX

Martin Engineering, Neponset, IL

## SOLIDS HANDLING EQUIPMENT & SYSTEMS, OTHER

### Balers

Security Engineered Machinery, Westboro, MA

### Barrel handling equipment

Bascale Company, Inc., Houston, TX  
Dematic Corp., Grand Rapids, MI  
Flexicon Corp., Bethlehem, PA  
HAVER & BOECKER OHG, Wire Weaving and Machinery  
Division, OELDE, Germany  
Material Transfer & Storage Inc., Allegan, MI

### Drum handling equipment

Bascale Company, Inc., Houston, TX  
Dec Group - Dietrich Engineering Consultants sa,  
Ecublens, Switzerland  
Dematic Corp., Grand Rapids, MI  
Flexicon Corp., Bethlehem, PA  
HAVER & BOECKER OHG, Wire Weaving and Machinery  
Division, OELDE, Germany  
Material Transfer & Storage Inc., Allegan, MI  
M. O. Industries, Whippany, NJ  
**MUELLER GMBH, P.O. Box 1409, Rheinfelden, Germany**  
79604 (+49-76-23-9690; FAX: +49-7623-96969; e-mail:  
info@mueller-gmbh.com; web site: www.mueller-  
gmbh.com)  
Vector Technologies Ltd., Milwaukee, WI  
Vibra Screw Inc., Totowa, NJ

### Materials handling systems

Acricon Inc., Moonachie, NJ  
Aumund Fordertechnik GmbH, Rheinberg, Germany  
Bascale Company, Inc., Houston, TX  
**BEUMER GROUP GMBH & CO. KG, Oelder Str. 40, Bec-**  
**kum, Germany 59269 (+49 2521 240; FAX: +49 2521**  
**24280; e-mail: beumer@beumergroup.com; web site:**  
**www.beumergroup.com)**  
Coperion GmbH, Weingarten, Wuertt., Germany  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467**  
**(800-445-0730; 402-362-2000; FAX: 402-362-2001;**  
**e-mail: sales@cyclonaire.com; web site: www.cy-**  
**clonaire.com)**

Dematic Corp., Grand Rapids, MI  
Dynamic Air Inc., St. Paul, MN  
Ehcolo A/S, Foevling, Denmark  
Flexicon Corp., Bethlehem, PA  
LEWCO, Inc., Sandusky, OH  
Magnetic Products, Inc., Highland, MI  
Martin Engineering, Neponset, IL  
Material Transfer & Storage Inc., Allegan, MI  
M. O. Industries, Whippany, NJ  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes,**  
**MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail:**  
**sales@nol-tec.com; web site: www.nol-tec.com)**

Omni-Lift, Inc., Salt Lake City, UT  
Powder Systems Ltd, Liverpool  
PSL USA, Boise, ID  
**REMBE GMBH, SAFETY+CONTROL, Gallbergweg**  
**21, Brilon, Germany 59929 (49-2961-7405-0; FAX:**  
**49-2961-50-714; e-mail: sales@rembe.de; web site:**  
**www.rembe.com)**

**REMBE, INC., 3809 Beam Road Ste K, Charlotte, NC**  
**28217 (704.716.7022; FAX: 704.716.7025; e-mail:**  
**info@rembe.us; web site: www.rembe.us)**

Sandvik Process Systems, Div. of Sandvik Materials Tech-  
nology Deutschland GmbH, Fellbach, Germany  
Southworth Products Corp., Portland, ME  
Sweet Manufacturing Company, Springfield, OH  
Vector Technologies Ltd., Milwaukee, WI  
Vibra Screw Inc., Totowa, NJ

### Palletizers

Bascale Company, Inc., Houston, TX  
**BEUMER GROUP GMBH & CO. KG, Oelder Str. 40, Bec-**  
**kum, Germany 59269 (+49 2521 240; FAX: +49 2521**  
**24280; e-mail: beumer@beumergroup.com; web site:**  
**www.beumergroup.com)**  
Ehcolo A/S, Foevling, Denmark  
HAVER & BOECKER OHG, Wire Weaving and Machinery  
Division, OELDE, Germany  
Industrial Magnetics, Inc., Boyne City, MI  
**MUELLER GMBH, P.O. Box 1409, Rheinfelden, Germany**  
79604 (+49-76-23-9690; FAX: +49-7623-96969; e-mail:  
info@mueller-gmbh.com; web site: www.mueller-  
gmbh.com)  
Southworth Products Corp., Portland, ME

### Robotic components

**BEUMER GROUP GMBH & CO. KG, Oelder Str. 40, Bec-**  
**kum, Germany 59269 (+49 2521 240; FAX: +49 2521**  
**24280; e-mail: beumer@beumergroup.com; web site:**  
**www.beumergroup.com)**

### Storage systems

**BEUMER GROUP GMBH & CO. KG, Oelder Str. 40, Bec-**  
**kum, Germany 59269 (+49 2521 240; FAX: +49 2521**  
**24280; e-mail: beumer@beumergroup.com; web site:**  
**www.beumergroup.com)**  
Dematic Corp., Grand Rapids, MI  
HAVER & BOECKER OHG, Wire Weaving and Machinery  
Division, OELDE, Germany  
Sandvik Process Systems, Div. of Sandvik Materials Tech-  
nology Deutschland GmbH, Fellbach, Germany  
Vibra Screw Inc., Totowa, NJ

### Valves, diverter conveyor

Bascale Company, Inc., Houston, TX  
Buhler Inc., Minneapolis, MN  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes,**  
**MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail:**  
**sales@nol-tec.com; web site: www.nol-tec.com)**  
Sandvik Process Systems, Div. of Sandvik Materials Tech-  
nology Deutschland GmbH, Fellbach, Germany  
Vortex, Salina, KS

### Valves, powder

Bascale Company, Inc., Houston, TX  
GEA Process Engineering, Columbia, MD  
**MUELLER GMBH, P.O. Box 1409, Rheinfelden, Germany**  
79604 (+49-76-23-9690; FAX: +49-7623-96969; e-mail:  
info@mueller-gmbh.com; web site: www.mueller-  
gmbh.com)  
Posi-flate, St. Paul, MN  
SAMSON Controls, Inc., Baytown, TX  
Vortex, Salina, KS

## WEIGHING, FEEDING & PROPORTIONING EQUIPMENT

### Batching & blending systems

Acricon Inc., Moonachie, NJ  
Bascale Company, Inc., Houston, TX  
Brabender Technologie GmbH & Co. KG, Duisburg,  
Germany  
Buhler Inc., Minneapolis, MN  
**CYCLONAIRE CORP., P.O. Box 366, York, NE 68467**  
**(800-445-0730; 402-362-2000; FAX: 402-362-2001;**  
**e-mail: sales@cyclonaire.com; web site: www.cy-**  
**clonaire.com)**  
Eastern Instruments, Wilmington, NC  
Flexicon Corp., Bethlehem, PA  
GEA Process Engineering, Columbia, MD  
Hardy Process Solutions, Inc., Industrial Weighing, San  
Diego, CA  
**LEWA GMBH, Ulmer Str. 10, Leonberg, Germany 71229**  
**(49-7152-14-0; FAX: 49-7152-14-1303; e-mail: lewa@**  
**lewa.de; web site: www.lewa.com)**  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes,**  
**MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail:**  
**sales@nol-tec.com; web site: www.nol-tec.com)**  
Siemens Industry, Inc., Process Instrumentation & Analyt-  
ics, Spring House, PA

### Proportioners

Acricon Inc., Moonachie, NJ  
Bascale Company, Inc., Houston, TX  
Fluid Metering, Inc., Syosset, NY  
Nordson SEALANT EQUIPMENT, Plymouth, MI

### Scales, automatic weighing

Acricon Inc., Moonachie, NJ  
Bascale Company, Inc., Houston, TX  
Hardy Process Solutions, Inc., Industrial Weighing, San  
Diego, CA  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes,**  
**MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail:**  
**sales@nol-tec.com; web site: www.nol-tec.com)**

### Scales, bagging, filling

Bascale Company, Inc., Houston, TX  
Eastern Instruments, Wilmington, NC  
Flexicon Corp., Bethlehem, PA  
GEA Process Engineering, Columbia, MD  
Hardy Process Solutions, Inc., Industrial Weighing, San  
Diego, CA  
HAVER & BOECKER OHG, Wire Weaving and Machinery  
Division, OELDE, Germany

### Scales, checkweight

Bascale Company, Inc., Houston, TX  
Eastern Instruments, Wilmington, NC

Hardy Process Solutions, Inc., Industrial Weighing, San  
Diego, CA  
HAVER & BOECKER OHG, Wire Weaving and Machinery  
Division, OELDE, Germany  
Vibra Screw Inc., Totowa, NJ

### Scales, continuous weighing

Acricon Inc., Moonachie, NJ  
Eastern Instruments, Wilmington, NC  
Hardy Process Solutions, Inc., Industrial Weighing, San  
Diego, CA  
Kubota Corporation, Singapore, Singapore  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes,**  
**MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail:**  
**sales@nol-tec.com; web site: www.nol-tec.com)**  
Schenck Process, Kansas City, MO  
Schenck Process GmbH, Darmstadt, Germany  
Vibra Screw Inc., Totowa, NJ

### Scales, conveying

Pacific Scale Co., Inc., Clackamas, OR  
Siemens Industry, Inc., Process Instrumentation & Analyt-  
ics, Spring House, PA

### Scales, counting

Pacific Scale Co., Inc., Clackamas, OR  
PCE Instruments, Units 12/13 Southpoint Business Park,  
Southampton

### Scales, floor, platform

Bascale Company, Inc., Houston, TX  
Hardy Process Solutions, Inc., Industrial Weighing, San  
Diego, CA  
Kubota Corporation, Singapore, Singapore  
Pacific Scale Co., Inc., Clackamas, OR

### Scales, forklift

Pacific Scale Co., Inc., Clackamas, OR

### Scales, gas cylinder filling

Bascale Company, Inc., Houston, TX

### Scales, hopper

Bascale Company, Inc., Houston, TX  
Flexicon Corp., Bethlehem, PA  
Hardy Process Solutions, Inc., Industrial Weighing, San  
Diego, CA  
Pacific Scale Co., Inc., Clackamas, OR  
PCE Instruments, Units 12/13 Southpoint Business Park,  
Southampton

### Scales, portable

Pacific Scale Co., Inc., Clackamas, OR  
PCE Instruments, Units 12/13 Southpoint Business Park,  
Southampton

### Scales, railroad car

Bascale Company, Inc., Houston, TX  
Schenck Process GmbH, Darmstadt, Germany

### Scales, remote indicating

Bascale Company, Inc., Houston, TX  
Hardy Process Solutions, Inc., Industrial Weighing, San  
Diego, CA  
Pacific Scale Co., Inc., Clackamas, OR

### Scales, tank

Bascale Company, Inc., Houston, TX  
Hardy Process Solutions, Inc., Industrial Weighing, San  
Diego, CA  
Pacific Scale Co., Inc., Clackamas, OR

### Scales, totalizing

Eastern Instruments, Wilmington, NC  
Pacific Scale Co., Inc., Clackamas, OR

### Scales, truck

Bascale Company, Inc., Houston, TX  
Schenck Process GmbH, Darmstadt, Germany

# 3

# ELECTRICAL POWER GENERATION & TRANSMISSION

- 119 Bearings & bushings**
  - 119 Boilers, industrial**
  - 119 Drives, Other**
  - 119 Drives, Turbine**
  - 120 Electrical & power generation equipment**
  - 120 Electrical heating equipment**
  - 120 Lighting fixtures**
  - 120 Motor controls**
  - 120 Motors, electric**
  - 120 Other electrical equipment**
  - 120 Rectifiers**
-



## BEARINGS & BUSHINGS

### Bearing isolators

AEGIS Bearing Protection Rings, Mechanic Falls, ME

### Bearings

Greene, Tweed & Co., Kulpsville, PA  
Greene, Tweed & Co. Ltd., Nottingham, Notts  
Isotech, Inc., Hatfield, PA

### Bushings

Isotech, Inc., Hatfield, PA  
Regal Industries, Inc., Painesville, OH

## BOILERS, INDUSTRIAL

### Ash conditioning systems

Mars Mineral, Mars, PA

### Boiler accessories

Bryan Steam LLC, Peru, IN  
Ernst Flow Industries, Farmingdale, NJ

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE),** Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

John Zink Harmworthy Combustion, Tulsa, OK  
Topog-E Gasket Co., Tulsa, OK

**USA INDUSTRIES, INC., 302 State Street, S. Houston, TX 77587** (800-456-8721; 713-941-3797; FAX: 713-941-1086; e-mail: info@usaindustries.com; web site: www.usaindustries.com)

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Boilers, automatic, packaged

Fulton Companies, The, Fulton Thermal Corporation, Pulaslaski, NY

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE),** Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Boilers, carbon monoxide fired

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Boilers, coal fired

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Boilers, fire tube

Fulton Companies, The, Fulton Thermal Corporation, Pulaslaski, NY  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE),** Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Boilers, fluidized bed

CPFD-Software, Albuquerque, New Mexico

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE),** Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Boilers, integral furnace

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE),** Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Boilers, natural gas fired

Bryan Steam LLC, Peru, IN  
HTT Energy GmbH, Herford, Germany  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE),** Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Boilers, oil fired

Bryan Steam LLC, Peru, IN  
HTT Energy GmbH, Herford, Germany  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE),** Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Boilers, waste heat recovery

Advanced Heat Recovery, Inc., Division of AQUA Innovations, Inc., Baltimore, MD  
HTT Energy GmbH, Herford, Germany  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE),** Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Boilers, water tube

Bryan Steam LLC, Peru, IN  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE),** Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## DRIVES, OTHER

### Couplings, shaft

IGW - IG Wateeuw International nv, Headquarters, Oostkamp, Belgium  
Voith Turbo GmbH & Co. KG, Crailsheim, Germany

### Drives, belt

Isotech, Inc., Hatfield, PA

### Drives, conveyor

Rockwell Automation, Inc., Milwaukee, WI  
Voith Turbo GmbH & Co. KG, Crailsheim, Germany

### Drives, crusher

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Drives, gear

IGW - IG Wateeuw International nv, Headquarters, Oostkamp, Belgium

MICROMO, Clearwater, FL  
Voith Turbo GmbH & Co. KG, Crailsheim, Germany

### Drives, magnetic

PDC Machines, Inc., Warminster, PA

### Drives, pump

Rockwell Automation, Inc., Milwaukee, WI  
Voith Turbo GmbH & Co. KG, Crailsheim, Germany

### Drives, variable speed, centrifuge

Rockwell Automation, Inc., Milwaukee, WI

### Drives, variable speed, electrical

IGW - IG Wateeuw International nv, Headquarters, Oostkamp, Belgium  
MICROMO, Clearwater, FL  
Rockwell Automation, Inc., Milwaukee, WI  
Siemens, Industry USA, Solutions, Automation and Drives Technologies, Valhalla, GA

### Drives, variable speed, hydraulic

Voith Turbo GmbH & Co. KG, Crailsheim, Germany

### Drives, variable speed, mechanical

IGW - IG Wateeuw International nv, Headquarters, Oostkamp, Belgium  
Voith Turbo GmbH & Co. KG, Crailsheim, Germany

### Drives, variable speed, mixer

Rockwell Automation, Inc., Milwaukee, WI

### Gears

IGW - IG Wateeuw International nv, Headquarters, Oostkamp, Belgium  
Regal Industries, Inc., Painesville, OH

### Joints, universal

Voith Turbo GmbH & Co. KG, Crailsheim, Germany

### Shafting

IGW - IG Wateeuw International nv, Headquarters, Oostkamp, Belgium  
Regal Industries, Inc., Painesville, OH

### Speed reducers

IGW - IG Wateeuw International nv, Headquarters, Oostkamp, Belgium  
MICROMO, Clearwater, FL

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Transmissions

IGW - IG Wateeuw International nv, Headquarters, Oostkamp, Belgium

## DRIVES, TURBINE

### Generator drives, steam

Dresser-Rand, Corporate Headquarters, Houston, TX  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Turbines, combined steam-gas

Dresser-Rand, Corporate Headquarters, Houston, TX  
HIMA Paul Hildebrandt GmbH + Co KG, Bruehl, Germany  
MAN Diesel & Turbo SE, Augsburg, Germany  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Turbines, mechanical drive, gas

Dresser-Rand, Corporate Headquarters, Houston, TX  
MAN Diesel & Turbo SE, Augsburg, Germany  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427** (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Turbines, mechanical drive, steam

Dresser-Rand, Corporate Headquarters, Houston, TX  
MAN Diesel & Turbo SE, Augsburg, Germany

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## ELECTRICAL & POWER GENERATION EQUIPMENT

### Batteries & electrical storage equipment

Lectrus, Chattanooga, TN

### Cogeneration systems & equipment

Air Products and Chemicals, Inc., Allentown, PA  
ProSim SA, LABEGE, France  
Russelectric Inc., Hingham, MA

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Engine-generator sets

Lectrus, Chattanooga, TN

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Engines, diesel

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Engines, gasoline

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Engines, LPG

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Engines, natural gas

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Expanders

MAN Diesel & Turbo SE, Augsburg, Germany

### Generator-turbine sets

Dresser-Rand, Corporate Headquarters, Houston, TX  
MAN Diesel & Turbo SE, Augsburg, Germany  
**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Generators, electrical

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)  
**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Power supplies, emergency

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)  
Russelectric Inc., Hingham, MA  
S&C Electric Company, Chicago, IL

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## ELECTRICAL HEATING EQUIPMENT

### Bands, electric heating

Kloepfer-Therm GmbH & Co. KG, Dortmund, Germany  
Watlow, St. Louis, MO

### Heaters, electric immersion

Dalton Electric Heating Co., Inc., Ipswich, MA  
Kloepfer-Therm GmbH & Co. KG, Dortmund, Germany  
Watlow, St. Louis, MO

### Heaters, thermal fluid electric

Fulton Companies, The, Fulton Thermal Corporation, Pulaški, NY  
Kloepfer-Therm GmbH & Co. KG, Dortmund, Germany  
Mokon, Buffalo, NY  
Spaltech International Inc., Halton Hills, Ontario, Canada

### Strips, electric heating

Kloepfer-Therm GmbH & Co. KG, Dortmund, Germany  
Watlow, St. Louis, MO

### Tape, electric heating

BARTEC GmbH, Bad Mergentheim, Germany  
Kloepfer-Therm GmbH & Co. KG, Dortmund, Germany

## LIGHTING FIXTURES

### Lamps, incandescent

Osram Sylvania, Danvers, MA

### Lamps, infrared

Osram Sylvania, Danvers, MA

### Lamps, mercury vapor

Osram Sylvania, Danvers, MA

### Lamps, photochemical

Osram Sylvania, Danvers, MA

### Lamps, sodium vapor

Osram Sylvania, Danvers, MA

### Lamps, ultraviolet

Dymax Corp., Torrington, CT  
Osram Sylvania, Danvers, MA

### Lighting equipment, emergency

Osram Sylvania, Danvers, MA

### Lighting, explosion proof

Osram Sylvania, Danvers, MA  
R. STAHL, Waldenburg, Germany

### Lighting: panelboards, instruments & gages

Osram Sylvania, Danvers, MA

## MOTOR CONTROLS

### Actuators or starters, motor

Bascale Company, Inc., Houston, TX  
Hilliard Corp., Elmira, NY

## MOTORS, ELECTRIC

### Motors, A.C.

Siemens, Industry USA, Solutions, Automation and Drives Technologies, Alpharetta, GA

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Motors, D.C.

MICROMO, Clearwater, FL

### Motors, explosion proof

BARTEC GmbH, Bad Mergentheim, Germany

### Motors, submersible

MM Industries, Inc., Vorti-Siv, Salem, OH

### Motors, variable speed

MICROMO, Clearwater, FL

### Motors, vertical

MICROMO, Clearwater, FL

## OTHER ELECTRICAL EQUIPMENT

### Circuit breakers

Phoenix Contact, Middletown, PA  
Phoenix Contact GmbH & Co.KG, Blomberg, Germany  
Schurter, Inc., Santa Rosa, CA

### Electrical equipment, other

Conveyor Components Co., Material Control, Inc., Crosswell, MI  
Electroswitch, Weymouth, MA  
Lightning Eliminators & Consultants, Inc., Boulder, CO  
Phoenix Contact, Middletown, PA  
Phoenix Contact GmbH & Co.KG, Blomberg, Germany  
Rockwell Automation, Inc., Milwaukee, WI  
Russelectric Inc., Hingham, MA  
S&C Electric Company, Chicago, IL  
Schurter, Inc., Santa Rosa, CA

### Switches, electrical

Electroswitch, Weymouth, MA  
Lectrus, Chattanooga, TN  
Madison Co., Branford, CT  
Rockwell Automation, Inc., Milwaukee, WI  
S&C Electric Company, Chicago, IL  
Schurter, Inc., Santa Rosa, CA  
Siemens, Industry USA, Solutions, Automation and Drives Technologies, Alpharetta, GA

### Switchgear & other power distribution equipment

Lectrus, Chattanooga, TN  
Madison Co., Branford, CT  
Russelectric Inc., Hingham, MA  
S&C Electric Company, Chicago, IL  
Schurter, Inc., Santa Rosa, CA

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Transformers

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## RECTIFIERS

### Rectifiers, germanium controlled

Denver Mineral Engineers, Inc., Littleton, CO

# 4

# INSTRUMENTATION & CONTROLS

- 122 Actuators, operators**
- 122 Analyzers, offstream**
- 123 Analyzers, onstream**
- 124 Computers, process control**
- 124 Controllers**
- 125 Data presentation equipment**
- 125 Indicators**
- 127 Measurement & testing equipment**
- 129 Recorders**
- 129 Transmitters & data transmission equipment**

## ACTUATORS, OPERATORS

### Actuators

ARCA Regler GmbH, Toennisvorst, Germany  
 Auma Actuators Inc., Cannonsburg, PA  
 AUMA Riester GmbH & Co. KG, Muelheim, Germany  
 Buerkert Fluid Control Systems, Ingelfingen  
 Burkert Fluid Control Systems, Charlotte, NC  
 Georg Fischer Piping Systems Ltd., Schaffhausen, Switzerland  
 Isotech, Inc., Hatfield, PA  
 Posi-flate, St. Paul, MN  
 Rockwell Automation, Inc., Milwaukee, WI  
 SAMSON Controls, Inc., Baytown, TX  
 Voith Turbo GmbH & Co. KG, Crailsheim, Germany

### Cylinders, pneumatic

Isotech, Inc., Hatfield, PA

### Valve operators, diaphragm

SAMSON Controls, Inc., Baytown, TX

### Valve operators, electrohydraulic

SAMSON Controls, Inc., Baytown, TX  
 Voith Turbo GmbH & Co. KG, Crailsheim, Germany

### Valve operators, electropneumatic

Flowserve Corp., Irving, TX  
 SAMSON Controls, Inc., Baytown, TX

### Valve operators, motor operated

SAMSON Controls, Inc., Baytown, TX

### Valve operators, piston

Auma Actuators Inc., Cannonsburg, PA  
 AUMA Riester GmbH & Co. KG, Muelheim, Germany  
 Flowserve Corp., Irving, TX  
 SAMSON Controls, Inc., Baytown, TX

### Valve operators, pneumatic

Buerkert Fluid Control Systems, Ingelfingen  
 Burkert Fluid Control Systems, Charlotte, NC  
 Flowserve Corp., Flow Control Div., Cookeville, TN  
 Posi-flate, St. Paul, MN  
 SAMSON Controls, Inc., Baytown, TX

### Valve operators, solenoid

Flowserve Corp., Irving, TX  
 SAMSON Controls, Inc., Baytown, TX

### Valve, position indicators

Flowserve Corp., Irving, TX  
 Hans Turck GmbH & Co. KG, Muelheim an der Ruhr, Germany  
 SAMSON Controls, Inc., Baytown, TX

### Valve positioners, microprocessor equipped

ARCA Regler GmbH, Toennisvorst, Germany  
 Flowserve Corp., Irving, TX  
 SAMSON Controls, Inc., Baytown, TX  
 Siemens Industry, Inc., Solutions, Automation and Drive Technologies, Norcross, GA

### Valve positioners, other

SAMSON Controls, Inc., Baytown, TX

## ANALYZERS, OFFSTREAM

### Analyzers, air quality

Clean Air Engineering, Palatine, IL  
 Sierra Monitor Corp., Milpitas, CA  
 Sporian Microsystems, Inc., Lafayette, CO

### Analyzers, atomic absorption

Shimadzu Scientific Instruments, Columbia, MD

### Analyzers, biological

Fluid Imaging Technologies, Inc., Scarborough, ME  
 Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA

### Analyzers, BOD

LAR Process Analyzers AG, Berlin, Germany

### Analyzers, carbon dioxide or monoxide

Analytical Systems Int'l / KECO R&D, Houston, TX  
 Delphian Corp., Northvale, NJ  
 GOW-MAC Instrument Co., Bethlehem, PA  
 Illinois Instruments, Johnsburg, IL  
 PCE Instruments, Units 12/13 Southpoint Business Park, Southampton

Siemens Industry, Inc., Applied Automation, Bartlesville, OK  
 Sierra Monitor Corp., Milpitas, CA  
 Systech Instruments Ltd (Systech Illinois), Thame  
 UIC Inc., Joliet, IL

### Analyzers, chlorine

Jumo Process Control Inc., East Syracuse, NY  
 SensoTech GmbH, Magdeburg-Barleben, Germany  
 Sierra Monitor Corp., Milpitas, CA

### Analyzers, chlorine, total

PANalytical BV, Almelo, Netherlands

### Analyzers, chromatographic

BARTEC GmbH, Bad Mergentheim, Germany  
 Emerson Process Management, Austin, TX  
 GOW-MAC Instrument Co., Bethlehem, PA  
 PDR-Separations LLC, Palm Beach Gardens, FL  
 Shimadzu Scientific Instruments, Columbia, MD  
 Siemens Industry, Inc., Applied Automation, Bartlesville, OK

### Analyzers, combustible gases

Control Instruments Corp., Fairfield, NJ  
 Delphian Corp., Northvale, NJ  
 Emerson Process Management, Austin, TX  
 Sensor Electronics Corporation, Savage, MN  
 Sierra Monitor Corp., Milpitas, CA

### Analyzers, combustion

Clean Air Instrument Rental, Palatine, IL  
 Emerson Process Management, Austin, TX  
 LAR Process Analyzers AG, Berlin, Germany  
 LECO Corporation, St. Joseph, MI

### Analyzers, concentration

Anton PAAR GmbH, Graz, Austria  
 Anton PAAR USA, Ashland, VA  
 Automation Products Inc. (Dynatrol Div.), Houston, TX  
 Berthold Technologies GmbH & Co.KG, Bad Wildbad  
 Emerson Process Management, Austin, TX  
**FLEXIM AMERICAS, 250 V Executive Drive, Edgewood, NY 11717 (1 888 852 74 73 North America; 631-492-2300; FAX: 631-492-2117; e-mail: salesus@flexim.com; web site: www.flexim.com)**  
**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH, Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30 936 676 60; FAX: 49 0 30 936 676 80; e-mail: info@flexim.com; web site: www.flexim.com)**

Fluid Imaging Technologies, Inc., Scarborough, ME  
 K-Patents, Inc., Naperville, IL  
 Polytec, Inc., Process Analytics, Hopkinton  
 SensoTech GmbH, Magdeburg-Barleben, Germany  
 SensoTech Inc., Wayne, NJ  
 Sierra Monitor Corp., Milpitas, CA  
 tec5USA, Plainview, NY

### Analyzers, conductivity

Emerson Process Management, Austin, TX  
 Illinois Instruments, Johnsburg, IL  
 Jumo Process Control Inc., East Syracuse, NY  
 JUMO GmbH & Co. KG, Fulda, Germany  
 Myron L Company, Carlsbad, CA  
 Systech Instruments Ltd (Systech Illinois), Thame  
 Van London-pHoenix Co., Houston, TX

### Analyzers, emission

Control Instruments Corp., Fairfield, NJ  
 Emerson Process Management, Austin, TX  
 M&C TechGroup, Ventura, CA  
 Siemens Industry, Inc., Applied Automation, Bartlesville, OK

### Analyzers, environmental conditions

Emerson Process Management, Austin, TX  
 Idealab Inc., Franklin, MA  
 Sierra Monitor Corp., Milpitas, CA  
 Sporian Microsystems, Inc., Lafayette, CO  
 Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA

### Analyzers, fats & oils

Fluid Imaging Technologies, Inc., Scarborough, ME  
**MOISTTECH CORP., 1283 Tallevast Rd, Sarasota, FL 34243 (9413517870; 9413517870; FAX: 9413517870; e-mail: afordham@moisttech.com)**

### Analyzers, gas density

Illinois Instruments, Johnsburg, IL  
 PCE Instruments, Units 12/13 Southpoint Business Park, Southampton  
 Pfeiffer Vacuum, Inc., Nashua, NH  
**PFEIFFER VACUUM GMBH, Berliner Strasse 43, Asslar, Germany 35614 (+49-6441-802 0; FAX: +49-6441-802 1202; e-mail: info@pfeiffer-vacuum.de; web site: www.pfeiffer-vacuum.com)**  
 Systech Instruments Ltd (Systech Illinois), Thame

### Analyzers, hydrocarbons

Analytical Systems Int'l / KECO R&D, Houston, TX  
 BARTEC GmbH, Bad Mergentheim, Germany  
 Control Instruments Corp., Fairfield, NJ  
 GOW-MAC Instrument Co., Bethlehem, PA  
 PANalytical BV, Almelo, Netherlands  
 Sensor Electronics Corporation, Savage, MN  
 Siemens Industry, Inc., Applied Automation, Bartlesville, OK  
 Sierra Monitor Corp., Milpitas, CA  
 Sporian Microsystems, Inc., Lafayette, CO  
 Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA

### Analyzers, hydrogen

Control Instruments Corp., Fairfield, NJ  
 Illinois Instruments, Johnsburg, IL  
 LECO Corporation, St. Joseph, MI  
 Sierra Monitor Corp., Milpitas, CA  
 Systech Instruments Ltd (Systech Illinois), Thame

### Analyzers, infrared

Analytical Systems Int'l / KECO R&D, Houston, TX  
 Idealab Inc., Franklin, MA  
 Siemens Industry, Inc., Applied Automation, Bartlesville, OK  
 Sierra Monitor Corp., Milpitas, CA

### Analyzers, mass spectrometer

LECO Corporation, St. Joseph, MI  
 Pfeiffer Vacuum, Inc., Nashua, NH  
**PFEIFFER VACUUM GMBH, Berliner Strasse 43, Asslar, Germany 35614 (+49-6441-802 0; FAX: +49-6441-802 1202; e-mail: info@pfeiffer-vacuum.de; web site: www.pfeiffer-vacuum.com)**  
 Siemens Industry, Inc., Applied Automation, Bartlesville, OK

### Analyzers, moisture content

BARTEC GmbH, Bad Mergentheim, Germany  
 FOSS NIRSystems, Inc., Laurel, MD  
 Illinois Instruments, Johnsburg, IL  
 LECO Corporation, St. Joseph, MI  
 Polytec, Inc., Process Analytics, Hopkinton  
 Siemens Industry, Inc., Solutions, Automation and Drive Technologies, Norcross, GA  
 Systech Instruments Ltd (Systech Illinois), Thame

### Analyzers, near infrared

BARTEC GmbH, Bad Mergentheim, Germany  
 FOSS NIRSystems, Inc., Laurel, MD  
 Idealab Inc., Franklin, MA  
 PANalytical BV, Almelo, Netherlands  
 Polytec, Inc., Process Analytics, Hopkinton  
 tec5USA, Plainview, NY

### Analyzers, neutron activation

PANalytical BV, Almelo, Netherlands

### Analyzers, nitrogen

Illinois Instruments, Johnsburg, IL  
 LECO Corporation, St. Joseph, MI  
 Sporian Microsystems, Inc., Lafayette, CO  
 Systech Instruments Ltd (Systech Illinois), Thame

### Analyzers, nitrogen oxide

Sierra Monitor Corp., Milpitas, CA

### Analyzers, nitrogen, total

LAR Process Analyzers AG, Berlin, Germany  
 LECO Corporation, St. Joseph, MI  
 PANalytical BV, Almelo, Netherlands  
 Shimadzu Scientific Instruments, Columbia, MD

### Analyzers, oil content

Fluid Imaging Technologies, Inc., Scarborough, ME  
 SensoTech GmbH, Magdeburg-Barleben, Germany  
 Sigrist Photometer AG, Ennetbuergen, Switzerland  
 Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA

### Analyzers, organic carbon

Analytical Systems Int'l / KECO R&D, Houston, TX  
 LAR Process Analyzers AG, Berlin, Germany  
 LECO Corporation, St. Joseph, MI  
 Sigrist Photometer AG, Ennetbuergen, Switzerland  
 UIC Inc., Joliet, IL

### Analyzers, organic carbon, total

LAR Process Analyzers AG, Berlin, Germany  
 PANalytical BV, Almelo, Netherlands  
 Shimadzu Scientific Instruments, Columbia, MD  
 UIC Inc., Joliet, IL

### Analyzers, organic halogen, total

PANalytical BV, Almelo, Netherlands

## Analyzers, oxygen content

AirSep Corporation, A Chart Industries Company, Buffalo, NY  
Illinois Instruments, Johnsburg, IL  
Sierra Monitor Corp., Milpitas, CA  
Systech Instruments Ltd (Systech Illinois), Thame

## Analyzers, oxygen demand

LAR Process Analysers AG, Berlin, Germany

## Analyzers, oxygen, dissolved

Anton PAAR GmbH, Graz, Austria  
Dr. Thiedig GmbH & Co KG, Berlin, Germany  
Jumo Process Control Inc., East Syracuse, NY  
Van London-pHoenix Co., Houston, TX

## Analyzers, ozone content

Sigrist Photometer AG, Ennetbuergen, Switzerland

## Analyzers, particle size

Fluid Imaging Technologies, Inc., Scarborough, ME  
FRITSCHB GmbH, Milling and Sizing, Idar-Oberstein, Germany  
G.R. Sprenger Engineering, Inc., Golden, CO  
Shimadzu Scientific Instruments, Columbia, MD  
Sympatec GmbH, System | Partikel | Technik, Clausthal-Zellerfeld, Germany  
Sympatec, Inc., System | Partikel | Technik, Pennington, NJ

## Analyzers, pH

Analytical Measurements, Chester, NJ  
Emerson Process Management, Austin, TX  
Jumo Process Control Inc., East Syracuse, NY  
JUMO GmbH & Co. KG, Fulda, Germany  
Myron L Company, Carlsbad, CA  
PCE Instruments, Units 12/13 Southpoint Business Park, Southampton  
Van London-pHoenix Co., Houston, TX  
Walchem, IWAKI America, Inc., Holliston, MA

## Analyzers, phosphorus

PANalytical BV, Almelo, Netherlands

## Analyzers, sodium ion concentration

Dr. Thiedig GmbH & Co KG, Berlin, Germany

## Analyzers, sound

PCE Instruments, Units 12/13 Southpoint Business Park, Southampton  
SensoTech GmbH, Magdeburg-Barleben, Germany

## Analyzers, spectrometer

FOSS NIRSystems, Inc., Laurel, MD  
Idealab Inc., Franklin, MA  
LECO Corporation, St. Joseph, MI  
MIDAC Corp., Westfield, MA  
Pfeiffer Vacuum, Inc., Nashua, NH  
Polytec, Inc., Process Analytics, Hopkinton  
Shimadzu Scientific Instruments, Columbia, MD  
Sporian Microsystems, Inc., Lafayette, CO

## Analyzers, spectrophotometer

FOSS NIRSystems, Inc., Laurel, MD  
Idealab Inc., Franklin, MA  
Shimadzu Scientific Instruments, Columbia, MD  
Sias, New Castle, DE  
tec5USA, Plainview, NY

## Analyzers, stack gases

Emerson Process Management, Austin, TX  
MIDAC Corp., Westfield, MA  
Siemens Industry, Inc., Applied Automation, Bartlesville, OK

## Analyzers, sulfur dioxide

Control Instruments Corp., Fairfield, NJ  
PureAire Monitoring Systems, Inc., Lake Zurich, IL  
Siemens Industry, Inc., Applied Automation, Bartlesville, OK  
Sierra Monitor Corp., Milpitas, CA

## Analyzers, sulfur, total

LECO Corporation, St. Joseph, MI  
PANalytical BV, Almelo, Netherlands  
Siemens Industry, Inc., Applied Automation, Bartlesville, OK

## Analyzers, suspended solids

Automation Products Inc. (Dynatrol Div.), Houston, TX  
Fluid Imaging Technologies, Inc., Scarborough, ME  
Markland Specialty Engineering Ltd., Georgetown, Ontario, Canada  
Sigrist Photometer AG, Ennetbuergen, Switzerland

## Analyzers, thermal

ATS RheoSystems, Cannon Instrument Company, Borden-town, NJ  
Shimadzu Scientific Instruments, Columbia, MD

## Analyzers, thin film

PANalytical BV, Almelo, Netherlands  
tec5USA, Plainview, NY

## Analyzers, total solids

K-Patents, Inc., Naperville, IL

## Analyzers, ultraviolet

tec5USA, Plainview, NY

## Analyzers, vapor pressure

BARTEC GmbH, Bad Mergentheim, Germany

## Analyzers, VOCs

Analytical Systems Int'l / KECO R&D, Houston, TX  
Idealab Inc., Franklin, MA  
Sporian Microsystems, Inc., Lafayette, CO

## Analyzers, water quality

Analytical Systems Int'l / KECO R&D, Houston, TX  
Dr. Thiedig GmbH & Co KG, Berlin, Germany  
Fluid Imaging Technologies, Inc., Scarborough, ME  
LAR Process Analysers AG, Berlin, Germany  
Myron L Company, Carlsbad, CA  
Sporian Microsystems, Inc., Lafayette, CO  
Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA  
Van London-pHoenix Co., Houston, TX

## Analyzers, flame photometers

BWB Technologies UK Ltd, Newbury

## Detectors, dust

Auburn Systems, LLC, Danvers, MA

## Detectors, explosion

Compur Monitors GmbH & Co. KG, Munich, Germany  
**FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)**

## Detectors, flame

**FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)**

General Monitors, Lake Forest, CA  
Sensor Electronics Corp., Minneapolis, MN

## Detectors, gases

Analytical Systems Int'l / KECO R&D, Houston, TX  
Compur Monitors GmbH & Co. KG, Munich, Germany  
Control Instruments Corp., Fairfield, NJ  
Delphian Corp., Northvale, NJ  
Enmet Corp., Ann Arbor, MI  
General Monitors, Lake Forest, CA  
GfG Instrumentation, Inc., Ann Arbor, MI  
GOW-MAC Instrument Co., Bethlehem, PA  
Illinois Instruments, Johnsburg, IL  
Mil-Ram Technology, Inc., Fremont, CA  
PCE Instruments, Units 12/13 Southpoint Business Park, Southampton  
PureAire Monitoring Systems, Inc., Lake Zurich, IL  
Sensor Electronics Corp., Minneapolis, MN  
Sensor Electronics Corporation, Savage, MN  
**SIERRA INSTRUMENTS, INC., 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-868-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)**  
Sierra Monitor Corp., Milpitas, CA  
Systech Instruments Ltd (Systech Illinois), Thame

## Detectors, gases, combustible

Control Instruments Corp., Fairfield, NJ  
Delphian Corp., Northvale, NJ  
Enmet Corp., Ann Arbor, MI  
General Monitors, Lake Forest, CA  
GfG Instrumentation, Inc., Ann Arbor, MI  
Mil-Ram Technology, Inc., Fremont, CA  
PureAire Monitoring Systems, Inc., Lake Zurich, IL  
Sensor Electronics Corp., Minneapolis, MN  
Sensor Electronics Corporation, Savage, MN  
Sierra Monitor Corp., Milpitas, CA

## Detectors, gases, toxic

Analytical Systems Int'l / KECO R&D, Houston, TX  
Control Instruments Corp., Fairfield, NJ  
Delphian Corp., Northvale, NJ  
Enmet Corp., Ann Arbor, MI  
General Monitors, Lake Forest, CA  
GfG Instrumentation, Inc., Ann Arbor, MI  
Mil-Ram Technology, Inc., Fremont, CA  
PureAire Monitoring Systems, Inc., Lake Zurich, IL

Sensor Electronics Corp., Minneapolis, MN  
Sensor Electronics Corporation, Savage, MN  
Sierra Monitor Corp., Milpitas, CA

## Detectors, liquid-leak

Analytical Systems Int'l / KECO R&D, Houston, TX  
SensoTech GmbH, Magdeburg-Barleben, Germany  
SGB GmbH, Siegen, Germany

## Detectors, moisture

Berthold Technologies GmbH & Co.KG, Bad Wildbad

## Detectors, other

PDR-Separations LLC, Palm Beach Gardens, FL  
**USA INDUSTRIES, INC., 302 State Street, S. Houston, TX 77587 (800-456-8721; 713-941-3797; FAX: 713-941-1086; e-mail: info@usaindustries.com; web site: www.usaindustries.com)**

## Detectors, radiation

Berthold Technologies GmbH & Co.KG, Bad Wildbad  
TowerScan, Port Huron, MI  
TowerScan, Sarnia, Ontario, Canada

## Detectors, sludge blanket level

Madison Co., Branford, CT  
Markland Specialty Engineering Ltd., Georgetown, Ontario, Canada

## Detectors, vibration

PCE Instruments, Units 12/13 Southpoint Business Park, Southampton  
PRUEFTECHNIK, Ismaning, Germany  
Sporian Microsystems, Inc., Lafayette, CO  
**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)**  
**See our ad on page 100**

Vibra-Metrics, div. of Mirstras Holdings, Princeton Junction, NJ

## Samplers, automatic

BIAR Sampling Systems, Gonzales, LA  
Fluid Metering, Inc., Syosset, NY  
Markland Specialty Engineering Ltd., Georgetown, Ontario, Canada  
Tema Systems, Inc., Cincinnati, OH

## Samplers, gas, air

BIAR Sampling Systems, Gonzales, LA  
Clean Air Express Equipment, Palatine, IL  
Clean Air Instrument Rental, Palatine, IL  
M&C TechGroup, Ventura, CA

## Samplers, liquid

BIAR Sampling Systems, Gonzales, LA  
Fluid Metering, Inc., Syosset, NY  
Markland Specialty Engineering Ltd., Georgetown, Ontario, Canada  
Sentry Equipment Corp, Oconomowoc, WI  
Sias, New Castle, DE  
Xiril AG, Hombrechtikon, Switzerland

## Samplers, solids

Sympatec GmbH, System | Partikel | Technik, Clausthal-Zellerfeld, Germany  
Sympatec, Inc., System | Partikel | Technik, Pennington, NJ

## ANALYZERS, ONSTREAM

### Chromatographs, onstream

Emerson Process Management, Austin, TX  
Siemens Industry, Inc., Applied Automation, Bartlesville, OK

### Monitors, air quality

Enmet Corp., Ann Arbor, MI  
MIDAC Corp., Westfield, MA  
Sensor Electronics Corp., Minneapolis, MN  
Siemens Industry, Inc., Solutions, Automation and Drive Technologies, Norcross, GA  
Sierra Monitor Corp., Milpitas, CA

### Monitors, ammonia

GfG Instrumentation, Inc., Ann Arbor, MI  
MIDAC Corp., Westfield, MA  
Mil-Ram Technology, Inc., Fremont, CA  
PureAire Monitoring Systems, Inc., Lake Zurich, IL  
SensoTech GmbH, Magdeburg-Barleben, Germany

### Monitors, carbon dioxide or monoxide

Delphian Corp., Northvale, NJ  
Enmet Corp., Ann Arbor, MI  
General Monitors, Lake Forest, CA  
GfG Instrumentation, Inc., Ann Arbor, MI

GOW-MAC Instrument Co., Bethlehem, PA  
 Mil-Ram Technology, Inc., Fremont, CA  
 PureAire Monitoring Systems, Inc., Lake Zurich, IL  
 Sensor Electronics Corp., Minneapolis, MN  
 Sierra Monitor Corp., Milpitas, CA

## Monitors, chlorine

Enmet Corp., Ann Arbor, MI  
 GIG Instrumentation, Inc., Ann Arbor, MI  
 Mil-Ram Technology, Inc., Fremont, CA  
 optek-Danulat, Inc., Germantown, WI  
 PureAire Monitoring Systems, Inc., Lake Zurich, IL  
 Sensor Electronics Corp., Minneapolis, MN  
 Sierra Monitor Corp., Milpitas, CA

## Monitors, colorimetric

optek-Danulat, Inc., Germantown, WI

## Monitors, combustible gases, or vapors

Control Instruments Corp., Fairfield, NJ  
 Delphian Corp., Northvale, NJ  
 Enmet Corp., Ann Arbor, MI  
 General Monitors, Lake Forest, CA  
 GIG Instrumentation, Inc., Ann Arbor, MI  
 Mil-Ram Technology, Inc., Fremont, CA  
 PureAire Monitoring Systems, Inc., Lake Zurich, IL  
 Sensor Electronics Corp., Minneapolis, MN  
 Sierra Monitor Corp., Milpitas, CA

## Monitors, composition

**FLEXIM AMERICAS, 250 V Executive Drive, Edgewood, NY 11717 (1 888 852 74 73 North America; 631-492-2300; FAX: 631-492-2117; e-mail: salesus@flexim.com; web site: www.flexim.com)**  
**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH, Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30 936 676 60; FAX: 49 0 30 936 676 80; e-mail: info@flexim.com; web site: www.flexim.com)**  
 SensoTech GmbH, Magdeburg-Barleben, Germany  
 SensoTech Inc., Wayne, NJ

## Monitors, conductivity

Myron L Company, Carlsbad, CA  
 optek-Danulat, Inc., Germantown, WI

## Monitors, dispersion

**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCI@marcom@fluidcomponents.com; web site: www.fluidcomponents.com)**

## Monitors, dust

Auburn Systems, LLC, Danvers, MA  
 Clean Air Instrument Rental, Palatine, IL  
 Matsushima Measure Tech, Des Plaines, IL  
 Midwesco Filter Resources, Inc., Winchester, VA  
 Monitor Technologies LLC, Elburn, IL  
 Sigris Photometer AG, Ennetbürgen, Switzerland

## Monitors, emissions, continuous

Auburn Systems, LLC, Danvers, MA  
 Clean Air Engineering, Palatine, IL  
**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCI@marcom@fluidcomponents.com; web site: www.fluidcomponents.com)**  
 MIDAC Corp., Westfield, MA  
**SIERRA INSTRUMENTS, INC., 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)**

## Monitors, humidity

Hampshire Controls Corp., Dover, NH  
 PCE Instruments, Units 12/13 Southpoint Business Park, Southampton  
 S-Products Inc., Fairfield, CT

## Monitors, hydrocarbon content

Analytical Systems Int'l / KECO R&D, Houston, TX  
 Clean Air Express Equipment, Palatine, IL  
 Enmet Corp., Ann Arbor, MI  
 General Monitors, Lake Forest, CA  
 GIG Instrumentation, Inc., Ann Arbor, MI  
 Sensor Electronics Corp., Minneapolis, MN  
 Sierra Monitor Corp., Milpitas, CA  
 Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA

## Monitors, hydrogen cyanide content

PureAire Monitoring Systems, Inc., Lake Zurich, IL  
 Sensor Electronics Corp., Minneapolis, MN  
 Sierra Monitor Corp., Milpitas, CA

## Monitors, hydrogen sulfide content

Analytical Systems Int'l / KECO R&D, Houston, TX  
 Enmet Corp., Ann Arbor, MI  
 General Monitors, Lake Forest, CA  
 GIG Instrumentation, Inc., Ann Arbor, MI  
 Sensor Electronics Corp., Minneapolis, MN  
 Sierra Monitor Corp., Milpitas, CA

## Monitors, octane

FOSS NIRSystems, Inc., Laurel, MD

## Monitors, oil content

Fluid Imaging Technologies, Inc., Scarborough, ME  
 optek-Danulat, Inc., Germantown, WI  
 SensoTech Inc., Wayne, NJ  
 Sigris Photometer AG, Ennetbürgen, Switzerland  
 Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA

## Monitors, organic carbon, total

LAR Process Analysers AG, Berlin, Germany  
 Sigris Photometer AG, Ennetbürgen, Switzerland

## Monitors, oxygen content

Enmet Corp., Ann Arbor, MI  
 General Monitors, Lake Forest, CA  
 GIG Instrumentation, Inc., Ann Arbor, MI  
 PureAire Monitoring Systems, Inc., Lake Zurich, IL  
 Sensor Electronics Corp., Minneapolis, MN  
 Sierra Monitor Corp., Milpitas, CA

## Monitors, particle size

Fluid Imaging Technologies, Inc., Scarborough, ME  
 G.R. Sprenger Engineering, Inc., Golden, CO  
 Sympatec GmbH, System | Partikel | Technik, Clausthal-Zellerfeld, Germany  
 Sympatec, Inc., System | Partikel | Technik, Pennington, NJ

## Monitors, pH

Analytical Measurements, Chester, NJ  
 Emerson Process Management, Austin, TX  
 Van London-pHoenix Co., Houston, TX

## Monitors, stack gases

Clean Air Engineering, Palatine, IL  
**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCI@marcom@fluidcomponents.com; web site: www.fluidcomponents.com)**

M&C TechGroup, Ventura, CA  
 MIDAC Corp., Westfield, MA  
 Mil-Ram Technology, Inc., Fremont, CA  
 Sigris Photometer AG, Ennetbürgen, Switzerland

## Monitors, sulfur

SensoTech Inc., Wayne, NJ

## Monitors, viscosity

Anton PAAR GmbH, Graz, Austria  
 Automation Products Inc. (Dynatrol Div.), Houston, TX  
 BARTEC GmbH, Bad Mergentheim, Germany  
 Brookfield Engineering Laboratories, Inc., Middleboro, MA  
 Hydramation Ltd, Malton

## Monitors, VOCs

Analytical Systems Int'l / KECO R&D, Houston, TX  
 Clean Air Express Equipment, Palatine, IL  
 Clean Air Instrument Rental, Palatine, IL  
 Mil-Ram Technology, Inc., Fremont, CA  
 Sporian Microsystems, Inc., Lafayette, CO

## Monitors, water quality

Analytical Systems Int'l / KECO R&D, Houston, TX  
 Fluid Imaging Technologies, Inc., Scarborough, ME  
 LAR Process Analysers AG, Berlin, Germany  
 Myron L Company, Carlsbad, CA  
 optek-Danulat, Inc., Germantown, WI  
 Sigris Photometer AG, Ennetbürgen, Switzerland  
 Sporian Microsystems, Inc., Lafayette, CO  
 Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA  
 Van London-pHoenix Co., Houston, TX

## Spectrometer accessories or services

FOSS NIRSystems, Inc., Laurel, MD  
 Polytec, Inc., Process Analytics, Hopkinton  
 tecUSA, Plainville, NY

## Spectrometers

FOSS NIRSystems, Inc., Laurel, MD  
 MIDAC Corp., Westfield, MA  
 optek-Danulat, Inc., Germantown, WI  
 Pfeiffer Vacuum, Inc., Nashua, NH  
 Polytec, Inc., Process Analytics, Hopkinton  
 tecUSA, Plainville, NY

## COMPUTERS, PROCESS CONTROL

### Analog process control computers

Acromag, Inc., Wixom, MI

### Direct digital process control computers

Acromag, Inc., Wixom, MI  
 Emerson Process Management, Austin, TX  
 Siemens, Industry USA, Solutions, Automation and Drives Technologies, Alpharetta, GA  
 Sierra Monitor Corp., Milpitas, CA

### Hybrid process control computers

Emerson Process Management, Austin, TX  
 Emerson Process Management, Austin, TX

### Input-output equipment

Acromag, Inc., Wixom, MI  
 Emerson Process Management, Austin, TX  
 Hans Turck GmbH & Co. KG, Muelheim an der Ruhr, Germany  
 HIMA Paul Hildebrandt GmbH & Co KG, Bruehl, Germany  
 Moore Industries International, Inc., North Hills, CA  
 R. STAHL, Waldenburg, Germany  
 Sierra Monitor Corp., Milpitas, CA  
 Symmetric Research, Las Vegas, NV

### Supervisory process control computers

Acromag, Inc., Wixom, MI  
 Digital Applications International, London  
 Emerson Process Management, Austin, TX  
 Sierra Monitor Corp., Milpitas, CA  
 Vista Control Systems, Inc., Los Alamos, NM

### Surge suppression systems

Phoenix Contact, Middletown, PA

## CONTROLLERS

### Controllers, air conditioning

SAMSON Controls, Inc., Baytown, TX

### Controllers, batching or weighing

Acrison Inc., Moonachie, NJ  
 Bascale Company, Inc., Houston, TX  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**  
 Red Seal Measurement, Greenwood, SC

### Controllers, bin level

Automation Products Inc. (Dynatrol Div.), Houston, TX  
 Bascale Company, Inc., Houston, TX  
 Conveyor Components Co., Material Control, Inc., Crosswell, MI  
 Monitor Technologies LLC, Elburn, IL  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**

### Controllers, boiler

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**  
 SAMSON Controls, Inc., Baytown, TX  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

### Controllers, combustion

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**  
**UNIFLUX / EXOTHERM CORP., 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)**

See our ad on page 68

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## Controllers, electric

HIMA Paul Hildebrandt GmbH + Co KG, Bruehl, Germany  
SAMSON Controls, Inc., Baytown, TX  
Sierra Monitor Corp., Milpitas, CA

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## Controllers, flow & flow ratio

Bronkhorst High-Tech BV, Ruurlo, Netherlands  
Brooks Instruments, Hatfield, PA  
Buerkert Fluid Control Systems, Ingelfingen  
Burkert Fluid Control Systems, Charlotte, NC  
Conveyor Components Co., Material Control, Inc., Crosswell, MI

Delta M Corp., Oak Ridge, TN  
**FCI-FLUID COMPONENTS INTERNATIONAL**, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCI@fluidcomponents.com; web site: www.fluidcomponents.com)

Red Seal Measurement, Greenwood, SC  
SAMSON Controls, Inc., Baytown, TX  
Siemens Industry, Inc., Process Instrumentation & Analytics, Spring House, PA

**SIERRA INSTRUMENTS, INC.**, 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)

## Controllers, humidity

S-Products Inc., Fairfield, CT  
Thermotron, Holland, MI

## Controllers, liquid level

Bascale Company, Inc., Houston, TX  
Delta M Corp., Oak Ridge, TN

**FCI-FLUID COMPONENTS INTERNATIONAL**, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCI@fluidcomponents.com; web site: www.fluidcomponents.com)

Georg Fischer Piping Systems Ltd., Schaffhausen, Switzerland

Levelase, Inc., Denver, Colorado

Madison Co., Branford, CT  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA

Monitor Technologies LLC, Elburn, IL  
Siemens Industry, Inc., Process Instrumentation & Analytics, Spring House, PA

**SIERRA INSTRUMENTS, INC.**, 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)

## Controllers, oxidation-reduction potential

Analytical Measurements, Chester, NJ

## Controllers, pH

Analytical Measurements, Chester, NJ  
Siemens Industry, Inc., Process Instrumentation & Analytics, Spring House, PA  
Van London-pHoenix Co., Houston, TX  
Walchem, IWAKI America, Inc., Holliston, MA

## Controllers, pneumatic

Cashco, Inc., Ellsworth, KS  
**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)

Pneumatech, Inc., Rock Hill, SC  
SAMSON Controls, Inc., Baytown, TX

## Controllers, pressure

Brooks Instruments, Hatfield, PA  
Cashco, Inc., Ellsworth, KS  
SAMSON Controls, Inc., Baytown, TX  
Strobic Air, a CECO Environmental Company, Telford, PA  
**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)

See our ad on page 100

## Controllers, process

Automation Products Inc. (Dynatrol Div.), Houston, TX  
Emerson Process Management, Austin, TX  
Jumo Process Control Inc., East Syracuse, NY  
JUMO GmbH & Co. KG, Fulda, Germany

**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)

Rockwell Automation, Inc., Milwaukee, WI  
Siemens Industry, Inc., Solutions, Automation and Drive Technologies, Norcross, GA

**SIERRA INSTRUMENTS, INC.**, 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)

Sierra Monitor Corp., Milpitas, CA  
Watlow, St. Louis, MO

## Controllers, product

Strobic Air, a CECO Environmental Company, Telford, PA

## Controllers, programmable

Bascale Company, Inc., Houston, TX  
Emerson Process Management, Austin, TX  
JUMO GmbH & Co. KG, Fulda, Germany

**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)

Phoenix Contact, Middletown, PA  
Phoenix Contact GmbH & Co. KG, Blomberg, Germany  
Rockwell Automation, Inc., Milwaukee, WI  
Siemens, Industry USA, Solutions, Automation and Drives Technologies, Alpharetta, GA  
Sierra Monitor Corp., Milpitas, CA  
Strobic Air, a CECO Environmental Company, Telford, PA  
Walchem, IWAKI America, Inc., Holliston, MA

## Controllers, pump

Fluid Metering, Inc., Syosset, NY  
Pleiffer Vacuum, Inc., Nashua, NH

## Controllers, SCR power

Watlow, St. Louis, MO

## Controllers, sludge level

Madison Co., Branford, CT  
Markland Speciality Engineering Ltd., Georgetown, Ontario, Canada

## Controllers, temperature

Cashco, Inc., Ellsworth, KS  
CTP Corp., Northport, NY  
Delta M Corp., Oak Ridge, TN  
Electronic Development Labs, Danville, VA  
Hampshire Controls Corp., Dover, NH  
HTT Energy GmbH, Herford, Germany  
Iron, Inc., Santa Cruz, CA

**LAUDA DR. R. WOBSE GMBH & CO. KG**, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49) (0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)

Mokon, Buffalo, NY  
Phoenix Contact, Middletown, PA  
Raytek Corp., Santa Cruz, CA  
Rockwell Automation, Inc., Milwaukee, WI  
S-Products Inc., Fairfield, CT  
SAMSON Controls, Inc., Baytown, TX  
Thermotron, Holland, MI  
Watlow, St. Louis, MO

## Controllers, time cycle

Bascale Company, Inc., Houston, TX

## Controllers, vacuum

**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)

## Controllers, viscosity

Anton PAAR GmbH, Graz, Austria  
Brookfield Engineering Laboratories, Inc., Middleboro, MA

## Regulators, air

LA-MAN Corp., Mazeppa, MN  
SAMSON Controls, Inc., Baytown, TX  
**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)

See our ad on page 100

## Regulators, back pressure

Cashco, Inc., Ellsworth, KS  
SAMSON Controls, Inc., Baytown, TX  
**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)

See our ad on page 100

## Regulators, feedwater

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## Regulators, flow

Bronkhorst High-Tech BV, Ruurlo, Netherlands  
Brooks Instruments, Hatfield, PA  
Emerson Process Management, Austin, TX  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA  
SAMSON Controls, Inc., Baytown, TX

## Regulators, gas

Emerson Process Management, Austin, TX  
GASCO Affiliates, LLC, Oldsmar, FL  
SAMSON Controls, Inc., Baytown, TX

## Regulators, pressure

Air Products and Chemicals, Inc., Allentown, PA  
Brooks Instruments, Hatfield, PA  
Cashco, Inc., Ellsworth, KS  
Emerson Process Management, Austin, TX  
SAMSON Controls, Inc., Baytown, TX  
Strobic Air, a CECO Environmental Company, Telford, PA  
**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)

See our ad on page 100

## Regulators, temperature

S-Products Inc., Fairfield, CT  
SAMSON Controls, Inc., Baytown, TX  
**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)

See our ad on page 100

## Regulators, vacuum

**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)

See our ad on page 100

## DATA PRESENTATION EQUIPMENT

### Counters

Acromag, Inc., Wixom, MI

### Data logging systems

Acromag, Inc., Wixom, MI  
Hampshire Controls Corp., Dover, NH  
PRUEFTECHNIK, Ismaning, Germany  
Sierra Monitor Corp., Milpitas, CA  
Symmetric Research, Las Vegas, NV

### Displays, liquid-crystal

R. STAHL, Waldenburg, Germany

### Totalizers

Acromag, Inc., Wixom, MI  
Sierra Monitor Corp., Milpitas, CA

## INDICATORS

### Alarms, annunciator

Acromag, Inc., Wixom, MI  
**FIKE**, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

### Alarms, carbon monoxide

Delphian Corp., Northvale, NJ  
**FIKE**, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

Sierra Monitor Corp., Milpitas, CA

### Alarms, combustible gases

Control Instruments Corp., Fairfield, NJ  
Delphian Corp., Northvale, NJ  
Sierra Monitor Corp., Milpitas, CA

## Alarms, flame

**FIKE**, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: [industrialprotection@fike.com](mailto:industrialprotection@fike.com); web site: [www.fike.com](http://www.fike.com))

## Alarms, flow

AW-Lake Company, Lake Monitors & AW Gear Meters, Franksville, WI  
Delta M Corp., Oak Ridge, TN  
**FCI-FLUID COMPONENTS INTERNATIONAL**, 1755 La Costa Meadows Dr., San Marcos, CA 92078 ((800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: [FCImarcom@fluidcomponents.com](mailto:FCImarcom@fluidcomponents.com); web site: [www.fluidcomponents.com](http://www.fluidcomponents.com))

Madison Co., Branford, CT  
Oseco, Broken Arrow, OK  
Universal Flow Monitors, Inc., Hazel Park, MI

## Alarms, humidity

Hampshire Controls Corp., Dover, NH  
S-Products Inc., Fairfield, CT

## Alarms, liquid level

Delta M Corp., Oak Ridge, TN  
**FCI-FLUID COMPONENTS INTERNATIONAL**, 1755 La Costa Meadows Dr., San Marcos, CA 92078 ((800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: [FCImarcom@fluidcomponents.com](mailto:FCImarcom@fluidcomponents.com); web site: [www.fluidcomponents.com](http://www.fluidcomponents.com))

Hampshire Controls Corp., Dover, NH  
Levelese, Inc., Denver, Colorado  
Madison Co., Branford, CT  
Moore Industries International, Inc., North Hills, CA  
TankLink, a wholly-owned subsidiary of Telular Corporation, Chicago, IL

## Alarms, motion

**FIKE**, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: [industrialprotection@fike.com](mailto:industrialprotection@fike.com); web site: [www.fike.com](http://www.fike.com))

## Alarms, other

Acromag, Inc., Wixom, MI

## Alarms, portable (gas, vapor)

Sierra Monitor Corp., Milpitas, CA

## Alarms, pressure

**FIKE**, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: [industrialprotection@fike.com](mailto:industrialprotection@fike.com); web site: [www.fike.com](http://www.fike.com))

Moore Industries International, Inc., North Hills, CA  
Oseco, Broken Arrow, OK

## Alarms, solids level

Berthold Technologies GmbH & Co.KG, Bad Wildbad Conveyor Components Co., Material Control, Inc., Crosswell, MI  
Monitor Technologies LLC, Elburn, IL  
TankLink, a wholly-owned subsidiary of Telular Corporation, Chicago, IL

## Alarms, temperature

Acromag, Inc., Wixom, MI  
**FCI-FLUID COMPONENTS INTERNATIONAL**, 1755 La Costa Meadows Dr., San Marcos, CA 92078 ((800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: [FCImarcom@fluidcomponents.com](mailto:FCImarcom@fluidcomponents.com); web site: [www.fluidcomponents.com](http://www.fluidcomponents.com))

Hampshire Controls Corp., Dover, NH  
Moore Industries International, Inc., North Hills, CA  
S-Products Inc., Fairfield, CT  
TankLink, a wholly-owned subsidiary of Telular Corporation, Chicago, IL

## Flowmeters, coriolis

Bronkhorst High-Tech BV, Ruurlo, Netherlands

## Flowmeters, differential pressure

AW-Lake Company, Lake Monitors & AW Gear Meters, Franksville, WI  
Badger Meter Europa GmbH, Neuffen, Germany  
Badger Meter, Inc., Milwaukee, WI  
Eastern Instruments, Wilmington, NC  
Emerson Process Management, Austin, TX  
Jumo Process Control Inc., East Syracuse, NY  
JUMO GmbH & Co. KG, Fulda, Germany  
SAMSON Controls, Inc., Baytown, TX  
Universal Flow Monitors, Inc., Hazel Park, MI

## Flowmeters, electromagnetic

Badger Meter Europa GmbH, Neuffen, Germany  
Emerson Process Management, Austin, TX  
Heinrichs Messtechnik GmbH, Koeln, Germany

## Flowmeters, magnetic

Buerkert Fluid Control Systems, Ingelfingen  
Burkert Fluid Control Systems, Charlotte, NC  
Emerson Process Management, Austin, TX  
Ernst Flow Industries, Farmingdale, NJ  
GEA Process Engineering, Columbia, MD

## Flowmeters, mass

AW-Lake Company, Lake Monitors & AW Gear Meters, Franksville, WI  
Berthold Technologies GmbH & Co.KG, Bad Wildbad  
Bronkhorst High-Tech BV, Ruurlo, Netherlands  
Brooks Instruments, Hatfield, PA  
Delta M Corp., Oak Ridge, TN  
Eastern Instruments, Wilmington, NC  
Emerson Process Management, Austin, TX  
**FCI-FLUID COMPONENTS INTERNATIONAL**, 1755 La Costa Meadows Dr., San Marcos, CA 92078 ((800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: [FCImarcom@fluidcomponents.com](mailto:FCImarcom@fluidcomponents.com); web site: [www.fluidcomponents.com](http://www.fluidcomponents.com))

Heinrichs Messtechnik GmbH, Koeln, Germany  
Kurz Instruments Inc., Monterey, CA  
Matsushita Measure Tech, Des Plaines, IL

Red Seal Measurement, Greenwood, SC  
**REMBE GMBH, SAFETY-CONTROL**, Gallbergweg 21, Brilon, Germany 59929 (49-2961-7405-0; FAX: 49-2961-50-714; e-mail: [sales@rembe.de](mailto:sales@rembe.de); web site: [www.rembe.com](http://www.rembe.com))

**REMBE, INC.**, 3809 Beam Road Ste K, Charlotte, NC 28217 (704.716.7022; FAX: 704.716.7025; e-mail: [info@rembe.us](mailto:info@rembe.us); web site: [www.rembe.us](http://www.rembe.us))



**SIERRA INSTRUMENTS, INC.**, 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: [info@sierrainstruments.com](mailto:info@sierrainstruments.com); web site: [www.sierrainstruments.com](http://www.sierrainstruments.com))

## Flowmeters, orifice plate

Emerson Process Management, Austin, TX  
Heinrichs Messtechnik GmbH, Koeln, Germany  
SAMSON Controls, Inc., Baytown, TX

## Flowmeters, positive displacement

AW-Lake Company, Lake Monitors & AW Gear Meters, Franksville, WI  
Badger Meter Europa GmbH, Neuffen, Germany  
Badger Meter, Inc., Tulsa, OK  
Badger Meter, Inc., Milwaukee, WI  
Brooks Instruments, Hatfield, PA  
Emerson Process Management, Austin, TX  
Red Seal Measurement, Greenwood, SC

## Flowmeters, propeller

AW-Lake Company, Lake Monitors & AW Gear Meters, Franksville, WI  
Emerson Process Management, Austin, TX

## Flowmeters, rotameters

AW-Lake Company, Lake Monitors & AW Gear Meters, Franksville, WI  
Brooks Instruments, Hatfield, PA  
Cole-Parmer, Vernon Hills, IL  
Emerson Process Management, Austin, TX  
Heinrichs Messtechnik GmbH, Koeln, Germany  
Universal Flow Monitors, Inc., Hazel Park, MI

## Flowmeters, turbine

AW-Lake Company, Lake Monitors & AW Gear Meters, Franksville, WI  
Badger Meter Europa GmbH, Neuffen, Germany  
Badger Meter, Inc., Milwaukee, WI  
Badger Meter, Inc., Tulsa, OK  
Emerson Process Management, Austin, TX

## Flowmeters, ultrasonic

Accusonic Technologies, Inc., West Wareham, MA  
Badger Meter Europa GmbH, Neuffen, Germany  
**FLEXIM AMERICAS**, 250 V Executive Drive, Edgewood, NY 11717 (1 888 852 74 73 North America; 631-492-2300; FAX: 631-492-2117; e-mail: [salesus@flexim.com](mailto:salesus@flexim.com); web site: [www.flexim.com](http://www.flexim.com))  
**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH**, Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30 936 676 60; FAX: 49 0 30 936 676 80; e-mail: [info@flexim.com](mailto:info@flexim.com); web site: [www.flexim.com](http://www.flexim.com))  
Siemens Industry, Inc., Solutions, Automation and Drive Technologies, Norcross, GA

**SIERRA INSTRUMENTS, INC.**, 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: [info@sierrainstruments.com](mailto:info@sierrainstruments.com); web site: [www.sierrainstruments.com](http://www.sierrainstruments.com))

## Flowmeters, variable area

AW-Lake Company, Lake Monitors & AW Gear Meters, Franksville, WI  
Badger Meter Europa GmbH, Neuffen, Germany  
Brooks Instruments, Hatfield, PA  
Cole-Parmer, Vernon Hills, IL  
Emerson Process Management, Austin, TX  
Heinrichs Messtechnik GmbH, Koeln, Germany  
Universal Flow Monitors, Inc., Hazel Park, MI

## Flowmeters, vortex shedding

Badger Meter Europa GmbH, Neuffen, Germany  
Emerson Process Management, Austin, TX  
Heinrichs Messtechnik GmbH, Koeln, Germany  
**SIERRA INSTRUMENTS, INC.**, 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: [info@sierrainstruments.com](mailto:info@sierrainstruments.com); web site: [www.sierrainstruments.com](http://www.sierrainstruments.com))  
Universal Flow Monitors, Inc., Hazel Park, MI

## Flowmeters, weirs & flumes

Badger Meter Europa GmbH, Neuffen, Germany  
Levelese, Inc., Denver, Colorado

## Gages, density

Berthold Technologies GmbH & Co.KG, Bad Wildbad  
Heinrichs Messtechnik GmbH, Koeln, Germany  
Markland Specialty Engineering Ltd., Georgetown, Ontario, Canada  
SensoTech Inc., Wayne, NJ

## Gages, filter

Midwesco Filter Resources, Inc., Winchester, VA

## Gages, liquid level

Delta M Corp., Oak Ridge, TN  
Ernst Flow Industries, Farmingdale, NJ  
**FCI-FLUID COMPONENTS INTERNATIONAL**, 1755 La Costa Meadows Dr., San Marcos, CA 92078 ((800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: [FCImarcom@fluidcomponents.com](mailto:FCImarcom@fluidcomponents.com); web site: [www.fluidcomponents.com](http://www.fluidcomponents.com))

Heinrichs Messtechnik GmbH, Koeln, Germany  
Levelese, Inc., Denver, Colorado  
TankLink, a wholly-owned subsidiary of Telular Corporation, Chicago, IL  
TowerScan, Port Huron, MI  
TowerScan, Sarnia, Ontario, Canada  
VEGA Grieshaber KG, Schiltach, Germany  
VEGA Americas, Inc., Cincinnati, OH

## Gages, liquid level, sanitary

Madison Co., Branford, CT

## Gages, mechanical force

Sensor Technology Ltd, Banbury

## Gages, nuclear radiation

TowerScan, Sarnia, Ontario, Canada  
TowerScan, Port Huron, MI

## Gages, pressure

Ashcroft Inc., Stratford, CT  
Ernst Flow Industries, Farmingdale, NJ  
Palmer Wahl Temperature Instruments, Asheville, NC  
Tel-Tru Manufacturing Co., Rochester, NY  
VEGA Grieshaber KG, Schiltach, Germany  
VEGA Americas, Inc., Cincinnati, OH  
WIKA Instrument, LP, Lawrenceville, GA

## Gages, tank

Ernst Flow Industries, Farmingdale, NJ  
Levelese, Inc., Denver, Colorado  
TankLink, a wholly-owned subsidiary of Telular Corporation, Chicago, IL  
VEGA Grieshaber KG, Schiltach, Germany  
VEGA Americas, Inc., Cincinnati, OH  
WIKA Instrument, LP, Lawrenceville, GA

## Gages, temperature

Ashcroft Inc., Stratford, CT  
Palmer Wahl Temperature Instruments, Asheville, NC  
S-Products Inc., Fairfield, CT  
TankLink, a wholly-owned subsidiary of Telular Corporation, Chicago, IL  
Tel-Tru Manufacturing Co., Rochester, NY  
WIKA Instrument, LP, Lawrenceville, GA

## Gages, vacuum & differential pressure

Ashcroft Inc., Stratford, CT  
TankLink, a wholly-owned subsidiary of Telular Corporation, Chicago, IL



# PRODUCT DIRECTORY

VEGA Grieshaber KG, Schiltach, Germany  
VEGA Americas, Inc., Cincinnati, OH  
WIKA Instrument, LP, Lawrenceville, GA

## Gages, water

Leveles, Inc., Denver, Colorado  
VEGA Grieshaber KG, Schiltach, Germany  
VEGA Americas, Inc., Cincinnati, OH

## Glasses, furnace

Technical Glass Products, Painesville, OH

## Glasses, gage

Ernst Flow Industries, Farmingdale, NJ

## Glasses, sight flow

Technical Glass Products, Painesville, OH  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Indicators, bin level

Bascale Company, Inc., Houston, TX  
Conveyor Components Co., Material Control, Inc., Crosswell, MI

Matsushima Measure Tech, Des Plaines, IL  
Monitor Technologies LLC, Elburn, IL  
VEGA Grieshaber KG, Schiltach, Germany  
VEGA Americas, Inc., Cincinnati, OH

## Indicators, carbon monoxide

Sierra Monitor Corp., Milpitas, CA

## Indicators, combustible gases

Clean Air Express Equipment, Palatine, IL  
Sierra Monitor Corp., Milpitas, CA

## Indicators, dewpoint or humidity

S-Products Inc., Fairfield, CT

## Indicators, flow

Auburn Systems, LLC, Danvers, MA  
AW-Lake Company, Lake Monitors & AW Gear Meters, Franksville, WI  
Badger Meter, Inc., Milwaukee, WI  
Brooks Instruments, Hatfield, PA  
Delta M Corp., Oak Ridge, TN  
Ernst Flow Industries, Farmingdale, NJ

**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCImarcom@fluidcomponents.com; web site: www.fluidcomponents.com)**

**FLEXIM AMERICAS, 250 V Executive Drive, Edgewood, NY 11717 (1 888 852 74 73 North America; 631-492-2300; FAX: 631-492-2117; e-mail: salesus@flexim.com; web site: www.flexim.com)**

**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH, Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30 936 676 60; FAX: 49 0 30 936 676 80; e-mail: info@flexim.com; web site: www.flexim.com)**

Monitor Technologies LLC, Elburn, IL  
Red Seal Measurement, Greenwood, SC  
Siemens Industry, Inc., Process Instrumentation & Analytics, Spring House, PA

**SIERRA INSTRUMENTS, INC., 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)**

Universal Flow Monitors, Inc., Hazel Park, MI

## Indicators, liquid level

Automation Products Inc. (Dynatrol Div.), Houston, TX  
Bascale Company, Inc., Houston, TX  
Delta M Corp., Oak Ridge, TN  
Ernst Flow Industries, Farmingdale, NJ

**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCImarcom@fluidcomponents.com; web site: www.fluidcomponents.com)**

Leveles, Inc., Denver, Colorado

Madison Co., Branford, CT

Monitor Technologies LLC, Elburn, IL

**SIERRA INSTRUMENTS, INC., 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)**

TankLink, a wholly-owned subsidiary of Telular Corporation, Chicago, IL

VEGA Grieshaber KG, Schiltach, Germany  
VEGA Americas, Inc., Cincinnati, OH

## Indicators, mass flow

Brooks Instruments, Hatfield, PA  
Clean Air Express Equipment, Palatine, IL

Conveyor Components Co., Material Control, Inc., Crosswell, MI

Delta M Corp., Oak Ridge, TN

**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCImarcom@fluidcomponents.com; web site: www.fluidcomponents.com)**

Red Seal Measurement, Greenwood, SC

**SIERRA INSTRUMENTS, INC., 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)**

## Indicators, moisture

**MOISTTECH CORP., 1283 Tallevast Rd, Sarasota, FL 34243 (9413517870; 9413517870; FAX: 9413517870; e-mail: afordham@moisttech.com)**

Siemens Industry, Inc., Solutions, Automation and Drive Technologies, Norcross, GA

## Indicators, other

Schurter, Inc., Santa Rosa, CA  
Sierra Monitor Corp., Milpitas, CA

## Indicators, pressure

Ashcroft Inc., Stratford, CT  
Brooks Instruments, Hatfield, PA  
Tel-Tru Manufacturing Co., Rochester, NY

## Indicators, solids level

Automation Products Inc. (Dynatrol Div.), Houston, TX  
Conveyor Components Co., Material Control, Inc., Crosswell, MI

Monitor Technologies LLC, Elburn, IL  
VEGA Grieshaber KG, Schiltach, Germany  
VEGA Americas, Inc., Cincinnati, OH

## Indicators, specific gravity

Anton PAAR GmbH, Graz, Austria  
Anton PAAR USA, Ashland, VA  
Automation Products Inc. (Dynatrol Div.), Houston, TX  
Red Seal Measurement, Greenwood, SC  
SensoTech Inc., Wayne, NJ

## Indicators, temperature

Acromag, Inc., Wixom, MI  
Ashcroft Inc., Stratford, CT  
Bascale Company, Inc., Houston, TX  
Electronic Development Labs, Danville, VA  
**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCImarcom@fluidcomponents.com; web site: www.fluidcomponents.com)**

Hampshire Controls Corp., Dover, NH  
Iron, Inc., Santa Cruz, CA  
Palmer Wahl Temperature Instruments, Asheville, NC  
Raytek Corp., Santa Cruz, CA  
S-Products Inc., Fairfield, CT  
Tel-Tru Manufacturing Co., Rochester, NY  
Williamson Corporation, Concord, MA

## Indicators, vacuum

Ashcroft Inc., Stratford, CT

## Indicators, valve position

Hans Turck GmbH & Co. KG, Muelheim an der Ruhr, Germany

## Indicators, viscosity

Anton PAAR GmbH, Graz, Austria  
Hydramotion Ltd, Maltou

## Indicators, weight

Bascale Company, Inc., Houston, TX  
Pacific Scale Co., Inc., Clackamas, OR

## Thermistors

Electronic Development Labs, Danville, VA  
GIC Thermodynamics, Charlevoix, MI  
Temp-Pro Inc., Northampton, MA

## Thermocouples

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
Clean Air Express Equipment, Palatine, IL  
Cole-Parmer, Vernon Hills, IL  
Electronic Development Labs, Danville, VA  
Emerson Process Management, Austin, TX  
GIC Thermodynamics, Charlevoix, MI  
Harprow Industries, Inc., Columbus, OH  
JUMO GmbH & Co. KG, Fulda, Germany  
Moore Industries International, Inc., North Hills, CA  
S-Products Inc., Fairfield, CT  
Temp-Pro Inc., Northampton, MA  
Watlow, St. Louis, MO

# Instrumentation & controls

## Thermometers, bimetallic

Ernst Flow Industries, Farmingdale, NJ  
Tel-Tru Manufacturing Co., Rochester, NY  
Temp-Pro Inc., Northampton, MA  
WIKA Instrument, LP, Lawrenceville, GA

## Thermometers, dial

Tel-Tru Manufacturing Co., Rochester, NY  
Temp-Pro Inc., Northampton, MA  
WIKA Instrument, LP, Lawrenceville, GA

## Thermometers, digital

Palmer Wahl Temperature Instruments, Asheville, NC  
Raytek GmbH, Berlin, Germany  
S-Products Inc., Fairfield, CT  
Tel-Tru Manufacturing Co., Rochester, NY

## Thermometers, electrical

Raytek Corp., Santa Cruz, CA  
Temp-Pro Inc., Northampton, MA

## Thermometers, infrared

Palmer Wahl Temperature Instruments, Asheville, NC  
Williamson Corporation, Concord, MA

## Thermometers, precision

Anton PAAR USA, Ashland, VA  
CTP Corp., Northport, NY  
Palmer Wahl Temperature Instruments, Asheville, NC

## Thermometers, recording

Raytek Corp., Santa Cruz, CA

## Thermometers, resistance temperature detectors

Electronic Development Labs, Danville, VA  
GIC Thermodynamics, Charlevoix, MI  
Heinrichs Messtechnik GmbH, Koeln, Germany  
Jumo Process Control Inc., East Syracuse, NY  
JUMO GmbH & Co. KG, Fulda, Germany  
Moore Industries International, Inc., North Hills, CA  
Palmer Wahl Temperature Instruments, Asheville, NC  
S-Products Inc., Fairfield, CT  
Temp-Pro Inc., Northampton, MA

## Thermometers, surface

Electronic Development Labs, Danville, VA  
Iron, Inc., Santa Cruz, CA  
Raytek Corp., Santa Cruz, CA  
Raytek GmbH, Berlin, Germany  
S-Products Inc., Fairfield, CT  
Temp-Pro Inc., Northampton, MA

## Thermostats

Jumo Process Control Inc., East Syracuse, NY  
**LAUDA DR. R. WOBSE GMBH & CO. KG, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 0)9343 503-0; +1856 7647300; FAX: +49 0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)**  
S-Products Inc., Fairfield, CT

## Thermowells

Electronic Development Labs, Danville, VA  
GIC Thermodynamics, Charlevoix, MI  
Moore Industries International, Inc., North Hills, CA  
Palmer Wahl Temperature Instruments, Asheville, NC  
S-Products Inc., Fairfield, CT  
Tel-Tru Manufacturing Co., Rochester, NY  
Temp-Pro Inc., Northampton, MA  
WIKA Instrument, LP, Lawrenceville, GA

# MEASUREMENT & TESTING EQUIPMENT

## Alloy identification equipment

Acromag, Inc., Wixom, MI

## Calibration gas standards

Clean Air Engineering, Palatine, IL  
Clean Air Instrument Rental, Palatine, IL  
**SIERRA INSTRUMENTS, INC., 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)**

## Calibration & test equipment

Ashcroft Inc., Stratford, CT  
Atlas Material Testing Technology LLC, Mount Prospect, IL  
ATS RheoSystems, Cannon Instrument Company, Borden-town, NJ  
Beamex, Inc., Marietta, GA  
Brookfield Engineering Laboratories, Inc., Middleboro, MA  
Clean Air Engineering, Palatine, IL  
Clean Air Express Equipment, Palatine, IL

Electronic Development Labs, Danville, VA  
Emerson Process Management, Austin, TX  
**FLEXIM AMERICAS, 250 V Executive Drive, Edgewood, NY 11717 (1 888 852 74 73 North America; 631-492-2300; FAX: 631-492-2117; e-mail: salesus@flexim.com; web site: www.flexim.com)**

**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH, Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30 936 676 60; FAX: 49 0 30 936 676 80; e-mail: info@flexim.com; web site: www.flexim.com)**

FRITSCHE GmbH, Milling and Sizing, Idar-Oberstein, Germany

Illinois Instruments, Johnsbury, IL  
Iron, Inc., Santa Cruz, CA

Kollo Corp., Cary, IL

Konica Minolta Sensing Americas, Ramsey, NJ  
**LAUDA DR. R. WOBSEER GMBH & CO. KG, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)**

MOISTTECH CORP., 1283 TALLEVAST RD, SARASOTA, FL 34243 (9413517870; 9413517870; FAX: 9413517870; E-MAIL: AFORDHAM@MOISTTECH.COM)

Palmer Wahl Temperature Instruments, Asheville, NC  
PRUEFTECHNIK, Ismaning, Germany

Raytek Corp., Santa Cruz, CA

Raytek GmbH, Berlin, Germany

Sensor Technology Ltd, Banbury

**SIERRA INSTRUMENTS, INC., 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)**

Sierra Monitor Corp., Milpitas, CA

Systech Instruments Ltd (Systech Illinois), Thame

WIKA Instrument, LP, Lawrenceville, GA

## Calorimeters

LECO Corporation, St. Joseph, MI

## Cameras, high-speed

Raytek GmbH, Berlin, Germany

## Chambers, test

Atlas Material Testing Technology LLC, Mount Prospect, IL  
**HEMCO CORPORATION, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemcocorp.com; web site: www.HEMCOcorp.com)**

Kollo Corp., Cary, IL

Q-Lab Corporation, Westlake, OH

Singleton Corp., Cleveland, OH

Thermometrics Corp, Mansfield, MA

Thermotron, Holland, MI

## Colorimeters

Konica Minolta Sensing Americas, Ramsey, NJ  
optek-Danulat, Inc., Germantown, WI

## Corrosion measurement equipment

Anton PAAR GmbH, Graz, Austria

Applus RTD USA, Houston, TX

Singleton Corp., Cleveland, OH

## Density-measuring equipment

Anton PAAR GmbH, Graz, Austria

Anton PAAR USA, Ashland, VA

Automation Products Inc. (Dynatrol Div.), Houston, TX

Berthold Technologies GmbH & Co.KG, Bad Wildbad

Heinrichs Messtechnik GmbH, Koeln, Germany

K-Patents, Inc., Naperville, IL

Konica Minolta Sensing Americas, Ramsey, NJ

**LAUDA DR. R. WOBSEER GMBH & CO. KG, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)**

Markland Specialty Engineering Ltd., Georgetown, Ontario, Canada

Red Seal Measurement, Greenwood, SC

SensoTech GmbH, Magdeburg-Barleben, Germany

SensoTech Inc., Wayne, NJ

TowerScan, Port Huron, MI

TowerScan, Sarnia, Ontario, Canada

## Detectors, interface

Automation Products Inc. (Dynatrol Div.), Houston, TX

**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCI@marcom@fluidcomponents.com; web site: www.fluidcomponents.com)**

**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH, Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30 936 676 60; FAX: 49 0 30 936 676 80; e-mail: info@flexim.com; web site: www.flexim.com)**

Markland Specialty Engineering Ltd., Georgetown, Ontario, Canada

SensoTech Inc., Wayne, NJ

TowerScan, Port Huron, MI

## Detectors, metal

Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA

**USA INDUSTRIES, INC., 302 State Street, S. Houston, TX 77587 (800-456-8721; 713-941-3797; FAX: 713-941-1086; e-mail: info@usaindustries.com; web site: www.usaindustries.com)**

Acromag, Inc., Wixom, MI

Magnetic Products, Inc., Highland, MI

TowerScan, Sarnia, Ontario, Canada

## Detectors, leak

Auburn Systems, LLC, Danvers, MA

BS & B Safety Systems, Inc., Tulsa, OK

**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCI@marcom@fluidcomponents.com; web site: www.fluidcomponents.com)**

**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH, Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30 936 676 60; FAX: 49 0 30 936 676 80; e-mail: info@flexim.com; web site: www.flexim.com)**

GOW-MAC Instrument Co., Bethlehem, PA

Mil-Ram Technology, Inc., Fremont, CA

Pfeiffer Vacuum, Inc., Nashua, NH

RKI Instruments, Inc., Union City, CA

Sensor Electronics Corp., Minneapolis, MN

SGB GmbH, Siegen, Germany

**SIERRA INSTRUMENTS, INC., 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)**

Sierra Monitor Corp., Milpitas, CA

**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)**

See our ad on page 100

Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA

**USA INDUSTRIES, INC., 302 State Street, S. Houston, TX 77587 (800-456-8721; 713-941-3797; FAX: 713-941-1086; e-mail: info@usaindustries.com; web site: www.usaindustries.com)**

Acromag, Inc., Wixom, MI

Magnetic Products, Inc., Highland, MI

## Electrodes, ion-sensitive

Analytical Measurements, Chester, NJ

## Electrodes, pH

Analytical Measurements, Chester, NJ

Jumo Process Control Inc., East Syracuse, NY

Van London-pHoenix Co., Houston, TX

Walchem, IWAKI America, Inc., Holliston, MA

Acromag, Inc., Wixom, MI

Magnetic Products, Inc., Highland, MI

## Enclosures, instrument

A Box 4 U, Wichita, Kansas

## Flash points, automatic

Anton PAAR GmbH, Graz, Austria

## Fluidic systems

**FLEXIM AMERICAS, 250 V Executive Drive, Edgewood, NY 11717 (1 888 852 74 73 North America; 631-492-2300; FAX: 631-492-2117; e-mail: salesus@flexim.com; web site: www.flexim.com)**

**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH, Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30 936 676 60; FAX: 49 0 30 936 676 80; e-mail: info@flexim.com; web site: www.flexim.com)**

SensoTech GmbH, Magdeburg-Barleben, Germany

## Gas dilution systems

Clean Air Instrument Rental, Palatine, IL

## Gas sampling bags

Clean Air Express Equipment, Palatine, IL

Clean Air Instrument Rental, Palatine, IL

## Infrared Thermometer

Williamson Corporation, Concord, MA

## Ion measurement or selection

Pfeiffer Vacuum, Inc., Nashua, NH

Van London-pHoenix Co., Houston, TX

## Laser systems

Elos Fikturlaser AB, Molndal, Sweden

Oxford Lasers, Inc., Shirley, MA

PRUEFTECHNIK, Ismaning, Germany

## Load cells

Bascale Company, Inc., Houston, TX

Hardy Process Solutions, Inc., Industrial Weighing, San Diego, CA

Kubota Corporation, Singapore, Singapore

Schenck Process GmbH, Darmstadt, Germany

Sensor Technology Ltd, Banbury

## Manometers

VEGA Grieshaber KG, Schiltach, Germany

VEGA Americas, Inc., Cincinnati, OH

## Meters, air

Clean Air Express Equipment, Palatine, IL

Eastern Instruments, Wilmington, NC

**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCI@marcom@fluidcomponents.com; web site: www.fluidcomponents.com)**

**SIERRA INSTRUMENTS, INC., 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)**

Universal Flow Monitors, Inc., Hazel Park, MI

## Meters, conductivity

Anton PAAR USA, Ashland, VA

Dr. Thiedig GmbH & Co KG, Berlin, Germany

Walchem, IWAKI America, Inc., Holliston, MA

## Meters, displacement

Badger Meter, Inc., Milwaukee, WI

PRUEFTECHNIK, Ismaning, Germany

Red Seal Measurement, Greenwood, SC

## Meters, electrical

Escitec, Mesa, AZ

## Meters, gas

**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCI@marcom@fluidcomponents.com; web site: www.fluidcomponents.com)**

**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH, Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30 936 676 60; FAX: 49 0 30 936 676 80; e-mail: info@flexim.com; web site: www.flexim.com)**

**SIERRA INSTRUMENTS, INC., 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)**

Escitec, Mesa, AZ

## Meters, heat flow

**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCI@marcom@fluidcomponents.com; web site: www.fluidcomponents.com)**

**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH, Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30 936 676 60; FAX: 49 0 30 936 676 80; e-mail: info@flexim.com; web site: www.flexim.com)**

**SIERRA INSTRUMENTS, INC., 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)**

## Meters, oxygen

Anton PAAR GmbH, Graz, Austria

Dr. Thiedig GmbH & Co KG, Berlin, Germany

RKI Instruments, Inc., Union City, CA

## Meters, pH

Cole-Parmer, Vernon Hills, IL

Dr. Thiedig GmbH & Co KG, Berlin, Germany

Myron L Company, Carlsbad, CA

Van London-pHoenix Co., Houston, TX

Walchem, IWAKI America, Inc., Holliston, MA

## Meters, recording

Analytical Measurements, Chester, NJ

Badger Meter, Inc., Milwaukee, WI

Badger Meter, Inc., Tulsa, OK

## Meters, salinity

SensoTech Inc., Wayne, NJ

## Meters, sludge

Markland Specialty Engineering Ltd., Georgetown, Ontario, Canada

## Meters, surface tension

**LAUDA DR. R. WOBSEER GMBH & CO. KG, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)**

## Meters, turbidity

optek-Danulat, Inc., Germantown, WI

Sigrist Photometer AG, Ennetbuergen, Switzerland

## Meters, ultrasonic

Anton PAAR GmbH, Graz, Austria

**FLEXIM AMERICAS**, 250 V Executive Drive, Edgewood, NY 11717 (1 888 852 74 73 North America; 631-492-2300; FAX: 631-492-2117; e-mail: salesus@flexim.com; web site: www.flexim.com)

**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH**, Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30 936 676 60; FAX: 49 0 30 936 676 80; e-mail: info@flexim.com; web site: www.flexim.com)

Georg Fischer Piping Systems Ltd., Schaffhausen, Switzerland

SensoTech GmbH, Magdeburg-Barleben, Germany

SensoTech Inc., Wayne, NJ

Siemens Industry, Inc., Solutions, Automation and Drive Technologies, Norcross, GA

**SIERRA INSTRUMENTS, INC.**, 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)

**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)

See our ad on page 100

## Meters, ultraviolet

Dymax Corp., Torrington, CT  
optek-Danulat, Inc., Germantown, WI

## Meters, vibration

PRUEFTECHNIK, Ismaning, Germany  
Vibra-Metrics, div. of Mistras Holdings, Princeton Junction, NJ

## Meters, water

Badger Meter, Inc., Milwaukee, WI

**FCI-FLUID COMPONENTS INTERNATIONAL**, 1755 La Costa Meadows Dr., San Marcos, CA 92078 (800) 854-1993; 760-744-6950; FAX: 760-736-6250; e-mail: FCIclarcom@fluidcomponents.com; web site: www.fluidcomponents.com)

**FLEXIM AMERICAS**, 250 V Executive Drive, Edgewood, NY 11717 (1 888 852 74 73 North America; 631-492-2300; FAX: 631-492-2117; e-mail: salesus@flexim.com; web site: www.flexim.com)

**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH**, Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30 936 676 60; FAX: 49 0 30 936 676 80; e-mail: info@flexim.com; web site: www.flexim.com)

Myron L Company, Carlsbad, CA

Red Seal Measurement, Greenwood, SC

Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA

Universal Flow Monitors, Inc., Hazel Park, MI

## Meters, zeta potential

Anton PAAR GmbH, Graz, Austria

Anton PAAR USA, Ashland, VA

## Permeation tubes

Clean Air Instrument Rental, Palatine, IL

## Photometers

BWB Technologies UK Ltd, Newbury

Konica Minolta Sensing Americas, Ramsey, NJ

optek-Danulat, Inc., Germantown, WI

Sias, New Castle, DE

Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA

## Powder Testing

Freeman Technology Ltd, Tewkesbury, Gloucestershire

## Pyrometers

Electronic Development Labs, Danville, VA

Ircan, Inc., Santa Cruz, CA

Raytek Corp., Santa Cruz, CA

Raytek GmbH, Berlin, Germany

Williamson Corporation, Concord, MA

## Refractometers

Anton PAAR GmbH, Graz, Austria

Anton PAAR USA, Ashland, VA

**FLEXIM AMERICAS**, 250 V Executive Drive, Edgewood, NY 11717 (1 888 852 74 73 North America; 631-492-2300; FAX: 631-492-2117; e-mail: salesus@flexim.com; web site: www.flexim.com)

**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH**, Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30 936 676 60; FAX: 49 0 30 936 676 80; e-mail: info@flexim.com; web site: www.flexim.com)

K-Patents, Inc., Naperville, IL

## Rheometers

Anton PAAR GmbH, Graz, Austria

Anton PAAR USA, Ashland, VA

ATS RheoSystems, Cannon Instrument Company, Borden-town, NJ

Brookfield Engineering Laboratories, Inc., Middleboro, MA

Davis-Standard, LLC, Pawcatuck, CT

Freeman Technology Ltd, Tewkesbury, Gloucestershire

## Salinometers

Anton PAAR GmbH, Graz, Austria

## Temperature Sensor

Williamson Corporation, Concord, MA

## Testers, cloud & pour point, automatic

Anton PAAR GmbH, Graz, Austria

## Testers, flash point

Anton PAAR GmbH, Graz, Austria

## Testers, hardness

Anton PAAR GmbH, Graz, Austria

Brookfield Engineering Laboratories, Inc., Middleboro, MA

Shimadzu Scientific Instruments, Columbia, MD

## Testers, ring & ball

Anton PAAR GmbH, Graz, Austria

## Testers, tensile strength

Brookfield Engineering Laboratories, Inc., Middleboro, MA

Shimadzu Scientific Instruments, Columbia, MD

## Testing equipment, other

Atlas Material Testing Technology LLC, Mount Prospect, IL

Brookfield Engineering Laboratories, Inc., Middleboro, MA

FOSS NIRSystems, Inc., Laurel, MD

G.R. Sprenger Engineering, Inc., Golden, CO

Harp Industries, Inc., Columbus, OH

Illinois Instruments, Johnsbury, IL

Konica Minolta Sensing Americas, Ramsey, NJ

KRUSS GmbH, Marketing, Hamburg, Germany

MOISTTECH CORP., 1283 TALLEVAST RD, SARASOTA, FL 34243 (941)3517870; 9413517870; FAX: 9413517870; E-MAIL: AFORDHAM@MOISTTECH.COM)

Newson Gale Ltd, Nottingham

Q-Lab Corporation, Westlake, OH

Raytek GmbH, Berlin, Germany

Rockwell Automation, Inc., Milwaukee, WI

Sensor Technology Ltd, Banbury

**SIERRA INSTRUMENTS, INC.**, 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200;

FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)

Singleton Corp., Cleveland, OH

Systech Instruments Ltd (Systech Illinois), Thame

Thermotron, Holland, MI

**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)

See our ad on page 100

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

UIC Inc., Joliet, IL

## RECORDERS

### Recorder parts & accessories

Analytical Measurements, Chester, NJ

### Recorders, liquid level

Madison Co., Branford, CT  
Met-Pro Global Pump Solutions, a CECO Environmental Company, Telford, PA

### Recorders, mass flow

**SIERRA INSTRUMENTS, INC.**, 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)

### Recorders, specific gravity

Anton PAAR GmbH, Graz, Austria

### Recorders, temperature

Cole-Parmer, Vernon Hills, IL  
Hampshire Controls Corp., Dover, NH  
JUMO GmbH & Co. KG, Fulda, Germany  
Palmer Wahl Temperature Instruments, Asheville, NC  
Raytek Corp., Santa Cruz, CA  
Williamson Corporation, Concord, MA

### Recorders, viscosity

Anton PAAR GmbH, Graz, Austria  
Brookfield Engineering Laboratories, Inc., Middleboro, MA

## TRANSMITTERS & DATA TRANSMISSION EQUIPMENT

### Cables, fiberoptic

tec5USA, Plainview, NY

### Cables, other

Hans Turck GmbH & Co. KG, Muelheim an der Ruhr, Germany

### Converters, signal

Acromag, Inc., Wixom, MI  
Hans Turck GmbH & Co. KG, Muelheim an der Ruhr, Germany

Moore Industries International, Inc., North Hills, CA

Pepperl + Fuchs GmbH, Mannheim, Germany

Phoenix Contact, Middletown, PA

Phoenix Contact GmbH & Co. KG, Blomberg, Germany

R. STAHL, Waldenburg, Germany

S-Products Inc., Fairfield, CT

### Data Transmission, Wireless

Hans Turck GmbH & Co. KG, Muelheim an der Ruhr, Germany

Levelese, Inc., Denver, Colorado

Pepperl + Fuchs GmbH, Mannheim, Germany

Phoenix Contact GmbH & Co. KG, Blomberg, Germany

R. STAHL, Waldenburg, Germany

### Electrical equipment, intrinsic safety

Hans Turck GmbH & Co. KG, Muelheim an der Ruhr, Germany

HIMA Paul Hildebrandt GmbH & Co KG, Bruehl, Germany

Pepperl + Fuchs GmbH, Mannheim, Germany

Phoenix Contact, Middletown, PA

Phoenix Contact GmbH & Co. KG, Blomberg, Germany

R. STAHL, Waldenburg, Germany

Vibra-Metrics, div. of Mistras Holdings, Princeton Junction, NJ

### Radio remote control systems

Pepperl + Fuchs GmbH, Mannheim, Germany

Phoenix Contact, Middletown, PA

Phoenix Contact GmbH & Co. KG, Blomberg, Germany

### Relays, time delay

Bascale Company, Inc., Houston, TX

Pepperl + Fuchs GmbH, Mannheim, Germany

Phoenix Contact GmbH & Co. KG, Blomberg, Germany

### Telemetering & data transmission systems

Moore Industries International, Inc., North Hills, CA

### Transducers

Ashcroft Inc., Stratford, CT

Clean Air Instrument Rental, Palatine, IL



## Content Licensing for Every Marketing Strategy



Marketing solutions fit for:

- Outdoor
- Direct Mail
- Print Advertising
- Tradeshow/POP Displays
- Social Media
- Radio & Television

### Logo Licensing | Reprints Eprints | Plaques

Leverage branded content from *Chemical Engineering* to create a more powerful and sophisticated statement about your product, service, or company in your next marketing campaign. Contact Wright's Media to find out more about how we can customize your acknowledgements and recognitions to enhance your marketing strategies.

For more information, call Wright's Media at 877.652.5295 or visit our website at [www.wrightsmedia.com](http://www.wrightsmedia.com)

## Instrumentation & controls

**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH,**  
Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30  
936 676 60; FAX: 49 0 30 936 676 80; e-mail: [info@flexim.com](mailto:info@flexim.com))  
web site: [www.flexim.com](http://www.flexim.com))

Phoenix Contact, Middletown, PA  
Phoenix Contact GmbH & Co.KG, Blomberg, Germany  
R. STAHL, Waldenburg, Germany  
Sensor Technology Ltd, Banbury  
Vibra-Metrics, div. of Mistras Holdings, Princeton Junction, NJ

### Transmitters, level

Berthold Technologies GmbH & Co.KG, Bad Wildbad  
Buerkert Fluid Control Systems, Ingelfingen  
Burkert Fluid Control Systems, Charlotte, NC  
Emerson Process Management, Austin, TX

**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La  
Costa Meadows Dr., San Marcos, CA 92078 ((800)  
854-1993; 760-744-6950; FAX: 760-736-6250; e-mail:  
[FCImarcom@fluidcomponents.com](mailto:FCImarcom@fluidcomponents.com); web site: [www.fluidcomponents.com](http://www.fluidcomponents.com))**

Levelese, Inc, Denver, Colorado  
Monitor Technologies LLC, Elburn, IL  
Pepperl + Fuchs GmbH, Mannheim, Germany  
VEGA Grieshaber KG, Schiltach, Germany  
VEGA Americas, Inc., Cincinnati, OH  
WIKA Instrument, LP, Lawrenceville, GA

### Transmitters, mass flow

AW-Lake Company, Lake Monitors & AW Gear Meters,  
Franksville, WI

Berthold Technologies GmbH & Co.KG, Bad Wildbad  
Bronkhorst High-Tech BV, Ruurlo, Netherlands  
Emerson Process Management, Austin, TX

**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La  
Costa Meadows Dr., San Marcos, CA 92078 ((800)  
854-1993; 760-744-6950; FAX: 760-736-6250; e-mail:  
[FCImarcom@fluidcomponents.com](mailto:FCImarcom@fluidcomponents.com); web site: [www.fluidcomponents.com](http://www.fluidcomponents.com))**

**FLEXIM, FLEXIBLE INDUSTRIEMESSTECHNIK GMBH,**  
Wolfener Str. 36, Berlin, Germany D-12681 (49 0 30  
936 676 60; FAX: 49 0 30 936 676 80; e-mail: [info@flexim.com](mailto:info@flexim.com))  
web site: [www.flexim.com](http://www.flexim.com))

### Transmitters, pressure

Ashcroft Inc., Stratford, CT  
Emerson Process Management, Austin, TX  
Hans Turck GmbH & Co. KG, Muelheim an der Ruhr,  
Germany  
Jumo Process Control Inc., East Syracuse, NY  
JUMO GmbH & Co. KG, Fulda, Germany  
Pepperl + Fuchs GmbH, Mannheim, Germany  
Siemens Industry, Inc., Solutions, Automation and Drive  
Technologies, Norcross, GA  
Tel-Tru Manufacturing Co., Rochester, NY  
VEGA Grieshaber KG, Schiltach, Germany  
VEGA Americas, Inc., Cincinnati, OH  
WIKA Instrument, LP, Lawrenceville, GA

### Transmitters, pressure-critical

Ashcroft Inc., Stratford, CT

### Transmitters, temperature

Emerson Process Management, Austin, TX  
**FCI-FLUID COMPONENTS INTERNATIONAL, 1755 La  
Costa Meadows Dr., San Marcos, CA 92078 ((800)  
854-1993; 760-744-6950; FAX: 760-736-6250; e-mail:  
[FCImarcom@fluidcomponents.com](mailto:FCImarcom@fluidcomponents.com); web site: [www.fluidcomponents.com](http://www.fluidcomponents.com))**

GIC Thermodynamics, Charlevoix, MI  
Hampshire Controls Corp., Dover, NH  
Hans Turck GmbH & Co. KG, Muelheim an der Ruhr,  
Germany  
JUMO GmbH & Co. KG, Fulda, Germany  
Moore Industries International, Inc., North Hills, CA  
Pepperl + Fuchs GmbH, Mannheim, Germany  
Phoenix Contact, Middletown, PA  
Phoenix Contact GmbH & Co.KG, Blomberg, Germany  
R. STAHL, Waldenburg, Germany  
S-Products Inc., Fairfield, CT  
Siemens Industry, Inc., Solutions, Automation and Drive  
Technologies, Norcross, GA  
Tel-Tru Manufacturing Co., Rochester, NY  
WIKA Instrument, LP, Lawrenceville, GA

# 5

# PROCESSING EQUIPMENT

- |   |   |
|---|---|
| <b>131 Air conditioning &amp; refrigeration equipment</b> | <b>144 Heat transfer media</b>                        |
| <b>131 Centrifuges</b>                                    | <b>144 Heating &amp; cooling equipment, other</b>     |
| <b>131 Classifiers &amp; gravity separators</b>           | <b>145 Kilns, ovens &amp; furnaces</b>                |
| <b>132 Cooling tower systems</b>                          | <b>146 Mixing equipment for fluids</b>                |
| <b>132 Custom fabricated equipment</b>                    | <b>148 Mixing equipment for solids &amp; fluids</b>   |
| <b>132 Dryers</b>   | <b>149 Packings, trays for towers &amp; columns</b>   |
| <b>136 Dust collectors &amp; separators</b>               | <b>149 Process vessels &amp; reactors</b>             |
| <b>137 Electrochemical equipment</b>                      | <b>151 Reaction &amp; separation equipment, other</b> |
| <b>137 Entrainment separation equipment</b>               | <b>152 Screening equipment</b>                        |
| <b>137 Evaporators &amp; crystallizers</b>                | <b>152 Scrubbers</b>                                  |
| <b>138 Filter media &amp; aids</b>                        | <b>153 Size reduction equipment</b>                   |
| <b>139 Filtration equipment</b>                           | <b>155 Towers &amp; columns</b>                       |
| <b>141 Heat exchangers, condensers &amp; coolers</b>      | <b>155 Water treatment equipment</b>                  |

---

## DISPLAY ADVERTISERS IN THIS SECTION

Ekato Group	147
Komline-Sanderson	135
Wyssmont Co. Inc.	133

## AIR CONDITIONING & REFRIGERATION EQUIPMENT

### Air conditioners

BARTEC GmbH, Bad Mergentheim, Germany  
**PAHARPUR COOLING TOWERS LTD, Paharpur House,**  
 8/1/B Diamond Harbour Road, Kolkata, India 700027  
 (+913340133000; FAX: +913340133499; e-mail:  
 pctccu@paharpur.com; web site: www.paharpur.com)

See our ad on page 82

### Cryogenic equipment

Air Products and Chemicals, Inc., Allentown, PA  
 SIAD Macchine Impianti, Bergamo, Italy

### Dehumidifiers

Lectrodryer, Richmond, KY  
 Munters Corporation, Air Treatment, Amesbury, MA

### Humidifiers

Armstrong International, Three Rivers, MI  
 Membrana, Charlotte, NC

### Refrigeration equipment, chillers

CTP Corp., Northport, NY  
 GEA Refrigeration North America, York, PA  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave.**  
 (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)  
**KOERTING HANNOVER AG, Badenstedter Str. 56,**  
 Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)

See our ad on page 107

**LAUDA DR. R. WOBSEY GMBH & CO. KG, Pfarrstrasse**  
 41/43, Lauda-Koenigshofen, Germany 97922 (+49-0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)

Mokon, Buffalo, NY

Pneumatech, Inc., Rock Hill, SC  
 Thermionics Corp, Mansfield, MA

### Refrigeration equipment, freezers

**SANDVIK PROCESS SYSTEMS, INC., 21 Campus Rd.,**  
 Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: info@sandvik.com; web site: www.process-systems.sandvik.com)

### Refrigeration equipment & systems

CTP Corp., Northport, NY  
 GEA Refrigeration North America, York, PA  
**LAUDA DR. R. WOBSEY GMBH & CO. KG, Pfarrstrasse**  
 41/43, Lauda-Koenigshofen, Germany 97922 (+49-0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)

Lectrodryer, Richmond, KY  
 Mokon, Buffalo, NY

## CENTRIFUGES

### Centrifuge parts & accessories

Ferrum Inc., Centrifuge Technology, Houston, TX  
 Heinkel Filtering Systems Inc., Swedesboro, NJ  
 Shiv Shakti Process Equipment P. Ltd., International Marketing & Sales, Mumbai, India  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

Western States Machine Co., Hamilton, OH  
 Sharpex Filters (I) Pvt. Ltd., Sales, Navimumbai, India  
 Tema Systems, Inc., Cincinnati, OH  
 Western States Machine Co., Hamilton, OH

### Centrifuges, batch, automatic basket

Ferrum Inc., Centrifuge Technology, Houston, TX  
 Heinkel Filtering Systems Inc., Swedesboro, NJ  
 Shiv Shakti Process Equipment P. Ltd., International Marketing & Sales, Mumbai, India

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

Western States Machine Co., Hamilton, OH

### Centrifuges, batch, perforated basket

Ferrum Inc., Centrifuge Technology, Houston, TX  
 Heinkel Filtering Systems Inc., Swedesboro, NJ  
 Midwest Steel Company Inc, Houston, Texas

Shiv Shakti Process Equipment P. Ltd., International Marketing & Sales, Mumbai, India

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

Western States Machine Co., Hamilton, OH

### Centrifuges, continuous, conical angle, perforated basket

Ferrum Inc., Centrifuge Technology, Houston, TX  
 Heinkel Filtering Systems Inc., Swedesboro, NJ  
 Tema Systems, Inc., Cincinnati, OH  
 Western States Machine Co., Hamilton, OH

### Centrifuges, continuous, pusher discharge

B & P Process Equipment, Saginaw, MI  
 Ferrum Inc., Centrifuge Technology, Houston, TX  
 Heinkel Filtering Systems Inc., Swedesboro, NJ  
 Tema Systems, Inc., Cincinnati, OH

### Centrifuges, continuous, solid bowl, scroll discharge

B & P Process Equipment, Saginaw, MI  
 Ferrum Inc., Centrifuge Technology, Houston, TX  
 Flottweg SE, Vilsbiburg, Germany  
 GEA Mechanical Equipment US, Inc. GEA Westfalia Separator Division, Northvale, NJ  
**GEA WESTFALIA SEPARATOR GROUP GMBH, Werner-Habig-Str. 1., Oelde, Germany 59302 (+ 49-2522-77-0; FAX: + 49-2522-77-2488; e-mail: ws.info@gea.com; web site: www.gea.com)**

Tema Systems, Inc., Cincinnati, OH

### Centrifuges, disc, nozzle discharge

Ferrum Inc., Centrifuge Technology, Houston, TX  
 GEA Mechanical Equipment US, Inc. GEA Westfalia Separator Division, Northvale, NJ  
**GEA WESTFALIA SEPARATOR GROUP GMBH, Werner-Habig-Str. 1., Oelde, Germany 59302 (+ 49-2522-77-0; FAX: + 49-2522-77-2488; e-mail: ws.info@gea.com; web site: www.gea.com)**

### Centrifuges, disc, solid bowl

Ferrum Inc., Centrifuge Technology, Houston, TX  
 Flottweg SE, Vilsbiburg, Germany  
 GEA Mechanical Equipment US, Inc. GEA Westfalia Separator Division, Northvale, NJ  
**GEA WESTFALIA SEPARATOR GROUP GMBH, Werner-Habig-Str. 1., Oelde, Germany 59302 (+ 49-2522-77-0; FAX: + 49-2522-77-2488; e-mail: ws.info@gea.com; web site: www.gea.com)**

Tema Systems, Inc., Cincinnati, OH

### Centrifuges, disc, valve discharge

Ferrum Inc., Centrifuge Technology, Houston, TX  
 Flottweg SE, Vilsbiburg, Germany  
 GEA Mechanical Equipment US, Inc. GEA Westfalia Separator Division, Northvale, NJ  
**GEA WESTFALIA SEPARATOR GROUP GMBH, Werner-Habig-Str. 1., Oelde, Germany 59302 (+ 49-2522-77-0; FAX: + 49-2522-77-2488; e-mail: ws.info@gea.com; web site: www.gea.com)**

### Centrifuges, filter, continuous, screen bowl, scroll discharge

Aaron Process Equipment Co., Bensenville, IL  
 Ferrum Inc., Centrifuge Technology, Houston, TX  
 Tema Systems, Inc., Cincinnati, OH

### Centrifuges, filter, inverting

Ferrum Inc., Centrifuge Technology, Houston, TX  
 Heinkel Filtering Systems Inc., Swedesboro, NJ  
 Sias, New Castle, DE  
 Western States Machine Co., Hamilton, OH

### Centrifuges, laboratory or pilot plant

B & P Process Equipment, Saginaw, MI  
 Ferrum Inc., Centrifuge Technology, Houston, TX  
 GEA Mechanical Equipment US, Inc. GEA Westfalia Separator Division, Northvale, NJ  
**GEA WESTFALIA SEPARATOR GROUP GMBH, Werner-Habig-Str. 1., Oelde, Germany 59302 (+ 49-2522-77-0; FAX: + 49-2522-77-2488; e-mail: ws.info@gea.com; web site: www.gea.com)**

Heinkel Filtering Systems Inc., Swedesboro, NJ  
 Sias, New Castle, DE  
 Tema Systems, Inc., Cincinnati, OH  
 Western States Machine Co., Hamilton, OH

### Centrifuges, liquid-liquid

B & P Process Equipment, Saginaw, MI

Ferrum Inc., Centrifuge Technology, Houston, TX  
 Flottweg SE, Vilsbiburg, Germany  
 GEA Mechanical Equipment US, Inc. GEA Westfalia Separator Division, Northvale, NJ  
**GEA WESTFALIA SEPARATOR GROUP GMBH, Werner-Habig-Str. 1., Oelde, Germany 59302 (+ 49-2522-77-0; FAX: + 49-2522-77-2488; e-mail: ws.info@gea.com; web site: www.gea.com)**  
 Sharpex Filters (I) Pvt. Ltd., Sales, Navimumbai, India

### Centrifuges, other

Ferrum Inc., Centrifuge Technology, Houston, TX  
 Western States Machine Co., Hamilton, OH

### Centrifuges, solid basket

Ferrum Inc., Centrifuge Technology, Houston, TX  
 Flottweg SE, Vilsbiburg, Germany  
 Western States Machine Co., Hamilton, OH

## CLASSIFIERS & GRAVITY SEPARATORS

### Clarifiers, flotation

**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**  
 See our ad on page 135

### Clarifiers, settling

Pollution Control Systems, Inc., Millford, OH  
 Westech Engineering Inc., Salt Lake City, UT

### Classifiers, air

AAAmachine, Inc., Des Plaines, IL  
 Buhler Inc., Minneapolis, MN  
 Fisher Klosterman, a CECO Environmental Company, Louisville, KY  
 Kemutec Group, Inc., Bristol, PA  
 Mesto Minerals Industries, Inc., York, PA  
 Prater-Sterling, Bollingbrook, IL

### Classifiers, cyclone

AAAmachine, Inc., Des Plaines, IL  
 AKW Apparate + Verfahren GmbH, Hirschau, Bavaria, Germany  
 Fisher Klosterman, a CECO Environmental Company, Louisville, KY

### Classifiers, mechanical, magnetic

Industrial Magnetics, Inc., Boyne City, MI

### Classifiers, mechanical, screening

AAAmachine, Inc., Des Plaines, IL  
 AKW Apparate + Verfahren GmbH, Hirschau, Bavaria, Germany  
 Bascale Company, Inc., Houston, TX  
 Kason Corp., Millburn, NJ

### Classifiers, mechanical, vibrating

Kason Corp., Millburn, NJ  
 MM Industries, Inc., Vorti-Siv, Salem, OH

### Decanters

Flottweg SE, Vilsbiburg, Germany  
 GEA Mechanical Equipment US, Inc. GEA Westfalia Separator Division, Northvale, NJ  
**GEA WESTFALIA SEPARATOR GROUP GMBH, Werner-Habig-Str. 1., Oelde, Germany 59302 (+ 49-2522-77-0; FAX: + 49-2522-77-2488; e-mail: ws.info@gea.com; web site: www.gea.com)**

### Liquid-liquid processing

Flottweg SE, Vilsbiburg, Germany  
 Franken Filtertechnik KG, Germany, Huertl, Germany  
**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)**  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

### Particle size control systems

FRITSCH GmbH, Milling and Sizing, Idar-Oberstein, Germany  
 G.R. Sprenger Engineering, Inc., Golden, CO  
 Modern Process Equipment, Inc., Chicago, IL  
 Prater-Sterling, Bollingbrook, IL  
 Sympatec GmbH, System | Partikel | Technik, Clausthal-Zellerfeld, Germany  
 Sympatec, Inc., System | Partikel | Technik, Pennington, NJ

### Thickeners, centrifugal

Flottweg SE, Vilsbiburg, Germany

# PRODUCT DIRECTORY

## Processing equipment

GEA Mechanical Equipment US, Inc. GEA Westfalia Separator Division, Northvale, NJ  
**GEA WESTFALIA SEPARATOR GROUP GMBH**, Werner-Habig-Str. 1., Oelde, Germany 59302 (+ 49-2522-77-0; FAX: + 49-2522-77-2488; e-mail: ws.info@gea.com; web site: www.gea.com)

### Thickeners, gravity

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Hol-land Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

Westech Engineering Inc., Salt Lake City, UT

### Thickeners, rake or sedimentation

AKW Apparate + Verfahren GmbH, Hirschau, Bavaria, Germany

Westech Engineering Inc., Salt Lake City, UT

## COOLING TOWER SYSTEMS

### Cooling towers

CU SERVICES LLC, Elk Grove, IL  
Delta Cooling Towers Inc., 185 US Highway 206, Roxbury Township, NJ 07836 (973-586-2201; FAX: 973-586-2243; e-mail: info@deltacooling.com; web site: www.deltacooling.com)

Mokon, Buffalo, NY

**PAHARPUR COOLING TOWERS LTD**, Paharpur House, 8/1/B Diamond Harbour Road, Kolkata, India 700027 (+913340133000; FAX: +913340133499; e-mail: pctccu@paharpur.com; web site: www.paharpur.com)

See our ad on page 82

SPX Cooling Technologies, Overland Park, KS

### Cooling towers, repair & upgrade

SPX Cooling Technologies, Overland Park, KS

### Drift eliminators, cooling tower

**COASTAL TECHNOLOGIES INC.**, P.O. Box 624, Hampton, SC 29924 (803-943-4822; FAX: 803-943-4744; e-mail: sales@cti-sc.com; web site: www.coastal-technologiesinc.com)

Delta Cooling Towers Inc., 185 US Highway 206, Roxbury Township, NJ 07836 (973-586-2201; FAX: 973-586-2243; e-mail: info@deltacooling.com; web site: www.deltacooling.com)

**KIMRE, INC.**, 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

SPX Cooling Technologies, Overland Park, KS

### Spray nozzles, cooling tower

PNR AMERICA, LLC, Poughkeepsie, NY  
SPX Cooling Technologies, Overland Park, KS

## CUSTOM FABRICATED EQUIPMENT

### Castings, foundries

Wall Colmonoy Corporation, Madison Heights, MI

### Equipment, process, custom

Bascale Company, Inc., Houston, TX  
Bepex International LLC, Minneapolis, MN

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: info@caloris.com; web site: www.caloris.com)

Charles Ross & Son Co., Hauppauge, NY

Chematur Ecoplanning OY, Pori, Finland

**EKATO RUEHR- UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)

See our ad on page 147

FABRICATED PLASTICS LIMITED, MAPLE, Canada  
Flexicon Corp., Bethlehem, PA

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Hol-land Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

Liquid Process Systems, inc., Indian Trail, NC  
Material Transfer & Storage Inc., Allegan, MI

Mars Mineral, Mars, PA

Mokon, Buffalo, NY

**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)

Patterson Ind. Canada, of All-Weld Company Limited, Scarborough, Ontario, Canada

Paul O. Abbe, Bensenville, IL

Pope Scientific, Inc., Saukville, WI

Powder Systems Ltd, Liverpool

PSL USA, Boise, ID

**SANDVIK PROCESS SYSTEMS, INC.**, 21 Campus Rd., Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: info@sandvik.com; web site: www.process-systems.sandvik.com)

Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
tec5USA, Plainview, NY

### Equipment, process, custom, cryogenic

**LAUDA DR. R. WOBSEER GMBH & CO. KG**, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 (0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)

Modern Process Equipment, Inc., Chicago, IL  
NEUHAUS NEOTECH Maschinen- und Anlagenbau GmbH, Germany

Pope Scientific, Inc., Saukville, WI

RAS Process Equipment Inc., Robbinsville, NJ

### Extrusions, custom

Davis-Standard, LLC, Pawcatuck, CT

### Lining applications, custom

Abresist Kalenborn Corporation, Urbana, IN

### Pipe & pipe systems, custom

Abresist Kalenborn Corporation, Urbana, IN  
Davis-Standard, LLC, Pawcatuck, CT  
FABRICATED PLASTICS LIMITED, MAPLE, Canada  
Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
Spaltech International Inc., Halton Hills, Ontario, Canada  
Team Industries, Inc., Kaukauna, WI

### Plastic fabrication, custom

Duall/HEE, a CECO Environmental Company, Owosso, MI  
FABRICATED PLASTICS LIMITED, MAPLE, Canada

### Pultrusion, custom

Creative Pultrusions, Inc., Alum Bank, PA

## Reinforced-plastics fabrication, custom

Bustin Industrial Products, East Stroudsburg, PA  
Creative Pultrusions, Inc., Alum Bank, PA  
Duall/HEE, a CECO Environmental Company, Owosso, MI  
FABRICATED PLASTICS LIMITED, MAPLE, Canada  
**HEMCO CORPORATION**, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemcocorp.com; web site: www.HEMCOcorp.com)  
ZCL Dualam, Inc., Edmonton, Alberta, Canada

## DRYERS

### Dryer parts & accessories

AMANDUS KAHL GmbH & Co. KG, Reinbek, Germany  
Bepex International LLC, Minneapolis, MN

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

Lectrodryer, Richmond, KY

Paul O. Abbe, Bensenville, IL

### Dryers, air

Bepex International LLC, Minneapolis, MN

LA-MAN Corp., Mazeppa, MN

Lectrodryer, Richmond, KY

Leister Technologies AG, Kargiswil, Switzerland

SIAD Macchine Impianti, Bergamo, Italy

SPX Flow Technology, Ocala, FL

Sweet Manufacturing Company, Springfield, OH

### Dryers, apron

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

### Dryers, batch

AVA-Huep GmbH u.Co KG, Herrsching, Germany  
AVA-Americas, LLC c/o GreerWalker, Charlotte, NC

## WYSSMONT<sup>®</sup>'s TURBO-DRYER<sup>®</sup>

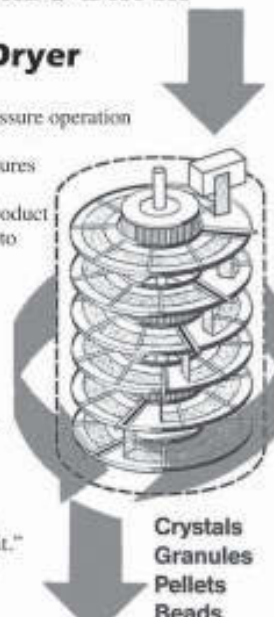
Vs.  
**Vacuum Dryer**

Usual advantages:

- continuous atmospheric pressure operation
- unattended operation
- can dry to lower final moistures (as low as .001%)
- no personnel exposure to product
- no dust to surroundings (or to plug filters)
- closer temperature control
- compact scale-up

Actual comments from users where the TURBO-DRYER<sup>®</sup> replaced a vacuum dryer:

- "You'd have to break the operator's arm to get it away from him."
- "It's the best piece of equipment in our plant."
- "We turn it on and forget it."
- "Why didn't we buy this last time?"



Crystals  
Granules  
Pellets  
Beads

**IT PAYS TO BUY THE BEST**

## TURBO-DRYER<sup>®</sup>

By  
**Wyssmont<sup>®</sup>**

Wyssmont Company, Inc.  
1470 Bergen Boulevard  
Fort Lee, NJ 07024  
201-947-4600  
FAX 201-947-0324  
EMAIL sales@wyssmont.com  
WEB www.wyssmont.com

**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

GEA Process Engineering, Columbia, MD  
Gruender Loedige Maschinenbau GmbH, Paderborn, Germany

**JAYGO, INC., 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)**

**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**

See our ad on page 135

Paul O. Abbe, Bensenville, IL  
Procedyne Corp., New Brunswick, NJ  
Shiv Shakti Process Equipment P. Ltd., International Marketing & Sales, Mumbai, India  
Spray Drying Systems, Inc., Eldersburg, MD

## Dryers, belt

AKW Apparate & Verfahren GmbH, Hirschau, Bavaria, Germany  
AMANDUS KAHL GmbH & Co. KG, Reinbek, Germany  
AWT World Trade Inc., Chicago, IL  
Berndorf Band GmbH, Berndorf, Austria

**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

Steri Technologies Inc., Bohemia, NY

## Dryers, centrifugal

Bepex International LLC, Minneapolis, MN  
Heinkel Filtering Systems Inc., Swedesboro, NJ  
Metso Minerals Industries, Inc., York, PA  
PSG Dover Europe GmbH, Oberglatt / ZH, Switzerland  
Singleton Corp., Cleveland, OH  
Spray Drying Systems, Inc., Eldersburg, MD  
Tema Systems, Inc., Cincinnati, OH  
Western States Machine Co., Hamilton, OH

## Dryers, chamber

EDWARDS US HEADQUARTERS, Sanborn, NY  
McGill AirPressure LLC, Columbus, OH  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Dryers, closed circuit

Bepex International LLC, Minneapolis, MN  
Buss-SMS-Canzler GmbH, Butzbach, Germany  
**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

GEA Process Engineering, Columbia, MD  
**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**

See our ad on page 135

Lectrodryer, Richmond, KY  
Procedyne Corp., New Brunswick, NJ  
Spray Drying Systems, Inc., Eldersburg, MD

**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Dryers, conical, vacuum

AVA-Huep GmbH u.Co.KG, Hirsching, Germany  
AVA-Americas, LLC c/o GreerWalker, Charlotte, NC  
Charles Ross & Son Co., Hauppauge, NY

**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

EDWARDS US HEADQUARTERS, Sanborn, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Hosokawa Micron B.V., Mixing, Drying & Agglomeration, Doetinchem, Netherlands  
**JAYGO, INC., 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)**

McGill AirPressure LLC, Columbus, OH  
Patterson Ind. Canada, of All-Weld Company Limited, Scarborough, Ontario, Canada  
Paul O. Abbe, Bensenville, IL  
Shiv Shakti Process Equipment P. Ltd., International Marketing & Sales, Mumbai, India

## Dryers, continuous

AMANDUS KAHL GmbH & Co. KG, Reinbek, Germany  
ANDRITZ Gouda, Waddinxveen, Netherlands  
AVA-Huep GmbH u.Co.KG, Hirsching, Germany  
AVA-Americas, LLC c/o GreerWalker, Charlotte, NC  
Bepex International LLC, Minneapolis, MN  
Buss-SMS-Canzler GmbH, Butzbach, Germany  
Cober, Inc., Stratford, CT

**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

EDWARDS US HEADQUARTERS, Sanborn, NY  
Epcor Industrial Systems, LP, The Woodlands, TX  
Gruender Loedige Maschinenbau GmbH, Paderborn, Germany

**GIG KARASEK GMBH, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: office@gigkarasek.at; web site: www.gigkarasek.com)**

**HEYL & PATTERSON INC., RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heylpatterson.com)**

Hosokawa Micron B.V., Mixing, Drying & Agglomeration, Doetinchem, Netherlands  
Kason Corp., Millburn, NJ

**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**

See our ad on page 135

Lectrodryer, Richmond, KY  
LIST AG, Arisdorf, Switzerland  
Paul O. Abbe, Bensenville, IL  
Procedyne Corp., New Brunswick, NJ  
**SANDVIK PROCESS SYSTEMS, INC., 21 Campus Rd., Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: info@sandvik.com; web site: www.process-systems.sandvik.com)**

Spray Drying Systems, Inc., Eldersburg, MD  
Steri Technologies Inc., Bohemia, NY  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Dryers, conveyor

AWT World Trade Inc., Chicago, IL  
Bepex International LLC, Minneapolis, MN  
Cober, Inc., Stratford, CT

**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

**SANDVIK PROCESS SYSTEMS, INC., 21 Campus Rd., Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: info@sandvik.com; web site: www.process-systems.sandvik.com)**

## Dryers, desiccant, disposable cartridge

SPX Flow Technology, Ocala, FL

## Dryers, desiccant, package unit

AAAmachine, Inc., Des Plaines, IL  
Lectrodryer, Richmond, KY  
Munters Corporation, Air Treatment, Amesbury, MA  
Pneumatech, Inc., Rock Hill, SC  
SPX Flow Technology, Ocala, FL

## Dryers, drum

ANDRITZ Gouda, Waddinxveen, Netherlands  
**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

Encon Evaporators, Hooksett, NH  
GEA Barr-Rosin, Boisbriand, Quebec, Canada

## Dryers, drum, rotary vacuum

McGill AirPressure LLC, Columbus, OH  
Paul O. Abbe, Bensenville, IL

## Dryers, electric

Cober, Inc., Stratford, CT  
**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

Encon Evaporators, Hooksett, NH  
Lectrodryer, Richmond, KY  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Dryers, flash

Bepex International LLC, Minneapolis, MN  
**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

GEA Barr-Rosin, Boisbriand, Quebec, Canada  
GEA Process Engineering, Columbia, MD  
**HEYL & PATTERSON INC., RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heylpatterson.com)**

Hosokawa Micron B.V., Mixing, Drying & Agglomeration, Doetinchem, Netherlands  
Spray Drying Systems, Inc., Eldersburg, MD  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Dryers, fluidized bed

ANDRITZ Gouda, Waddinxveen, Netherlands  
Bepex International LLC, Minneapolis, MN  
Buhler Inc., Minneapolis, MN  
**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

CPFD Software, Albuquerque, New Mexico  
Dynamic Air Inc., St. Paul, MN  
Evaporator Dryer Technologies, Hammond, WI  
GEA Barr-Rosin, Boisbriand, Quebec, Canada  
GEA Process Engineering, Columbia, MD

**HEYL & PATTERSON INC., RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heylpatterson.com)**

Kason Corp., Millburn, NJ  
Kinergy Corp., Louisville, KY  
NEUHAUS NEOTEC Maschinen- und Anlagenbau GmbH, Germany  
Paul O. Abbe, Bensenville, IL  
Procedyne Corp., New Brunswick, NJ  
Shiv Shakti Process Equipment P. Ltd., International Marketing & Sales, Mumbai, India  
Spray Drying Systems, Inc., Eldersburg, MD  
Sweet Manufacturing Company, Springfield, OH

## Dryers, freeze

EDWARDS US HEADQUARTERS, Sanborn, NY  
GEA Process Engineering, Columbia, MD

## Dryers, gas

Cober, Inc., Stratford, CT  
**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

Lectrodryer, Richmond, KY  
Pneumatech, Inc., Rock Hill, SC  
SPX Flow Technology, Ocala, FL

## Dryers, infrared

AWT World Trade Inc., Chicago, IL  
**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

McGill AirPressure LLC, Columbus, OH

## Dryers, microwave

Cober, Inc., Stratford, CT  
Progressive Recovery Inc., Duplo, IL

## Dryers, oxygen-enriched air

AirSep Corporation, A Chart Industries Company, Buffalo, NY

## Dryers, paddle

ANDRITZ Gouda, Waddinxveen, Netherlands  
Charles Ross & Son Co., Hauppauge, NY  
**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

Dynamic Air Inc., St. Paul, MN  
Encon Evaporators, Hooksett, NH  
GEA Barr-Rosin, Boisbriand, Quebec, Canada  
**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**

See our ad on page 135

McGill AirPressure LLC, Columbus, OH  
Paul O. Abbe, Bensenville, IL

## Dryers, pan

EDWARDS US HEADQUARTERS, Sanborn, NY



**WYSSMONT CO. INC.**, 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## Dryers, radiant heat

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

**WYSSMONT CO. INC.**, 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## Dryers, refrigerated air

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

**LA-MAN Corp.**, Mazeppa, MN  
Lectrodryer, Richmond, KY  
Pneumatech, Inc., Rock Hill, SC

**WYSSMONT CO. INC.**, 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## Dryers, rotary

Bepex International LLC, Minneapolis, MN

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

**EDWARDS US HEADQUARTERS**, Sanborn, NY  
GEA Barr-Rosin, Boisbriand, Quebec, Canada  
Harper International, Buffalo, NY

**HEYL & PATTERSON INC.**, RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heylopatterson.com)

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

McGill AirPressure LLC, Columbus, OH  
Metso Minerals Industries, Inc., York, PA  
Patterson Ind. Canada, of All-Well Company Limited,  
Scarborough, Ontario, Canada  
Paul O. Abbe, Bensenville, IL

## Dryers, screw flight

Bepex International LLC, Minneapolis, MN  
Buss-SMS-Canzler GmbH, Butzbach, Germany

**EKATO RUEHR- UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)

See our ad on page 147

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

## Dryers, shelf, vacuum

**EDWARDS US HEADQUARTERS**, Sanborn, NY  
McGill AirPressure LLC, Columbus, OH  
Paul O. Abbe, Bensenville, IL

Shiv Shakti Process Equipment P. Ltd., International Marketing & Sales, Mumbai, India  
Steri Technologies Inc., Bohemia, NY

## Dryers, spin flash

Buss-SMS-Canzler GmbH, Butzbach, Germany  
GEA Process Engineering, Columbia, MD

## Dryers, spiral screw

**ANDRITZ Gouda**, Waddinxveen, Netherlands

Bepex International LLC, Minneapolis, MN  
Charles Ross & Son Co., Hauppauge, NY

**EKATO RUEHR- UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)

See our ad on page 147

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

Paul O. Abbe, Bensenville, IL

## Dryers, spray

AAAMachine, Inc., Des Plaines, IL

Aaron Process Equipment Co., Bensenville, IL  
Evaporator Dryer Technologies, Hammond, WI  
Fujisaki Electric, Des Plaines, IL  
GEA Process Engineering, Columbia, MD

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

**PNR AMERICA LLC**, Poughkeepsie, NY  
Spray Drying Systems, Inc., Eldersburg, MD  
Spraying Systems Co., Wheaton, IL

## Dryers, steam jacketed

Bepex International LLC, Minneapolis, MN  
Buss-SMS-Canzler GmbH, Butzbach, Germany

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

GEA Barr-Rosin, Boisbriand, Quebec, Canada

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

Paul O. Abbe, Bensenville, IL

# Dry. Heat. Cool. Filter. Wash. Dewater.



Komline-Sanderson develops, designs and manufactures innovative solutions for industrial process/production filtration, drying and heat transfer applications. For industrial and municipal wastewater treatment plants we offer clarification, sludge dewatering and sludge drying technology.

Our experience ranges from simple one-machine installations to complex multi-step processes and systems.

## Paddle Dryer • Paddle Processor • Paddle Cooler

- indirect heating using steam or thermal fluid
- indirect cooling with water/glycol
- high heat transfer rates
- low residual moisture (solvent)
- uniform heating and cooling
- controlled environment



## Vacuum Filters

- continuous filtration
- thin or thick slurries
- corrosive slurries
- cake washing



## Rotary Atomizer

- spray dryers
- dry scrubbers
- direct drive, variable speed



**e-mail:** info@komline.com  
**call:** 1-800-CALL 4 K-S  
(1-800-225-5457)  
**web:** www.komline.com



**Komline-Sanderson**

## Dryers, steam tube

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: [comessa@comessa.fr](mailto:comessa@comessa.fr); web site: [www.comessa.com](http://www.comessa.com))

GEA Barr-Rosin, Boisbriand, Quebec, Canada  
McGill AirPressure LLC, Columbus, OH

## Dryers, suspension

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: [comessa@comessa.fr](mailto:comessa@comessa.fr); web site: [www.comessa.com](http://www.comessa.com))

GEA Process Engineering, Columbia, MD

**WYSSMONT CO. INC.**, 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: [sales@wyssmont.com](mailto:sales@wyssmont.com); web site: [www.wyssmont.com](http://www.wyssmont.com))

See our ad on page 133

## Dryers, tray

Powder Systems Ltd, Liverpool  
PSL USA, Boise, ID

**WYSSMONT CO. INC.**, 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: [sales@wyssmont.com](mailto:sales@wyssmont.com); web site: [www.wyssmont.com](http://www.wyssmont.com))

See our ad on page 133

## Dryers, tray, vacuum

EDWARDS US HEADQUARTERS, Sanborn, NY  
McGill AirPressure LLC, Columbus, OH  
Powder Systems Ltd, Liverpool  
PSL USA, Boise, ID

Shiv Shakti Process Equipment P. Ltd., International Marketing & Sales, Mumbai, India

Steri Technologies Inc., Bohemia, NY

**WYSSMONT CO. INC.**, 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: [sales@wyssmont.com](mailto:sales@wyssmont.com); web site: [www.wyssmont.com](http://www.wyssmont.com))

See our ad on page 133

## Dryers, tumble

Charles Ross & Son Co., Hauppauge, NY  
EDWARDS US HEADQUARTERS, Sanborn, NY

**JAYGO, INC.**, 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: [sales@jaygoinc.com](mailto:sales@jaygoinc.com); web site: [www.jaygoinc.com](http://www.jaygoinc.com))

Paul O. Abbe, Bensenville, IL

## Dryers, tunnel

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: [comessa@comessa.fr](mailto:comessa@comessa.fr); web site: [www.comessa.com](http://www.comessa.com))

## Dryers, V cone

Paul O. Abbe, Bensenville, IL

## Dryers, vacuum

ANDRITZ Gouda, Waddinxveen, Netherlands

Bepex International LLC, Minneapolis, MN

Buss-SMS-Canzler GmbH, Butzbach, Germany

Charles Ross & Son Co., Hauppauge, NY

**CROLL-REYNOLDS CO. INC.**, Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: [info@croll.com](mailto:info@croll.com); web site: [www.croll.com](http://www.croll.com))

EDWARDS US HEADQUARTERS, Sanborn, NY

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hoheflum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: [info@ekato.com](mailto:info@ekato.com); web site: [www.ekato.com](http://www.ekato.com))**

See our ad on page 147

Gebrueder Loedige Maschinenbau GmbH, Paderborn, Germany

**GIG KARASEK GMBH, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: [office@gigkarasek.at](mailto:office@gigkarasek.at); web site: [www.gigkarasek.com](http://www.gigkarasek.com))**

Hosokawa Micron B.V., Mixing, Drying & Agglomeration, Doetinchem, Netherlands

**JAYGO, INC.**, 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: [sales@jaygoinc.com](mailto:sales@jaygoinc.com); web site: [www.jaygoinc.com](http://www.jaygoinc.com))

**KOMLINE-SANDEORON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: [info@komline.com](mailto:info@komline.com); web site: [www.komline.com](http://www.komline.com))

See our ad on page 135

LIST AG, Arisdorf, Switzerland

McGill AirPressure LLC, Columbus, OH

Paul O. Abbe, Bensenville, IL

Pope Scientific, Inc., Saukville, WI

Powder Systems Ltd, Liverpool

PSL USA, Boise, ID

Steri Technologies Inc., Bohemia, NY

## Dryers, vacuum pan

Paul O. Abbe, Bensenville, IL

## Dryers, vertical

Buss-SMS-Canzler GmbH, Butzbach, Germany  
Charles Ross & Son Co., Hauppauge, NY

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: [comessa@comessa.fr](mailto:comessa@comessa.fr); web site: [www.comessa.com](http://www.comessa.com))

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hoheflum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: [info@ekato.com](mailto:info@ekato.com); web site: [www.ekato.com](http://www.ekato.com))**

See our ad on page 147

**GIG KARASEK GMBH, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: [office@gigkarasek.at](mailto:office@gigkarasek.at); web site: [www.gigkarasek.com](http://www.gigkarasek.com))**

Paul O. Abbe, Bensenville, IL

Spray Drying Systems, Inc., Eldersburg, MD

**WYSSMONT CO. INC.**, 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: [sales@wyssmont.com](mailto:sales@wyssmont.com); web site: [www.wyssmont.com](http://www.wyssmont.com))

See our ad on page 133

## Dryers, vibrating

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: [comessa@comessa.fr](mailto:comessa@comessa.fr); web site: [www.comessa.com](http://www.comessa.com))

GEA Process Engineering, Columbia, MD

Kason Corp., Millburn, NJ

Kinergy Corp., Louisville, KY

## DUST COLLECTORS & SEPARATORS

### Baghouses

Ambient Engineering Inc., Rocky Hill, NJ  
American Fabric Filter Co., Wesley Chapel, FL

**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: [sales@bionomicind.com](mailto:sales@bionomicind.com); web site: [www.bionomicind.com](http://www.bionomicind.com))

Buhler Inc., Minneapolis, MN

Evaporator Dryer Technologies, Hammond, WI

Fisher Klosterman, a CECO Environmental Company, Louisville, KY

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

GEA Process Engineering, Columbia, MD

Schenck Process, Kansas City, MO

Scientific Dust Collectors, Alsip, IL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

**HEMCO CORPORATION**, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: [info@hemcocorp.com](mailto:info@hemcocorp.com); web site: [www.HEMCOcorp.com](http://www.HEMCOcorp.com))

Midwestco Filter Resources, Inc., Winchester, VA

Scientific Dust Collectors, Alsip, IL

Turner EnviroLogic, Inc., Deerfield Beach, FL

## Dust collectors, cartridge

AIRLANCO, 312 S. Highway 73, PO Box 398, Falls Church, VA 22041 (800-500-9777; 402-245-2325; FAX: 402-245-5196; e-mail: [sales@airlanco.com](mailto:sales@airlanco.com); web site: [www.airlanco.com](http://www.airlanco.com))

Dynamic Air Inc., St. Paul, MN

Fisher Klosterman, a CECO Environmental Company, Louisville, KY

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

# PRODUCT DIRECTORY

**CYCLONAIRE CORP.**, P.O. Box 366, York, NE 68467  
(800-445-0730; 402-362-2000; FAX: 402-362-2001;  
e-mail: sales@cyclonaire.com; web site: www.cyclonaire.com)

Evaporator Dryer Technologies, Hammond, WI  
Fisher Klosterman, a CECO Environmental Company, Louisville, KY

Flexicon Corp., Bethlehem, PA  
Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

GEA Process Engineering, Columbia, MD

**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)

Schenck Process, Kansas City, MO

Scientific Dust Collectors, Alsip, IL

Vector Technologies Ltd., Milwaukee, WI

## Dust collectors, tray type

Advanced Industrial Technology Corp., Paramus, NJ  
Fisher Klosterman, a CECO Environmental Company, Louisville, KY

TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

Turner EnviroLogic, Inc., Deerfield Beach, FL

## Dust collectors, tubular

Turner EnviroLogic, Inc., Deerfield Beach, FL

## Dust collectors, wet

AAAmachine, Inc., Des Plaines, IL

Dual/HEE, a CECO Environmental Company, Owosso, MI  
Fisher Klosterman, a CECO Environmental Company, Louisville, KY

**KIMRE, INC.**, 744 SW 1st Street, Homestead, FL 33030  
(305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

## Dust removal equipment

AWT World Trade Inc., Chicago, IL

Dual/HEE, a CECO Environmental Company, Owosso, MI  
Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

GEA Process Engineering, Columbia, MD

**HEMCO CORPORATION**, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemcocorp.com; web site: www.HEMCOcorp.com)

**KIMRE, INC.**, 744 SW 1st Street, Homestead, FL 33030  
(305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)

Scientific Dust Collectors, Alsip, IL

## Wet Electrostatic precipitators

**BELTRAN TECHNOLOGIES, INC.**, 1133 East 35 Street, Brooklyn, New York 11210 (718-338-3311; FAX: 718-253-9028; e-mail: info@beltrantechnologies.com; web site: www.beltrantechnologies.com)

## ELECTROCHEMICAL EQUIPMENT

### Electrodes: anodes & cathodes

Denver Mineral Engineers, Inc., Littleton, CO  
Lightning Eliminators & Consultants, Inc., Boulder, CO

### Electrolytic cells

Denver Mineral Engineers, Inc., Littleton, CO  
PCA GmbH, Hausweiler, Germany  
ThyssenKrupp Industrial Solutions AG, Business Unit Process Technologies, Dortmund, Germany

## ENTRAINMENT SEPARATION EQUIPMENT

### Defoamers, physical

**COASTAL TECHNOLOGIES INC.**, P.O. Box 624, Hampton, SC 29924 (803-943-4822; FAX: 803-943-4744; e-mail: sales@cti-sc.com; web site: www.coastal-technologiesinc.com)

**EKATO RUEHR-UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)

See our ad on page 147

### Mist eliminators

Advanced Industrial Technology Corp., Paramus, NJ  
AMACS, Houston, TX  
Ambient Engineering Inc., Rocky Hill, NJ

CECO Filters, a CECO Environmental Company, Telford, PA



**COASTAL TECHNOLOGIES INC.**, P.O. Box 624, Hampton, SC 29924 (803-943-4822; FAX: 803-943-4744; e-mail: sales@cti-sc.com; web site: www.coastal-technologiesinc.com)

Dual/HEE, a CECO Environmental Company, Owosso, MI  
Fisher Klosterman, a CECO Environmental Company, Louisville, KY

Hilliard Corp., Elmira, NY

Hudson Products Corp., Houston, TX



**KIMRE, INC.**, 744 SW 1st Street, Homestead, FL 33030  
(305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

KIRK Process Solutions Ltd, Walton-on-Thames

Spraying Systems Co., Wheaton, IL

**SULZER CHEMTECH LTD**, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)

## Traps, air

Armstrong International, Three Rivers, MI

**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; FAX: 704-583-1610; web site: www.tlv.com)

See our ad on page 100

## EVAPORATORS & CRYSTALLIZERS

### Crystallizers, cooling

**ALAUQA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alaquainc.com)

GEA Niro PT B.V., 's-Hertogenbosch, Netherlands  
**SANDVIK PROCESS SYSTEMS, INC.**, 21 Campus Rd., Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: info@sandvik.com; web site: www.process-systems.sandvik.com)

Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
**SULZER CHEMTECH LTD**, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)

### Crystallizers, evaporative

**ALAUQA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alaquainc.com)

Chematur EcoPlanning OY, Pori, Finland

GEA Process Engineering, Columbia, MD

### Crystallizers, freeze

GEA Niro PT B.V., 's-Hertogenbosch, Netherlands  
GEA Process Engineering, Columbia, MD  
**SULZER CHEMTECH LTD**, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)

### Crystallizers, melt

GEA Niro PT B.V., 's-Hertogenbosch, Netherlands  
GEA Process Engineering, Columbia, MD  
**SANDVIK PROCESS SYSTEMS, INC.**, 21 Campus Rd., Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: info@sandvik.com; web site: www.process-systems.sandvik.com)

Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany

## Processing equipment

**SULZER CHEMTECH LTD**, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)

## Crystallizers, Oslo Krystal

**ALAUQA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alaquainc.com)

GEA Process Engineering, Columbia, MD

## Crystallizers, scraped surface

GEA Niro PT B.V., 's-Hertogenbosch, Netherlands  
Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
**SULZER CHEMTECH LTD**, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)

## Crystallizers, vacuum

**ALAUQA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alaquainc.com)

Chematur EcoPlanning OY, Pori, Finland

**ROLL-REYNOLDS CO. INC.**, Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.roll.com)

GEA Process Engineering, Columbia, MD

## Evaporative systems, mechanical recompression

**ALAUQA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alaquainc.com)

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: info@caloris.com; web site: www.caloris.com)

Chematur EcoPlanning OY, Pori, Finland

Encon Evaporators, Hooksett, NH

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)

GEA Process Engineering, Columbia, MD

**GIG KARASEK GMBH**, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: office@gigkarasek.at; web site: www.gigkarasek.com)

## Evaporative systems, multiple effect

**ALAUQA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alaquainc.com)

Bus-SMS-Canzler GmbH, Butzbach, Germany

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: info@caloris.com; web site: www.caloris.com)

Chematur EcoPlanning OY, Pori, Finland

Evaporator Dryer Technologies, Hammond, WI

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)

GEA Process Engineering, Columbia, MD

**GIG KARASEK GMBH**, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: office@gigkarasek.at; web site: www.gigkarasek.com)

**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)

See our ad on page 107

LIST AG, Arisdorf, Switzerland

Schutte & Koerting, Treviso, PA

## Evaporative systems, thermal compression

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: [info@caloris.com](mailto:info@caloris.com); web site: [www.caloris.com](http://www.caloris.com))



**CROLL-REYNOLDS CO. INC.**, Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: [info@croll.com](mailto:info@croll.com); web site: [www.croll.com](http://www.croll.com))

Encon Evaporators, Hooksett, NH

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: [gea-wiegand.info@gea.com](mailto:gea-wiegand.info@gea.com); web site: [www.gea.com](http://www.gea.com))

GEA Process Engineering, Columbia, MD

**GIG KARASEK GMBH**, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: [office@gigkarasek.at](mailto:office@gigkarasek.at); web site: [www.gigkarasek.com](http://www.gigkarasek.com))

**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: [st@koerting.de](mailto:st@koerting.de); web site: [www.koerting.de](http://www.koerting.de))

See our ad on page 107

Schutte & Koerting, Treviso, PA

## Evaporators, agitated film

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

Buss-SMS-Canzler GmbH, Butzbach, Germany

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: [gea-wiegand.info@gea.com](mailto:gea-wiegand.info@gea.com); web site: [www.gea.com](http://www.gea.com))

**GIG KARASEK GMBH**, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: [office@gigkarasek.at](mailto:office@gigkarasek.at); web site: [www.gigkarasek.com](http://www.gigkarasek.com))

Pope Scientific, Inc., Saukville, WI

## Evaporators, climbing film

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: [gea-wiegand.info@gea.com](mailto:gea-wiegand.info@gea.com); web site: [www.gea.com](http://www.gea.com))

GEA Process Engineering, Columbia, MD

## Evaporators, coil

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

## Evaporators, falling film



**ALAQUA, Inc.**

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

Buss-SMS-Canzler GmbH, Butzbach, Germany

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: [info@caloris.com](mailto:info@caloris.com); web site: [www.caloris.com](http://www.caloris.com))

Chematur Ecoplaning OY, Pori, Finland

Evaporator Dryer Technologies, Hammond, WI

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: [gea-wiegand.info@gea.com](mailto:gea-wiegand.info@gea.com); web site: [www.gea.com](http://www.gea.com))

GEA PHE Systems, York, PA

GEA Process Engineering, Columbia, MD

**GIG KARASEK GMBH**, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: [office@gigkarasek.at](mailto:office@gigkarasek.at); web site: [www.gigkarasek.com](http://www.gigkarasek.com))

Pope Scientific, Inc., Saukville, WI

## Evaporators, flash

Advanced Industrial Technology Corp., Paramus, NJ

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: [info@caloris.com](mailto:info@caloris.com); web site: [www.caloris.com](http://www.caloris.com))

Chematur Ecoplaning OY, Pori, Finland

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: [gea-wiegand.info@gea.com](mailto:gea-wiegand.info@gea.com); web site: [www.gea.com](http://www.gea.com))

GEA Process Engineering, Columbia, MD

**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: [st@koerting.de](mailto:st@koerting.de); web site: [www.koerting.de](http://www.koerting.de))

See our ad on page 107

Pope Scientific, Inc., Saukville, WI

Wintek Corp., Flanders, NJ

## Evaporators, forced circulation

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

Buss-SMS-Canzler GmbH, Butzbach, Germany

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: [info@caloris.com](mailto:info@caloris.com); web site: [www.caloris.com](http://www.caloris.com))

CG Thermal LLC, Twinsburg, Ohio

Chematur Ecoplaning OY, Pori, Finland

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: [gea-wiegand.info@gea.com](mailto:gea-wiegand.info@gea.com); web site: [www.gea.com](http://www.gea.com))

GEA Process Engineering, Columbia, MD

**GIG KARASEK GMBH**, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: [office@gigkarasek.at](mailto:office@gigkarasek.at); web site: [www.gigkarasek.com](http://www.gigkarasek.com))

## Evaporators, horizontal tube

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: [info@caloris.com](mailto:info@caloris.com); web site: [www.caloris.com](http://www.caloris.com))

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: [gea-wiegand.info@gea.com](mailto:gea-wiegand.info@gea.com); web site: [www.gea.com](http://www.gea.com))

GEA Process Engineering, Columbia, MD

LIST AG, Arisdorf, Switzerland

## Evaporators, low temperature

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: [info@caloris.com](mailto:info@caloris.com); web site: [www.caloris.com](http://www.caloris.com))

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: [gea-wiegand.info@gea.com](mailto:gea-wiegand.info@gea.com); web site: [www.gea.com](http://www.gea.com))

GEA Process Engineering, Columbia, MD

Pope Scientific, Inc., Saukville, WI

## Evaporators, plate type

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: [gea-wiegand.info@gea.com](mailto:gea-wiegand.info@gea.com); web site: [www.gea.com](http://www.gea.com))

GEA PHE Systems, York, PA

GEA Process Engineering, Columbia, MD

## Evaporators, short path

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

Buss-SMS-Canzler GmbH, Butzbach, Germany

GEA Process Engineering, Columbia, MD

**GIG KARASEK GMBH**, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: [office@gigkarasek.at](mailto:office@gigkarasek.at); web site: [www.gigkarasek.com](http://www.gigkarasek.com))

Pope Scientific, Inc., Saukville, WI

## Evaporators, thin film

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

Buss-SMS-Canzler GmbH, Butzbach, Germany

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: [info@caloris.com](mailto:info@caloris.com); web site: [www.caloris.com](http://www.caloris.com))

CTP Corp., Northport, NY

GEA Process Engineering, Columbia, MD

**GIG KARASEK GMBH**, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: [office@gigkarasek.at](mailto:office@gigkarasek.at); web site: [www.gigkarasek.com](http://www.gigkarasek.com))

Pope Scientific, Inc., Saukville, WI

## Evaporators, vertical long tube

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: [info@caloris.com](mailto:info@caloris.com); web site: [www.caloris.com](http://www.caloris.com))

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: [gea-wiegand.info@gea.com](mailto:gea-wiegand.info@gea.com); web site: [www.gea.com](http://www.gea.com))

## Evaporators, vertical short tube (calandria)

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: [info@caloris.com](mailto:info@caloris.com); web site: [www.caloris.com](http://www.caloris.com))

## Evaporators, waste gas

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

## Evaporators, waste water

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

Buss-SMS-Canzler GmbH, Butzbach, Germany

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: [info@caloris.com](mailto:info@caloris.com); web site: [www.caloris.com](http://www.caloris.com))

Encon Evaporators, Hooksett, NH

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: [gea-wiegand.info@gea.com](mailto:gea-wiegand.info@gea.com); web site: [www.gea.com](http://www.gea.com))

GEA Process Engineering, Columbia, MD

**GIG KARASEK GMBH**, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: [office@gigkarasek.at](mailto:office@gigkarasek.at); web site: [www.gigkarasek.com](http://www.gigkarasek.com))

## Evaporators, wiped film

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alaquainc.com](http://www.alaquainc.com))

Buss-SMS-Canzler GmbH, Butzbach, Germany

**GIG KARASEK GMBH**, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: [office@gigkarasek.at](mailto:office@gigkarasek.at); web site: [www.gigkarasek.com](http://www.gigkarasek.com))

Pope Scientific, Inc., Saukville, WI

## Flakers, drum

ANDRITZ Gouda, Waddinxveen, Netherlands

## FILTER MEDIA & AIDS

### Felt, filter

Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North America; 908-234-1000; FAX: 908-234-9487; e-mail: [info@kmlonline.com](mailto:info@kmlonline.com); web site: [www.kmlonline.com](http://www.kmlonline.com))

See our ad on page 135

## Filter aids, activated carbon

**HEMCO CORPORATION**, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemcocorp.com; web site: www.HEMCOcorp.com)  
Jacobi Carbons, Inc., Columbus, OH  
TIGG Corporation, Oakdale, PA

## Filter aids, diatomaceous earth

Argonide Corporation, Sanford, FL

## Filter aids, zeolite

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
TIGG Corporation, Oakdale, PA

## Filter bags, acidproof

Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany

## Filter bags, alkaliproof

Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany

## Filter bags, glass

Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany

## Filter bags, natural fiber

American Fabric Filter Co., Wesley Chapel, FL

## Filter bags, synthetic fiber

American Fabric Filter Co., Wesley Chapel, FL  
Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany  
Keystone Filter, a CECO Environmental Company, Telford, PA  
Sefar Inc., Buffalo, NY

## Filter cloth, acidproof

CECO Filters, a CECO Environmental Company, Telford, PA  
**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)  
See our ad on page 135

## Filter cloth, alkaliproof

CECO Filters, a CECO Environmental Company, Telford, PA  
**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)  
See our ad on page 135

## Filter cloth, cotton

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)  
See our ad on page 135

## Filter cloth, glass

CECO Filters, a CECO Environmental Company, Telford, PA

## Filter cloth, metallic

G Bopp USA Inc., Wappingers Falls, NY  
MM Industries, Inc., Vort-Siv, Salem, OH  
Tema Systems, Inc., Cincinnati, OH

## Filter cloth, natural fiber

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)  
See our ad on page 135

## Filter cloth, synthetic fiber

CECO Filters, a CECO Environmental Company, Telford, PA  
**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)  
See our ad on page 135

## Filter media, other

Applied Porous Technologies, Inc., Tariffville, CT  
CECO Filters, a CECO Environmental Company, Telford, PA  
Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany  
Hilliard Corp., Elmira, NY  
KDF Fluid Treatment, Inc., Three Rivers, MI

**KIMRE, INC.**, 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)  
See our ad on page 135

Mefiag, a CECO Environmental Company, Owosso, MI  
Mott Corporation, Farmington, CT  
Sefar Inc., Buffalo, NY  
TIGG Corporation, Oakdale, PA  
ts-systemfilter gmbh, Ahorn-Berolzeim, Germany

## Pads, filter

CECO Filters, a CECO Environmental Company, Telford, PA

## Paper, filter

Mefiag, a CECO Environmental Company, Owosso, MI

## Plates, filter

G Bopp USA Inc., Wappingers Falls, NY

## Tubes, filter

Keystone Filter, a CECO Environmental Company, Telford, PA  
Mott Corporation, Farmington, CT  
Sefar Inc., Buffalo, NY  
ts-systemfilter gmbh, Ahorn-Berolzeim, Germany

## FILTRATION EQUIPMENT

### Biofilters

Ambient Engineering Inc., Rocky Hill, NJ  
Dual/HEE, a CECO Environmental Company, Owosso, MI  
Hepa Corporation, Anaheim, CA

### Dewatering, mechanical press

Filtera-Systems Co., Farmington Hills, MI  
**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)  
See our ad on page 135

Metso Minerals Industries, Inc., York, PA  
Steri Technologies Inc., Bohemia, NY

### Filter housings

Argonide Corporation, Sanford, FL  
Enerquip, LLC, Medford, WI  
Freudenberg Filtration Technologies SE & Co. KG, Weinheim, Germany  
JLS International, Inc., Charlotte, NC  
Keystone Filter, a CECO Environmental Company, Telford, PA  
Liquid Process Systems, inc., Indian Trail, NC  
SPX Flow Technology, Ocala, FL  
ts-systemfilter gmbh, Ahorn-Berolzeim, Germany  
United Filtration Systems, Inc., Sterling Heights, MI

### Filter parts & accessories

American Fabric Filter Co., Wesley Chapel, FL  
CECO Filters, a CECO Environmental Company, Telford, PA  
G Bopp USA Inc., Wappingers Falls, NY  
Hilliard Corp., Elmira, NY  
Industrial Magnetics, Inc., Boyne City, MI  
**JAYGO, INC.**, 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)  
Keystone Filter, a CECO Environmental Company, Telford, PA

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)  
See our ad on page 135

LA-MAN Corp., Mazeppa, MN  
Mefiag, a CECO Environmental Company, Owosso, MI  
Midwesco Filter Resources, Inc., Winchester, VA  
**ORIVAL WATER FILTERS**, 213 S Van Brunt St., Englewood, NJ 07631-9902 (800-567-9767; 201-568-3311; FAX: 201-568-1916; e-mail: sales@orival.com; web site: www.orival.com)

Schenck Process, Kansas City, MO  
SPX Flow Technology, Ocala, FL

### Filter presses

Filtera-Systems Co., Farmington Hills, MI  
**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)  
See our ad on page 135

### Filter systems

Advanced Cyclone Systems, S. A., Porto, Portugal  
Argonide Corporation, Sanford, FL

BHS-Sonthofen GmbH, Sonthofen, Deutschland  
BHS-Sonthofen Inc., Charlotte, NC  
CECO Filters, a CECO Environmental Company, Telford, PA  
Coperion GmbH, Weingarten, Wuert., Germany  
CTP Corp., Northport, NY  
Freudenberg Filtration Technologies SE & Co. KG, Weinheim, Germany  
Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany  
Hepa Corporation, Anaheim, CA  
Hilliard Corp., Elmira, NY  
HydroTec Systems Co., Inc., Tiskilwa, IL  
Keystone Filter, a CECO Environmental Company, Telford, PA

**KIMRE, INC.**, 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)  
See our ad on page 135

Liquid Process Systems, inc., Indian Trail, NC  
Magnetic Products, Inc., Highland, MI  
Mefiag, a CECO Environmental Company, Owosso, MI  
Microdyn Technologies, Inc., Raleigh, NC  
MICRODYN-NADIR GmbH, Wiesbaden, Germany  
MM Industries, Inc., Vort-Siv, Salem, OH  
Mott Corporation, Farmington, CT

**ORIVAL WATER FILTERS**, 213 S Van Brunt St., Englewood, NJ 07631-9902 (800-567-9767; 201-568-3311; FAX: 201-568-1916; e-mail: sales@orival.com; web site: www.orival.com)

Porvair Filtration Group Inc, Ashland, VA  
PSG Dover Europe GmbH, Oberglatt / ZH, Switzerland  
SPX Flow Technology, Ocala, FL  
Steri Technologies Inc., Bohemia, NY  
ts-systemfilter gmbh, Ahorn-Berolzeim, Germany

### Filters, activated carbon

Argonide Corporation, Sanford, FL  
Faudi GmbH, Stadtallendorf, Germany  
Freudenberg Filtration Technologies SE & Co. KG, Weinheim, Germany

**HEMCO CORPORATION**, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemcocorp.com; web site: www.HEMCOcorp.com)  
Keystone Filter, a CECO Environmental Company, Telford, PA  
Sharplex Filters (I) Pvt. Ltd., Sales, Navimumbai, India  
SPX Flow Technology, Ocala, FL  
TIGG Corporation, Oakdale, PA  
United Manufacturing International 2000, Red Bluff, CA

### Filters, air

Advanced Cyclone Systems, S. A., Porto, Portugal  
CECO Filters, a CECO Environmental Company, Telford, PA  
Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL  
Freudenberg Filtration Technologies SE & Co. KG, Weinheim, Germany

Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany  
Hepa Corporation, Anaheim, CA  
Keystone Filter, a CECO Environmental Company, Telford, PA

**KIMRE, INC.**, 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

LA-MAN Corp., Mazeppa, MN  
Lectrodryer, Richmond, KY  
Pneumattech, Inc., Rock Hill, SC  
SPX Flow Technology, Ocala, FL  
ts-systemfilter gmbh, Ahorn-Berolzeim, Germany  
United Filtration Systems, Inc., Sterling Heights, MI

### Filters, bag

AIRLANCO, 312 S. Highway 73, PO Box 398, Falls City, NE 68355-0398 (800-500-9777; 402-245-2325; FAX: 402-245-5196; e-mail: sales@airlanco.com; web site: www.airlanco.com)

Filtera-Systems Co., Farmington Hills, MI  
Filtration & Membrane Technology, Inc., Houston, TX  
Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Freudenberg Filtration Technologies SE & Co. KG, Weinheim, Germany  
Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany

Hilliard Corp., Elmira, NY  
Keystone Filter, a CECO Environmental Company, Telford, PA

Midwesco Filter Resources, Inc., Winchester, VA  
Sharplex Filters (I) Pvt. Ltd., Sales, Navimumbai, India

### Filters, belt

BHS-Sonthofen GmbH, Sonthofen, Deutschland  
BHS-Sonthofen Inc., Charlotte, NC  
Faudi GmbH, Stadtallendorf, Germany

Freudenberg Filtration Technologies SE & Co. KG, Weinheim, Germany  
 G Bopp USA Inc., Wappingers Falls, NY  
**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**  
 See our ad on page 135

## Filters, cartridge

AIRLANCO, 312 S. Highway 73, PO Box 398, Falls City, NE 68355-0398 (800-500-9777; 402-245-2325; FAX: 402-245-5196; e-mail: sales@airlanco.com; web site: www.airlanco.com)

Applied Porous Technologies, Inc., Tariffville, CT  
 Argonide Corporation, Sanford, FL  
 Faudi GmbH, Stadtallendorf, Germany  
 Filtration & Membrane Technology, Inc., Houston, TX  
 Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL  
 Freudenberg Filtration Technologies SE & Co. KG, Weinheim, Germany

G Bopp USA Inc., Wappingers Falls, NY  
 Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany  
 Hilliard Corp., Elmira, NY  
 Keystone Filter, a CECO Environmental Company, Telford, PA

Liquid Process Systems, inc., Indian Trail, NC  
 Mefiag, a CECO Environmental Company, Owosso, MI  
 Mott Corporation, Farmington, CT  
 Porvair Filtration Group Inc, Ashland, VA  
 Sharpex Filters (I) Pvt. Ltd., Sales, NaviMumbai, India  
 SPX Flow Technology, Ocala, FL  
 Steri Technologies Inc., Bohemia, NY  
 ts-systemfilter gmbh, Ahorn-Berolzheim, Germany  
 United Filtration Systems, Inc., Sterling Heights, MI

## Filters, centrifugal

G Bopp USA Inc., Wappingers Falls, NY  
 KIRK Process Solutions Ltd, Walton-on-Thames  
 Sharpex Filters (I) Pvt. Ltd., Sales, NaviMumbai, India  
 Tema Systems, Inc., Cincinnati, OH  
 Western States Machine Co., Hamilton, OH

## Filters, clarifying

Ameridia, Div. of Eurodia Industries, Somerset, NJ  
 BHS-Sonthofen GmbH, Sonthofen, Deutschland  
 BHS-Sonthofen Inc., Charlotte, NC  
 Filtra-Systems Co., Farmington Hills, MI  
**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**  
 See our ad on page 135

## Filters, crossflow

Ameridia, Div. of Eurodia Industries, Somerset, NJ  
 Applied Porous Technologies, Inc., Tariffville, CT  
 G Bopp USA Inc., Wappingers Falls, NY  
 GEA Process Engineering, Columbia, MD  
 HydroTec Systems Co., Inc., Tiskliwa, IL  
**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)**

Membrana, Charlotte, NC  
 Microdyn Technologies, Inc., Raleigh, NC  
 MICRODYN-NADIR GmbH, Wiesbaden, Germany  
 Mott Corporation, Farmington, CT  
 Porvair Filtration Group Inc, Ashland, VA

## Filters, disc, pressure

G Bopp USA Inc., Wappingers Falls, NY  
 Mefiag, a CECO Environmental Company, Owosso, MI  
 Westech Engineering Inc., Salt Lake City, UT

## Filters, disc, vacuum

Westech Engineering Inc., Salt Lake City, UT

## Filters, drum, rotary gravity

Puritan Magnetics, Inc., Oxford, MI

## Filters, drum, rotary pressure continuous

BHS-Sonthofen GmbH, Sonthofen, Deutschland  
 BHS-Sonthofen Inc., Charlotte, NC  
 CTP Corp., Northport, NY

## Filters, drum, rotary vacuum continuous

**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**  
 See our ad on page 135

Sharpex Filters (I) Pvt. Ltd., Sales, NaviMumbai, India

## Filters, electromagnetic

Puritan Magnetics, Inc., Oxford, MI

## Filters, gas

CECO Filters, a CECO Environmental Company, Telford, PA  
 Faudi GmbH, Stadtallendorf, Germany  
 Freudenberg Filtration Technologies SE & Co. KG, Weinheim, Germany  
 G Bopp USA Inc., Wappingers Falls, NY  
**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)**

Lectrodryer, Richmond, KY  
 Mott Corporation, Farmington, CT  
 Porvair Filtration Group Inc, Ashland, VA  
 SPX Flow Technology, Ocala, FL  
 United Filtration Systems, Inc., Sterling Heights, MI

## Filters, gravity, porous bed

Freudenberg Filtration Technologies SE & Co. KG, Weinheim, Germany

## Filters, HEPA

Freudenberg Filtration Technologies SE & Co. KG, Weinheim, Germany  
**HEMCO CORPORATION, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemcocorp.com; web site: www.HEMCOcorp.com)**

Hepa Corporation, Anaheim, CA  
 Keystone Filter, a CECO Environmental Company, Telford, PA  
 Porvair Filtration Group Inc, Ashland, VA  
 ts-systemfilter gmbh, Ahorn-Berolzheim, Germany

## Filters, horizontal belt, vacuum

BHS-Sonthofen GmbH, Sonthofen, Deutschland  
 BHS-Sonthofen Inc., Charlotte, NC  
**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**  
 See our ad on page 135

Westech Engineering Inc., Salt Lake City, UT

## Filters, hydraulic

Fluid Line Products Inc., Willoughby, OH

## Filters, jacketed

MM Industries, Inc., Vorti-Siv, Salem, OH  
 Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany

## Filters, leaf, horizontal, pressure

BHS-Sonthofen GmbH, Sonthofen, Deutschland  
 BHS-Sonthofen Inc., Charlotte, NC  
 Sharpex Filters (I) Pvt. Ltd., Sales, NaviMumbai, India  
 Steri Technologies Inc., Bohemia, NY

## Filters, leaf, vacuum

Sharpex Filters (I) Pvt. Ltd., Sales, NaviMumbai, India

## Filters, leaf, vertical, pressure

Sharpex Filters (I) Pvt. Ltd., Sales, NaviMumbai, India

## Filters, Magnetic

Magnetic Products, Inc., Highland, MI  
 Puritan Magnetics, Inc., Oxford, MI

## Filters, membrane

Buss-SMS-Canzler GmbH, Butzbach, Germany  
 Filtration & Membrane Technology, Inc., Houston, TX  
**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)**

GEA Engineering, P.C., Nanuet, NY  
 GEA Process Engineering, Columbia, MD  
 Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany  
 Hepa Corporation, Anaheim, CA  
 HydroTec Systems Co., Inc., Tiskliwa, IL  
 Microdyn Technologies, Inc., Raleigh, NC  
 MICRODYN-NADIR GmbH, Wiesbaden, Germany  
 Midwesco Filter Resources, Inc., Winchester, VA  
 Porvair Filtration Group Inc, Ashland, VA  
 United Filtration Systems, Inc., Sterling Heights, MI

## Filters, microfiltration

Ameridia, Div. of Eurodia Industries, Somerset, NJ  
 Argonide Corporation, Sanford, FL  
 Filtration & Membrane Technology, Inc., Houston, TX  
 G Bopp USA Inc., Wappingers Falls, NY  
**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)**  
 GEA Engineering, P.C., Nanuet, NY

GEA Process Engineering, Columbia, MD  
 Hepa Corporation, Anaheim, CA  
 Microdyn Technologies, Inc., Raleigh, NC  
 MICRODYN-NADIR GmbH, Wiesbaden, Germany  
 Mott Corporation, Farmington, CT  
**ORIVAL WATER FILTERS, 213 S Van Brunt St., Englewood, NJ 07631-9902 (800-567-9767; 201-568-3311; FAX: 201-568-1916; e-mail: sales@orival.com; web site: www.orival.com)**

Porvair Filtration Group Inc, Ashland, VA  
 Steri Technologies Inc., Bohemia, NY  
 United Filtration Systems, Inc., Sterling Heights, MI

## Filters, nanofiltration

Ameridia, Div. of Eurodia Industries, Somerset, NJ  
 Argonide Corporation, Sanford, FL  
 beroplan GmbH Membran- und Prozesstechnik, St. Ingbert, Germany  
**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)**

GEA Engineering, P.C., Nanuet, NY  
 GEA Process Engineering, Columbia, MD  
 Gore / W. L. Gore & Associates GmbH, Putzbrunn, Bavaria, Germany  
 Keystone Filter, a CECO Environmental Company, Telford, PA  
 Microdyn Technologies, Inc., Raleigh, NC  
 MICRODYN-NADIR GmbH, Wiesbaden, Germany

## Filters, nutsche

De Dietrich Process Systems GmbH, Mainz, Germany  
 G Bopp USA Inc., Wappingers Falls, NY  
 Pope Scientific, Inc., Saukville, WI  
 Powder Systems Ltd, Liverpool  
 PSL USA, Boise, ID  
 Sharpex Filters (I) Pvt. Ltd., Sales, NaviMumbai, India  
 Steri Technologies Inc., Bohemia, NY

## Filters, oil removal

Filtra-Systems Co., Farmington Hills, MI  
 Filtration & Membrane Technology, Inc., Houston, TX  
 G Bopp USA Inc., Wappingers Falls, NY  
 Mefiag, a CECO Environmental Company, Owosso, MI  
 SPX Flow Technology, Ocala, FL

## Filters, other

BHS-Sonthofen GmbH, Sonthofen, Deutschland  
 BHS-Sonthofen Inc., Charlotte, NC  
 G Bopp USA Inc., Wappingers Falls, NY  
**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)**  
 LA-MAN Corp., Mazeppa, MN  
 Mefiag, a CECO Environmental Company, Owosso, MI  
 Membrana, Charlotte, NC  
 SPX Flow Technology, Ocala, FL

## Filters, pipeline

Hilliard Corp., Elmira, NY  
 Lectrodryer, Richmond, KY  
**ORIVAL WATER FILTERS, 213 S Van Brunt St., Englewood, NJ 07631-9902 (800-567-9767; 201-568-3311; FAX: 201-568-1916; e-mail: sales@orival.com; web site: www.orival.com)**  
 SPX Flow Technology, Ocala, FL

## Filters, plate & frame

Denver Mineral Engineers, Inc., Littleton, CO  
 GEA Process Engineering, Columbia, MD  
 Heinkel Filtering Systems Inc., Swedesboro, NJ  
 Hilliard Corp., Elmira, NY

## Filters, polymer

PSG Dover Europe GmbH, Oberglatt / ZH, Switzerland

## Filters, porous metal

Applied Porous Technologies, Inc., Tariffville, CT  
**JAYGO, INC., 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)**  
 Mott Corporation, Farmington, CT  
 Porvair Filtration Group Inc, Ashland, VA  
 Steri Technologies Inc., Bohemia, NY

## Filters, portable

Hilliard Corp., Elmira, NY  
 MM Industries, Inc., Vorti-Siv, Salem, OH

## Filters, precoat

BHS-Sonthofen GmbH, Sonthofen, Deutschland  
 BHS-Sonthofen Inc., Charlotte, NC  
**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**  
 See our ad on page 135  
 Mefiag, a CECO Environmental Company, Owosso, MI

# PRODUCT DIRECTORY

Mott Corporation, Farmington, CT  
Sharplex Filters (I) Pvt. Ltd., Sales, Navimumbai, India  
Steri Technologies Inc., Bohemia, NY

## Filters, pressure

BHS-Sonhofen GmbH, Sonthofen, Deutschland  
BHS-Sonhofen Inc., Charlotte, NC  
Faudi GmbH, Stadtlallendorf, Germany  
Heinkel Filtering Systems Inc., Swedesboro, NJ  
Hilliard Corp., Elmira, NY  
HydroTec Systems Co., Inc., Tiskilwa, IL  
Keystone Filter, a CECO Environmental Company, Telford, PA  
MM Industries, Inc., Vort-Siv, Salem, OH  
Powder Systems Ltd, Liverpool  
PSL USA, Boise, ID  
Steri Technologies Inc., Bohemia, NY  
United Filtration Systems, Inc, Sterling Heights, MI

## Filters, refrigerated

LA-MAN Corp., Mazeppa, MN

## Filters, sand

G Bopp USA Inc., Wappingers Falls, NY  
**ORIVAL WATER FILTERS, 213 S Van Brunt St., Englewood, NJ 07631-9902 (800-567-9767; 201-568-3311; FAX: 201-568-1916; e-mail: sales@orival.com; web site: www.orival.com)**  
Pollution Control Systems, Inc., Milford, OH  
United Manufacturing International 2000, Red Bluff, CA  
Westech Engineering Inc., Salt Lake City, UT

## Filters, self-cleaning

BHS-Sonhofen GmbH, Sonthofen, Deutschland  
BHS-Sonhofen Inc., Charlotte, NC  
Faudi GmbH, Stadtlallendorf, Germany  
Filtra-Systems Co., Farmington Hills, MI  
MM Industries, Inc., Vort-Siv, Salem, OH  
**ORIVAL WATER FILTERS, 213 S Van Brunt St., Englewood, NJ 07631-9902 (800-567-9767; 201-568-3311; FAX: 201-568-1916; e-mail: sales@orival.com; web site: www.orival.com)**  
Porvair Filtration Group Inc, Ashland, VA  
Sharplex Filters (I) Pvt. Ltd., Sales, Navimumbai, India  
Spencer Strainer Systems, Jeffersonville, IN  
Steri Technologies Inc., Bohemia, NY

## Filters, tubular

Applied Porous Technologies, Inc., Tariffville, CT  
Faudi GmbH, Stadtlallendorf, Germany  
Keystone Filter, a CECO Environmental Company, Telford, PA  
Mott Corporation, Farmington, CT

## Filters, ultrafiltration

Ameridia, Div. of Eurodia Industries, Somerset, NJ  
Argonide Corporation, Sanford, FL  
G Bopp USA Inc., Wappingers Falls, NY  
GEA Engineering, P.C., Nanuet, NY  
GEA Process Engineering, Columbia, MD  
Membrana, Charlotte, NC  
Microdyn Technologies, Inc., Raleigh, NC  
MICRODYN-NADIR GmbH, Wiesbaden, Germany  
SPX Flow Technology, Ocala, FL  
Steri Technologies Inc., Bohemia, NY

## Filters, vibrating

MM Industries, Inc., Vort-Siv, Salem, OH

## Filters, water

Argonide Corporation, Sanford, FL  
Entex Technologies Inc, Chapel Hill, NC  
Faudi GmbH, Stadtlallendorf, Germany  
Filtra-Systems Co., Farmington Hills, MI  
Filtration & Membrane Technology, Inc., Houston, TX  
Keystone Filter, a CECO Environmental Company, Telford, PA  
Microdyn Technologies, Inc., Raleigh, NC  
MICRODYN-NADIR GmbH, Wiesbaden, Germany



**ORIVAL WATER FILTERS, 213 S Van Brunt St., Englewood, NJ 07631-9902 (800-567-9767; 201-568-3311; FAX: 201-568-1916; e-mail: sales@orival.com; web site: www.orival.com)**

Siemens Industry, Inc. - Water Technologies, Alpharetta, GA

## Microfiltration equipment

beroplant GmbH Membran- und Prozesstechnik, St. Ingbert, Germany  
Filtration & Membrane Technology, Inc., Houston, TX  
GEA Process Engineering, Columbia, MD  
Membrana, Charlotte, NC  
Microdyn Technologies, Inc., Raleigh, NC  
MICRODYN-NADIR GmbH, Wiesbaden, Germany  
Porvair Filtration Group Inc, Ashland, VA

## Screw presses

**HEYL & PATTERSON INC., RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heylpatterson.com)**

## Strainers

Armstrong International, Three Rivers, MI  
CPI Wirecloth & Screens Inc., Pearland, TX  
Fluid Line Products Inc., Willoughby, OH  
Hilliard Corp., Elmira, NY  
JLS International, Inc., Charlotte, NC  
**KRAISSL CO. INC., 299 Williams Ave., Hackensack, NJ 07601-5225 (800-572-4775; 201-342-0008; FAX: 201-342-0025; e-mail: kraissl@aol.com; web site: www.strainers.com)**  
**ORIVAL WATER FILTERS, 213 S Van Brunt St., Englewood, NJ 07631-9902 (800-567-9767; 201-568-3311; FAX: 201-568-1916; e-mail: sales@orival.com; web site: www.orival.com)**  
Spraying Systems Co., Wheaton, IL  
Steri Technologies Inc., Bohemia, NY

## HEAT EXCHANGERS, CONDENSERS & COOLERS

### Aftercoolers

Schutte & Koerting, Trevoise, PA

### Condensate return systems

Fulton Companies, The, Fulton Thermal Corporation, Pulaaski, NY  
HRS Process Systems Ltd., Pune, India  
M&C TechGroup, Ventura, CA  
**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)**

See our ad on page 100

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

### Condensers, air cooled

Hudson Products Corp., Houston, TX  
SPX Cooling Technologies, Overland Park, KS

### Condensers, barometric

Advanced Industrial Technology Corp., Paramus, NJ  
**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alaquainc.com)**  
**CROLL-REYNOLDS CO. INC., Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.roll.com)**  
**KOERTING HANNOVER AG, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)**

See our ad on page 107

### Condensers, evaporative refrigerator

GEA Refrigeration North America, York, PA  
SPX Cooling Technologies, Overland Park, KS

# Processing equipment

## Condensers, fractional

HRS Process Systems Ltd., Pune, India

## Condensers, jet ejector

CG Thermal LLC, Twinsburg, Ohio  
**CROLL-REYNOLDS CO. INC., Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.roll.com)**  
Elmridge Inc., Livonia, MI  
**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)**

HRS Process Systems Ltd., Pune, India

**KOERTING HANNOVER AG, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)**

See our ad on page 107

manning&lewis div rubicon industries corp, Brooklyn, New York  
Schutte & Koerting, Trevoise, PA

## Condensers, plate

GEA PHE Systems, York, PA

## Condensers, reflux

**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alaquainc.com)**

HRS Process Systems Ltd., Pune, India

Hudson Products Corp., Houston, TX  
manning&lewis div rubicon industries corp, Brooklyn, New York

## Condensers, refrigerant

GEA Refrigeration North America, York, PA  
Hudson Products Corp., Houston, TX

## Condensers, shell & tube

**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alaquainc.com)**

CG Thermal LLC, Twinsburg, Ohio

**CROLL-REYNOLDS CO. INC., Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.roll.com)**

Enerquip, LLC, Medford, WI

GEA Refrigeration North America, York, PA

HRS Process Systems Ltd., Pune, India

**KOERTING HANNOVER AG, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)**

See our ad on page 107

manning&lewis div rubicon industries corp, Brooklyn, New York  
Schutte & Koerting, Trevoise, PA

## Condensers, steam

**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alaquainc.com)**

**CROLL-REYNOLDS CO. INC., Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.roll.com)**

Elmridge Inc., Livonia, MI

HRS Process Systems Ltd., Pune, India

Hudson Products Corp., Houston, TX

**KOERTING HANNOVER AG, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)**

See our ad on page 107

manning&lewis div rubicon industries corp, Brooklyn, New York  
Schutte & Koerting, Trevoise, PA

Topog-E Gasket Co., Tulsa, OK

Tranter Ltd., Wakefield

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

## Condensers, surface

**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alaquainc.com)**

**CROLL-REYNOLDS CO. INC., Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.roll.com)**

CU SERVICES LLC, Elk Grove, IL

**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: [st@koerting.de](mailto:st@koerting.de); web site: [www.koerting.de](http://www.koerting.de))

See our ad on page 107

Schutte & Koerting, Treviso, PA

## Condensers, tubular

**ALAUQA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alauqa.com](http://www.alauqa.com))

HRS Process Systems Ltd., Pune, India

## Condensers, vapor

**ALAUQA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: [alauqa@mindspring.com](mailto:alauqa@mindspring.com); web site: [www.alauqa.com](http://www.alauqa.com))

CG Thermal LLC, Twinsburg, Ohio

Enerquip, LLC, Medford, WI

HRS Process Systems Ltd., Pune, India

Hudson Products Corp., Houston, TX

**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: [st@koerting.de](mailto:st@koerting.de); web site: [www.koerting.de](http://www.koerting.de))

See our ad on page 107

## Coolers, air cooled

Bepex International LLC, Minneapolis, MN

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: [comessa@comessa.fr](mailto:comessa@comessa.fr); web site: [www.comessa.com](http://www.comessa.com))

Hudson Products Corp., Houston, TX

Mokon, Buffalo, NY

Pneumatech, Inc., Rock Hill, SC

Tex-Fin, Inc., Houston, Texas

## Coolers, belt

**AMANDUS KAHL GmbH & Co. KG**, Reinbek, Germany  
Berndorf Band GmbH, Berndorf, Austria

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: [comessa@comessa.fr](mailto:comessa@comessa.fr); web site: [www.comessa.com](http://www.comessa.com))

**SANDVIK PROCESS SYSTEMS, INC.**, 21 Campus Rd., Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: [info@sandvik.com](mailto:info@sandvik.com); web site: [www.process-systems.sandvik.com](http://www.process-systems.sandvik.com))

Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany

## Coolers, brine

HRS Process Systems Ltd., Pune, India

## Coolers, cascade

Thermotron, Holland, MI

## Coolers, closed circuit

**AMANDUS KAHL GmbH & Co. KG**, Reinbek, Germany  
Bepex International LLC, Minneapolis, MN

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: [comessa@comessa.fr](mailto:comessa@comessa.fr); web site: [www.comessa.com](http://www.comessa.com))

HRS Process Systems Ltd., Pune, India

Tranter Ltd., Wakefield

## Coolers, coil

Sentry Equipment Corp, Oconomowoc, WI

## Coolers, drum

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: [comessa@comessa.fr](mailto:comessa@comessa.fr); web site: [www.comessa.com](http://www.comessa.com))

**HEYL & PATTERSON INC., RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: [info@heylpatterson.com](mailto:info@heylpatterson.com); web site: [www.heylpatterson.com](http://www.heylpatterson.com))**

## Coolers, evaporative

Advanced Industrial Technology Corp., Paramus, NJ  
**CROLL-REYNOLDS CO. INC.**, Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: [info@croll.com](mailto:info@croll.com); web site: [www.croll.com](http://www.croll.com))

**DELTA COOLING TOWERS INC.**, 185 US Highway 206, Roxbury Township, NJ 07836 (973-586-2201; FAX: 973-586-2243; e-mail: [info@deltacoiling.com](mailto:info@deltacoiling.com); web site: [www.deltacoiling.com](http://www.deltacoiling.com))

Luma Comfort, Orange, CA

Spray Drying Systems, Inc., Eldersburg, MD

SPX Cooling Technologies, Overland Park, KS

Steri Technologies Inc., Bohemia, NY

## Coolers, finned tube

**FIN TUBE PRODUCTS, INC.**, 188 S Lyman St., Suite 100, Wadsworth, OH 44281 (800-334-3736; 330-334-3736; FAX: 330-334-3848; e-mail: [mb@fintube.com](mailto:mb@fintube.com); web site: [www.fintube.com](http://www.fintube.com))

Hudson Products Corp., Houston, TX

Tex-Fin, Inc., Houston, Texas

## Coolers, flash

Advanced Industrial Technology Corp., Paramus, NJ  
Bepex International LLC, Minneapolis, MN

**CALORIS ENGINEERING**, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: [info@caloris.com](mailto:info@caloris.com); web site: [www.caloris.com](http://www.caloris.com))

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: [comessa@comessa.fr](mailto:comessa@comessa.fr); web site: [www.comessa.com](http://www.comessa.com))

**CROLL-REYNOLDS CO. INC.**, Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: [info@croll.com](mailto:info@croll.com); web site: [www.croll.com](http://www.croll.com))

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: [gea-wiegand.info@gea.com](mailto:gea-wiegand.info@gea.com); web site: [www.gea.com](http://www.gea.com))

**HEYL & PATTERSON INC., RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: [info@heylpatterson.com](mailto:info@heylpatterson.com); web site: [www.heylpatterson.com](http://www.heylpatterson.com))**

## Coolers, plate

GEA PHE Systems, York, PA

Steri Technologies Inc., Bohemia, NY

## Coolers, rotary

**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: [comessa@comessa.fr](mailto:comessa@comessa.fr); web site: [www.comessa.com](http://www.comessa.com))

**HEYL & PATTERSON INC., RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: [info@heylpatterson.com](mailto:info@heylpatterson.com); web site: [www.heylpatterson.com](http://www.heylpatterson.com))**

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: [info@komline.com](mailto:info@komline.com); web site: [www.komline.com](http://www.komline.com))

See our ad on page 135

## Coolers, screw

ANDRITZ Gouda, Waddinxveen, Netherlands

Bepex International LLC, Minneapolis, MN

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: [info@komline.com](mailto:info@komline.com); web site: [www.komline.com](http://www.komline.com))

See our ad on page 135

## Coolers, spray

Spray Drying Systems, Inc., Eldersburg, MD

## Coolers, water

**DELTA COOLING TOWERS INC.**, 185 US Highway 206, Roxbury Township, NJ 07836 (973-586-2201; FAX: 973-586-2243; e-mail: [info@deltacoiling.com](mailto:info@deltacoiling.com); web site: [www.deltacoiling.com](http://www.deltacoiling.com))

Dr. Thiedig GmbH & Co KG, Berlin, Germany

HRS Process Systems Ltd., Pune, India

Hudson Products Corp., Houston, TX

Mokon, Buffalo, NY

Pneumatech, Inc., Rock Hill, SC

Sentry Equipment Corp, Oconomowoc, WI

## Desuperheaters



**CROLL-REYNOLDS CO. INC.**, Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: [info@croll.com](mailto:info@croll.com); web site: [www.croll.com](http://www.croll.com))

CU SERVICES LLC, Elk Grove, IL

Elmridge Inc., Livonia, MI

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))

SAMSON Controls, Inc., Baytown, TX

Schutte & Koerting, Treviso, PA

Sulzer Chemtech USA, Inc., Tulsa, OK

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: [info@wabashpower.com](mailto:info@wabashpower.com); web site: [www.wabashpower.com](http://www.wabashpower.com))

## Economizers

HRS Process Systems Ltd., Pune, India

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: [info@indeck-power.com](mailto:info@indeck-power.com); web site: [www.indeck.com](http://www.indeck.com))

Tex-Fin, Inc., Houston, Texas

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: [info@wabashpower.com](mailto:info@wabashpower.com); web site: [www.wabashpower.com](http://www.wabashpower.com))

## Heat exchanger parts & accessories

**FIN TUBE PRODUCTS, INC.**, 188 S Lyman St., Suite 100, Wadsworth, OH 44281 (800-334-3736; 330-334-3736; FAX: 330-334-3848; e-mail: [mb@fintube.com](mailto:mb@fintube.com); web site: [www.fintube.com](http://www.fintube.com))

Fulton Companies, The, Fulton Thermal Corporation, Pulaski, NY

GEA PHE Systems, York, PA

HRS Process Systems Ltd., Pune, India

Hudson Products Corp., Houston, TX

Saint-Gobain Ceramics/Structural Ceramics, Niagra Falls, NY

**TLV CORPORATION**, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: [www.tlv.com](http://www.tlv.com))

See our ad on page 100

Tranter Ltd., Wakefield

**USA INDUSTRIES, INC.**, 302 State Street, S. Houston, TX 77587 (800-456-8721; 713-941-3797; FAX: 713-941-1086; e-mail: [info@usaindustries.com](mailto:info@usaindustries.com); web site: [www.usaindustries.com](http://www.usaindustries.com))

## Heat exchangers, air cooled

Greenwood Engineering Inc., Excelsior, MN

Hudson Products Corp., Houston, TX

Midwest Steel Company Inc, Houston, Texas

Munters Corporation, Buena Vista, VA

**PAHARPUR COOLING TOWERS LTD.**, Paharpur House, 81/1/8 Diamond Harbour Road, Kolkata, India 700027 (+913340133000; FAX: +913340133499; e-mail: [ptccu@paharpur.com](mailto:ptccu@paharpur.com); web site: [www.paharpur.com](http://www.paharpur.com))

See our ad on page 82

Spaltech International Inc., Halton Hills, Ontario, Canada

SPX Cooling Technologies, Overland Park, KS

Tex-Fin, Inc., Houston, Texas

## Heat exchangers, all-welded

GEA PHE Systems, York, PA

Greenwood Engineering Inc., Excelsior, MN

HRS Process Systems Ltd., Pune, India

JLS International, Inc., Charlotte, NC

Munters Corporation, Buena Vista, VA

Spaltech International Inc., Halton Hills, Ontario, Canada

Tranter Ltd., Wakefield

## Heat exchangers, bayonet

Enerquip, LLC, Medford, WI

HRS Process Systems Ltd., Pune, India

## Heat exchangers, cascade

GEA Refrigeration North America, York, PA

HRS Process Systems Ltd., Pune, India

## Heat exchangers, ceramic

CG Thermal LLC, Twinsburg, Ohio

CTP Corp., Northport, NY

Procedyne Corp., New Brunswick, NJ

## Heat exchangers, coil

Armstrong International, Three Rivers, MI

Greenwood Engineering Inc., Excelsior, MN

Linde AG, Engineering Division, Pullach, Germany

Sentry Equipment Corp, Oconomowoc, WI

## Heat exchangers, direct contact steam

**CROLL-REYNOLDS CO. INC.**, Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: [info@croll.com](mailto:info@croll.com); web site: [www.croll.com](http://www.croll.com))

Elmridge Inc., Livonia, MI

Hydro-Thermal Corp., Waukesha, WI

**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: [st@koerting.de](mailto:st@koerting.de); web site: [www.koerting.de](http://www.koerting.de))

See our ad on page 107

Pick Heaters Inc., West Bend, WI



ProSonic LLC, Milwaukee, WI  
 Spaltech International Inc., Halton Hills, Ontario, Canada  
 Sulzer Chemtech USA, Inc., Tulsa, OK  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-1427 (800-704-2002; 847-541-5600; FAX: 847-541-0279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

## Heat exchangers, double pipe

BORSIG GmbH, Berlin, Germany  
 HRS Process Systems Ltd., Pune, India  
 Team Industries, Inc., Kaukauna, WI

## Heat exchangers, falling film

**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alauqa.com)**

**CALORIS ENGINEERING, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: info@caloris.com; web site: www.caloris.com)**

**GIG KARASEK GMBH, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: office@gigkarasek.at; web site: www.gigkarasek.com)**

HRS Process Systems Ltd., Pune, India  
 manning&lewis div rubicon industries corp, Brooklyn, New York

## Heat exchangers, finned tube

**FIN TUBE PRODUCTS, INC., 188 S Lyman St., Suite 100, Wadsworth, OH 44281 (800-334-3736; 330-334-3736; FAX: 330-334-3848; e-mail: mb@fintube.com; web site: www.fintube.com)**

Greenwood Engineering Inc., Excelsior, MN  
 Hudson Products Corp., Houston, TX  
 MULTITHERM LLC, Devault, PA  
 Munters Corporation, Buena Vista, VA

## Heat exchangers, glass

CG Thermal LLC, Twinsburg, Ohio  
 De Dietrich Process Systems GmbH, Mainz, Germany

## Heat exchangers, graphite

CG Thermal LLC, Twinsburg, Ohio  
 Nantong Fareast Chemical Equipment Co. LTD, International Trading, Nantong, Peoples Rep. of China

## Heat exchangers, jacketed pipe

Dueker GmbH & Co. KGaA, Laufach, Germany  
 HRS Process Systems Ltd., Pune, India

## Heat exchangers, plate

GEA PHE Systems, York, PA  
 GEA Refrigeration North America, York, PA  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

Munters Corporation, Buena Vista, VA  
 Tranter Ltd., Wakefield  
 United Performance Metals, Houston, TX

## Heat exchangers, plate coil

Tranter Ltd., Wakefield

## Heat exchangers, plate fin

Armstrong International, Three Rivers, MI  
 Greenwood Engineering Inc., Excelsior, MN  
 Linde AG, Engineering Division, Pullach, Germany

## Heat exchangers, PTFE tube

Sentry Equipment Corp., Oconomowoc, WI

## Heat exchangers, scraped surface

BORSIG GmbH, Berlin, Germany  
 Buss-SMS-Canzler GmbH, Butzbach, Germany  
 HRS Process Systems Ltd., Pune, India  
 Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany

## Heat exchangers, screw flight

Bexep International LLC, Minneapolis, MN

**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North America; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**

See our ad on page 135

Metso Minerals Industries, Inc., York, PA

## Heat exchangers, shell & tube

Aaron Process Equipment Co., Bensenville, IL  
 Advanced Heat Recovery, Inc., Division of AQUA Innovations, Inc., Baltimore, MD

**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alauqa.com)**

Anguil Environmental Systems, Inc., Milwaukee, WI  
**CALORIS ENGINEERING, 8649 Commerce Drive, Easton, MD 21601 (410-822-6900; FAX: 410-822-9006; e-mail: info@caloris.com; web site: www.caloris.com)**

Coperion GmbH, Weingarten, Wuertt., Germany  
**CROLL-REYNOLDS CO. INC., Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.croll.com)**

Enerquip, LLC, Medford, WI  
 Epoon Industrial Systems, LP, The Woodlands, TX  
 GEA Refrigeration North America, York, PA

**GIG KARASEK GMBH, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: office@gigkarasek.at; web site: www.gigkarasek.com)**

HRS Process Systems Ltd., Pune, India  
 manning&lewis div rubicon industries corp, Brooklyn, New York

MULTITHERM LLC, Devault, PA  
 Munters Corporation, Buena Vista, VA  
 Nantong Fareast Chemical Equipment Co. LTD, International Trading, Nantong, Peoples Rep. of China

**PRAJ INDUSTRIES LIMITED, Praj Tower\* 274 & 275, Bhumkar Chowk-Hinjewadi Road., Hinjewadi, Pune, India 411057. (+912022951511; FAX: +912022951718; e-mail: info@praj.net; web site: www.praj.net)**

RAS Process Equipment Inc., Robbinsville, NJ  
 Spaltech International Inc., Halton Hills, Ontario, Canada  
 Sulzer Chemtech USA, Inc., Tulsa, OK

## Heat exchangers, spiral

Dr. Thiedig GmbH & Co KG, Berlin, Germany  
**FIN TUBE PRODUCTS, INC., 188 S Lyman St., Suite 100, Wadsworth, OH 44281 (800-334-3736; 330-334-3736; FAX: 330-334-3848; e-mail: mb@fintube.com; web site: www.fintube.com)**

HRS Process Systems Ltd., Pune, India  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

ProSonic LLC, Milwaukee, WI  
 Sentry Equipment Corp., Oconomowoc, WI  
 Tranter Ltd., Wakefield

## Heat exchangers, tantalum

CG Thermal LLC, Twinsburg, Ohio

## Heat exchangers, titanium

**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alauqa.com)**

GEA PHE Systems, York, PA  
 HRS Process Systems Ltd., Pune, India  
 JLS International, Inc., Charlotte, NC

**PRAJ INDUSTRIES LIMITED, Praj Tower\* 274 & 275, Bhumkar Chowk-Hinjewadi Road., Hinjewadi, Pune, India 411057. (+912022951511; FAX: +912022951718; e-mail: info@praj.net; web site: www.praj.net)**

Tranter Ltd., Wakefield

## Heat exchangers, U tube

Bryan Steam LLC, Peru, IN  
**CROLL-REYNOLDS CO. INC., Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.croll.com)**

Enerquip, LLC, Medford, WI  
 HRS Process Systems Ltd., Pune, India  
 manning&lewis div rubicon industries corp, Brooklyn, New York

MULTITHERM LLC, Devault, PA  
**PRAJ INDUSTRIES LIMITED, Praj Tower\* 274 & 275, Bhumkar Chowk-Hinjewadi Road., Hinjewadi, Pune, India 411057. (+912022951511; FAX: +912022951718; e-mail: info@praj.net; web site: www.praj.net)**

Spaltech International Inc., Halton Hills, Ontario, Canada

## Heat transfer systems

Advanced Heat Recovery, Inc., Division of AQUA Innovations, Inc., Baltimore, MD  
 Fulton Companies, The, Fulton Thermal Corporation, Pulaski, NY

HRS Process Systems Ltd., Pune, India  
 HTT Energy GmbH, Herford, Germany  
 Hudson Products Corp., Houston, TX

**LAUDA DR. R. WOBSE GMBH & CO. KG, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 (0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)**

Mokon, Buffalo, NY  
 MULTITHERM LLC, Devault, PA  
 Munters Corporation, Buena Vista, VA

ProSonic LLC, Milwaukee, WI  
 Solutia Inc., A subsidiary of Eastman Chemical Co., St. Louis, MO

Spaltech International Inc., Halton Hills, Ontario, Canada  
**UNIFLUX / EXOTHERM CORP., 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)**

See our ad on page 68

## Heaters, microwave

Cober, Inc., Stratford, CT

## Heaters, process liquid

Advanced Heat Recovery, Inc., Division of AQUA Innovations, Inc., Baltimore, MD

Dalton Electric Heating Co., Inc., Ipswich, MA  
 HRS Process Systems Ltd., Pune, India

**KOERTING HANNOVER AG, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)**

See our ad on page 107

manning&lewis div rubicon industries corp, Brooklyn, New York

Pick Heaters Inc., West Bend, WI

ProSonic LLC, Milwaukee, WI

**UNIFLUX / EXOTHERM CORP., 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)**

See our ad on page 68

## Heaters, process slurry

Advanced Heat Recovery, Inc., Division of AQUA Innovations, Inc., Baltimore, MD

HRS Process Systems Ltd., Pune, India

Hydro-Thermal Corp., Waukesha, WI

Pick Heaters Inc., West Bend, WI

ProSonic LLC, Milwaukee, WI

**UNIFLUX / EXOTHERM CORP., 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)**

See our ad on page 68

## Heaters, Water

Pick Heaters Inc., West Bend, WI

## Inserts, heat-exchanger tube

CTI Industries, Inc., Carlsbad, CA  
 Tex-Fin, Inc., Houston, Texas

## Preheaters

Advanced Heat Recovery, Inc., Division of AQUA Innovations, Inc., Baltimore, MD

Enerquip, LLC, Medford, WI

HRS Process Systems Ltd., Pune, India

Hudson Products Corp., Houston, TX

JLS International, Inc., Charlotte, NC

manning&lewis div rubicon industries corp, Brooklyn, New York

Process Combustion Corp., Pittsburgh, PA

**UNIFLUX / EXOTHERM CORP., 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)**

See our ad on page 68

## Reboilers

Enerquip, LLC, Medford, WI

HRS Process Systems Ltd., Pune, India

manning&lewis div rubicon industries corp, Brooklyn, New York

Tex-Fin, Inc., Houston, Texas

**UNIFLUX / EXOTHERM CORP., 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)**

See our ad on page 68

## Superheaters

HRS Process Systems Ltd., Pune, India

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

**PRAJ INDUSTRIES LIMITED, Praj Tower\* 274 & 275, Bhumkar Chowk-Hinjewadi Road., Hinjewadi, Pune, India 411057. (+912022951511; FAX: +912022951718; e-mail: info@praj.net; web site: www.praj.net)**

RAS Process Equipment Inc., Robbinsville, NJ

**UNIFLUX / EXOTHERM CORP., 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)**

See our ad on page 68

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## Troughs, cooled or heated

ANDRITZ Gouda, Waddinxveen, Netherlands  
**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

Team Industries, Inc., Kaukauna, WI

## Waste heat recovery units

Advanced Heat Recovery, Inc., Division of AQUA Innovations, Inc., Baltimore, MD

BORSIG GmbH, Berlin, Germany  
 HRS Process Systems Ltd., Pune, India  
 HTT Energy GmbH, Herford, Germany  
 Hudson Products Corp., Houston, TX

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

Munters Corporation, Buena Vista, VA  
 RAS Process Equipment Inc., Robbinsville, NJ  
 Turner EnviroLogic, Inc., Deerfield Beach, FL

## HEAT TRANSFER MEDIA

### Heat transfer fluids, cooling fluids

**LAUDA DR. R. WOBSEER GMBH & CO. KG**, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 (0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)

Liquid Process Systems, inc., Indian Trail, NC  
 Petron Plus Global, Inc., Hutchinson, Kansas  
 Solutia Inc., A subsidiary of Eastman Chemical Co., St. Louis, MO

### Heat transfer fluids, heating fluids

**LAUDA DR. R. WOBSEER GMBH & CO. KG**, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 (0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)

Liquid Process Systems, inc., Indian Trail, NC  
 MULTITHERM LLC, Devault, PA  
 Petron Plus Global, Inc., Hutchinson, Kansas  
 Solutia Inc., A subsidiary of Eastman Chemical Co., St. Louis, MO

### Heat transfer fluids, other

**LAUDA DR. R. WOBSEER GMBH & CO. KG**, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 (0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)

Momentive Performance Materials Inc., Waterford, NY  
 MULTITHERM LLC, Devault, PA  
 Petron Plus Global, Inc., Hutchinson, Kansas  
 Solutia Inc., A subsidiary of Eastman Chemical Co., St. Louis, MO

### Hot oils

Liquid Process Systems, inc., Indian Trail, NC  
 Solutia Inc., A subsidiary of Eastman Chemical Co., St. Louis, MO

### Thermal fluids

**LAUDA DR. R. WOBSEER GMBH & CO. KG**, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 (0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)

Liquid Process Systems, inc., Indian Trail, NC  
 MULTITHERM LLC, Devault, PA  
 Solutia Inc., A subsidiary of Eastman Chemical Co., St. Louis, MO

## HEATING & COOLING EQUIPMENT, OTHER

### Air preheat systems

Hudson Products Corp., Houston, TX  
 Munters Corporation, Buena Vista, VA  
 Process Combustion Corp., Pittsburgh, PA  
**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

Zeeco, Inc., Broken Arrow, OK

### Baths, constant temperature

**LAUDA DR. R. WOBSEER GMBH & CO. KG**, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 (0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)

### Chillers, recirculating

BARTEC GmbH, Bad Mergentheim, Germany  
**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

**LAUDA DR. R. WOBSEER GMBH & CO. KG**, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 (0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)

Thermonics Corp, Mansfield, MA  
**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Coils

Armstrong International, Three Rivers, MI  
**FIN TUBE PRODUCTS, INC.**, 188 S Lyman St., Suite 100, Wadsworth, OH 44281 (800-334-3736; 330-334-3736; FAX: 330-334-3848; e-mail: mb@fintube.com; web site: www.fintube.com)

### Gaskets, plate heat exchanger

GEA PHE Systems, York, PA  
 Topog-E Gasket Co., Tulsa, OK  
 Tranter Ltd., Wakefield  
 United Performance Metals, Houston, TX

### Generators, steam

Advanced Heat Recovery, Inc., Division of AQUA Innovations, Inc., Baltimore, MD  
**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

### Heaters, air & gas

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

Kloepffer-Therm GmbH & Co. KG, Dortmund, Germany  
 Leister Technologies AG, Kaegiswil, Switzerland  
 Process Combustion Corp., Pittsburgh, PA

**UNIFLUX®**  
*Quality Heaters Since 1957*



Hot Oil•Regeneration Gas•Crude Oil,  
 Air•Steam•Process•Offshore Heaters  
**Exotherm Corporation**  
**www.exotherm.com**

**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

Watlow, St. Louis, MO  
 Zeeco, Inc., Broken Arrow, OK

### Heaters, cartridge

Dalton Electric Heating Co., Inc., Ipswich, MA  
 Watlow, St. Louis, MO

### Heaters, direct fired

HTT Energy GmbH, Herford, Germany  
 Hudson Products Corp., Houston, TX  
**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)  
 Process Combustion Corp., Pittsburgh, PA  
 Tex-Fin, Inc., Houston, Texas

**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

### Heaters, drum

LEWCO, Inc., Sandusky, OH

### Heaters, feedwater

HRS Process Systems Ltd., Pune, India  
**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

ProSonic LLC, Milwaukee, WI  
**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Heaters, finned tube

**FIN TUBE PRODUCTS, INC.**, 188 S Lyman St., Suite 100, Wadsworth, OH 44281 (800-334-3736; 330-334-3736; FAX: 330-334-3848; e-mail: mb@fintube.com; web site: www.fintube.com)

Hudson Products Corp., Houston, TX  
 Tex-Fin, Inc., Houston, Texas

**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

### Heaters, gas fired

Fulton Companies, The, Fulton Thermal Corporation, Pulaski, NY

HTT Energy GmbH, Herford, Germany  
 Munters Corporation, Buena Vista, VA  
 Process Combustion Corp., Pittsburgh, PA  
 Tex-Fin, Inc., Houston, Texas

**UNIFLUX®**  
*Quality Heaters Since 1957*



Hot Oil•Regeneration Gas•Crude Oil,  
 Air•Steam•Process•Offshore Heaters  
**Exotherm Corporation**  
**www.exotherm.com**

**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

### Heaters, helical coil

**FIN TUBE PRODUCTS, INC.**, 188 S Lyman St., Suite 100, Wadsworth, OH 44281 (800-334-3736; 330-334-3736; FAX: 330-334-3848; e-mail: mb@fintube.com; web site: www.fintube.com)

Fulton Companies, The, Fulton Thermal Corporation, Pulaski, NY

HRS Process Systems Ltd., Pune, India  
**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

### Heaters, immersion

Dalton Electric Heating Co., Inc., Ipswich, MA

LAUDA DR. R. WOBSEY GMBH & CO. KG, Pfarrstrasse 41/43, Lauda-Koenigshofen, Germany 97922 (+49 (0)9343 503-0; +1856 7647300; FAX: +49 (0)9343 503-222; e-mail: info@lauda.de; web site: www.lauda.de)

## Heaters, indirect fired (waterbath)

HRS Process Systems Ltd., Pune, India  
**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

## Heaters, induction

Dalton Electric Heating Co., Inc., Ipswich, MA  
 PRUEFTECHNIK, Ismaning, Germany

## Heaters, infrared

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

## Heaters, instantaneous

Pick Heaters Inc., West Bend, WI  
 Schutte & Koerting, Treviso, PA

**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

## Heaters, jacketed

Dalton Electric Heating Co., Inc., Ipswich, MA  
 HRS Process Systems Ltd., Pune, India  
 Hydro-Thermal Corp., Waukesha, WI  
 Pick Heaters Inc., West Bend, WI  
 Schutte & Koerting, Treviso, PA

## Heaters, molten salt

**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

## Heaters, pipeline

Schutte & Koerting, Treviso, PA

**UNIFLUX®**  
*Quality Heaters Since 1957*



Hot Oil•Regeneration Gas•Crude Oil,  
 Air•Steam•Process•Offshore Heaters

**Exotherm Corporation**  
**www.exotherm.com**

**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

## Heaters, plate

Dalton Electric Heating Co., Inc., Ipswich, MA  
 GEA PHE Systems, York, PA

## Heaters, portable

**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

## Heaters, sandwich type

Kloepper-Therm GmbH & Co. KG, Dortmund, Germany

## Heaters, screw flight

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)  
 See our ad on page 135

## Heaters, spiral

HRS Process Systems Ltd., Pune, India

## Heaters, steam injection

Elmridge Inc., Livonia, MI  
**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)

Hydro-Thermal Corp., Waukesha, WI  
**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)

See our ad on page 107

Pick Heaters Inc., West Bend, WI

ProSonic LLC, Milwaukee, WI

Schutte & Koerting, Treviso, PA

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## Heaters, tank car

Armstrong International, Three Rivers, MI  
 Hydro-Thermal Corp., Waukesha, WI  
 Pick Heaters Inc., West Bend, WI

## Heaters, thermal liquid

Fulton Companies, The, Fulton Thermal Corporation, Pulaski, NY

HRS Process Systems Ltd., Pune, India

HTT Energy GmbH, Herford, Germany

**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

Mokon, Buffalo, NY

MULTITHERM LLC, Devault, PA

Spaltech International Inc., Halton Hills, Ontario, Canada

**UNIFLUX®**  
*Quality Heaters Since 1957*



Hot Oil•Regeneration Gas•Crude Oil,  
 Air•Steam•Process•Offshore Heaters

**Exotherm Corporation**  
**www.exotherm.com**

**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

## Heaters, tubular

Dalton Electric Heating Co., Inc., Ipswich, MA  
 HRS Process Systems Ltd., Pune, India  
**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

Watlow, St. Louis, MO

## Heaters, unit

Armstrong International, Three Rivers, MI  
 Dalton Electric Heating Co., Inc., Ipswich, MA  
 HTT Energy GmbH, Herford, Germany

## Heaters, bayonet

Dalton Electric Heating Co., Inc., Ipswich, MA  
 Tex-Fin, Inc., Houston, Texas

## Recuperators

Advanced Heat Recovery, Inc., Division of AQUA Innovations, Inc., Baltimore, MD  
 HRS Process Systems Ltd., Pune, India

## Sterilizers

HRS Process Systems Ltd., Pune, India

## Tracing, pipe

Spaltech International Inc., Halton Hills, Ontario, Canada

## Vaporizers

**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

## KILNS, OVENS & FURNACES

### Burners, coal

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

### Burners, combination fuel

Process Combustion Corp., Pittsburgh, PA  
**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

Zeeco, Inc., Broken Arrow, OK

### Burners, gas

John Zink Hamworthy Combustion, Tulsa, OK  
 Process Combustion Corp., Pittsburgh, PA  
**UNIFLUX / EXOTHERM CORP.**, 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

Zeeco, Inc., Broken Arrow, OK

### Burners, oil

John Zink Hamworthy Combustion, Tulsa, OK  
 Process Combustion Corp., Pittsburgh, PA  
**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

Zeeco, Inc., Broken Arrow, OK

### Calciners, fluidizing

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

CPFD-Software, Albuquerque, New Mexico  
 GEA Process Engineering, Columbia, MD  
**HEYL & PATTERSON INC.**, RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heylpatterson.com)

Procedyne Corp., New Brunswick, NJ

### Calciners, rotary

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

Denver Mineral Engineers, Inc., Littleton, CO  
 Harper International, Buffalo, NY  
 Harrop Industries, Inc., Columbus, OH  
**HEYL & PATTERSON INC.**, RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heylpatterson.com)

### Furnaces, annealing

Epcon Industrial Systems, LP, The Woodlands, TX  
 Harper International, Buffalo, NY  
 Harrop Industries, Inc., Columbus, OH  
 L&L Special Furnace Co., Inc., Aston, PA

Lucifer Furnaces Inc., Warrington, PA  
Procedyne Corp., New Brunswick, NJ

## Furnaces, electric

Harper International, Buffalo, NY  
Harrop Industries, Inc., Columbus, OH  
LEWCO, Inc., Sandusky, OH  
L&L Special Furnace Co., Inc., Aston, PA  
Lucifer Furnaces Inc., Warrington, PA  
Procedyne Corp., New Brunswick, NJ

## Furnaces, fluid bed

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

Procedyne Corp., New Brunswick, NJ

## Furnaces, gas burning

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

Epcon Industrial Systems, LP, The Woodlands, TX  
Harper International, Buffalo, NY

Harrop Industries, Inc., Columbus, OH

INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)

LEWCO, Inc., Sandusky, OH

L&L Special Furnace Co., Inc., Aston, PA

UNIFLUX / EXOTHERM CORP., 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

## Furnaces, hearth

Harper International, Buffalo, NY  
Harrop Industries, Inc., Columbus, OH  
L&L Special Furnace Co., Inc., Aston, PA  
Lucifer Furnaces Inc., Warrington, PA

WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## Furnaces, high pressure

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

UNIFLUX / EXOTHERM CORP., 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

## Furnaces, high temperature

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

Epcon Industrial Systems, LP, The Woodlands, TX  
Harper International, Buffalo, NY

Harrop Industries, Inc., Columbus, OH

L&L Special Furnace Co., Inc., Aston, PA

Lucifer Furnaces Inc., Warrington, PA

Procedyne Corp., New Brunswick, NJ

UNIFLUX / EXOTHERM CORP., 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

ZIRCAR Refractory Composites, Inc., Florida, NY

## Furnaces, induction

L&L Special Furnace Co., Inc., Aston, PA  
ZIRCAR Refractory Composites, Inc., Florida, NY

## Furnaces, melting

Denver Mineral Engineers, Inc., Littleton, CO  
Harrop Industries, Inc., Columbus, OH

## Furnaces, muffle

Harper International, Buffalo, NY  
Harrop Industries, Inc., Columbus, OH  
L&L Special Furnace Co., Inc., Aston, PA  
Lucifer Furnaces Inc., Warrington, PA

## Furnaces, multiple hearth

Harper International, Buffalo, NY  
WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## Furnaces, radiant heating

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

Harper International, Buffalo, NY

Harrop Industries, Inc., Columbus, OH

## Furnaces, rotary hearth

Harrop Industries, Inc., Columbus, OH

WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## Furnaces, vacuum

LEWCO, Inc., Sandusky, OH  
ZIRCAR Refractory Composites, Inc., Florida, NY

## Furnaces, vertical

Harper International, Buffalo, NY  
Harrop Industries, Inc., Columbus, OH  
L&L Special Furnace Co., Inc., Aston, PA  
Lucifer Furnaces Inc., Warrington, PA

UNIFLUX / EXOTHERM CORP., 888 Wilcrest Drive, Houston, TX 77042 (713-981-9100; FAX: 713-981-7081; e-mail: info@exotherm.com; web site: www.exotherm.com)

See our ad on page 68

WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## Kiln, oven & furnace accessories

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

Harper International, Buffalo, NY

Harrop Industries, Inc., Columbus, OH

Lucifer Furnaces Inc., Warrington, PA

ZIRCAR Refractory Composites, Inc., Florida, NY

## Kilns, fluidizing

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

CPFD-Software, Albuquerque, New Mexico  
Procedyne Corp., New Brunswick, NJ

## Kilns, rotary

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

Harper International, Buffalo, NY

Harrop Industries, Inc., Columbus, OH

HEYL & PATTERSON INC., RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heylpatterson.com)

Metso Minerals Industries, Inc., York, PA

## Kilns, vertical transfer

Harper International, Buffalo, NY

WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## Ovens, drying

AWT World Trade Inc., Chicago, IL  
Cober, Inc., Stratford, CT

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

Epcon Industrial Systems, LP, The Woodlands, TX  
Harper International, Buffalo, NY

Harrop Industries, Inc., Columbus, OH

WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## Ovens, electric

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

Epcon Industrial Systems, LP, The Woodlands, TX  
Harrop Industries, Inc., Columbus, OH

LEWCO, Inc., Sandusky, OH  
L&L Special Furnace Co., Inc., Aston, PA  
Lucifer Furnaces Inc., Warrington, PA

## Ovens, infrared

AWT World Trade Inc., Chicago, IL

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

## Ovens, microwave

Cober, Inc., Stratford, CT

## Ovens, radiant heating

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

## Ovens, vacuum

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## Roasters, food products

COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North America; 908-234-1000; FAX: 908-234-9487; e-mail: info@konline.com; web site: www.konline.com)

See our ad on page 135

NEUHAUS NEOTEC Maschinen- und Anlagenbau GmbH, Germany

Sweet Manufacturing Company, Springfield, OH

WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## MIXING EQUIPMENT FOR FLUIDS

### Homogenizers

ADMIX INC., 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: mixing@admix.com; web site: www.admix.com)

Bepex International LLC, Minneapolis, MN

Charles Ross & Son Co., Hauppauge, NY

EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)

See our ad on page 147

IKA-Werke GmbH & Co.KG, Staufen, Germany

Microfluidics, Newton, MA

Wilhelm Siefert GmbH & Co. KG, Velbert, Germany

### Homogenizers, high pressure

Charles Ross & Son Co., Hauppauge, NY

EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)

See our ad on page 147

Microfluidics, Newton, MA

### Liquid-mixer parts & accessories

ADMIX INC., 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: mixing@admix.com; web site: www.admix.com)

Charles Ross & Son Co., Hauppauge, NY

EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)

See our ad on page 147

IKA-Werke GmbH & Co.KG, Staufen, Germany

### Mixers, air driven

ADMIX INC., 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: mixing@admix.com; web site: www.admix.com)

Conn and Co., L.L.C., Warren, PA

**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)  
 Nordson SEALANT EQUIPMENT, Plymouth, MI  
 Pope Scientific, Inc., Saukville, WI

## Mixers, anchor

Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)  
 See our ad on page 147

LOTUS MIXERS INC., North Venice, FL

## Mixers, batch

Aaron Process Equipment Co., Bensenville, IL  
**ADMIX INC.**, 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: mixing@admix.com; web site: www.admix.com)  
 AVA-Huep GmbH u.Co.KG, Herrsching, Germany  
 AVA-Americas, LLC c/o GreerWalker, Charlotte, NC  
 Bematek Systems, Inc., Salem, MA  
 Bepex International LLC, Minneapolis, MN  
 Charles Ross & Son Co., Hauppauge, NY  
 Conn and Co., L.L.C., Warren, PA

**EKATO RUEHR- UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)  
 See our ad on page 147  
 EquipNet, Inc., Canton, MA  
 GEA Process Engineering, Columbia, MD  
 Gebrueder Loedige Maschinenbau GmbH, Paderborn, Germany  
 IKA-Werke GmbH & Co.KG, Staufen, Germany  
**JAYGO, INC.**, 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)  
 Microfluidics, Newton, MA  
**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)

Pope Scientific, Inc., Saukville, WI  
 Quadro Engineering Corp., WATERLOO, Ontario, Canada  
 Shiv Shakti Process Equipment P. Ltd., International Marketing & Sales, Mumbai, India

## Mixers, bottom entering

**EKATO RUEHR- UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)  
 See our ad on page 147

LOTUS MIXERS INC., North Venice, FL

## Mixers, chilled

Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)  
 See our ad on page 147

## Mixers, cone

AVA-Huep GmbH u.Co.KG, Herrsching, Germany  
 AVA-Americas, LLC c/o GreerWalker, Charlotte, NC  
 Charles Ross & Son Co., Hauppauge, NY  
**JAYGO, INC.**, 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)

## Mixers, continuous

**ADMIX INC.**, 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: mixing@admix.com; web site: www.admix.com)  
 AVA-Huep GmbH u.Co.KG, Herrsching, Germany  
 AVA-Americas, LLC c/o GreerWalker, Charlotte, NC  
 Bematek Systems, Inc., Salem, MA  
 Bepex International LLC, Minneapolis, MN  
 BUSS ChemTech AG, Pratteln 1, Switzerland  
 Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)  
 See our ad on page 147

EquipNet, Inc., Canton, MA  
 GEA Process Engineering, Columbia, MD  
 Gebrueder Loedige Maschinenbau GmbH, Paderborn, Germany  
 IKA-Werke GmbH & Co.KG, Staufen, Germany  
 JLS International, Inc., Charlotte, NC  
 Kollo Corp., Cary, IL  
 Microfluidics, Newton, MA  
 Sulzer Chemtech USA, Inc., Tulsa, OK  
 Wilhelm Siefert GmbH & Co. KG, Velbert, Germany

## Mixers, disc

Charles Ross & Son Co., Hauppauge, NY  
 Conn and Co., L.L.C., Warren, PA

## Mixers, gas-liquid, high intensity

**ADMIX INC.**, 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: mixing@admix.com; web site: www.admix.com)  
 Biazzi SA, Chailly/Montreux, Switzerland

**EKATO RUEHR- UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)  
 See our ad on page 147

GEA Process Engineering, Columbia, MD  
**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)  
 See our ad on page 107

Vortab Company, San Marcos, CA

## Mixers, gate

Charles Ross & Son Co., Hauppauge, NY

## Mixers, heated

Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)  
 See our ad on page 147

IKA-Werke GmbH & Co.KG, Staufen, Germany  
**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)  
 See our ad on page 107

Sulzer Chemtech USA, Inc., Tulsa, OK

## Mixers, jet

**EKATO RUEHR- UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)  
 See our ad on page 147

Elmridge Inc., Livonia, MI  
**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)

GEA Process Engineering, Columbia, MD  
**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)  
 See our ad on page 107

Quadro Engineering Corp., WATERLOO, Ontario, Canada  
 Schutte & Koerting, Treviso, PA

## Mixers, paddle

AWT World Trade Inc., Chicago, IL  
 Bepex International LLC, Minneapolis, MN  
 Charles Ross & Son Co., Hauppauge, NY  
 Dynamic Air Inc., St. Paul, MN

**EKATO RUEHR- UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)  
 See our ad on page 147

**HEYL & PATTERSON INC.**, RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylypatterson.com; web site: www.heylypatterson.com)  
**JAYGO, INC.**, 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)  
 LOTUS MIXERS INC., North Venice, FL

**Mixers, pipeline (inline)**  
**ADMIX INC.**, 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: mixing@admix.com; web site: www.admix.com)  
 Bematek Systems, Inc., Salem, MA  
 Charles Ross & Son Co., Hauppauge, NY



**80 YEARS**  
OF MIXING TECHNOLOGY

## EKATO GROUP

### LEADING WORLDWIDE IN MIXING TECHNOLOGIES

Having advanced to world market leader, the EKATO GROUP has provided their customers with more than 80 years of technical excellence and experience. The companies within the EKATO GROUP offer a broad spectrum of mixing technologies.

From modularly designed industrial agitators to turnkey production plants, the EKATO GROUP provides a wide range of engineering services and custom-made solutions for the most challenging customer applications. The synergies within the EKATO GROUP ensure reliable and cost-effective solutions that meet the highest quality standards for every application. This is supported by a global service network.

[www.ekato.com](http://www.ekato.com)

**Your Contact in:**  
 Europe, Tel. +49 7622 29-0, e-mail: info@ekato.com / USA, Tel. +1 201 825 4684, e-mail: usa@ekato.com

IKA-Werke GmbH & Co.KG, Staufen, Germany  
 JLS International, Inc., Charlotte, NC  
 Koflo Corp., Cary, IL  
 Quadro Engineering Corp., WATERLOO, Ontario, Canada  
 Sulzer Chemtech USA, Inc., Tulsa, OK  
 Wilhelm Siefert GmbH & Co. KG, Velbert, Germany

## Mixers, rotary

Charles Ross & Son Co., Hauppauge, NY

## Mixers, portable

**ADMIX INC.**, 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: [mixing@admixon.com](mailto:mixing@admixon.com); web site: [www.admixon.com](http://www.admixon.com))

Charles Ross & Son Co., Hauppauge, NY  
 Conn and Co., L.L.C., Warren, PA  
 LOTUS MIXERS INC., North Venice, FL  
 Microfluidics, Newton, MA

## Mixers, pressure

Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: [info@ekato.com](mailto:info@ekato.com); web site: [www.ekato.com](http://www.ekato.com))**

See our ad on page 147

Fluitron, Inc., Ivyland, PA  
 JLS International, Inc., Charlotte, NC  
 Microfluidics, Newton, MA  
 Pope Scientific, Inc., Saukville, WI

## Mixers, propeller

**ADMIX INC.**, 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: [mixing@admixon.com](mailto:mixing@admixon.com); web site: [www.admixon.com](http://www.admixon.com))

Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: [info@ekato.com](mailto:info@ekato.com); web site: [www.ekato.com](http://www.ekato.com))**

See our ad on page 147

IKA-Werke GmbH & Co.KG, Staufen, Germany  
 Pope Scientific, Inc., Saukville, WI

## Mixers, side entering

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: [info@ekato.com](mailto:info@ekato.com); web site: [www.ekato.com](http://www.ekato.com))**

See our ad on page 147

LOTUS MIXERS INC., North Venice, FL

## Mixers, slurry

**ADMIX INC.**, 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: [mixing@admixon.com](mailto:mixing@admixon.com); web site: [www.admixon.com](http://www.admixon.com))

Bematek Systems, Inc., Salem, MA  
 Bepex International LLC, Minneapolis, MN  
 Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: [info@ekato.com](mailto:info@ekato.com); web site: [www.ekato.com](http://www.ekato.com))**

See our ad on page 147

Hosokawa Micron B.V., Mixing, Drying & Agglomeration, Doetinchem, Netherlands  
 Pope Scientific, Inc., Saukville, WI  
 Schutte & Koerting, Treviso, PA  
 Sulzer Chemtech USA, Inc., Tulsa, OK  
 Wilhelm Siefert GmbH & Co. KG, Velbert, Germany

## Mixers, static

**ADMIX INC.**, 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: [mixing@admixon.com](mailto:mixing@admixon.com); web site: [www.admixon.com](http://www.admixon.com))

Charles Ross & Son Co., Hauppauge, NY  
 JLS International, Inc., Charlotte, NC  
 Koflo Corp., Cary, IL  
 LOTUS MIXERS INC., North Venice, FL  
 Sulzer Chemtech USA, Inc., Tulsa, OK

**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: [chemtech@sulzer.com](mailto:chemtech@sulzer.com); web site: [www.sulzer.com](http://www.sulzer.com))**

## Mixers, top entering

**ADMIX INC.**, 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: [mixing@admixon.com](mailto:mixing@admixon.com); web site: [www.admixon.com](http://www.admixon.com))

Charles Ross & Son Co., Hauppauge, NY  
 Conn and Co., L.L.C., Warren, PA  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: [info@ekato.com](mailto:info@ekato.com); web site: [www.ekato.com](http://www.ekato.com))**

See our ad on page 147

IKA-Werke GmbH & Co.KG, Staufen, Germany  
 LOTUS MIXERS INC., North Venice, FL  
 Pope Scientific, Inc., Saukville, WI

Quadro Engineering Corp., WATERLOO, Ontario, Canada

## Mixers, turbine

Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: [info@ekato.com](mailto:info@ekato.com); web site: [www.ekato.com](http://www.ekato.com))**

See our ad on page 147

LOTUS MIXERS INC., North Venice, FL

## Mixers, vacuum

**ADMIX INC.**, 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: [mixing@admixon.com](mailto:mixing@admixon.com); web site: [www.admixon.com](http://www.admixon.com))

Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: [info@ekato.com](mailto:info@ekato.com); web site: [www.ekato.com](http://www.ekato.com))**

See our ad on page 147

GEA Process Engineering, Columbia, MD  
**JAYGO, INC.**, 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: [sales@jaygoinc.com](mailto:sales@jaygoinc.com); web site: [www.jaygoinc.com](http://www.jaygoinc.com))

Pope Scientific, Inc., Saukville, WI  
 Schutte & Koerting, Treviso, PA

## Mixers: barrel, drum, carboy

Conn and Co., L.L.C., Warren, PA  
 Paul O. Abbe, Bensenville, IL

## Mixing equipment for gas, air

Koflo Corp., Cary, IL

## MIXING EQUIPMENT FOR SOLIDS & FLUIDS

### Batching & blending systems

Acrison Inc., Moonachie, NJ  
 Charles Ross & Son Co., Hauppauge, NY  
 Pope Scientific, Inc., Saukville, WI  
 Shiv Shakti Process Equipment P. Ltd., International Marketing & Sales, Mumbai, India  
 Siemens Industry, Inc., Process Instrumentation & Analytics, Spring House, PA

### Blenders, cone

Charles Ross & Son Co., Hauppauge, NY  
**JAYGO, INC.**, 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: [sales@jaygoinc.com](mailto:sales@jaygoinc.com); web site: [www.jaygoinc.com](http://www.jaygoinc.com))  
 Munson Machinery Company, Inc., Utica, NY  
**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: [sales@nol-tec.com](mailto:sales@nol-tec.com); web site: [www.nol-tec.com](http://www.nol-tec.com))

Paul O. Abbe, Bensenville, IL  
 Shiv Shakti Process Equipment P. Ltd., International Marketing & Sales, Mumbai, India

### Blenders, continuous

Acrison Inc., Moonachie, NJ  
**ADMIX INC.**, 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: [mixing@admixon.com](mailto:mixing@admixon.com); web site: [www.admixon.com](http://www.admixon.com))

Bematek Systems, Inc., Salem, MA  
 Bepex International LLC, Minneapolis, MN  
 Charles Ross & Son Co., Hauppauge, NY  
 GEA Process Engineering, Columbia, MD  
 Koflo Corp., Cary, IL  
 LIST AG, Arisdorf, Switzerland  
 Paul O. Abbe, Bensenville, IL  
 Sulzer Chemtech USA, Inc., Tulsa, OK  
 Vibra Screw Inc., Totowa, NJ  
 Wilhelm Siefert GmbH & Co. KG, Velbert, Germany

### Blenders, horizontal

Acrison Inc., Moonachie, NJ  
 Bepex International LLC, Minneapolis, MN  
 Charles Ross & Son Co., Hauppauge, NY  
**JAYGO, INC.**, 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: [sales@jaygoinc.com](mailto:sales@jaygoinc.com); web site: [www.jaygoinc.com](http://www.jaygoinc.com))

Paul O. Abbe, Bensenville, IL  
 Vibra Screw Inc., Totowa, NJ

### Blenders, inline

**ADMIX INC.**, 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: [mixing@admixon.com](mailto:mixing@admixon.com); web site: [www.admixon.com](http://www.admixon.com))

Bematek Systems, Inc., Salem, MA  
 Bepex International LLC, Minneapolis, MN  
 Charles Ross & Son Co., Hauppauge, NY  
 GEA Process Engineering, Columbia, MD  
 Koflo Corp., Cary, IL  
 Sulzer Chemtech USA, Inc., Tulsa, OK

Wilhelm Siefert GmbH & Co. KG, Velbert, Germany

## Blenders, liquid feed

Bematek Systems, Inc., Salem, MA  
 Bepex International LLC, Minneapolis, MN  
 Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: [info@ekato.com](mailto:info@ekato.com); web site: [www.ekato.com](http://www.ekato.com))**

See our ad on page 147

GEA Process Engineering, Columbia, MD  
 Paul O. Abbe, Bensenville, IL

## Blenders, pneumatic

Dynamic Air Inc., St. Paul, MN  
**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: [sales@nol-tec.com](mailto:sales@nol-tec.com); web site: [www.nol-tec.com](http://www.nol-tec.com))

## Blenders, ribbon

Aaron Process Equipment Co., Bensenville, IL  
 Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: [info@ekato.com](mailto:info@ekato.com); web site: [www.ekato.com](http://www.ekato.com))**

See our ad on page 147

Midwest Steel Company Inc, Houston, Texas  
 Munson Machinery Company, Inc., Utica, NY  
 Paul O. Abbe, Bensenville, IL

## Blenders, spiral

Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: [info@ekato.com](mailto:info@ekato.com); web site: [www.ekato.com](http://www.ekato.com))**

See our ad on page 147

Paul O. Abbe, Bensenville, IL

## Blenders, tumbling V

Bascale Company, Inc., Houston, TX  
 Bioengineering Inc., Somerville, MA  
 Charles Ross & Son Co., Hauppauge, NY  
 Munson Machinery Company, Inc., Utica, NY  
 Paul O. Abbe, Bensenville, IL

## Mixers, continuous kneaders

AMANDUS KAHL GmbH & Co. KG, Reinbek, Germany  
 Bepex International LLC, Minneapolis, MN  
 B & P Process Equipment, Saginaw, MI  
 BUSS ChemTech AG, Pratteln 1, Switzerland  
 Charles Ross & Son Co., Hauppauge, NY  
 IKA-Werke GmbH & Co.KG, Staufen, Germany  
 LIST AG, Arisdorf, Switzerland

## Mixers, double arm kneaders

B & P Process Equipment, Saginaw, MI  
 Charles Ross & Son Co., Hauppauge, NY  
 IKA-Werke GmbH & Co.KG, Staufen, Germany  
**JAYGO, INC.**, 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: [sales@jaygoinc.com](mailto:sales@jaygoinc.com); web site: [www.jaygoinc.com](http://www.jaygoinc.com))

LIST AG, Arisdorf, Switzerland  
 Paul O. Abbe, Bensenville, IL

## Mixers, gravity flow

Bepex International LLC, Minneapolis, MN  
 Charles Ross & Son Co., Hauppauge, NY  
 Sulzer Chemtech USA, Inc., Tulsa, OK

## Mixers, high shear



*Advanced Mixing Technologies*

**ADMIX INC.**, 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: [mixing@admixon.com](mailto:mixing@admixon.com); web site: [www.admixon.com](http://www.admixon.com))

Bematek Systems, Inc., Salem, MA  
 Bepex International LLC, Minneapolis, MN  
 Charles Ross & Son Co., Hauppauge, NY  
 Conn and Co., L.L.C., Warren, PA

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

GEA Process Engineering, Columbia, MD  
Hosokawa Micron B.V., Mixing, Drying & Agglomeration, Doetinchem, Netherlands  
IKA-Werke GmbH & Co.KG, Staufen, Germany  
**JAYGO, INC., 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)**

LIST AG, Arisdorf, Switzerland  
Paul O. Abbe, Bensenville, IL  
Quadro Engineering Corp., WATERLOO, Ontario, Canada  
Vortab Company, San Marcos, CA  
Wilhelm Siefert GmbH & Co. KG, Velbert, Germany

## Mixers, magnetically coupled

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Fluifron, Inc., Ixvlyland, PA

## Mixers, motionless

**ADMIX INC., 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: mixing@admixon.com; web site: www.admixon.com)**

Charles Ross & Son Co., Hauppauge, NY  
JLS International, Inc., Charlotte, NC  
Koflo Corp., Cary, IL  
Nordson SEALANT EQUIPMENT, Plymouth, MI  
Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

## Mixers, other solid-liquid

AVA-Huep GmbH u.Co.KG, Herrsching, Germany  
AVA-Americas, LLC c/o GreerWalker, Charlotte, NC  
Bepex International LLC, Minneapolis, MN  
Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Elmridge Inc., Livonia, MI  
**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)**

GEA Process Engineering, Columbia, MD  
Mars Mineral, Mars, PA  
Paul O. Abbe, Bensenville, IL  
Wilhelm Siefert GmbH & Co. KG, Velbert, Germany

## Mixers, pan

Charles Ross & Son Co., Hauppauge, NY  
Mars Mineral, Mars, PA

## Mixers, planetary

B & P Process Equipment, Saginaw, MI  
Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

**JAYGO, INC., 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)**

Paul O. Abbe, Bensenville, IL

## Mixers, ribbon

Bepex International LLC, Minneapolis, MN  
Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Hosokawa Micron B.V., Mixing, Drying & Agglomeration, Doetinchem, Netherlands  
Kemutec Group, Inc., Bristol, PA  
Paul O. Abbe, Bensenville, IL

## Mixers, roller

Charles Ross & Son Co., Hauppauge, NY

## Mixers, rotary blade

Bepex International LLC, Minneapolis, MN  
Boerger Pumps, Chanhassen, MN  
Charles Ross & Son Co., Hauppauge, NY  
Paul O. Abbe, Bensenville, IL

## Mixers, rotary disc

Conn and Co., L.L.C., Warren, PA  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Mars Mineral, Mars, PA

## Mixers, rotary drum

Bascale Company, Inc., Houston, TX  
Mars Mineral, Mars, PA  
Munson Machinery Company, Inc., Utica, NY  
Paul O. Abbe, Bensenville, IL

## Mixers, screw

Bepex International LLC, Minneapolis, MN  
Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Hosokawa Micron B.V., Mixing, Drying & Agglomeration, Doetinchem, Netherlands  
**JAYGO, INC., 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)**

Paul O. Abbe, Bensenville, IL  
Vibra Screw Inc., Totowa, NJ

## Mixers, spiral ribbon

Bepex International LLC, Minneapolis, MN  
Charles Ross & Son Co., Hauppauge, NY  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Paul O. Abbe, Bensenville, IL

## Mixers, spiral screw

Bepex International LLC, Minneapolis, MN  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Paul O. Abbe, Bensenville, IL

## Mixers, vacuum tumble

**JAYGO, INC., 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)**

Paul O. Abbe, Bensenville, IL

## Mixers, vertical stationary

Bepex International LLC, Minneapolis, MN  
Charles Ross & Son Co., Hauppauge, NY  
Conn and Co., L.L.C., Warren, PA

## Mullers

Paul O. Abbe, Bensenville, IL

## Solid-liquid-mixer parts & accessories

Bepex International LLC, Minneapolis, MN  
Conn and Co., L.L.C., Warren, PA  
**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

IKA-Werke GmbH & Co.KG, Staufen, Germany  
Paul O. Abbe, Bensenville, IL

## PACKINGS, TRAYS FOR TOWERS & COLUMNS

### Packings, cooling tower

DELTA COOLING TOWERS INC., 185 US Highway 206, Roxbury Township, NJ 07836 (973-586-2201; FAX: 973-586-2243; e-mail: info@deltacoolding.com; web site: www.deltacoolding.com)  
SPX Cooling Technologies, Overland Park, KS

### Packings, tower & column, ceramic

Christy Catalytics LLC, St. Louis, MO  
RVT Process Equipment, Inc., Knoxville, TN  
Sulzer Chemtech USA, Inc., Tulsa, OK

### Packings, tower & column, metal

AMACS, Houston, TX

Christy Catalytics LLC, St. Louis, MO  
RVT Process Equipment, Inc., Knoxville, TN  
Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

### Packings, tower & column, plastic

AMACS, Houston, TX  
Christy Catalytics LLC, St. Louis, MO  
DELTA COOLING TOWERS INC., 185 US Highway 206, Roxbury Township, NJ 07836 (973-586-2201; FAX: 973-586-2243; e-mail: info@deltacoolding.com; web site: www.deltacoolding.com)



**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)**

RVT Process Equipment, Inc., Knoxville, TN  
Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

### Packings, tower & column, random

Christy Catalytics LLC, St. Louis, MO  
RVT Process Equipment, Inc., Knoxville, TN  
Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

### Packings, tower & column, structured

AMACS, Houston, TX  
Christy Catalytics LLC, St. Louis, MO  
**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)**

RVT Process Equipment, Inc., Knoxville, TN  
Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

### Packings, trays for towers & columns

AMACS, Houston, TX  
Christy Catalytics LLC, St. Louis, MO  
KIRK Process Solutions Ltd, Walton-on-Thames  
RVT Process Equipment, Inc., Knoxville, TN  
Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

### Saddles, polyethylene, tower packings

Christy Catalytics LLC, St. Louis, MO  
RVT Process Equipment, Inc., Knoxville, TN

### Trays & tower internals

AMACS, Houston, TX  
Creative Pultrusions, Inc., Alum Bank, PA  
KIRK Process Solutions Ltd, Walton-on-Thames  
RVT Process Equipment, Inc., Knoxville, TN  
Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

## PROCESS VESSELS & REACTORS

### Autoclaves

Biazzi SA, Chailly/Montreux, Switzerland

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Patterson Ind. Canada, of All-Weld Company Limited, Scarborough, Ontario, Canada

WSF Industries, Buffalo, NY

## Biochemical equipment

RAS Process Equipment Inc., Robbinsville, NJ

## Bioreactors

Bioengineering AG, Wald, Switzerland

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

GEA Process Engineering, Columbia, MD

Pope Scientific, Inc., Saukville, WI

Veolia Water Solutions & Technologies, Moon Township, PA

## Carbonylation reactors

Biazzi SA, Chailly/Montreux, Switzerland

## Coalescers

AMACS, Houston, TX

CECO Filters, a CECO Environmental Company, Telford, PA

Filtration & Membrane Technology, Inc., Houston, TX

Franken Filtertechnik KG, Germany, Huerth, Germany



**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33003 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)**

Pollution Control Systems, Inc., Millford, OH

SPX Flow Technology, Ocala, FL

## Deaerators, degasifiers

Advance Boiler & Tank Co., West Allis, WI

Charles Ross & Son Co., Hauppauge, NY

**ROLL-REYNOLDS CO. INC., Six Campus Drive, Parsippany, NJ 07054 (908-232-4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.roll.com)**

Denver Mineral Engineers, Inc., Littleton, CO

Fulton Companies, The, Fulton Thermal Corporation, Pulaski, NY

Hilliard Corp., Elmira, NY

**JAYGO, INC., 7 Emery Ave., Randolph, NJ 07869 (1-888-81-JAYGO; 908-688-3600; FAX: 908-688-6060; e-mail: sales@jaygoinc.com; web site: www.jaygoinc.com)**

Membrana, Charlotte, NC

Pope Scientific, Inc., Saukville, WI

## Digesters, cookers

Charles Ross & Son Co., Hauppauge, NY

## Extraction equipment

Bepex International LLC, Minneapolis, MN

GEA Process Engineering, Columbia, MD

**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**

See our ad on page 135

Membrana, Charlotte, NC

**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

## Fermentation equipment & fermentors

Bioengineering AG, Wald, Switzerland

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

GEA Process Engineering, Columbia, MD

Pope Scientific, Inc., Saukville, WI

## Generators, hydrogen

Air Products and Chemicals, Inc., Allentown, PA

## Generators, nitrogen

Air Products and Chemicals, Inc., Allentown, PA

Pneumatech, Inc., Rock Hill, SC

## Generators, oxygen

Air Products and Chemicals, Inc., Allentown, PA

AirSep Corporation, A Chart Industries Company, Buffalo, NY

GASCO Affiliates, LLC, Oldsmar, FL

Pneumatech, Inc., Rock Hill, SC

## Generators, ozone

AirSep Corporation, A Chart Industries Company, Buffalo, NY

## Generators, synthesis gas

Aaron Process Equipment Co., Bensenville, IL

## Hydrogenation plants

Biazzi SA, Chailly/Montreux, Switzerland

## Hydrogenation reactors

Biazzi SA, Chailly/Montreux, Switzerland

## Kettles, agitated

Charles Ross & Son Co., Hauppauge, NY

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Fluitron, Inc., Ivyland, PA

Patterson Ind. Canada, of All-Weld Company Limited, Scarborough, Ontario, Canada

## Kettles, caustic

Charles Ross & Son Co., Hauppauge, NY

## Kettles, crystallizing

Charles Ross & Son Co., Hauppauge, NY

Pope Scientific, Inc., Saukville, WI

## Kettles, electrically heated

Charles Ross & Son Co., Hauppauge, NY

Pope Scientific, Inc., Saukville, WI

## Kettles, jacketed

Aaron Process Equipment Co., Bensenville, IL

**ADMIX INC., 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: mixing@admix.com; web site: www.admix.com)**

Charles Ross & Son Co., Hauppauge, NY

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Patterson Ind. Canada, of All-Weld Company Limited, Scarborough, Ontario, Canada

WSF Industries, Buffalo, NY

## Kettles, melting

Charles Ross & Son Co., Hauppauge, NY

## Kettles, special metals

Charles Ross & Son Co., Hauppauge, NY

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Patterson Ind. Canada, of All-Weld Company Limited, Scarborough, Ontario, Canada

## Kettles, vacuum

**ADMIX INC., 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: mixing@admix.com; web site: www.admix.com)**

Charles Ross & Son Co., Hauppauge, NY

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Pope Scientific, Inc., Saukville, WI

## Oxidation plants

Biazzi SA, Chailly/Montreux, Switzerland

## Oxidation reactors

Biazzi SA, Chailly/Montreux, Switzerland

## Oxidizers, catalytic

ADWEST TECHNOLOGIES, a CECO Environmental Company, Anaheim, CA

Anguil Environmental Systems, Inc., Milwaukee, WI

## Oxidizers, regenerative

Anguil Environmental Systems, Inc., Milwaukee, WI

## Polymerizers

Air Liquide Global E&C Solutions Germany GmbH, Frankfurt am Main, Germany

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

LIST AG, Arisdorf, Switzerland

## Reactors, continuous

**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alauqa-inc.com)**

AVA-Huep GmbH u.Co.KG, Herrsching, Germany

AVA-Americas, LLC c/o GreerWalker, Charlotte, NC

Biazzi SA, Chailly/Montreux, Switzerland

**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Gebrueder Loedige Maschinenbau GmbH, Paderborn, Germany

**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**

See our ad on page 135

Midwest Steel Company Inc, Houston, Texas

PDC Machines, Inc., Warminster, PA

Pope Scientific, Inc., Saukville, WI

**PRAJ INDUSTRIES LIMITED, Praj Tower\* 274 & 275,**

**Bhumkar Chowk-Hinjewadi Road., Hinjewadi, Pune, India 411057. (+912022951511; FAX: +912022951718; e-mail: info@praj.net; web site: www.praj.net)**

Procedyne Corp., New Brunswick, NJ

Sulzer Chemtech USA, Inc., Tulsa, OK

**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Reactors, cooled, heated

AVA-Huep GmbH u.Co.KG, Herrsching, Germany

AVA-Americas, LLC c/o GreerWalker, Charlotte, NC

Bepex International LLC, Minneapolis, MN

Biazzi SA, Chailly/Montreux, Switzerland

Charles Ross & Son Co., Hauppauge, NY

**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: + 49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Fluitron, Inc., Ivyland, PA

Gebrueder Loedige Maschinenbau GmbH, Paderborn, Germany

**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**

See our ad on page 135

Patterson Ind. Canada, of All-Weld Company Limited, Scarborough, Ontario, Canada

Pope Scientific, Inc., Saukville, WI

Procedyne Corp., New Brunswick, NJ

**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Reactors, fluid bed

Bepex International LLC, Minneapolis, MN

**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

Procedyne Corp., New Brunswick, NJ

## Reactors, gas-liquid

Biazzi SA, Chailly/Montreux, Switzerland



**EKATO RUEHR- UND MISCHTECHNIK GMBH**, Hohe-Flum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)

See our ad on page 147

Fluitron, Inc., Ivyland, PA  
PDC Machines, Inc., Warminster, PA

## Reactors, hollow flight

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

## Reactors, jacketed

Advance Boiler & Tank Co., West Allis, WI  
AVA-Huep GmbH u.Co.KG, Hersching, Germany  
AVA-Americas, LLC c/o GreerWalker, Charlotte, NC  
Bepex International LLC, Minneapolis, MN  
Bioengineering AG, Wald, Switzerland  
Charles Ross & Son Co., Hauppauge, NY  
Chattanooga Boiler and Tank Co., Chattanooga, TN  
**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

De Dietrich Process Systems GmbH, Mainz, Germany  
EquipNet, Inc., Canton, MA  
PDC Machines, Inc., Warminster, PA  
Pope Scientific, Inc., Saukville, WI  
Procedyne Corp., New Brunswick, NJ  
WSF Industries, Buffalo, NY

## Reactors, jacketed, dimple

Charles Ross & Son Co., Hauppauge, NY  
**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

Pope Scientific, Inc., Saukville, WI  
**PAJ INDUSTRIES LIMITED**, Praj Tower" 274 & 275, Bhumkar Chowk-Hinjewadi Road., Hinjewadi, Pune, India 411057. (+912022951511; FAX: +912022951718; e-mail: info@praj.net; web site: www.praj.net)

Procedyne Corp., New Brunswick, NJ  
RAS Process Equipment Inc., Robbinsville, NJ

## Reactors, jacketed, half-pipe

Chattanooga Boiler and Tank Co., Chattanooga, TN  
**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

## Reactors, lined, glass

Aaron Process Equipment Co., Bensenville, IL  
EquipNet, Inc., Canton, MA

## Reactors, lined, metal

Advance Boiler & Tank Co., West Allis, WI  
Pope Scientific, Inc., Saukville, WI

## Reactors, loop

Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD**, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)

## Reactors, pilot plant

Biazzi SA, Chailly/Montreux, Switzerland  
Bioengineering AG, Wald, Switzerland  
**COMESSA**, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)

Fluitron, Inc., Ivyland, PA  
PDC Machines, Inc., Warminster, PA  
Pope Scientific, Inc., Saukville, WI  
Procedyne Corp., New Brunswick, NJ  
Zeton Inc., Burlington, Ontario, Canada

## Reactors, plastic lined

Pope Scientific, Inc., Saukville, WI

## Reactors, rotary blade

Charles Ross & Son Co., Hauppauge, NY  
**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

LIST AG, Arisdorf, Switzerland

## Reactors, rotary disc

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

**WYSSMONT CO. INC.**, 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## Separators

Advanced Industrial Technology Corp., Paramus, NJ  
**ALAUQA**, Inc., 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alauqa.com)

**COASTAL TECHNOLOGIES INC.**, P.O. Box 624, Hampton, SC 29924 (803-943-4822; FAX: 803-943-4744; e-mail: sales@cti-sc.com; web site: www.coastal-technologiesinc.com)

Gilbert Industries, Sparta, MO  
Hudson Products Corp., Houston, TX  
INOX-TECH INC., Ste. Catherine, Canada  
**KIMRE**, INC., 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

SPX Flow Technology, Ocala, FL  
**SULZER CHEMTECH LTD**, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)

Walker Magnetics, Milwaukee, WI

## Sublimers

**WYSSMONT CO. INC.**, 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## Vessels, plastic lined

Dual/HEE, a CECO Environmental Company, Owosso, MI  
FABRICATED PLASTICS LIMITED, MAPLE, Canada  
Pope Scientific, Inc., Saukville, WI  
TIGG Corporation, Oakdale, PA

## Vessels, pressure, cryogenic

Pope Scientific, Inc., Saukville, WI

## Vessels, pressure, custom

Advance Boiler & Tank Co., West Allis, WI  
Charles Ross & Son Co., Hauppauge, NY  
Chattanooga Boiler and Tank Co., Chattanooga, TN  
EquipNet, Inc., Canton, MA  
Fisher Klosterman, a CECO Environmental Company, Louisville, KY  
Fluitron, Inc., Ivyland, PA  
INOX-TECH INC., Ste. Catherine, Canada  
Lectrodryer, Richmond, KY  
Liquid Process Systems, inc., Indian Trail, NC  
Niles Steel Tank, Ambler, PA  
Patterson Ind. Canada, of All-Weld Company Limited, Scarborough, Ontario, Canada  
Pope Scientific, Inc., Saukville, WI  
Powder Systems Ltd, Liverpool  
Team Industries, Inc., Kaukauna, WI  
TIGG Corporation, Oakdale, PA  
WSF Industries, Buffalo, NY

## Vessels, pressure, jacketed, dimple

Charles Ross & Son Co., Hauppauge, NY  
EquipNet, Inc., Canton, MA  
Fisher Klosterman, a CECO Environmental Company, Louisville, KY  
Pope Scientific, Inc., Saukville, WI

## Vessels, pressure, multilayered heavy wall

Fisher Klosterman, a CECO Environmental Company, Louisville, KY

## Washers, continuous belt

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

## Washers, horizontal vacuum filter

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

## Washers, spray

PNR AMERICA, LLC, Poughkeepsie, NY  
Progressive Recovery Inc., Duplo, IL

## REACTION & SEPARATION EQUIPMENT, OTHER

### Acid gas removal systems

**KIMRE**, INC., 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

### Adsorption systems, pressure swing

Wintek Corp., Flanders, NJ

### Aerators

Conveyor Components Co., Material Control, Inc., Crosswell, MI  
Dual/HEE, a CECO Environmental Company, Owosso, MI  
**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)

See our ad on page 107

Membrana, Charlotte, NC  
Monitor Technologies LLC, Elburn, IL  
Mott Corporation, Farmington, CT  
**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)

### Atomizers

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

### Chromatography, production-scale equipment

Ameridia, Div. of Eurodia Industries, Somerset, NJ  
PDR-Separations LLC, Palm Beach Gardens, FL

### CIP Spray Nozzles

Evaporator Dryer Technologies, Hammond, WI

### Diffusers, spargers

Mott Corporation, Farmington, CT  
Pollution Control Systems, Inc., Millford, OH  
Schutte & Koerting, Trevose, PA

### Diversers

**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)

### Extractors, centrifugal

B & P Process Equipment, Saginaw, MI

### Hydrogen generation units

SPX Flow Technology, Ocala, FL

### Manways

Evaporator Dryer Technologies, Hammond, WI

### Membrane systems for gases

Air Products and Chemicals, Inc., Allentown, PA  
berolan GmbH Membran- und Prozesstechnik, St. Ingbert, Germany  
BORSIG GmbH, Berlin, Germany  
Buss-SMS-Canzier GmbH, Butzbach, Germany  
**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)  
**SULZER CHEMTECH LTD**, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)

### Membrane systems for liquids

Ameridia, Div. of Eurodia Industries, Somerset, NJ  
berolan GmbH Membran- und Prozesstechnik, St. Ingbert, Germany  
Buss-SMS-Canzier GmbH, Butzbach, Germany  
GEA Engineering, P.C., Nanuet, NY  
GEA Process Engineering, Columbia, MD  
**INDECK POWER EQUIPMENT CO.**, 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)  
Membrana, Charlotte, NC  
Microdyn Technologies, Inc., Raleigh, NC

MICRODYN-NADIR GmbH, Wiesbaden, Germany  
 Progressive Recovery Inc., Duplo, IL  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

## Mixer-settlers

Denver Mineral Engineers, Inc., Littleton, CO  
 Franken Filtertechnik KG, Germany, Huerth, Germany

## Monomer-recovery systems

Buss-SMS-Canzler GmbH, Butzbach, Germany  
**GIG KARASEK GMBH, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: office@gigkarasek.at; web site: www.gigkarasek.com)**  
 Pope Scientific, Inc., Saukville, WI

## Natural gas processing plants

Air Liquide Global E&C Solutions Germany GmbH, Frankfurt am Main, Germany

## Nozzles, atomizing

PNR AMERICA, LLC, Poughkeepsie, NY  
 Spraying Systems Co., Wheaton, IL

## Nozzles, mixing

Charles Ross & Son Co., Hauppauge, NY  
 Elmridge Inc., Livonia, MI  
**KOERTING HANNOVER AG, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)**

See our ad on page 107

## Nozzles, spray

Evaporator Dryer Technologies, Hammond, WI  
**KOERTING HANNOVER AG, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)**

See our ad on page 107

PNR AMERICA, LLC, Poughkeepsie, NY  
 Pollution Control Systems, Inc., Millford, OH  
 Spraying Systems Co., Wheaton, IL

## Oil purification equipment

**GIG KARASEK GMBH, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: office@gigkarasek.at; web site: www.gigkarasek.com)**

## Pervaporation equipment

beroplan GmbH Membran- und Prozesstechnik, St. Ingbert, Germany  
 Buss-SMS-Canzler GmbH, Butzbach, Germany  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

## Separators for metals

Denver Mineral Engineers, Inc., Littleton, CO  
 Industrial Magnetics, Inc., Boyne City, MI  
 Walker Magnetics, Milwaukee, WI

## Solvent extraction systems

B & P Process Equipment, Saginaw, MI  
 LIST AG, Arisdorf, Switzerland  
 Wintek Corp., Flanders, NJ

## Solvent recovery systems

**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alauqa-inc.com)**

beroplan GmbH Membran- und Prozesstechnik, St. Ingbert, Germany  
 Buss-SMS-Canzler GmbH, Butzbach, Germany  
**CR CLEANAIR, Six Campus Drive, Parsippany, NJ 07054 (908 232 4200; FAX: 908-232-2146; e-mail: info@croil.com; web site: www.crcleanair.com)**  
 EDWARDS US HEADQUARTERS, Sanborn, NY  
 Franken Filtertechnik KG, Germany, Huerth, Germany  
**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)**  
 GEA Process Engineering, Columbia, MD  
**GIG KARASEK GMBH, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: office@gigkarasek.at; web site: www.gigkarasek.com)**  
 Hilliard Corp., Elmira, NY

**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**

See our ad on page 135

Munters Corporation, Buena Vista, VA  
 NexGen Enviro Systems Inc., Lindenhurst, NY  
 Pope Scientific, Inc., Saukville, WI  
**PRAJ INDUSTRIES LIMITED, Praj Tower" 274 & 275, Bhumkar Chowk-Hinjewadi Road,, Hinjewadi, Pune, India 411057. (+912022951511; FAX: +912022951718; e-mail: info@praj.net; web site: www.praj.net)**  
 Progressive Recovery Inc., Duplo, IL  
 Wintek Corp., Flanders, NJ  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Solvent recycling systems

**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alauqa-inc.com)**

beroplan GmbH Membran- und Prozesstechnik, St. Ingbert, Germany  
 Progressive Recovery Inc., Duplo, IL

## Sprayers

PNR AMERICA, LLC, Poughkeepsie, NY

## Strippers, air

Advanced Industrial Technology Corp., Paramus, NJ  
 CECCO Filters, a CECCO Environmental Company, Telford, PA  
 Duall/HEE, a CECCO Environmental Company, Owosso, MI  
**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)**

## Syngas generation units

Air Liquide Global E&C Solutions Germany GmbH, Frankfurt am Main, Germany

## SCREENING EQUIPMENT

### Screening

American Fabric Filter Co., Wesley Chapel, FL  
 Great Western Mfg. Co., Leavenworth, KS  
 Kinergy Corp., Louisville, KY  
 Particle Reduction Service, Elk Grove Village, IL  
 Sefar Inc., Buffalo, NY  
 Vibra Screw Inc., Totowa, NJ  
 Westech Engineering Inc., Salt Lake City, UT

### Screens, air

Great Western Mfg. Co., Leavenworth, KS  
 RKI Instruments, Inc., Union City, CA

### Screens, bar

MM Industries, Inc., Vorti-Siv, Salem, OH  
 Tema Systems, Inc., Cincinnati, OH  
 Vibra Screw Inc., Totowa, NJ

### Screens, centrifugal

Kason Corp., Millburn, NJ  
 Kemutec Group, Inc., Bristol, PA  
 Prater-Sterling, Bollingbrook, IL  
 Sefar Inc., Buffalo, NY  
 Tema Systems, Inc., Cincinnati, OH  
 Western States Machine Co., Hamilton, OH

### Screens, cylindrical

Kason Corp., Millburn, NJ  
 MM Industries, Inc., Vorti-Siv, Salem, OH  
 Sefar Inc., Buffalo, NY

### Screens, grizzly

Kinergy Corp., Louisville, KY

### Screens, gyratory

Great Western Mfg. Co., Leavenworth, KS  
 Kason Corp., Millburn, NJ  
 MM Industries, Inc., Vorti-Siv, Salem, OH

### Screens, milled slot

MM Industries, Inc., Vorti-Siv, Salem, OH

### Screens, perforated plate

Tema Systems, Inc., Cincinnati, OH

### Screens, rotary

Great Western Mfg. Co., Leavenworth, KS  
 MM Industries, Inc., Vorti-Siv, Salem, OH

## Screens, stationary

Schenck Process GmbH, Darmstadt, Germany

## Screens, synthetic

Great Western Mfg. Co., Leavenworth, KS  
 Sefar Inc., Buffalo, NY

## Screens, testing

Great Western Mfg. Co., Leavenworth, KS

## Screens, vibrating

Great Western Mfg. Co., Leavenworth, KS  
 Kason Corp., Millburn, NJ  
 Kinergy Corp., Louisville, KY  
 Schenck Process GmbH, Darmstadt, Germany  
 Sefar Inc., Buffalo, NY  
 Thermotron, Holland, MI  
 Vibra Screw Inc., Totowa, NJ

## Screens, wire

American Fabric Filter Co., Wesley Chapel, FL  
 G Bopp USA Inc., Wappingers Falls, NY  
 Great Western Mfg. Co., Leavenworth, KS  
 MM Industries, Inc., Vorti-Siv, Salem, OH

## Separators, magnetic

Industrial Magnetics, Inc., Boyne City, MI  
**KRAISSL CO. INC., 299 Williams Ave., Hackensack, NJ 07601-5225 (800-572-4775; 201-342-0008; FAX: 201-342-0025; e-mail: kraissl@aol.com; web site: www.strainers.com)**

Magnetic Products, Inc., Highland, MI  
 Metso Minerals Industries, Inc., York, PA  
 Puritan Magnetics, Inc., Oxford, MI  
 Walker Magnetics, Milwaukee, WI

## Sieves

American Fabric Filter Co., Wesley Chapel, FL  
 Great Western Mfg. Co., Leavenworth, KS  
 Quadro Engineering Corp., WATERLOO, Ontario, Canada  
 Sefar Inc., Buffalo, NY

## Sifters, sifting machines

American Fabric Filter Co., Wesley Chapel, FL  
 Great Western Mfg. Co., Leavenworth, KS  
 Kason Corp., Millburn, NJ  
 Prater-Sterling, Bollingbrook, IL

## Wire cloth

CPI Wirecloth & Screens Inc, Pearland, TX  
 G Bopp USA Inc., Wappingers Falls, NY  
 MM Industries, Inc., Vorti-Siv, Salem, OH

## Wire mesh

AMACS, Houston, TX  
**COASTAL TECHNOLOGIES INC., P.O. Box 624, Hampton, SC 29924 (803-943-4822; FAX: 803-943-4744; e-mail: sales@cti-sc.com; web site: www.coastal-technologiesinc.com)**

CPI Wirecloth & Screens Inc, Pearland, TX  
 G Bopp USA Inc., Wappingers Falls, NY  
**KRAISSL CO. INC., 299 Williams Ave., Hackensack, NJ 07601-5225 (800-572-4775; 201-342-0008; FAX: 201-342-0025; e-mail: kraissl@aol.com; web site: www.strainers.com)**  
 MM Industries, Inc., Vorti-Siv, Salem, OH

## SCRUBBERS

### Scrubbers, centrifugal

Advanced Industrial Technology Corp., Paramus, NJ  
 Advanced Air Technologies, Inc., Corunna, MI  
**BIONOMIC INDUSTRIES INC., 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)**

Duall/HEE, a CECCO Environmental Company, Owosso, MI  
 Fisher Klosterman, a CECCO Environmental Company, Louisville, KY

Hudson Products Corp., Houston, TX  
 KIRK Process Solutions Ltd, Walton-on-Thames  
 Turner EnviroLogic, Inc., Deerfield Beach, FL

### Scrubbers, conical

Turner EnviroLogic, Inc., Deerfield Beach, FL

### Scrubbers, cyclone

Advanced Industrial Technology Corp., Paramus, NJ  
 Advanced Cyclone Systems, S. A., Porto, Portugal  
 Ambient Engineering Inc., Rocky Hill, NJ

**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)

**CR CLEANAIR**, Six Campus Drive, Parsippany, NJ 07054 (908 232 4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.crleanair.com)

Fisher Klosterman, a CECO Environmental Company, Louisville, KY

GEA Process Engineering, Columbia, MD  
KIRK Process Solutions Ltd, Walton-on-Thames  
Turner EnviroLogic, Inc., Deerfield Beach, FL

## Scrubbers, fluidized bed

**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)

CECO Filters, a CECO Environmental Company, Telford, PA  
CPFD-Software, Albuquerque, New Mexico

## Scrubbers, fume, gas

Advanced Industrial Technology Corp., Paramus, NJ  
Advanced Air Technologies, Inc., Corunna, MI  
Ambient Engineering Inc., Rocky Hill, NJ

**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)

Branch Environmental Corp., Somerville, NJ

# CR CleanAir

Leaders in Clean Air Technology

**CR CLEANAIR**, Six Campus Drive, Parsippany, NJ 07054 (908 232 4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.crleanair.com)

Dual/HEE, a CECO Environmental Company, Owosso, MI  
Elmridge Inc., Livonia, MI

FABRICATED PLASTICS LIMITED, MAPLE, Canada  
Fisher Klosterman, a CECO Environmental Company, Louisville, KY

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)

GEA Process Engineering, Columbia, MD

**HEMCO CORPORATION**, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemcocorp.com; web site: www.HEMCOcorp.com)



**KIMRE, INC.**, 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

McGill AirClean LLC, Columbus, OH  
Schutte & Koerting, Treviso, PA  
Turner EnviroLogic, Inc., Deerfield Beach, FL

## Scrubbers, impingement baffle

Advanced Industrial Technology Corp., Paramus, NJ  
Ambient Engineering Inc., Rocky Hill, NJ

**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)

**CR CLEANAIR**, Six Campus Drive, Parsippany, NJ 07054 (908 232 4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.crleanair.com)

Dual/HEE, a CECO Environmental Company, Owosso, MI  
**KIMRE, INC.**, 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

Turner EnviroLogic, Inc., Deerfield Beach, FL

## Scrubbers, jet

Advanced Industrial Technology Corp., Paramus, NJ  
**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)

**CR CLEANAIR**, Six Campus Drive, Parsippany, NJ 07054 (908 232 4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.crleanair.com)

Branch Environmental Corp., Somerville, NJ

# CR CleanAir

Leaders in Clean Air Technology

**CR CLEANAIR**, Six Campus Drive, Parsippany, NJ 07054 (908 232 4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.crleanair.com)

Elmridge Inc., Livonia, MI

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)

**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)

See our ad on page 107

Schutte & Koerting, Treviso, PA  
Turner EnviroLogic, Inc., Deerfield Beach, FL

## Scrubbers, oil mist

Advanced Industrial Technology Corp., Paramus, NJ  
Ambient Engineering Inc., Rocky Hill, NJ

**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)

**COASTAL TECHNOLOGIES INC.**, P.O. Box 624, Hampton, SC 29924 (803-943-4822; FAX: 803-943-4744; e-mail: sales@cti-sc.com; web site: www.coastaltechnologiesinc.com)

**CR CLEANAIR**, Six Campus Drive, Parsippany, NJ 07054 (908 232 4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.crleanair.com)

Dual/HEE, a CECO Environmental Company, Owosso, MI  
**KIMRE, INC.**, 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

Turner EnviroLogic, Inc., Deerfield Beach, FL

## Scrubbers, orifice

Advanced Industrial Technology Corp., Paramus, NJ  
**CR CLEANAIR**, Six Campus Drive, Parsippany, NJ 07054 (908 232 4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.crleanair.com)

Turner EnviroLogic, Inc., Deerfield Beach, FL

## Scrubbers, packed column

Advanced Industrial Technology Corp., Paramus, NJ  
Advanced Air Technologies, Inc., Corunna, MI

**ALAUQA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail: alauqa@mindspring.com; web site: www.alauqa.com)

Ambient Engineering Inc., Rocky Hill, NJ

**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)

Branch Environmental Corp., Somerville, NJ

**CR CLEANAIR**, Six Campus Drive, Parsippany, NJ 07054 (908 232 4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.crleanair.com)

**DELTA COOLING TOWERS INC.**, 185 US Highway 206, Roxbury Township, NJ 07836 (973-586-2201; FAX: 973-586-2243; e-mail: info@deltacoooling.com; web site: www.deltacoooling.com)

Dual/HEE, a CECO Environmental Company, Owosso, MI  
FABRICATED PLASTICS LIMITED, MAPLE, Canada  
Fisher Klosterman, a CECO Environmental Company, Louisville, KY

**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)

**KIMRE, INC.**, 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

**PRAJ INDUSTRIES LIMITED**, Praj Tower\* 274 & 275, Bhumkar Chowk-Hinjewadi Road., Hinjewadi, Pune, India 411057. (+912022951511; FAX: +912022951718; e-mail: info@praj.net; web site: www.praj.net)

Schutte & Koerting, Treviso, PA  
Turner EnviroLogic, Inc., Deerfield Beach, FL

## Scrubbers, plate column

Advanced Industrial Technology Corp., Paramus, NJ  
**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

## Scrubbers, rotary

Turner EnviroLogic, Inc., Deerfield Beach, FL

## Scrubbers, spray

Advanced Industrial Technology Corp., Paramus, NJ

**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)

Branch Environmental Corp., Somerville, NJ

**CR CLEANAIR**, Six Campus Drive, Parsippany, NJ 07054 (908 232 4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.crleanair.com)

Dual/HEE, a CECO Environmental Company, Owosso, MI  
Elmridge Inc., Livonia, MI

Evaporator Dryer Technologies, Hammond, WI  
Fisher Klosterman, a CECO Environmental Company, Louisville, KY

GEA Process Engineering, Columbia, MD

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

McGill AirClean LLC, Columbus, OH  
Spraying Systems Co., Wheaton, IL  
Turner EnviroLogic, Inc., Deerfield Beach, FL  
Westchester Germicide Co., Pittsburgh, PA

## Scrubbers, venturi

Advanced Industrial Technology Corp., Paramus, NJ  
Ambient Engineering Inc., Rocky Hill, NJ

**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)

Branch Environmental Corp., Somerville, NJ

# CR CleanAir

Leaders in Clean Air Technology

**CR CLEANAIR**, Six Campus Drive, Parsippany, NJ 07054 (908 232 4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.crleanair.com)

Dual/HEE, a CECO Environmental Company, Owosso, MI  
Elmridge Inc., Livonia, MI

Fisher Klosterman, a CECO Environmental Company, Louisville, KY  
**GEA WIEGAND GMBH**, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)

**KOERTING HANNOVER AG**, Badenstedter Str. 56, Hannover, Germany 30453 (0511-2129-0; FAX: 0511-2129-223; e-mail: st@koerting.de; web site: www.koerting.de)

See our ad on page 107

Schutte & Koerting, Treviso, PA  
Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

## Scrubbers, wire mesh tray

Advanced Industrial Technology Corp., Paramus, NJ  
Ambient Engineering Inc., Rocky Hill, NJ

**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)

Turner EnviroLogic, Inc., Deerfield Beach, FL

Turner EnviroLogic, Inc., Deerfield Beach, FL

# SIZE REDUCTION EQUIPMENT

## Breakers

FREWITT manufacturer of machines Ltd., WE CARE ABOUT MILLING, Fribourg, Switzerland

Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany

**WYSSMONT CO. INC.**, 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

## Chippers

**WYSSMONT CO. INC.**, 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

See our ad on page 133

## Comminutors

AAAmachine, Inc., Des Plaines, IL  
FRITSCHE GmbH, Milling and Sizing, Idar-Oberstein, Germany

Pollution Control Systems, Inc., Milford, OH  
**WYSSMONT CO. INC.**, 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)

See our ad on page 133

See our ad on page 133

## Crushers, cone

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

## Crushers, fluid energy

AAAMachine, Inc., Des Plaines, IL

## Crushers, gyratory

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

## Crushers, impact

American Pulverizer, St. Louis, MO  
Stedman, Aurora, IN

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Crushers, jaw

FRITSCH GmbH, Milling and Sizing, Idar-Oberstein, Germany

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

## Crushers, prebreaker

Alexanderwerk AG, Remscheid, Germany  
American Pulverizer, St. Louis, MO  
Bepex International LLC, Minneapolis, MN  
FREWITT manufacturer of machines Ltd., WE CARE ABOUT MILLING, Fribourg, Switzerland  
FRITSCH GmbH, Milling and Sizing, Idar-Oberstein, Germany  
Kemutec Group, Inc., Bristol, PA  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Crushers, rotary

American Pulverizer, St. Louis, MO  
Bepex International LLC, Minneapolis, MN  
Boerger Pumps, Chanhassen, MN  
Munson Machinery Company, Inc., Utica, NY  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

## Crushers, rotary blade

Boerger Pumps, Chanhassen, MN  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Disintegration equipment parts & accessories

Bepex International LLC, Minneapolis, MN  
Herbold Meckesheim USA, Resource Recycling Systems Inc., Statersville, RI  
Security Engineered Machinery, Westboro, MA

## Flakers

Herbold Meckesheim USA, Resource Recycling Systems Inc., Statersville, RI  
Ludman Industries, Milwaukee, WI  
**SANDVIK PROCESS SYSTEMS, INC., 21 Campus Rd., Totowa, NJ 07512 (973-790-1600; FAX: 973-790-3377; e-mail: info@sandvik.com; web site: www.process-systems.sandvik.com)**

Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany

## Hogs

American Pulverizer, St. Louis, MO

## Lumpbreakers

American Pulverizer, St. Louis, MO  
Bepex International LLC, Minneapolis, MN

Dynamic Air Inc., St. Paul, MN  
FREWITT manufacturer of machines Ltd., WE CARE ABOUT MILLING, Fribourg, Switzerland  
**HEYL & PATTERSON INC., RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heylopatterson.com)**

Kemutec Group, Inc., Bristol, PA  
Kinergy Corp., Louisville, KY  
Material Transfer & Storage Inc., Allegan, MI  
Munson Machinery Company, Inc., Utica, NY  
Paul O. Abbe, Bensenville, IL  
Prater-Sterling, Bollingbrook, IL  
Stedman, Aurora, IN  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Lumpbreakers for solid & liquid systems

Charles Ross & Son Co., Hauppauge, NY  
FREWITT manufacturer of machines Ltd., WE CARE ABOUT MILLING, Fribourg, Switzerland  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Mills, attrition

Air Products and Chemicals, Inc., Allentown, PA  
Bepex International LLC, Minneapolis, MN  
Munson Machinery Company, Inc., Utica, NY  
Paul O. Abbe, Bensenville, IL  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Mills, ball

Aaron Process Equipment Co., Bensenville, IL  
FRITSCH GmbH, Milling and Sizing, Idar-Oberstein, Germany  
Metso Minerals Industries, Inc., York, PA  
Paul O. Abbe, Bensenville, IL  
Tema Systems, Inc., Cincinnati, OH  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

## Mills, cage

Stedman, Aurora, IN  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Mills, colloid

Bematek Systems, Inc., Salem, MA  
Wilhelm Siefert GmbH & Co. KG, Velbert, Germany

## Mills, cone

FREWITT manufacturer of machines Ltd., WE CARE ABOUT MILLING, Fribourg, Switzerland  
Kemutec Group, Inc., Bristol, PA  
Quadro Engineering Corp., WATERLOO, Ontario, Canada

## Mills, disc

Charles Ross & Son Co., Hauppauge, NY  
FRITSCH GmbH, Milling and Sizing, Idar-Oberstein, Germany  
Modern Process Equipment, Inc., Chicago, IL  
Tema Systems, Inc., Cincinnati, OH  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Mills, grinding

Air Products and Chemicals, Inc., Allentown, PA  
AMANDUS KAHL GmbH & Co. KG, Reinbek, Germany  
American Pulverizer, St. Louis, MO

Bepex International LLC, Minneapolis, MN  
Charles Ross & Son Co., Hauppauge, NY  
FREWITT manufacturer of machines Ltd., WE CARE ABOUT MILLING, Fribourg, Switzerland  
FRITSCH GmbH, Milling and Sizing, Idar-Oberstein, Germany  
Kemutec Group, Inc., Bristol, PA  
Metso Minerals Industries, Inc., York, PA  
Modern Process Equipment, Inc., Chicago, IL  
NEUHAUS NEOTEC Maschinen- und Anlagenbau GmbH, Germany  
Particle Reduction Service, Elk Grove Village, IL  
Paul O. Abbe, Bensenville, IL  
Prater-Sterling, Bollingbrook, IL  
Quadro Engineering Corp., WATERLOO, Ontario, Canada  
Tema Systems, Inc., Cincinnati, OH

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

## Mills, hammer

AMANDUS KAHL GmbH & Co. KG, Reinbek, Germany  
American Pulverizer, St. Louis, MO  
Bepex International LLC, Minneapolis, MN  
FREWITT manufacturer of machines Ltd., WE CARE ABOUT MILLING, Fribourg, Switzerland  
Munson Machinery Company, Inc., Utica, NY  
Prater-Sterling, Bollingbrook, IL  
Stedman, Aurora, IN

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

## Mills, homogenizing

**ADMIX INC., 234 Abby Rd., Manchester, NH 03103 (800-466-2369; 603-627-2340; FAX: 603-627-2019; e-mail: mixing@admix.com; web site: www.admix.com)**

Bematek Systems, Inc., Salem, MA  
Bepex International LLC, Minneapolis, MN  
Charles Ross & Son Co., Hauppauge, NY  
FREWITT manufacturer of machines Ltd., WE CARE ABOUT MILLING, Fribourg, Switzerland  
Modern Process Equipment, Inc., Chicago, IL  
Wilhelm Siefert GmbH & Co. KG, Velbert, Germany

## Mills, impact

American Pulverizer, St. Louis, MO  
Bepex International LLC, Minneapolis, MN  
FREWITT manufacturer of machines Ltd., WE CARE ABOUT MILLING, Fribourg, Switzerland  
FRITSCH GmbH, Milling and Sizing, Idar-Oberstein, Germany  
Munson Machinery Company, Inc., Utica, NY  
Quadro Engineering Corp., WATERLOO, Ontario, Canada  
Stedman, Aurora, IN

**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

## Mills, jacketed ball

Paul O. Abbe, Bensenville, IL  
Tema Systems, Inc., Cincinnati, OH  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

## Mills, jet

AAAMachine, Inc., Des Plaines, IL  
Particle Reduction Service, Elk Grove Village, IL  
PSL USA, Boise, ID

## Mills, other

FREWITT manufacturer of machines Ltd., WE CARE ABOUT MILLING, Fribourg, Switzerland  
Modern Process Equipment, Inc., Chicago, IL

## Mills, pebble

Paul O. Abbe, Bensenville, IL

## Mills, pug

**HEYL & PATTERSON INC., RENNEBURG DIVISION, PO**  
Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX:  
412-788-9822; e-mail: info@heylypatterson.com; web  
site: www.heylypatterson.com)

## Mills, ring roll

American Pulverizer, St. Louis, MO  
**WABASH POWER EQUIPMENT CO., 444 Carpenter**  
Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-  
2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@  
wabashpower.com; web site: www.wabashpower.  
com)

## Mills, rod

Paul O. Abbe, Bensenville, IL  
**WABASH POWER EQUIPMENT CO., 444 Carpenter**  
Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-  
2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@  
wabashpower.com; web site: www.wabashpower.  
com)  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee,**  
NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail:  
sales@wyssmont.com; web site: www.wyssmont.  
com)

See our ad on page 133

## Mills, roller

AMANDUS KAHL GmbH & Co. KG, Reinbek, Germany  
Buhler Inc., Minneapolis, MN  
Charles Ross & Son Co., Hauppauge, NY  
EXAKT Technologies, Inc., Oklahoma City, OK  
Ludman Industries, Milwaukee, WI  
Modern Process Equipment, Inc., Chicago, IL  
NEUHAUS NEOTECH Maschinen- und Anlagenbau GmbH,  
Germany

**WABASH POWER EQUIPMENT CO., 444 Carpenter**  
Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-  
2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@  
wabashpower.com; web site: www.wabashpower.  
com)

## Mills, tube

Paul O. Abbe, Bensenville, IL

## Mills, tumbling

Paul O. Abbe, Bensenville, IL

## Mills, vertical

AAAmachine, Inc., Des Plaines, IL  
Bepex International LLC, Minneapolis, MN  
**WABASH POWER EQUIPMENT CO., 444 Carpenter**  
Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-  
2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@  
wabashpower.com; web site: www.wabashpower.  
com)

## Refiners, particle size

Particle Reduction Service, Elk Grove Village, IL

## Shredders

Alexanderwerk AG, Remscheid, Germany  
American Pulverizer, St. Louis, MO  
Bepex International LLC, Minneapolis, MN  
Boerger Pumps, Chanhassen, MN  
Herbold Mackesheim USA, Resource Recycling Systems  
Inc., Slatersville, RI  
Munson Machinery Company, Inc., Utica, NY  
Security Engineered Machinery, Westboro, MA  
**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee,**  
NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail:  
sales@wyssmont.com; web site: www.wyssmont.  
com)

See our ad on page 133

## TOWERS & COLUMNS

### Columns, absorption or adsorption

Advanced Industrial Technology Corp., Paramus, NY  
AirSep Corporation, A Chart Industries Company, Buffalo,  
NY  
**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg,**  
NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail:  
alauqa@mindspring.com; web site: www.alauqa.  
com)  
**BIONOMIC INDUSTRIES INC., 777 Corporate Dr., Mah-**  
wah, NJ 07430-2008 (800-311-6767; 201-529-1094;  
FAX: 201-529-0252; e-mail: sales@bionomicind.com;  
web site: www.bionomicind.com)  
Dual/HEE, a CECO Environmental Company, Owosso, MI

**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen,**  
Germany 76275 (49-7243-7050; FAX: 49-7243-705330;  
e-mail: gea-wiegand.info@gea.com; web site: www.  
gea.com)

**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33030**  
(305 233-4249; FAX: 305 233-8687; e-mail: sales@  
kimre.com; web site: www.kimre.com)  
Midwest Steel Company Inc, Houston, Texas  
**PRAJ INDUSTRIES LIMITED, Praj Tower# 274 & 275,**  
Bhumkar Chowk-Hinjewadi Road., Hinjewadi, Pune,  
India 411057. (+912022951511; FAX: +912022951718;  
e-mail: info@praj.net; web site: www.praj.net)

Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65,**  
Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX:  
+41 52 262 00 60; e-mail: chemtech@sulzer.com; web  
site: www.sulzer.com)

### Columns, bubble cap

RA5 Process Equipment Inc., Robbinsville, NJ  
Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65,**  
Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX:  
+41 52 262 00 60; e-mail: chemtech@sulzer.com; web  
site: www.sulzer.com)

### Columns, contacting or mixing

RA5 Process Equipment Inc., Robbinsville, NJ

### Columns, custom fabricated

Dual/HEE, a CECO Environmental Company, Owosso, MI  
Enerquip, LLC, Medford, WI  
Patterson Ind. Canada, of All-Weld Company Limited,  
Scarborough, Ontario, Canada  
Pope Scientific, Inc., Saukville, WI  
RA5 Process Equipment Inc., Robbinsville, NJ  
Team Industries, Inc., Kaukauna, WI

### Columns, fluidized bed

CPFD-Software, Albuquerque, New Mexico  
GEA Process Engineering, Columbia, MD

### Columns, graphite

Nantong Fareast Chemical Equipment Co. LTD, Interna-  
tional Trading, Nantong, Peoples Rep. of China

### Columns, packed

Advanced Industrial Technology Corp., Paramus, NJ  
**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg,**  
NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail:  
alauqa@mindspring.com; web site: www.alauqa.  
com)

**BIONOMIC INDUSTRIES INC., 777 Corporate Dr., Mah-**  
wah, NJ 07430-2008 (800-311-6767; 201-529-1094;  
FAX: 201-529-0252; e-mail: sales@bionomicind.com;  
web site: www.bionomicind.com)

De Dietrich Process Systems GmbH, Mainz, Germany  
DELTA COOLING TOWERS INC., 185 US Highway 206,  
Roxbury Township, NJ 07836 (973-586-2201; FAX: 973-  
586-2243; e-mail: info@deltacooling.com; web site: www.  
deltacooling.com)

Dual/HEE, a CECO Environmental Company, Owosso, MI  
FABRICATED PLASTICS LIMITED, MAPLE, Canada  
Pope Scientific, Inc., Saukville, WI  
Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65,**  
Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX:  
+41 52 262 00 60; e-mail: chemtech@sulzer.com; web  
site: www.sulzer.com)

### Columns, thin film

Pope Scientific, Inc., Saukville, WI

### Columns, vacuum

Pope Scientific, Inc., Saukville, WI  
Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65,**  
Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX:  
+41 52 262 00 60; e-mail: chemtech@sulzer.com; web  
site: www.sulzer.com)

### Columns, valve tray

Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65,**  
Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX:  
+41 52 262 00 60; e-mail: chemtech@sulzer.com; web  
site: www.sulzer.com)

### Distillation columns, automatic packaged unit

**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg,**  
NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail:  
alauqa@mindspring.com; web site: www.alauqa.  
com)

CTP Corp., Northport, NY  
Pope Scientific, Inc., Saukville, WI  
Progressive Recovery Inc., Duplo, IL

### Distillation columns, molecular distillation

Busz-SMS-Canzler GmbH, Butzbach, Germany  
GEA Process Engineering, Columbia, MD  
**GIG KARASEK GMBH, Neusiedlerstrasse 15-19, Glogn-**  
nitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX:  
+43-2662-42824; e-mail: office@gigkarasek.at; web  
site: www.gigkarasek.com)  
Pope Scientific, Inc., Saukville, WI

### Distillation columns, sieve tray

Advanced Industrial Technology Corp., Paramus, NJ  
**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg,**  
NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail:  
alauqa@mindspring.com; web site: www.alauqa.  
com)

AMACS, Houston, TX  
**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen,**  
Germany 76275 (49-7243-7050; FAX: 49-7243-705330;  
e-mail: gea-wiegand.info@gea.com; web site: www.  
gea.com)

GEA Process Engineering, Columbia, MD  
Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65,**  
Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX:  
+41 52 262 00 60; e-mail: chemtech@sulzer.com; web  
site: www.sulzer.com)

### Distillation columns, steam stripping

Advanced Industrial Technology Corp., Paramus, NJ  
**ALAUQA, INC., 7004 Blvd. East, Suite 28A, Guttenberg,**  
NJ 07093 (201-758-1577; FAX: 201-758-1522; e-mail:  
alauqa@mindspring.com; web site: www.alauqa.  
com)

**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen,**  
Germany 76275 (49-7243-7050; FAX: 49-7243-705330;  
e-mail: gea-wiegand.info@gea.com; web site: www.  
gea.com)

GEA Process Engineering, Columbia, MD  
Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65,**  
Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX:  
+41 52 262 00 60; e-mail: chemtech@sulzer.com; web  
site: www.sulzer.com)

### Distillation columns, vapor compression

**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen,**  
Germany 76275 (49-7243-7050; FAX: 49-7243-705330;  
e-mail: gea-wiegand.info@gea.com; web site: www.  
gea.com)

GEA Process Engineering, Columbia, MD  
Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65,**  
Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX:  
+41 52 262 00 60; e-mail: chemtech@sulzer.com; web  
site: www.sulzer.com)

### Online diagnostics of columns

TowerScan, Sarnia, Ontario, Canada  
TowerScan, Port Huron, MI

### Tower parts & accessories

AMACS, Houston, TX  
**COASTAL TECHNOLOGIES INC., P.O. Box 624, Hamp-**  
ton, SC 29924 (803-943-4822; FAX: 803-943-4744;  
e-mail: sales@cti-sc.com; web site: www.coastalt-  
echnologiesinc.com)

Sulzer Chemtech USA, Inc., Tulsa, OK  
**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65,**  
Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX:  
+41 52 262 00 60; e-mail: chemtech@sulzer.com; web  
site: www.sulzer.com)  
Swager Communications, Fremont, IN

## WATER TREATMENT EQUIPMENT

### Boiler feedwater systems

Bryan Steam LLC, Peru, IN  
GEA Engineering, P.C., Nanuet, NY  
Hydro-Thermal Corp., Waukesha, WI  
HydroTec Systems Co., Inc., Tiskilwa, IL  
**INDECK POWER EQUIPMENT CO., 1111 Willis Ave.**  
(CE), Wheeling, IL 60090 (800-446-3325; 847-541-  
8300; FAX: 847-541-9984; e-mail: info@indeck-power.  
com; web site: www.indeck.com)  
Siemens Industry, Inc. - Water Technologies, Alpharetta,  
GA  
Topog-E Gasket Co., Tulsa, OK  
Veolia Water Solutions & Technologies, Moon Township, PA

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## Cooling-water treatment, chemical

Petron Plus Global, Inc., Hutchinson, Kansas  
sera ProDos GmbH, Immenhausen, Germany  
Veolia Water Solutions & Technologies, Moon Township, PA

## Desalination units

**ALAQUA, INC.**, 7004 Blvd. East, Suite 28A, Guttenberg, NJ 07083 (201-758-1577; FAX: 201-758-1522; e-mail: alaquainc@mindspring.com; web site: www.alaquainc.com)

Ameridia, Div. of Eurodia Industries, Somerset, NJ  
Cat Pumps, Minneapolis, MN  
GEA Engineering, P.C., Nanuet, NY  
HydroTec Systems Co., Inc., Tiskilwa, IL  
PCA GmbH, Heusweiler, Germany

## Electrodialysis units

Ameridia, Div. of Eurodia Industries, Somerset, NJ  
beroplan GmbH Membran- und Prozesstechnik, St. Ingbert, Germany  
PCA GmbH, Heusweiler, Germany

## Hypochlorinators

Fluid Metering, Inc., Syosset, NY

## Ion exchanger equipment

Ameridia, Div. of Eurodia Industries, Somerset, NJ  
HydroTec Systems Co., Inc., Tiskilwa, IL  
TIGG Corporation, Oakdale, PA  
United Manufacturing International 2000, Red Bluff, CA  
Veolia Water Solutions & Technologies, Moon Township, PA

## Ozonators

Air Products and Chemicals, Inc., Allentown, PA  
AirSep Corporation, A Chart Industries Company, Buffalo, NY  
Elmridge Inc., Livonia, MI

## Precipitators, water treating

Mefiag, a CECO Environmental Company, Owosso, MI  
Veolia Water Solutions & Technologies, Moon Township, PA

## Resins, ion exchange

**LANXESS CORPORATION**, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)  
United Manufacturing International 2000, Red Bluff, CA

## Reverse osmosis systems

beroplan GmbH Membran- und Prozesstechnik, St. Ingbert, Germany

Cat Pumps, Minneapolis, MN

Filtration & Membrane Technology, Inc., Houston, TX

**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)**

GEA Engineering, P.C., Nanuet, NY

GEA Process Engineering, Columbia, MD

HydroTec Systems Co., Inc., Tiskilwa, IL

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

ProSonic LLC, Milwaukee, WI  
Siemens Industry, Inc. - Water Technologies, Alpharetta, GA  
Veolia Water Solutions & Technologies, Moon Township, PA

**WABASH POWER EQUIPMENT CO.**, 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)

## Ultrafiltration systems

Argonide Corporation, Sanford, FL  
beroplan GmbH Membran- und Prozesstechnik, St. Ingbert, Germany

**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen, Germany 76275 (49-7243-7050; FAX: 49-7243-705330; e-mail: gea-wiegand.info@gea.com; web site: www.gea.com)**

GEA Engineering, P.C., Nanuet, NY

GEA Process Engineering, Columbia, MD

Membrana, Charlotte, NC

Veolia Water Solutions & Technologies, Moon Township, PA  
Westech Engineering Inc., Salt Lake City, UT

## Ultraviolet disinfection systems

Newman Regency Group, Stafford, TX

## Water-conditioning package systems

Acriston Inc., Moonachie, NJ

DELTA COOLING TOWERS INC., 185 US Highway 206, Roxbury Township, NJ 07836 (973-586-2201; FAX: 973-586-2243; e-mail: info@deltacoooling.com; web site: www.deltacoooling.com)

HydroTec Systems Co., Inc., Tiskilwa, IL  
sera ProDos GmbH, Immenhausen, Germany  
Veolia Water Solutions & Technologies, Moon Township, PA

## Water pollution systems

ADI Systems Inc., Fredericton, New Brunswick, Canada  
Air Products and Chemicals, Inc., Allentown, PA  
Delta Cooling Towers Inc., 185 US Highway 206, Roxbury Township, NJ 07836 (973-586-2201; FAX: 973-586-2243; e-mail: info@deltacoooling.com; web site: www.deltacoooling.com)

Duall/HEE, a CECO Environmental Company, Owosso, MI  
Entex Technologies Inc., Chapel Hill, NC

GEA Engineering, P.C., Nanuet, NY  
Jacobi Carbons, Inc., Columbus, OH

**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)

See our ad on page 135

Siemens Industry, Inc. - Water Technologies, Alpharetta, GA  
TIGG Corporation, Oakdale, PA  
Veolia Water Solutions & Technologies, Moon Township, PA

## Water treatment control equipment

Biowater Technology, Cumberland, Rhode Island

Dr. Thiedig GmbH & Co KG, Berlin, Germany

Encon Evaporators, Hooksett, NH

Entex Technologies Inc., Chapel Hill, NC

sera ProDos GmbH, Immenhausen, Germany

**SIERRA INSTRUMENTS, INC.**, 5 Harris Ct., Bldg. L, Monterey, CA 93940 (800-866-0200; 831-373-0200; FAX: 831-373-4402; e-mail: info@sierrainstruments.com; web site: www.sierrainstruments.com)

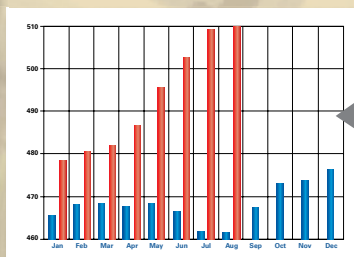
Veolia Water Solutions & Technologies, Moon Township, PA  
Walchem, IWAKI America, Inc., Holliston, MA

Get *Chemical Engineering's* Plant Cost Index to improve plant cost estimates...and delivered in advance of the print edition!

For more than 40 years, chemical process industries professionals- engineers, manager and technicians, have used *Chemical Engineering's* Plant Cost Index to adjust process plant construction costs from one period to another.

This database includes all annual archives (1947 to present) and monthly data archives (1970 to present). Instead of waiting more than two weeks for the print or online version of *Chemical Engineering* to arrive, subscribers can access new data as soon as it's calculated.

	Sep '06 Prelim.	Aug '06 Final	Sep '05 Final
CE Index	513.1	510.0	467.2
Equipment	606.5	602.3	541.2
Heat Exchanges and Tanks	565.1	560.9	509.2
Process Machinery	559.6	556.2	521.7
Pipe, valves and fittings	734.7	731.7	620.8
Process Instruments	441.4	437.2	379.5
Pumps and Compressions	788.9	788.3	756.3
Electrical equipment	418.9	414.2	374.6
Structural supports	643.7	637.7	579.3
Construction Labor	314.7	312.9	309.1
Buildings	476.9	475.2	444.7
Engineering Supervision	350.7	351.9	346.9



Resources included with *Chemical Engineering's* Plant Cost Index:

- Electronic notification of monthly updates as soon as they are available
- All annual data archives (1947 to present)
- Monthly data archives (1970 to present)
- Option to download in Excel format

Subscribe today at [www.chemengonline.com/pci](http://www.chemengonline.com/pci)

# 6

# ENGINEERING MATERIALS

- 158 Aluminum & aluminum alloys**
- 158 Ceramics, including glass**
- 158 Composites**
- 158 Copper & copper alloys**
- 158 Insulation materials**
- 159 Iron & iron alloys**
- 159 Lubricants**
- 159 Materials for buildings & building construction**
- 159 Metals & alloys, other nonferrous**
- 160 Nickel & nickel alloys**
- 160 Plastics materials**
- 160 Protective coatings & linings**
- 160 Refractory materials**
- 161 Rubber & rubberlike materials**
- 161 Stainless Steels**
- 161 Steels**

---

## **DISPLAY ADVERTISERS IN THIS SECTION**

Saint-Gobain Ceramics	158
-----------------------	-----

# PRODUCT DIRECTORY

## ALUMINUM & ALUMINUM ALLOYS

### Aluminum

TW Metals, Exton, PA

### Aluminum alloys

Milward Alloys, Lockport, NY

## CERAMICS, INCLUDING GLASS

### Carbides

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

Saint-Gobain Ceramics/Structural Ceramics, Niagara Falls, NY

### Carbon & graphite

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

CG Thermal LLC, Twinsburg, Ohio  
Scenic Precise Element Inc., Kaohsiung City, Taiwan

### Fibers, mineral

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

### Fused silica

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

Technical Glass Products, Painesville, OH

### Glass

De Dietrich Process Systems GmbH, Mainz, Germany  
Goel Scientific Glass Works, Baroda, India  
Technical Glass Products, Painesville, OH

### Porcelain & stoneware, chemical

P-Ker Engineering, Waterport, NY

### Powders, ceramic

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

### Quartz

Technical Glass Products, Painesville, OH

### Silicon carbide

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

RKI Instruments, Inc., Union City, CA  
Saint-Gobain Ceramics/Structural Ceramics, Niagara Falls, NY  
Scenic Precise Element Inc., Kaohsiung City, Taiwan

### Tile

Abresist Kalenborn Corporation, Urbana, IN  
Saint-Gobain Ceramics/Structural Ceramics, Niagara Falls, NY

## COMPOSITES

### Carbon-carbon composites

Creative Pultrusions, Inc., Alum Bank, PA  
Greene, Tweed & Co., Kulpsville, PA

### Ceramic metals

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

P-Ker Engineering, Waterport, NY

## Engineering materials

## COPPER & COPPER ALLOYS

### Brass

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

### Bronze

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

### Copper

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

### Copper alloys, other

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

Milward Alloys, Lockport, NY  
Wall Colmonoy Corporation, Madison Heights, MI

## INSULATION MATERIALS

### Insulation, asbestos replacement

ZIRCAR Refractory Composites, Inc., Florida, NY

### Insulation, coatings & sealers

Synthetic Surfaces Inc., Scotch Plains, NJ  
ZIRCAR Refractory Composites, Inc., Florida, NY

### Insulation, glass fiber

Technical Glass Products, Painesville, OH

# HEXOLOY<sup>®</sup> SILICON CARBIDE

The Name  
That Makes  
A World  
Of Difference



No other company in the world has more expertise with silicon carbide than Saint-Gobain Ceramics. Our Hexoloy<sup>®</sup> sintered alpha silicon carbide is the material of choice for high performance applications in a variety of chemical processing industries throughout the worldwide market. Hexoloy components are custom made and offer excellent performance at temperatures up to 1650°C (3000°F), universal corrosion resistance, excellent wear resistance, high strength, and high thermal conductivity. Wherever you're located in the global market, specify Hexoloy silicon carbide, the name that delivers performance you can count on.

Saint-Gobain Ceramics  
23 Acheson Drive  
Niagara Falls, New York 14303

Telephone: 716-278-6233  
Fax: 716-278-2373  
[scd.sales@saint-gobain.com](mailto:scd.sales@saint-gobain.com)

[www.hexoloy.com](http://www.hexoloy.com)





## Insulation, high temperature

P-Ker Engineering, Watport, NY  
Sauereisen, Pittsburgh, PA  
ZIRCAR Refractory Composites, Inc., Florida, NY

## Insulation, low temperature

Meyer Tool & Mfg., Inc., oaklawn, IL

## Insulation, refractory

Christy Catalytics LLC, St. Louis, MO  
Sauereisen, Pittsburgh, PA  
ZIRCAR Refractory Composites, Inc., Florida, NY

## Insulation, urethane foam

Bayer MaterialScience LLC, Pittsburgh, PA

## Jacketing, insulation

Polyguard Products, Inc., Ennis, TX

## IRON & IRON ALLOYS

### Cast irons

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

### Cast irons, alloy

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

### Cast irons, high-silicon

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

### Ductile iron

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

### Wrought iron

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

## LUBRICANTS

### Lubricants, engine oil

Petron Plus Global, Inc., Hutchinson, Kansas

### Lubricants, greases

Cortec Corp., St. Paul, MN  
CPI Wirecloth & Screens Inc, Pearlland, TX  
Petron Plus Global, Inc., Hutchinson, Kansas

### Lubricants, industrial oils

Petron Plus Global, Inc., Hutchinson, Kansas

### Lubricants, process oils

Petron Plus Global, Inc., Hutchinson, Kansas

## MATERIALS FOR BUILDINGS & BUILDING CONSTRUCTION

### Decking

Bustin Industrial Products, East Stroudsburg, PA  
Creative Pultrusions, Inc., Alum Bank, PA

### Flooring, acid resistant

Bustin Industrial Products, East Stroudsburg, PA  
Cass Polymers, Inc., Oklahoma City, OK  
Dudick Inc., Streetsboro, OH  
ITW Polymers Adhesives, North America, Danvers, MA  
Milamar Coatings L.L.C., Oklahoma City, OK  
Sauereisen, Pittsburgh, PA

### Flooring, aluminum

Bustin Industrial Products, East Stroudsburg, PA

### Flooring, carbon

Dudick Inc., Streetsboro, OH

### Flooring, fiberglass

Creative Pultrusions, Inc., Alum Bank, PA

### Flooring, iron & steel

Bustin Industrial Products, East Stroudsburg, PA

### Flooring, metal grid

Bustin Industrial Products, East Stroudsburg, PA

### Flooring, skid resistant

Bustin Industrial Products, East Stroudsburg, PA  
Cass Polymers, Inc., Oklahoma City, OK  
ITW Polymers Adhesives, North America, Danvers, MA  
Milamar Coatings L.L.C., Oklahoma City, OK  
Sauereisen, Pittsburgh, PA

### Wall materials, chemically resistant

Cass Polymers, Inc., Oklahoma City, OK  
Dudick Inc., Streetsboro, OH  
Milamar Coatings L.L.C., Oklahoma City, OK  
Sauereisen, Pittsburgh, PA

## METALS & ALLOYS, OTHER NONFERROUS

### Beryllium & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

### Chromium & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

Milward Alloys, Lockport, NY

### Cobalt alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

Milward Alloys, Lockport, NY

VDM Metals GmbH, Werdohl, NRW, Germany  
Wall Colmonoy Corporation, Madison Heights, MI

### Gold & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66  
BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Indium & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66  
BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
Milward Alloys, Lockport, NY

### Lead & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66  
Milward Alloys, Lockport, NY

### Magnesium

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

### Molybdenum & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66  
Regal Industries, Inc., Painesville, OH

### Niobium

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

### Palladium & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66  
BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Platinum & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66  
BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Selenium & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

### Silver & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66  
BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Tantalum & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

### Tellurium

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

### Thallium

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

### Tin & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

### Titanium & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66  
Milward Alloys, Lockport, NY  
VDM Metals GmbH, Werdohl, NRW, Germany

### Tungsten & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66  
Regal Industries, Inc., Painesville, OH  
Scenic Precise Element Inc., Kaohsiung City, Taiwan

### Zinc & alloys

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))  
See our ad on page 66

KDF Fluid Treatment, Inc., Three Rivers, MI  
Milward Alloys, Lockport, NY

## Zirconium

**AMERICAN ELEMENTS**, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

VDM Metals GmbH, Werdohl, NRW, Germany

## NICKEL & NICKEL ALLOYS

### Nickel

**AMERICAN ELEMENTS**, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

Corrosion Materials, Baker, LA

TW Metals, Exton, PA

United Performance Metals, Houston, TX

VDM Metals GmbH, Werdohl, NRW, Germany

### Nickel alloys

**AMERICAN ELEMENTS**, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

Corrosion Materials, Baker, LA

Regal Industries, Inc., Painesville, OH

**SANDVIK MATERIALS TECHNOLOGY, TUBULAR**

**PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-755-8823; 570-585-7500; FAX: 570-585-7642; web site: [www.smt.sandvik.com](http://www.smt.sandvik.com))**

See our ad on page 67

TW Metals, Exton, PA

United Performance Metals, Houston, TX

VDM Metals GmbH, Werdohl, NRW, Germany

Wall Colmonoy Corporation, Madison Heights, MI

### Nickel aluminum

**AMERICAN ELEMENTS**, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

## PLASTICS MATERIALS

### Acrylic copolymers

Momentive Specialty Chemicals, Epoxy, Phenolic & Coating Resins Division, Columbus, OH

### Acrylics

IMPACO, Inc., East Providence, RI

Momentive Specialty Chemicals, Epoxy, Phenolic & Coating Resins Division, Columbus, OH

### Epoxies

Cass Polymers, Inc., Oklahoma City, OK

Dudick Inc., Streetsboro, OH

Dymax Corp., Torrington, CT

Milamar Coatings L.L.C., Oklahoma City, OK

Transene Co. Inc., Danvers, MA

### Fiberglass-epoxy

Dudick Inc., Streetsboro, OH

### Fiberglass-polyester

Creative Pultrusions, Inc., Alum Bank, PA

Dudick Inc., Streetsboro, OH

### Fluorocarbons

Arkema Inc., King of Prussia, PA

Compressor Products International, Stafford, TX

### Foams, plastic

Bayer MaterialScience LLC, Pittsburgh, PA

### Nylon

**LANXESS CORPORATION**, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: [info@lanxess.com](mailto:info@lanxess.com); web site: [www.US.LANXESS.com](http://www.US.LANXESS.com))

### Plastics, other

Associated Bag Company, Milwaukee, WI

Bayer MaterialScience LLC, Pittsburgh, PA

Cortec Corp., St. Paul, MN

Creative Pultrusions, Inc., Alum Bank, PA

**LANXESS CORPORATION**, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: [info@lanxess.com](mailto:info@lanxess.com); web site: [www.US.LANXESS.com](http://www.US.LANXESS.com))

### Polycarbonates

Bayer MaterialScience LLC, Pittsburgh, PA

### Polyesters

Dudick Inc., Streetsboro, OH

**LANXESS CORPORATION**, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: [info@lanxess.com](mailto:info@lanxess.com); web site: [www.US.LANXESS.com](http://www.US.LANXESS.com))

ThyssenKrupp Industrial Solutions AG, Business Unit Process Technologies, Dortmund, Germany

### Polyethylenes

Associated Bag Company, Milwaukee, WI

Cortec Corp., St. Paul, MN

ThyssenKrupp Industrial Solutions AG, Business Unit Process Technologies, Dortmund, Germany

### Polypropylenes

Associated Bag Company, Milwaukee, WI

ThyssenKrupp Industrial Solutions AG, Business Unit Process Technologies, Dortmund, Germany

### Polytetrafluoroethylene

Compressor Products International, Stafford, TX

### Silicones

Transene Co. Inc., Danvers, MA

### Thermoplastic elastomers

Bayer MaterialScience LLC, Pittsburgh, PA

## PROTECTIVE COATINGS & LININGS

### Adhesives

Dymax Corp., Torrington, CT

ITW Polymers Adhesives, North America, Danvers, MA

Momentive Specialty Chemicals, Epoxy, Phenolic & Coating Resins Division, Columbus, OH

Synthetic Surfaces Inc., Scotch Plains, NJ

Transene Co. Inc., Danvers, MA

### Cargo Protection

Nier Systems Inc, Boca Raton, Florida

### Coatings, acrylic

Cortec Corp., St. Paul, MN

Dymax Corp., Torrington, CT

Momentive Specialty Chemicals, Epoxy, Phenolic & Coating Resins Division, Columbus, OH

Polyguard Products, Inc., Ennis, TX

### Coatings, ceramic

ITW Polymers Adhesives, North America, Danvers, MA

P-Ker Engineering, Waterport, NY

### Coatings, diffusion

Transene Co. Inc., Danvers, MA

Wall Colmonoy Corporation, Madison Heights, MI

### Coatings, epoxy

Cass Polymers, Inc., Oklahoma City, OK

Cortec Corp., St. Paul, MN

Dudick Inc., Streetsboro, OH

ITW Polymers Adhesives, North America, Danvers, MA

Midwesco Filter Resources, Inc., Winchester, VA

Milamar Coatings L.L.C., Oklahoma City, OK

Sauereisen, Pittsburgh, PA

Synthetic Surfaces Inc., Scotch Plains, NJ

Transene Co. Inc., Danvers, MA

### Coatings, fluoropolymer

Arkema Inc., King of Prussia, PA

### Coatings, metallic

Wall Colmonoy Corporation, Madison Heights, MI

### Coatings, nonskid

Cass Polymers, Inc., Oklahoma City, OK

Milamar Coatings L.L.C., Oklahoma City, OK

### Coatings, nonslip

Cass Polymers, Inc., Oklahoma City, OK

Milamar Coatings L.L.C., Oklahoma City, OK

### Coatings, nonstick

Fr. Jacob Soehne GmbH & Co. KG, Porta Westfalica, NRW, Germany

### Coatings, plastic

Arkema Inc., King of Prussia, PA

Dudick Inc., Streetsboro, OH

### Coatings, powder

Momentive Specialty Chemicals, Epoxy, Phenolic & Coating Resins Division, Columbus, OH

### Coatings, PVC

Synthetic Surfaces Inc., Scotch Plains, NJ

### Coatings, refractory

P-Ker Engineering, Waterport, NY

Sauereisen, Pittsburgh, PA

### Coatings, silicate

Sauereisen, Pittsburgh, PA

### Coatings, urethane

Bayer MaterialScience LLC, Pittsburgh, PA

Cass Polymers, Inc., Oklahoma City, OK

Dymax Corp., Torrington, CT

ITW Polymers Adhesives, North America, Danvers, MA

Milamar Coatings L.L.C., Oklahoma City, OK

### Coatings, vinyl ester

Sauereisen, Pittsburgh, PA

### Freight & Cargo Protection

Nier Systems Inc, Boca Raton, Florida

### Linings, basalt

Abresist Kalenborn Corporation, Urbana, IN

### Linings, cements & mortars

Abresist Kalenborn Corporation, Urbana, IN

Cortec Corp., St. Paul, MN

Dudick Inc., Streetsboro, OH

Sauereisen, Pittsburgh, PA

### Linings, ceramic

Abresist Kalenborn Corporation, Urbana, IN

Saint-Gobain Ceramics/Structural Ceramics, Niagara Falls, NY

### Linings, chlorosulfonated polyethylene

Watersaver Co., a division of CDI, Commerce City, CO

### Linings, epoxy

Cass Polymers, Inc., Oklahoma City, OK

Dudick Inc., Streetsboro, OH

Sauereisen, Pittsburgh, PA

### Linings, glass

Dueker GmbH & Co. KGaA, Laufach, Germany

### Linings, glass-reinforced plastic

Dudick Inc., Streetsboro, OH

ZCL Dualam, Inc., Edmonton, Alberta, Canada

### Linings, polyethylene

Associated Bag Company, Milwaukee, WI

Nier Systems Inc, Boca Raton, Florida

### Linings, refractory

Sauereisen, Pittsburgh, PA

ZIRCAR Refractory Composites, Inc., Florida, NY

### Linings, urethane

Bayer MaterialScience LLC, Pittsburgh, PA

Sauereisen, Pittsburgh, PA

### Linings, vinyl

Watersaver Co., a division of CDI, Commerce City, CO

### Paints

Cass Polymers, Inc., Oklahoma City, OK

Cortec Corp., St. Paul, MN

Milamar Coatings L.L.C., Oklahoma City, OK

### Sealants

Dymax Corp., Torrington, CT

IMPACO, Inc., East Providence, RI

ITW Polymers Adhesives, North America, Danvers, MA

## REFRACTORY MATERIALS

### Castables

**AMERICAN ELEMENTS**, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

### Foams, refractory

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

### Refractories

Advance Boiler & Tank Co., West Allis, WI  
AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

Christy Catalytics LLC, St. Louis, MO  
ZIRCAR Refractory Composites, Inc., Florida, NY

### Refractories, gunning

Sauereisen, Pittsburgh, PA

### Refractory mortars & cements

Advance Boiler & Tank Co., West Allis, WI  
Sauereisen, Pittsburgh, PA

## RUBBER & RUBBERLIKE MATERIALS

### Rubber, acrylic

Mallard Creek Polymers, Inc., Charlotte, NC

### Rubber, butyl

Apple Rubber Products, Lancaster, NY

# LANXESS

energizing Chemistry

LANXESS CORPORATION, 111 RIDC Park West Drive,  
Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: [info@lanxess.com](mailto:info@lanxess.com); web site: [www.US.LANXESS.com](http://www.US.LANXESS.com))

### Rubber, chlorinated polyethylene

Cachat, M. F., Co., Headquarters, Lakewood, OH

### Rubber, chlorosulfonated polyethylene

Cachat, M. F., Co., Headquarters, Lakewood, OH

### Rubber, ethylene propylene

LANXESS CORPORATION, 111 RIDC Park West Drive,  
Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: [info@lanxess.com](mailto:info@lanxess.com); web site: [www.US.LANXESS.com](http://www.US.LANXESS.com))

### Rubber, fluoroelastomers

Apple Rubber Products, Lancaster, NY  
Cachat, M. F., Co., Headquarters, Lakewood, OH

### Rubber, neoprene

Apple Rubber Products, Lancaster, NY  
Conveyor Components Co., Material Control, Inc., Crosswell, MI

LANXESS CORPORATION, 111 RIDC Park West Drive,  
Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: [info@lanxess.com](mailto:info@lanxess.com); web site: [www.US.LANXESS.com](http://www.US.LANXESS.com))

### Rubber, nitrile

Apple Rubber Products, Lancaster, NY  
Cachat, M. F., Co., Headquarters, Lakewood, OH  
LANXESS CORPORATION, 111 RIDC Park West Drive,  
Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: [info@lanxess.com](mailto:info@lanxess.com); web site: [www.US.LANXESS.com](http://www.US.LANXESS.com))

Mallard Creek Polymers, Inc., Charlotte, NC

### Rubber, polybutadiene

LANXESS CORPORATION, 111 RIDC Park West Drive,  
Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: [info@lanxess.com](mailto:info@lanxess.com); web site: [www.US.LANXESS.com](http://www.US.LANXESS.com))

Mallard Creek Polymers, Inc., Charlotte, NC

### Rubber, silicone

Apple Rubber Products, Lancaster, NY  
Momentive Performance Materials Inc., Waterford, NY

### Rubber, styrene butadiene

Apple Rubber Products, Lancaster, NY  
LANXESS CORPORATION, 111 RIDC Park West Drive,  
Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: [info@lanxess.com](mailto:info@lanxess.com); web site: [www.US.LANXESS.com](http://www.US.LANXESS.com))

Mallard Creek Polymers, Inc., Charlotte, NC

### Rubber, synthetic, other

Cachat, M. F., Co., Headquarters, Lakewood, OH  
LANXESS CORPORATION, 111 RIDC Park West Drive,  
Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: [info@lanxess.com](mailto:info@lanxess.com); web site: [www.US.LANXESS.com](http://www.US.LANXESS.com))

### Rubber, urethane

ITW Polymers Adhesives, North America, Danvers, MA

LANXESS CORPORATION, 111 RIDC Park West Drive,  
Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: [info@lanxess.com](mailto:info@lanxess.com); web site: [www.US.LANXESS.com](http://www.US.LANXESS.com))

## STAINLESS STEELS

### Stainless steels, AISI 300 series

Arch City Steel, Fenton, Missouri  
SANDVIK MATERIALS TECHNOLOGY, TUBULAR PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-755-8823; 570-585-7500; FAX: 570-585-7642; web site: [www.smt.sandvik.com](http://www.smt.sandvik.com))

See our ad on page 67

United Performance Metals, Houston, TX

### Stainless steels, AISI 400 series

SANDVIK MATERIALS TECHNOLOGY, TUBULAR PRODUCTS, P.O. Box 1220, Scranton, PA 18501 (800-755-8823; 570-585-7500; FAX: 570-585-7642; web site: [www.smt.sandvik.com](http://www.smt.sandvik.com))

See our ad on page 67

## STEELS

### Carbon steels

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

### High alloy steels

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

### Low alloy steels

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

### Medium alloy steels

AMERICAN ELEMENTS, Los Angeles, California 90024  
(310-208-0551; FAX: 310-208-0351; e-mail: [customerservice@americanelements.com](mailto:customerservice@americanelements.com); web site: [www.americanelements.com](http://www.americanelements.com))

See our ad on page 66

*The Chemical Engineering store offers a variety of industry topics you will come to rely on.*



- Environmental Management: Air-Pollution Control
- Environmental Management: Wastewater and Groundwater Treatment
- Fluid Handling

- Gas-Solid and Liquid-Solid Separation
- Liquid-Liquid and Gas-Liquid Separation
- Managing Bulk Solids
- Instrumentation
- Managing Steam

- Compressors
- Advanced Engineering
- Process Automation
- Plus much more

For a complete list of products, visit the *Chemical Engineering* store now. [store.chemengonline.com/store](http://store.chemengonline.com/store)

CHEMICAL  
ENGINEERING

# 7 PLANT MAINTENANCE

- 162** Cleaning equipment & services
- 163** Equipment repair & rebuilding
- 163** Fire protection equipment
- 163** Maintenance tools & equipment  
& replacement parts
- 163** Noise & vibration suppression equipment
- 164** Safety equipment & systems

---

## **CLEANING EQUIPMENT & SERVICES**

### **Acid mist/Gas cleaning**

**BELTRAN TECHNOLOGIES, INC.**, 1133 East 35 Street, Brooklyn, New York 11210 (718-338-3311; FAX: 718-253-9028; e-mail: [info@beltrantechnologies.com](mailto:info@beltrantechnologies.com); web site: [www.beltrantechnologies.com](http://www.beltrantechnologies.com))

### **Cleaners & refacers, tube**

Clean Harbors, Norwell, MA  
Goodway Technologies Corp., Stamford, CT

### **Cleaning chemicals & services**

Clean Harbors, Norwell, MA  
Cortec Corp., St. Paul, MN  
Spartan Chemical Services Inc., Jersey City, NJ  
Transene Co. Inc., Danvers, MA

### **Cleaning equipment, blast**

Hammelmann Corp., Miamisburg, OH  
Uraca GmbH & Co. KG, Bad Urach, Germany  
Veolia Environmental Services, Chicago, Illinois

### **Cleaning equipment, chemical**

Advance, Plymouth, MN  
GEA Process Engineering, Columbia, MD  
Hydro-Thermal Corp., Waukesha, WI  
NexGen Enviro Systems Inc., Lindenhurst, NY  
Petron Plus Global, Inc., Hutchinson, Kansas  
Singleton Corp., Cleveland, OH  
Veolia Environmental Services, Chicago, Illinois

### **Cleaning equipment, high-pressure liquid**

Advance, Plymouth, MN  
Cat Pumps, Minneapolis, MN  
GEA Process Engineering, Columbia, MD  
Goodway Technologies Corp., Stamford, CT  
Hammelmann Corp., Miamisburg, OH  
Hannay Reels Inc., Westerlo, NY  
INOX-TECH INC., Ste. Catherine, Canada  
Spraying Systems Co., Wheaton, IL  
Uraca GmbH & Co. KG, Bad Urach, Germany  
Veolia Environmental Services, Chicago, Illinois  
WOMA Corp., Edison, NJ

### **Cleaning equipment, mechanical**

Advance, Plymouth, MN

GEA Process Engineering, Columbia, MD  
Goodway Technologies Corp., Stamford, CT

### **Cleaning equipment, pharmaceutical**

Bioengineering AG, Wald, Switzerland  
Bioengineering Inc., Somerville, MA  
GEA Process Engineering, Columbia, MD  
Hydro-Thermal Corp., Waukesha, WI  
Pick Heaters Inc., West Bend, WI

### **Cleaning equipment, steam**

Hydro-Thermal Corp., Waukesha, WI  
Pick Heaters Inc., West Bend, WI  
Topog-E Gasket Co., Tulsa, OK

### **Cleaning equipment, tank cleaning**

Bioengineering Inc., Somerville, MA  
Butterworth Inc., Houston, TX  
Hammelmann Corp., Miamisburg, OH  
Hydro-Thermal Corp., Waukesha, WI  
Spraying Systems Co., Wheaton, IL  
Uraca GmbH & Co. KG, Bad Urach, Germany

Veolia Environmental Services, Chicago, Illinois  
WOMA Corp., Edison, NJ

## Cleaning parts & accessories

Butterworth Inc., Houston, TX  
Hammelmann Corp., Miamisburg, OH  
NexGen Enviro Systems Inc., Lindenhurst, NY  
PP PUBLICO Publications, Essen, NRW, Germany

## Sweepers

Advance, Plymouth, MN  
Industrial Magnetics, Inc., Boyne City, MI

## Vacuum cleaning systems

Clean Harbors, Norwell, MA  
Goodway Technologies Corp., Stamford, CT  
Vector Technologies Ltd., Milwaukee, WI  
Veolia Environmental Services, Chicago, Illinois

## Washers

Goodway Technologies Corp., Stamford, CT  
NexGen Enviro Systems Inc., Lindenhurst, NY  
Progressive Recovery Inc., Duplo, IL

## EQUIPMENT REPAIR & REBUILDING

### Pipeline rehabilitation processes

Team Industrial Services, Inc., Alvin, TX

### Pressure vessel repair

Advance Boiler & Tank Co., West Allis, WI  
BORSIG GmbH, Berlin, Germany  
HydroPro Inc., Engineering & Manufacturing, Bourbon  
Sulzer Chemtech USA, Inc., Tulsa, OK  
Team Industrial Services, Inc., Alvin, TX

### Pump repair

Wall Colmonoy Corporation, Madison Heights, MI

### Valve repair

BORSIG GmbH, Berlin, Germany  
HOERBIGER Kompressorstechnik Holding GmbH, Vienna, Austria

Team Industrial Services, Inc., Alvin, TX  
Wall Colmonoy Corporation, Madison Heights, MI

### Weld heat-treating

Wall Colmonoy Corporation, Madison Heights, MI

## FIRE PROTECTION EQUIPMENT

### Deluge systems

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

### Fire alarm systems

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

### Fire detection systems

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

General Monitors, Lake Forest, CA  
Red Dog Services LLC, Allen, TX  
Sensor Electronics Corp., Minneapolis, MN

### Fire extinguishers, portable

Red Dog Services LLC, Allen, TX  
Sensor Electronics Corp., Minneapolis, MN  
SPILL CONTAINMENT DIRECT, 208 Capital Dr., Buffalo, MN 55313 (7637623453; 7637623453; e-mail: sales@spillcontainmentdirect.com)

### Fire extinguishing systems, carbon dioxide

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

Sensor Electronics Corp., Minneapolis, MN

### Fire extinguishing systems, dry chemical

Sensor Electronics Corp., Minneapolis, MN

### Fire extinguishing systems, foam

Red Dog Services LLC, Allen, TX  
Sensor Electronics Corp., Minneapolis, MN

### Fire extinguishing systems, halogenated hydrocarbon

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

HEMCO CORPORATION, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemcocorp.com; web site: www.HEMCOcorp.com)

Sensor Electronics Corp., Minneapolis, MN

### Fire pumps

Schutte & Koerting, Treviso, PA

### Hose reels

Hannay Reels Inc., Westerlo, NY

### Smoke detection systems

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

### Spill response kits

Red Dog Services LLC, Allen, TX

### Sprinkler systems

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

## MAINTENANCE TOOLS & EQUIPMENT & REPLACEMENT PARTS

### Alloys, brazing

Wall Colmonoy Corporation, Madison Heights, MI

### Expanders, tube

HydroPro Inc., Engineering & Manufacturing, Bourbon  
USA INDUSTRIES, INC., 302 State Street, S. Houston, TX 77587 (800-456-8721; 713-941-3797; FAX: 713-941-1086; e-mail: info@usaindustries.com; web site: www.usaindustries.com)

### Leak sealing service

HydroPro Inc., Engineering & Manufacturing, Bourbon  
Team Industrial Services, Inc., Alvin, TX

### Lubricating equipment

Hannay Reels Inc., Westerlo, NY  
LA-MAN Corp., Mazepa, MN

### Machinery-alignment equipment

Elos Fixturlaser AB, Molndal, Sweden  
LUDECA, INC., Doral, FL

### Patching compounds

ITW Polymers Adhesives, North America, Danvers, MA

### Plant maintenance services

A Box 4 U, Wichita, Kansas  
Elos Fixturlaser AB, Molndal, Sweden  
PP PUBLICO Publications, Essen, NRW, Germany  
PRUEFTECHNIK, Ismaning, Germany  
SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)  
Team Industrial Services, Inc., Alvin, TX

### Rods, welding

Air Products and Chemicals, Inc., Allentown, PA

### Shaft-alignment equipment

Elos Fixturlaser AB, Molndal, Sweden  
LUDECA, INC., Doral, FL  
PRUEFTECHNIK, Ismaning, Germany

### Spray equipment, thermal

Wall Colmonoy Corporation, Madison Heights, MI

### Stud tensioners, hydraulic

Team Industrial Services, Inc., Alvin, TX

### Testing equipment, corrosion

Iris Inspection Services, Inc., Baytown, Texas  
Singleton Corp., Cleveland, OH

### Testing equipment, high pressure

Beamex, Inc., Marietta, GA  
TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)

See our ad on page 100

### Testing equipment, nondestructive

ATRS RheoSystems, Cannon Instrument Company, Borden-town, NJ  
PRUEFTECHNIK, Ismaning, Germany  
Raytek Corp., Santa Cruz, CA

### Tools & equipment, other

A Box 4 U, Wichita, Kansas  
Berndorf Band GmbH, Berndorf, Austria  
HydroPro Inc., Engineering & Manufacturing, Bourbon  
SGB GmbH, Siegen, Germany

### Tools, hand

CEJN Industrial Corp., Gurnee, Illinois  
Leister Technologies AG, Kaegiswil, Switzerland  
USA INDUSTRIES, INC., 302 State Street, S. Houston, TX 77587 (800-456-8721; 713-941-3797; FAX: 713-941-1086; e-mail: info@usaindustries.com; web site: www.usaindustries.com)

### Welding equipment

Hannay Reels Inc., Westerlo, NY  
Leister Technologies AG, Kaegiswil, Switzerland

## NOISE & VIBRATION SUPPRESSION EQUIPMENT

### Absorbers, vibration

Bascale Company, Inc., Houston, TX  
Isotech, Inc., Hatfield, PA  
McGill AirSilence LLC, Columbus, OH

### Analyzers, vibration

Isotech, Inc., Hatfield, PA  
LUDECA, INC., Doral, FL  
TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)

See our ad on page 100

### Insulation, acoustic

Isotech, Inc., Hatfield, PA

### Louvers, noise control

McGill AirSilence LLC, Columbus, OH

### Noise enclosures & barriers

EDWARDS US HEADQUARTERS, Sanborn, NY  
Isotech, Inc., Hatfield, PA  
McGill AirSilence LLC, Columbus, OH

### Silencers, exhaust

CU Services LLC, Elk Grove Village, IL  
CU SERVICES LLC, Elk Grove, IL  
EDWARDS US HEADQUARTERS, Sanborn, NY  
McGill AirSilence LLC, Columbus, OH

### Silencers, inline

CU Services LLC, Elk Grove Village, IL  
EDWARDS US HEADQUARTERS, Sanborn, NY  
McGill AirSilence LLC, Columbus, OH

### Silencers, intake

EDWARDS US HEADQUARTERS, Sanborn, NY  
McGill AirSilence LLC, Columbus, OH

### Testing instruments, vibration

LUDECA, INC., Doral, FL  
PRUEFTECHNIK, Ismaning, Germany  
Thermotron, Holland, MI  
TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)

See our ad on page 100

## SAFETY EQUIPMENT & SYSTEMS

### Air purifiers

SPX Flow Technology, Ocala, FL

### Antiskid materials

Bustin Industrial Products, East Stroudsburg, PA

### Aprons

Associated Bag Company, Milwaukee, WI

### Arresters, flame deflagration or detonation

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

Oseco, Broken Arrow, OK

### Arresters, flame, tank vent, inline

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

Oseco, Broken Arrow, OK

### Arresters, surge

Lightning Eliminators & Consultants, Inc., Boulder, CO

### Blowout doors & panels

BS & B Safety Systems, Inc., Tulsa, OK

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

Henderson Industrial Specialties, Waterdown, Ontario, Canada

Oseco, Broken Arrow, OK

### Climbing safety equipment

Sur-Loc Inc., Fremont, IN

### Clothing, chemical resistant

Associated Bag Company, Milwaukee, WI

### Containers, safety

Associated Bag Company, Milwaukee, WI  
Qosina, Edgewood, NY

### Coveralls

Qosina, Edgewood, NY

### Emergency shutdown systems

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

HIMA Paul Hildebrandt GmbH + Co KG, Bruehl, Germany  
Siemens AG, Karlsruhe, Germany

### Explosion isolation

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

Henderson Industrial Specialties, Waterdown, Ontario, Canada

Oseco, Broken Arrow, OK

REMBE GMBH, SAFETY+CONTROL, Gallbergweg 21, Brilon, Germany 59929 (49-2961-7405-0; FAX: 49-2961-50-714; e-mail: sales@rembe.de; web site: www.rembe.com)

REMBE, INC., 3809 Beam Road Ste K, Charlotte, NC 28217 (704.716.7022; FAX: 704.716.7025; e-mail: info@rembe.us; web site: www.rembe.us)

### Explosion suppression systems

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

HEMCO CORPORATION, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemcocorp.com; web site: www.HEMCOcorp.com)

Henderson Industrial Specialties, Waterdown, Ontario, Canada

### Explosion vents

BS & B Safety Systems, Inc., Tulsa, OK

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

Henderson Industrial Specialties, Waterdown, Ontario, Canada

HOERBIGER Kompressortechnik Holding GmbH, Vienna, Austria

Oseco, Broken Arrow, OK

REMBE GMBH, SAFETY+CONTROL, Gallbergweg 21, Brilon, Germany 59929 (49-2961-7405-0; FAX: 49-2961-50-714; e-mail: sales@rembe.de; web site: www.rembe.com)

REMBE, INC., 3809 Beam Road Ste K, Charlotte, NC 28217 (704.716.7022; FAX: 704.716.7025; e-mail: info@rembe.us; web site: www.rembe.us)

Scientific Dust Collectors, Alsip, IL

### Explosion Testing



FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

### Face shields

Associated Bag Company, Milwaukee, WI

### Glove boxes

HEMCO CORPORATION, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemcocorp.com; web site: www.HEMCOcorp.com)

Powder Systems Ltd, Liverpool

PSL USA, Boise, ID

### Gloves

Associated Bag Company, Milwaukee, WI  
Qosina, Edgewood, NY

### Harnesses

Sur-Loc Inc., Fremont, IN

### Marking & labeling systems

Associated Bag Company, Milwaukee, WI  
K-Sun Corporation, Somerset, WI

### Nozzles, fire fog

Spraying Systems Co., Wheaton, IL

### Pipe markers

K-Sun Corporation, Somerset, WI

### Pressure Relief

BS & B Safety Systems, Inc., Tulsa, OK

### Purge systems

Pepperl + Fuchs GmbH, Mannheim, Germany

### Railroad safety devices

Oseco, Broken Arrow, OK

Trans Environmental Systems, Inc., Greencastle, PA

### Rupture discs

BS & B Safety Systems, Inc., Tulsa, OK

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

Oseco, Broken Arrow, OK

REMBE GMBH, SAFETY+CONTROL, Gallbergweg 21, Brilon, Germany 59929 (49-2961-7405-0; FAX: 49-2961-50-714; e-mail: sales@rembe.de; web site: www.rembe.com)

REMBE, INC., 3809 Beam Road Ste K, Charlotte, NC 28217 (704.716.7022; FAX: 704.716.7025; e-mail: info@rembe.us; web site: www.rembe.us)

### Rupture panels

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

Oseco, Broken Arrow, OK

REMBE GMBH, SAFETY+CONTROL, Gallbergweg 21, Brilon, Germany 59929 (49-2961-7405-0; FAX: 49-2961-50-714; e-mail: sales@rembe.de; web site: www.rembe.com)

REMBE, INC., 3809 Beam Road Ste K, Charlotte, NC 28217 (704.716.7022; FAX: 704.716.7025; e-mail: info@rembe.us; web site: www.rembe.us)

### Safety audits

Dakota Software Corp., Cleveland, OH

### Shoes, safety

Winter Walking (a JORDAN DAVID company), Horsham, PA

### Showers, emergency

HEMCO CORPORATION, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemcocorp.com; web site: www.HEMCOcorp.com)

### Sinks, eye or face emergency

HEMCO CORPORATION, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemcocorp.com; web site: www.HEMCOcorp.com)

### Static detection & elimination systems

Newson Gale Ltd, Nottingham

### Storage cabinets

HEMCO CORPORATION, 711 South Powell Rd., Independence, MO 64056 (800-779-4362; 816-796-2900; FAX: 816-796-3333; e-mail: info@hemcocorp.com; web site: www.HEMCOcorp.com)

SPILL CONTAINMENT DIRECT, 208 Capital Dr., Buffalo, MN 55313 (7637623453; 7637623453; e-mail: sales@spillcontainmentdirect.com)

### Testing equipment, dust

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

### Testing equipment, gases & vapors

Delphian Corp., Northvale, NJ

FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

RKI Instruments, Inc., Union City, CA

### Valve & flange covers

Oseco, Broken Arrow, OK

### Testing equipment, emergency valves

Beamex, Inc., Marietta, GA

# 8

# DESIGN, ENGINEERING, & CONSTRUCTION

**165 Engineering services**

**167 Training**

## ENGINEERING SERVICES

### Arbitration, engineering

Knighthawk Engineering, Houston, TX  
TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

### Engineering: blast resistant modules

A Box 4 U, Wichita, Kansas

### Consultants, corrosion protection

Applus RTD USA, Houston, TX  
Knighthawk Engineering, Houston, TX

### Consultants, engineering

A Box 4 U, Wichita, Kansas  
Advanced GeoServices Corp., West Chester, PA  
Advanced Industrial Technology Corp., Paramus, NJ  
Airflow Sciences Corporation, Livonia, MI  
Air Liquide Global E&C Solutions Germany GmbH, Frankfurt am Main, Germany  
AKW Apparate + Verfahren GmbH, Hirschau, Bavaria, Germany

Applus RTD USA, Houston, TX  
Bayer Technology Services GmbH, Leverkusen, Germany

CAI Catalysts, Gwynedd Square, PA  
Clean Air Engineering, Palatine, IL  
Dec Group - Dietrich Engineering Consultants sa, Ecoublens, Switzerland

Dematic Corp., Grand Rapids, MI  
E-Vac Technologies, LLC, McMurray, PA  
GEA Engineering, P.C., Nanuet, NY

Gekko Engineering, Carson, CA  
Gharpure Consulting Engineers Pvt Ltd, Pune, India  
Harrop Industries, Inc., Columbus, OH

Johnson Matthey Davy Technologies Ltd., London  
Knighthawk Engineering, Houston, TX  
Lightning Eliminators & Consultants, Inc., Boulder, CO

Musco Engineering Associates, West Haven, CT  
NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)

PENTA Engineering, P.A., Charlotte, NC  
Process Systems Enterprise Limited, London  
ProSim SA, LABEGE, France

RAS Process Equipment Inc., Robbinsville, NJ  
River Consulting, Pittsburgh, PA  
Sulzer Chemtech USA, Inc., Tulsa, OK

Team Industrial Services, Inc., Alvin, TX  
TowerScan, Sarnia, Ontario, Canada  
TowerScan, Port Huron, MI

Wall Colmonoy Corporation, Madison Heights, MI

Walter P. Reuther Institute, Detroit, MI

Westinghouse Electric Company, Pittsburgh, PA

Wintech Engineering, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

Worldwide Technology, Inc., Houston, TX

### Engineering, biochemical & biotech

Bayer Technology Services GmbH, Leverkusen, Germany  
Sias, New Castle, DE  
Xiril AG, Hombrechtikon, Switzerland

### Engineering: equipment inspection & expediting

AKW Apparate + Verfahren GmbH, Hirschau, Bavaria, Germany  
Applus RTD USA, Houston, TX

Bayer Technology Services GmbH, Leverkusen, Germany  
FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

Knighthawk Engineering, Houston, TX

GEA Engineering, P.C., Nanuet, NY  
Gekko Engineering, Carson, CA  
Innovative Processing Solutions, Aurora, IN  
INOX-TECH INC., Ste. Catherine, Canada  
Johnson Matthey Davy Technologies Ltd., London  
Lyntek, Inc., Lakewood, CO  
Pope Scientific, Inc., Saukville, WI

SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada

Zeton Inc., Burlington, Ontario, Canada



## Engineering: pollution & environmental services

ADI Systems Inc., Fredericton, New Brunswick, Canada  
 ADI Systems Inc., Wolfboro, NH  
 Advanced GeoServices Corp., West Chester, PA  
 Advanced Industrial Technology Corp., Paramus, NJ  
 Advanced Cyclone Systems, S. A., Porto, Portugal  
 Air Products and Chemicals, Inc., Allentown, PA  
 Airflow Sciences Corporation, Livonia, MI  
 Ambient Engineering Inc., Rocky Hill, NJ  
**BIONOMIC INDUSTRIES INC., 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)**

CECO Filters, a CECO Environmental Company, Telford, PA  
 Clean Air Engineering, Palatine, IL  
 Conversion Technology, Inc., Norcross, GA  
 Dual/HEE, a CECO Environmental Company, Owosso, MI  
 Durr Systems, Inc., Clean Technology Systems, Plymouth, MI

Environmental C&C, St. Charles, IL  
 Epcon Industrial Systems, LP, The Woodlands, TX  
 Fisher Klosterman, a CECO Environmental Company, Louisville, KY

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

GEA Engineering, P.C., Nanuet, NY

**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33003 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)**

**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**

River Consulting, Pittsburgh, PA

Team Industrial Services, Inc., Alvin, TX

TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

Turner EnviroLogic, Inc., Deerfield Beach, FL

## Engineering: process design

**ABZ, INC., 4451 Brookfield Corp. Dr., Suite 107, Chantilly, VA 20151 (800-747-7401; 703-631-7401; FAX: 703-631-5282; e-mail: sales@abzinc.com; web site: www.abzinc.com)**

Advanced Industrial Technology Corp., Paramus, NJ  
 Air Liquide Global E&C Solutions Germany GmbH, Frankfurt am Main, Germany

AKW Apparate + Verfahren GmbH, Hirschau, Bavaria, Germany

Bascale Company, Inc., Houston, TX

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

Bayer Technology Services GmbH, Leverkusen, Germany  
 Biazzi SA, Chailly/Montreux, Switzerland

Buss-SMS-Canzler GmbH, Butzbach, Germany

CAI Catalysts, Gwynedd Square, PA

De Dietrich Process Systems GmbH, Mainz, Germany

Denver Mineral Engineers, Inc., Littleton, CO

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hoheflum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Emerson Process Management, Austin, TX

GEA Engineering, P.C., Nanuet, NY

GEA Process Engineering, Columbia, MD

Gekko Engineering, Carson, CA

**GIG KARASEK GMBH, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: office@gigkarasek.at; web site: www.gigkarasek.com)**

Haldor Topsoe A/S, Lyngby, Denmark

Harrop Industries, Inc., Columbus, OH

Innovative Processing Solutions, Aurora, IN

Johnson Matthey Davy Technologies Ltd., London

KIRK Process Solutions Ltd, Walton-on-Thames

Knighthawk Engineering, Houston, TX

Linde AG, Engineering Division, Pullach, Germany

Lyntek, Inc., Lakewood, CO

Musco Engineering Associates, West Haven, CT

**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**

PENTA Engineering, P.A., Charlotte, NC

Process Systems Enterprise Limited, London

River Consulting, Pittsburgh, PA

Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany

**SULZER CHEMTECH LTD, Sulzer Allee 48, P.O. Box 65, Winterthur, Switzerland 8404 (+41 52 262 11 22; FAX: +41 52 262 00 60; e-mail: chemtech@sulzer.com; web site: www.sulzer.com)**

TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

## Engineering: process modeling

Airflow Sciences Corporation, Livonia, MI

**EKATO RUEHR- UND MISCHTECHNIK GMBH, Hoheflum-Str.37, Schopfheim, Germany D-79650 (+49 7622 290; FAX: +49 7622 29 213; e-mail: info@ekato.com; web site: www.ekato.com)**

See our ad on page 147

Emerson Process Management, Austin, TX

Gekko Engineering, Carson, CA

Heat Transfer Research, Inc. (HTRI), College Station, TX

Invensys Systems (UK) Ltd, Crawley

Johnson Matthey Davy Technologies Ltd., London

Knighthawk Engineering, Houston, TX

Process Systems Enterprise Limited, London

## Engineering: procurement

Gekko Engineering, Carson, CA

Lyntek, Inc., Lakewood, CO

PENTA Engineering, P.A., Charlotte, NC

River Consulting, Pittsburgh, PA

ThyssenKrupp Industrial Solutions AG, Business Unit Process Technologies, Dortmund, Germany

ThyssenKrupp Industrial Solutions AG, Business Unit Process Technologies, Dortmund, Germany

ThyssenKrupp Industrial Solutions AG, Business Unit Process Technologies, Dortmund, Germany

## Engineering: project management

Air Liquide Global E&C Solutions Germany GmbH, Frankfurt am Main, Germany

Bayer Technology Services GmbH, Leverkusen, Germany  
 Coperion GmbH, Weingarten, Wuertl., Germany

Emerson Process Management, Austin, TX

GEA Process Engineering, Columbia, MD

Gekko Engineering, Carson, CA

Gharpure Consulting Engineers Pvt Ltd, Pune, India

HIMA Paul Hildebrandt GmbH + Co KG, Bruehl, Germany

Innovative Processing Solutions, Aurora, IN

INOX-TECH INC., Ste. Catherine, Canada

Musco Engineering Associates, West Haven, CT

PENTA Engineering, P.A., Charlotte, NC

River Consulting, Pittsburgh, PA

Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany

S&C Electric Company, Chicago, IL

ThyssenKrupp Industrial Solutions AG, Business Unit Process Technologies, Dortmund, Germany

ThyssenKrupp Industrial Solutions AG, Business Unit Process Technologies, Dortmund, Germany

## Engineering: research

CAI Catalysts, Gwynedd Square, PA

DECHEMA e.V., Frankfurt am Main, Germany

Harrop Industries, Inc., Columbus, OH

Heat Transfer Research, Inc. (HTRI), College Station, TX

Johnson Matthey Davy Technologies Ltd., London

Sias, New Castle, DE

TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

Xiril AG, Hombrechtikon, Switzerland

Xiril AG, Hombrechtikon, Switzerland

Xiril AG, Hombrechtikon, Switzerland

## Engineering: Welding

McWane and Associates, San Jose, CA

## Equipment testing

Airflow Sciences Corporation, Livonia, MI

Heat Transfer Research, Inc. (HTRI), College Station, TX

Knighthawk Engineering, Houston, TX

Newson Gale Ltd, Nottingham

PP PUBLICO Publications, Essen, NRW, Germany

PRUEFTECHNIK, Ismaning, Germany

Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany

S&C Electric Company, Chicago, IL

TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

## Equipment, used: procurement & supply

**INDECK POWER EQUIPMENT CO., 1111 Willis Ave. (CE), Wheeling, IL 60090 (800-446-3325; 847-541-8300; FAX: 847-541-9984; e-mail: info@indeck-power.com; web site: www.indeck.com)**

Lyntek, Inc., Lakewood, CO

TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

## Inspection

Applis RTD USA, Houston, TX

## ISO certification

Lloyd's Register Quality Assurance Ltd., Houston, TX

## Pilot plant services

Buss-SMS-Canzler GmbH, Butzbach, Germany

GEA Process Engineering, Columbia, MD

**GIG KARASEK GMBH, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: office@gigkarasek.at; web site: www.gigkarasek.com)**

Johnson Matthey Davy Technologies Ltd., London

Particle Reduction Service, Elk Grove Village, IL

Pope Scientific, Inc., Saukville, WI

Procedyne Corp., New Brunswick, NJ

Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany

Zeton Inc., Burlington, Ontario, Canada

## Plant decommissioning and dismantling

**ABZ, INC., 4451 Brookfield Corp. Dr., Suite 107, Chantilly, VA 20151 (800-747-7401; 703-631-7401; FAX: 703-631-5282; e-mail: sales@abzinc.com; web site: www.abzinc.com)**

## Plant documentation services

PENTA Engineering, P.A., Charlotte, NC  
 Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany

## Plant relocation

A Box 4 U, Wichita, Kansas

## Process safety management services

Conversion Technology, Inc., Norcross, GA  
 HIMA Paul Hildebrandt GmbH + Co KG, Bruehl, Germany  
 PENTA Engineering, P.A., Charlotte, NC

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

## Risk analysis

Bayer Technology Services GmbH, Leverkusen, Germany  
 HIMA Paul Hildebrandt GmbH + Co KG, Bruehl, Germany  
**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

Conversion Technology, Inc., Norcross, GA  
 HIMA Paul Hildebrandt GmbH + Co KG, Bruehl, Germany  
 PENTA Engineering, P.A., Charlotte, NC

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: tredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

# 9

# INFORMATION TECHNOLOGIES

- 169 Computer hardware**
- 169 Computer software**
- 170 Computers for design & engineering**

# PRODUCT DIRECTORY

## COMPUTER HARDWARE

### Computers, mainframe

Psychsoftpc, Quincy, MA

### Computers, monitors & displays

ASDQMS, Chagrin Falls, OH  
Intergraph Benelux BV, Hoofddorp, Netherlands  
PRUEFTECHNIK, Ismaning, Germany  
Psychsoftpc, Quincy, MA

### Computers, personal

Intergraph Benelux BV, Hoofddorp, Netherlands  
Psychsoftpc, Quincy, MA

### Computers, printers & plotters

Intergraph Benelux BV, Hoofddorp, Netherlands

### Digital computers, data processing

Psychsoftpc, Quincy, MA  
Symmetric Research, Las Vegas, NV

### Input & output equipment, data processing

Acromag, Inc., Wixom, MI  
HydroTec Systems Co., Inc., Tiskilwa, IL  
Sierra Monitor Corp., Milpitas, CA  
Symmetric Research, Las Vegas, NV

### Manufacturing execution systems

Werum Software & Systems AG, Lueneburg, Germany

### Simulators

Psychsoftpc, Quincy, MA

## COMPUTER SOFTWARE

### Advanced process control

CAMO Software, Oslo, Norway  
Emerson Process Management, Austin, TX  
GEA Process Engineering, Columbia, MD  
Parsec, Inc., Anaheim, CA  
PQ Systems, Dayton, OH  
Siemens AG, Karlsruhe, Germany

### Alarm Management

Emerson Process Management, Austin, TX  
**FIKE, 704 S. 10th St., Blue Springs, MO 64015 (1-866-758-6004; 816-229-3405; FAX: 816-229-4615; e-mail: industrialprotection@fike.com; web site: www.fike.com)**

Siemens AG, Karlsruhe, Germany  
Vista Control Systems, Inc., Los Alamos, NM

### Asset management

AVEVA Inc, Houston, TX  
Emerson Process Management, Austin, TX  
Parsec, Inc., Anaheim, CA  
Siemens AG, Karlsruhe, Germany

### Bar coding

Dematic Corp., Grand Rapids, MI  
Isotech, Inc, Hatfield, PA  
K-Sun Corporation, Somerset, WI

### Batch control

CAMO Software, Oslo, Norway  
Emerson Process Management, Austin, TX  
Parsec, Inc., Anaheim, CA  
Siemens AG, Karlsruhe, Germany  
Werum Software & Systems AG, Lueneburg, Germany  
Werum Software & Systems America, Inc., Parsippany, NJ

### Calibration management

Beamex, Inc., Marietta, GA  
Emerson Process Management, Austin, TX  
Intergraph Corporation Corporate Headquarters, Madison, AL  
PQ Systems, Dayton, OH  
Quality America, Inc., Tucson, AZ

### Chemical equipment design

CPFD-Software, Albuquerque, New Mexico  
Heat Transfer Research, Inc. (HTRI), College Station, TX  
Intergraph Benelux BV, Hoofddorp, Netherlands  
Intergraph Corporation Corporate Headquarters, Madison, AL

Process Systems Enterprise Limited, London  
ProSim SA, LABEGE, France  
Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
Technical Database Services, Inc. (TDS), New York, NY

### Chemical plant design & maintenance

**ABZ, INC., 4451 Brookfield Corp. Dr., Suite 107, Chantilly, VA 20151 (800-747-7401; 703-631-7401; FAX: 703-631-5282; e-mail: sales@abzinc.com; web site: www.abzinc.com)**

CU SERVICES LLC, Elk Grove, IL  
Intergraph Benelux BV, Hoofddorp, Netherlands  
Intergraph Corporation, Houston, Texas  
Intergraph Corporation Corporate Headquarters, Madison, AL  
Invensys Systems (UK) Ltd, Crawley  
Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
Technical Database Services, Inc. (TDS), New York, NY

### Chemical process design



**ABZ, INC., 4451 Brookfield Corp. Dr., Suite 107, Chantilly, VA 20151 (800-747-7401; 703-631-7401; FAX: 703-631-5282; e-mail: sales@abzinc.com; web site: www.abzinc.com)**

Chemstations Europe GmbH, Berlin, Germany  
Engineering Software, Germantown, MD  
Intergraph Benelux BV, Hoofddorp, Netherlands  
Intergraph Corporation Corporate Headquarters, Madison, AL  
Invensys Systems (UK) Ltd, Crawley  
Process Systems Enterprise Limited, London  
ProSim SA, LABEGE, France  
Siemens, Industry USA, Solutions, Automation and Drives Technologies, Alpharetta, GA  
Technical Database Services, Inc. (TDS), New York, NY

### Computational fluid dynamics

**ABZ, INC., 4451 Brookfield Corp. Dr., Suite 107, Chantilly, VA 20151 (800-747-7401; 703-631-7401; FAX: 703-631-5282; e-mail: sales@abzinc.com; web site: www.abzinc.com)**

Adaptive Research, Honolulu, HI  
Airflow Sciences Corporation, Livonia, MI  
CPFD-Software, Albuquerque, New Mexico  
CU SERVICES LLC, Elk Grove, IL

### Data acquisition & process control

Acromag, Inc., Wixom, MI  
Airflow Sciences Corporation, Livonia, MI  
Auburn Systems, LLC, Danvers, MA  
Davis-Standard, LLC, Pawcatuck, CT  
Digital Applications International, London  
Emerson Process Management, Austin, TX  
HydroTec Systems Co., Inc., Tiskilwa, IL  
Intergraph Corporation Corporate Headquarters, Madison, AL

Invensys Systems (UK) Ltd, Crawley  
Parsec, Inc., Anaheim, CA  
Polytec, Inc., Process Analytics, Hopkinton  
PQ Systems, Dayton, OH  
Quality America, Inc., Tucson, AZ  
Rockwell Software Brand, Rockwell Automation, Inc., Milwaukee, WI

Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
Siemens, Industry USA, Solutions, Automation and Drives Technologies, Alpharetta, GA  
Sierra Monitor Corp., Milpitas, CA  
StatPoint Technologies Inc., Warrenton, VA  
VEGA Grieshaber KG, Schiltach, Germany  
VEGA Americas, Inc., Cincinnati, OH  
Vista Control Systems, Inc., Los Alamos, NM  
Werum Software & Systems AG, Lueneburg, Germany  
Werum Software & Systems America, Inc., Parsippany, NJ

### Data visualization

Intergraph Corporation, Houston, Texas  
Parsec, Inc., Anaheim, CA  
StatPoint Technologies Inc., Warrenton, VA  
VEGA Grieshaber KG, Schiltach, Germany  
VEGA Americas, Inc., Cincinnati, OH

### Design of experiments

CAMO Software, Oslo, Norway  
Process Systems Enterprise Limited, London  
StatPoint Technologies Inc., Warrenton, VA

### Enterprise resource planning

AVEVA Inc, Houston, TX

## Information Technologies

### Environmental-compliance reporting

Auburn Systems, LLC, Danvers, MA  
Dakota Software Corp., Cleveland, OH  
Logical Technology, Inc., Peoria, IL  
Technical Database Services, Inc. (TDS), New York, NY

### Environmental, health & safety

Dakota Software Corp., Cleveland, OH  
K-Sun Corporation, Somerset, WI  
Logical Technology, Inc., Peoria, IL  
Technical Database Services, Inc. (TDS), New York, NY

### Failure analysis

Chemir, A Division of Evans Analytical Group, Maryland Heights, MO

### Hazardous-waste management

Clean Harbors, Norwell, MA  
Dakota Software Corp., Cleveland, OH

### Heat-exchange modeling

Airflow Sciences Corporation, Livonia, MI  
CU SERVICES LLC, Elk Grove, IL  
Heat Transfer Research, Inc. (HTRI), College Station, TX  
PP PUBLICO Publications, Essen, NRW, Germany

### Information management

Accelerated Technology Laboratories, Inc., West End, NC  
AVEVA Inc, Houston, TX  
Intergraph Corporation, Houston, Texas  
Intergraph Corporation Corporate Headquarters, Madison, AL  
Invensys Systems (UK) Ltd, Crawley  
Logical Technology, Inc., Peoria, IL  
StatPoint Technologies Inc., Warrenton, VA  
Technical Database Services, Inc. (TDS), New York, NY

### ISO compliance

Accelerated Technology Laboratories, Inc., West End, NC  
Beamex, Inc., Marietta, GA  
Dakota Software Corp., Cleveland, OH  
PQ Systems, Dayton, OH  
StatPoint Technologies Inc., Warrenton, VA

### Laboratory information management

Accelerated Technology Laboratories, Inc., West End, NC  
Digital Applications International, London  
Hampshire Controls Corp., Dover, NH

### Maintenance management

AVEVA Inc, Houston, TX  
Beamex, Inc., Marietta, GA  
Digital Applications International, London  
Emerson Process Management, Austin, TX  
HydroTec Systems Co., Inc., Tiskilwa, IL  
Intergraph Benelux BV, Hoofddorp, Netherlands  
Intergraph Corporation Corporate Headquarters, Madison, AL  
Parsec, Inc., Anaheim, CA

### Manufacturing execution systems

Digital Applications International, London  
Parsec, Inc., Anaheim, CA  
Siemens, Industry USA, Solutions, Automation and Drives Technologies, Alpharetta, GA  
Werum Software & Systems AG, Lueneburg, Germany  
Werum Software & Systems America, Inc., Parsippany, NJ

### Material Safety Data Sheet (MSDS) management

K-Sun Corporation, Somerset, WI  
Logical Technology, Inc., Peoria, IL

### Materials management

AVEVA Inc, Houston, TX  
Digital Applications International, London  
Intergraph Corporation, Houston, Texas  
Intergraph Corporation Corporate Headquarters, Madison, AL  
Logical Technology, Inc., Peoria, IL  
Siemens, Industry USA, Solutions, Automation and Drives Technologies, Alpharetta, GA

### Mathematics & statistics

CAMO Software, Oslo, Norway  
MTR Software, Toronto, Ontario, Canada  
PQ Systems, Dayton, OH  
Quality America, Inc., Tucson, AZ  
StatPoint Technologies Inc., Warrenton, VA

### Neural-network simulation

Emerson Process Management, Austin, TX

# PRODUCT DIRECTORY

## Physical properties

Engineering Software, Germantown, MD  
ProSim SA, LABEGE, France  
Technical Database Services, Inc. (TDS), New York, NY

## Plant optimization

AVEVA Inc, Houston, TX  
Dematic Corp., Grand Rapids, MI  
Emerson Process Management, Austin, TX  
Invensys Systems (UK) Ltd, Crawley  
Parsec, Inc., Anaheim, CA  
ProSim SA, LABEGE, France  
Siemens AG, Karlsruhe, Germany  
TowerScan, Port Huron, MI  
TowerScan, Sarnia, Ontario, Canada

## Pressure vessel design

PP PUBLICO Publications, Essen, NRW, Germany

## Process control

CAMO Software, Oslo, Norway  
Emerson Process Management, Austin, TX  
FOSS NIRSystems, Inc., Laurel, MD  
Invensys Systems (UK) Ltd, Crawley  
**NOL-TEC SYSTEMS, INC., 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)**

Polytec, Inc., Process Analytics, Hopkinton  
PQ Systems, Dayton, OH  
Quality America, Inc., Tucson, AZ  
Rockwell Automation, Inc., Milwaukee, WI  
Rockwell Software Brand, Rockwell Automation, Inc., Milwaukee, WI

Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany  
Schenck Process GmbH, Darmstadt, Germany  
Siemens AG, Karlsruhe, Germany  
StatPoint Technologies Inc., Warrenton, VA  
Vista Control Systems, Inc., Los Alamos, NM  
Werum Software & Systems AG, Lueneburg, Germany  
Werum Software & Systems America, Inc., Parsippany, NJ

## Process optimization

Adaptive Resources, Carnegie, PA

CAMO Software, Oslo, Norway  
Emerson Process Management, Austin, TX  
Engineering Software, Germantown, MD  
HydroTec Systems Co., Inc., Tiskilwa, IL  
Invensys Systems (UK) Ltd, Crawley  
Process Systems Enterprise Limited, London  
Quality America, Inc., Tucson, AZ  
Siemens AG, Karlsruhe, Germany  
StatPoint Technologies Inc., Warrenton, VA  
**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)**

See our ad on page 100

TowerScan, Sarnia, Ontario, Canada  
TowerScan, Port Huron, MI  
Werum Software & Systems AG, Lueneburg, Germany  
Werum Software & Systems America, Inc., Parsippany, NJ

## Process safety management

AVEVA Inc, Houston, TX  
Siemens AG, Karlsruhe, Germany

## Process simulation

Airflow Sciences Corporation, Livonia, MI  
Chemstations Europe GmbH, Berlin, Germany  
Emerson Process Management, Austin, TX  
Engineering Software, Germantown, MD  
Heat Transfer Research, Inc. (HTRI), College Station, TX  
Invensys Systems (UK) Ltd, Crawley  
Process Systems Enterprise Limited, London  
ProSim SA, LABEGE, France  
WinSim Inc., Richmond, TX

## Production scheduling

Werum Software & Systems AG, Lueneburg, Germany  
Werum Software & Systems America, Inc., Parsippany, NJ

## Project management

AVEVA Inc, Houston, TX

## Quality assurance or control

ASDQMS, Chagrin Falls, OH  
Beamex, Inc., Marietta, GA  
CAMO Software, Oslo, Norway  
FOSS NIRSystems, Inc., Laurel, MD

# Information Technologies

Parsec, Inc., Anaheim, CA  
Polytec, Inc., Process Analytics, Hopkinton  
PQ Systems, Dayton, OH  
Quality America, Inc., Tucson, AZ  
StatPoint Technologies Inc., Warrenton, VA  
Werum Software & Systems AG, Lueneburg, Germany  
Werum Software & Systems America, Inc., Parsippany, NJ

## Regulatory compliance

Beamex, Inc., Marietta, GA  
Dakota Software Corp., Cleveland, OH  
Digital Applications International, London  
Intergraph Corporation Corporate Headquarters, Madison, AL  
K-Sun Corporation, Somerset, WI  
Logical Technology, Inc., Peoria, IL  
Parsec, Inc., Anaheim, CA  
PQ Systems, Dayton, OH  
Technical Database Services, Inc. (TDS), New York, NY

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: Iredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

Werum Software & Systems AG, Lueneburg, Germany  
Werum Software & Systems America, Inc., Parsippany, NJ

## Software development

AVEVA Inc, Houston, TX  
Digital Applications International, London  
Engineering Software, Germantown, MD  
Heat Transfer Research, Inc. (HTRI), College Station, TX  
HydroTec Systems Co., Inc., Tiskilwa, IL  
Intergraph Corporation, Houston, Texas  
ProSim SA, LABEGE, France  
Rockwell Software Brand, Rockwell Automation, Inc., Milwaukee, WI  
Werum Software & Systems AG, Lueneburg, Germany  
Werum Software & Systems America, Inc., Parsippany, NJ

## Software, other

CU SERVICES LLC, Elk Grove, IL  
Dakota Software Corp., Cleveland, OH  
Digital Applications International, London  
Engineering Software, Germantown, MD  
HydroTec Systems Co., Inc., Tiskilwa, IL  
Intergraph Benelux BV, Hoofddorp, Netherlands  
Intergraph Corporation Corporate Headquarters, Madison, AL

Invensys Systems (UK) Ltd, Crawley  
K-Sun Corporation, Somerset, WI  
Logical Technology, Inc., Peoria, IL  
ProSim SA, LABEGE, France  
PRUEFTECHNIK, Ismaning, Germany  
StatPoint Technologies Inc., Warrenton, VA  
**TLV CORPORATION, 13901 S. Lakes Dr., Charlotte, NC 28273 (800-858-8727; 704-597-9070; FAX: 704-583-1610; web site: www.tlv.com)**

See our ad on page 100

Werum Software & Systems America, Inc., Parsippany, NJ

## Supply chain management

Dematic Corp., Grand Rapids, MI  
Hoover Container Solutions, Houston, TX  
Intergraph Corporation, Houston, Texas  
Intergraph Corporation Corporate Headquarters, Madison, AL

## COMPUTERS FOR DESIGN & ENGINEERING

### Computer aided design & drafting systems

Advanced GeoServices Corp., West Chester, PA  
AVEVA Inc, Houston, TX  
CU SERVICES LLC, Elk Grove, IL  
Intergraph Benelux BV, Hoofddorp, Netherlands  
Intergraph Corporation Corporate Headquarters, Madison, AL  
kubit USA, Houston, Texas  
Psychsoftpc, Quincy, MA

### Process simulation systems

**ABZ, INC., 4451 Brookfield Corp. Dr., Suite 107, Chantilly, VA 20151 (800-747-7401; 703-631-7401; FAX: 703-631-5282; e-mail: sales@abzinc.com; web site: www.abzinc.com)**

CPFD-Software, Albuquerque, New Mexico  
Engineering Software, Germantown, MD  
Invensys Systems (UK) Ltd, Crawley  
Process Systems Enterprise Limited, London  
ProSim SA, LABEGE, France

**CHEMICAL ENGINEERING**

**FREE On Demand Webinars**

View On Demand Webinars at  
**chemengonline.com/webcasts**

# 10 ENVIRONMENTAL SERVICES

- 171 Air pollution control equipment & systems**
- 172 Environmental services**
- 173 Waste handling equipment & systems**
- 173 Water pollution control equipment & systems**

## **AIR POLLUTION CONTROL EQUIPMENT & SYSTEMS**

### **Adsorption systems, carbon**

Advanced Air Technologies, Inc., Corunna, MI  
Branch Environmental Corp., Somerville, NJ  
**CR CLEANAIR, Six Campus Drive, Parsippany, NJ  
07054 (908 232 4200; FAX: 908-232-2146; e-mail:  
info@croll.com; web site: www.crleanair.com)**  
Durr Systems, Inc., Clean Technology Systems, Plymouth,  
MI  
Environmental C&C, St. Charles, IL  
Jacobi Carbons, Inc., Columbus, OH  
TIGG Corporation, Oakdale, PA  
United Manufacturing International 2000, Red Bluff, CA

### **Adsorption systems, other**

Durr Systems, Inc., Clean Technology Systems, Plymouth,  
MI  
McGill AirClean LLC, Columbus, OH  
Munters Corporation, Zeol, Amesbury, MA  
TIGG Corporation, Oakdale, PA

### **Afterburners**

ADWEST TECHNOLOGIES, a CECO Environmental Com-  
pany, Anaheim, CA  
Anguil Environmental Systems, Inc., Milwaukee, WI  
Process Combustion Corp., Pittsburgh, PA  
TMTS Associates, Inc., Combustion/Air Pollution Control,  
Atlanta, GA  
Turner EnviroLogic, Inc., Deerfield Beach, FL

### **Air pollution abatement systems**

Advanced Industrial Technology Corp., Paramus, NJ  
ADWEST TECHNOLOGIES, a CECO Environmental Com-  
pany, Anaheim, CA  
Air Products and Chemicals, Inc., Allentown, PA  
Ambient Engineering Inc., Rocky Hill, NJ  
Anguil Environmental Systems, Inc., Milwaukee, WI

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
**BELTRAN TECHNOLOGIES, INC., 1133 East 35 Street,  
Brooklyn, New York 11210 (718-338-3311; FAX: 718-  
253-9028; e-mail: info@beltrantechnologies.com;  
web site: www.beltrantechnologies.com)**  
**BIONOMIC INDUSTRIES INC., 777 Corporate Dr., Mah-  
wah, NJ 07430-2008 (800-311-6767; 201-529-1094;  
FAX: 201-529-0252; e-mail: sales@bionomicind.com;  
web site: www.bionomicind.com)**  
Buhler Inc., Minneapolis, MN  
CECO Filters, a CECO Environmental Company, Telford, PA  
**CR CLEANAIR, Six Campus Drive, Parsippany, NJ  
07054 (908 232 4200; FAX: 908-232-2146; e-mail:  
info@croll.com; web site: www.crleanair.com)**  
Duall/HEE, a CECO Environmental Company, Owosso, MI  
Durr Systems, Inc., Clean Technology Systems, Plymouth,  
MI  
Environmental C&C, St. Charles, IL  
Epon Industrial Systems, LP, The Woodlands, TX  
Fisher Klosterman, a CECO Environmental Company,  
Louisville, KY  
Flex-Kleen, a CECO Environmental Company, Glendale  
Heights, IL  
**GEA WIEGAND GMBH, Am Hardtwald 1, Ettlingen,  
Germany 76275 (49-7243-7050; FAX: 49-7243-705330;  
e-mail: gea-wiegand.info@gea.com; web site: www.  
gea.com)**  
Hypercat Advanced Catalyst Products, West Chester, PA  
**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33030  
(305 233-4249; FAX: 305 233-8687; e-mail: sales@  
kimre.com; web site: www.kimre.com)**  
McGill AirClean LLC, Columbus, OH  
Munters Corporation, Zeol, Amesbury, MA  
Munters Corporation, Air Treatment, Amesbury, MA  
Newman Regency Group, Stafford, TX  
**NOL-TEG SYSTEMS, INC., 425 Apollo Dr., Lino Lakes,  
MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail:  
sales@nol-tec.com; web site: www.nol-tec.com)**  
Process Combustion Corp., Pittsburgh, PA  
Strobic Air, a CECO Environmental Company, Telford, PA  
TIGG Corporation, Oakdale, PA  
Turner EnviroLogic, Inc., Deerfield Beach, FL

Westchester Germicide Co., Pittsburgh, PA

### **Carbon dioxide recovery plants**

Advanced Heat Recovery, Inc., Division of AQUA Innova-  
tions, Inc., Baltimore, MD

### **Chimneys, stacks & vents**

McGill AirClean LLC, Columbus, OH  
McGill AirFlow LLC, Groveport, OH  
Turner EnviroLogic, Inc., Deerfield Beach, FL

### **Combustors, catalytic**

ADWEST TECHNOLOGIES, a CECO Environmental Com-  
pany, Anaheim, CA  
Hypercat Advanced Catalyst Products, West Chester, PA  
TMTS Associates, Inc., Combustion/Air Pollution Control,  
Atlanta, GA  
Turner EnviroLogic, Inc., Deerfield Beach, FL

### **Combustors, other**

ADWEST TECHNOLOGIES, a CECO Environmental Com-  
pany, Anaheim, CA  
TMTS Associates, Inc., Combustion/Air Pollution Control,  
Atlanta, GA  
Turner EnviroLogic, Inc., Deerfield Beach, FL

### **Deodorizers**

CECO Filters, a CECO Environmental Company, Telford, PA  
Epon Industrial Systems, LP, The Woodlands, TX  
Westchester Germicide Co., Pittsburgh, PA

### **Flares, stack & accessories**

John Zink Hamworthy Combustion, Tulsa, OK  
Process Combustion Corp., Pittsburgh, PA  
Zeeco, Inc., Broken Arrow, OK

### **Hydrogen sulfide removal systems**

ADI Systems Inc., Fredericton, New Brunswick, Canada  
Duall/HEE, a CECO Environmental Company, Owosso, MI

Haldor Topsoe A/S, Lyngby, Denmark  
McGill AirClean LLC, Columbus, OH  
sera ProDos GmbH, Immenhausen, Germany

## NOx control systems

Advanced Industrial Technology Corp., Paramus, NJ  
**BELTRAN TECHNOLOGIES, INC.**, 1133 East 35 Street,  
Brooklyn, New York 11210 (718-338-3311; FAX: 718-253-9028; e-mail: info@beltrantechnologies.com;  
web site: www.beltrantechnologies.com)  
**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)

Branch Environmental Corp., Somerville, NJ  
Duall/HEE, a CECO Environmental Company, Owosso, MI  
Durr Systems, Inc., Clean Technology Systems, Plymouth, MI

Haldor Topsoe A/S, Lyngby, Denmark  
Hypercat Advanced Catalyst Products, West Chester, PA  
John Zink Hamworthy Combustion, Tulsa, OK  
McGill AirClean LLC, Columbus, OH  
M&C TechGroup, Ventura, CA

**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)

Spraying Systems Co., Wheaton, IL  
TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA  
Turner EnviroLogic, Inc., Deerfield Beach, FL

## Odor-control systems

ADI Systems Inc., Wolfeboro, NH  
Advanced Industrial Technology Corp., Paramus, NJ  
Advanced Air Technologies, Inc., Corunna, MI  
ADWEST TECHNOLOGIES, a CECO Environmental Company, Anaheim, CA  
Ambient Engineering Inc., Rocky Hill, NJ  
CECO Filters, a CECO Environmental Company, Telford, PA  
**CR CLEANAIR, Six Campus Drive, Parsippany, NJ 07054** (908 232 4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.crcleanair.com)

Duall/HEE, a CECO Environmental Company, Owosso, MI  
Durr Systems, Inc., Clean Technology Systems, Plymouth, MI

Environmental C&C, St. Charles, IL  
Hypercat Advanced Catalyst Products, West Chester, PA  
**KIMRE, INC.**, 744 SW 1st Street, Homestead, FL 33003 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

Process Combustion Corp., Pittsburgh, PA  
TIGG Corporation, Oakdale, PA  
Turner EnviroLogic, Inc., Deerfield Beach, FL

## Particulate removal systems

Advanced Cyclone Systems, S. A., Porto, Portugal  
**BELTRAN TECHNOLOGIES, INC.**, 1133 East 35 Street,  
Brooklyn, New York 11210 (718-338-3311; FAX: 718-253-9028; e-mail: info@beltrantechnologies.com;  
web site: www.beltrantechnologies.com)

Duall/HEE, a CECO Environmental Company, Owosso, MI  
Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL

Hypercat Advanced Catalyst Products, West Chester, PA  
**KIMRE, INC.**, 744 SW 1st Street, Homestead, FL 33003 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)

McGill AirClean LLC, Columbus, OH

## Sulfur Recovery

Haldor Topsoe A/S, Lyngby, Denmark  
John Zink Hamworthy Combustion, Tulsa, OK

## Vapor recovery systems

**BIONOMIC INDUSTRIES INC.**, 777 Corporate Dr., Mahwah, NJ 07430-2008 (800-311-6767; 201-529-1094; FAX: 201-529-0252; e-mail: sales@bionomicind.com; web site: www.bionomicind.com)

BORSIG GmbH, Berlin, Germany  
CECO Filters, a CECO Environmental Company, Telford, PA  
**CR CLEANAIR, Six Campus Drive, Parsippany, NJ 07054** (908 232 4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.crcleanair.com)

Durr Systems, Inc., Clean Technology Systems, Plymouth, MI  
Environmental C&C, St. Charles, IL

John Zink Hamworthy Combustion, Tulsa, OK  
Nash, a Gardner Denver Product, Bentleyville, PA  
Wintek Corp., Flanders, NJ  
Zeeco, Inc., Broken Arrow, OK

## ENVIRONMENTAL SERVICES

### Air pollution control

Advanced Cyclone Systems, S. A., Porto, Portugal  
ADWEST TECHNOLOGIES, a CECO Environmental Company, Anaheim, CA  
Air/Compliance Consultants, Inc., Pittsburgh, PA

Airflow Sciences Corporation, Livonia, MI  
Ambient Engineering Inc., Rocky Hill, NJ  
Anguil Environmental Systems, Inc., Milwaukee, WI  
Auburn Systems, LLC, Danvers, MA

**BELTRAN TECHNOLOGIES, INC.**, 1133 East 35 Street,  
Brooklyn, New York 11210 (718-338-3311; FAX: 718-253-9028; e-mail: info@beltrantechnologies.com;  
web site: www.beltrantechnologies.com)

Conversion Technology, Inc., Norcross, GA  
**CR CLEANAIR, Six Campus Drive, Parsippany, NJ 07054** (908 232 4200; FAX: 908-232-2146; e-mail: info@roll.com; web site: www.crcleanair.com)

Duall/HEE, a CECO Environmental Company, Owosso, MI  
Durr Systems, Inc., Clean Technology Systems, Plymouth, MI

Environmental C&C, St. Charles, IL  
Fisher Klosterman, a CECO Environmental Company, Louisville, KY

Flex-Kleen, a CECO Environmental Company, Glendale Heights, IL  
Hypercat Advanced Catalyst Products, West Chester, PA

John Zink Hamworthy Combustion, Tulsa, OK  
M&C TechGroup, Ventura, CA  
Munters Corporation, Zeol, Amesbury, MA

**NOL-TEC SYSTEMS, INC.**, 425 Apollo Dr., Lino Lakes, MN 55014 (651-780-8600; FAX: 651-780-4400; e-mail: sales@nol-tec.com; web site: www.nol-tec.com)

Schutte & Koerting, Trevose, PA  
Siemens Industry, Inc., Solutions, Automation and Drive Technologies, Norcross, GA

Strobic Air, a CECO Environmental Company, Telford, PA  
TIGG Corporation, Oakdale, PA  
TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251** (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: ireddmon@trinityconsultants.com; web site: www.trinityconsultants.com)

ts-systemfilter gmbh, Ahorn-Berolzeim, Germany  
Turner EnviroLogic, Inc., Deerfield Beach, FL

United Manufacturing International 2000, Red Bluff, CA  
Westchester Germicide Co., Pittsburgh, PA

## Bioremediation services

GEA Engineering, P.C., Nanuet, NY

## Compliance-information management

Clean Air Engineering, Palatine, IL  
Dakota Software Corp., Cleveland, OH  
**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251** (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: ireddmon@trinityconsultants.com; web site: www.trinityconsultants.com)

## Environmental consulting

Advanced GeoServices Corp., West Chester, PA  
Air/Compliance Consultants, Inc., Pittsburgh, PA  
Airflow Sciences Corporation, Livonia, MI  
Ambient Engineering Inc., Rocky Hill, NJ  
Clean Air Engineering, Palatine, IL  
Conversion Technology, Inc., Norcross, GA  
Durr Systems, Inc., Clean Technology Systems, Plymouth, MI

GEA Engineering, P.C., Nanuet, NY  
Spartan Chemical Services Inc., Jersey City, NJ  
TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

Clean Air Engineering, Palatine, IL

## Environmental regulations, interpreting

Advanced GeoServices Corp., West Chester, PA  
Air/Compliance Consultants, Inc., Pittsburgh, PA  
Dakota Software Corp., Cleveland, OH  
TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251** (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: ireddmon@trinityconsultants.com; web site: www.trinityconsultants.com)

## Full-service environmental firms

ADI Systems Inc., Wolfeboro, NH  
Advanced GeoServices Corp., West Chester, PA  
Ambient Engineering Inc., Rocky Hill, NJ  
Clean Harbors, Norwell, MA  
Conversion Technology, Inc., Norcross, GA  
GEA Engineering, P.C., Nanuet, NY

## Geotechnical services

Advanced GeoServices Corp., West Chester, PA

## Groundwater remediation

Advanced GeoServices Corp., West Chester, PA  
Conversion Technology, Inc., Norcross, GA  
GEA Engineering, P.C., Nanuet, NY  
TIGG Corporation, Oakdale, PA  
United Manufacturing International 2000, Red Bluff, CA

## Hazard audits

Dakota Software Corp., Cleveland, OH  
**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251** (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: ireddmon@trinityconsultants.com; web site: www.trinityconsultants.com)

## Hazardous waste services

Advanced GeoServices Corp., West Chester, PA  
Clean Harbors, Norwell, MA  
TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA  
Veolia Environmental Services, Chicago, Illinois

## Indoor-air-quality services

Air/Compliance Consultants, Inc., Pittsburgh, PA  
Ambient Engineering Inc., Rocky Hill, NJ  
BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
Conversion Technology, Inc., Norcross, GA  
Strobic Air, a CECO Environmental Company, Telford, PA

## Recycling firms

Midwest Steel Company Inc, Houston, Texas

## Remote monitoring

M&C TechGroup, Ventura, CA  
Russelectric Inc., Hingham, MA

## Sludge handling

Boeger Pumps, Chanhassen, MN  
**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)  
See our ad on page 135

Markland Specialty Engineering Ltd., Georgetown, Ontario, Canada  
ProSonix LLC, Milwaukee, WI  
TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

Vector Technologies Ltd., Milwaukee, WI  
Veolia Environmental Services, Chicago, Illinois

## Soil remediation

Advanced GeoServices Corp., West Chester, PA  
Anguil Environmental Systems, Inc., Milwaukee, WI  
Conversion Technology, Inc., Norcross, GA  
GEA Engineering, P.C., Nanuet, NY  
**KOMLINE-SANDERSON ENGINEERING CORP.**, 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)  
See our ad on page 135

TIGG Corporation, Oakdale, PA  
TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA

## Spill contingency, emergency response

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251** (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: ireddmon@trinityconsultants.com; web site: www.trinityconsultants.com)  
Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA

**Environmental Solutions  
Since 1974**

Trinity Consultants' highly responsive staff delivers innovative, cost effective solutions. Our services include:

- Air permitting & compliance assistance
- Environmental management services
- Air dispersion modeling
- Environmental training
- EH&S information management solutions


**Offices Nationwide  
(800) 229-6655  
trinityconsultants.com**

**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251** (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: ireddmon@trinityconsultants.com; web site: www.trinityconsultants.com)

## Environmental laboratories

Ambient Engineering Inc., Rocky Hill, NJ

## Spill control & emergency response

Clean Harbors, Norwell, MA  
ITW Polymers Adhesives, North America, Danvers, MA  
Spill Containment Direct, 208 Capital Dr., Buffalo, MN  
55313 (763)7623453; 7637623453; e-mail: sales@spill-containmentdirect.com

TIGG Corporation, Oakdale, PA  
Trans Environmental Systems, Inc., Greencastle, PA

## Training services

Team Industrial Services, Inc., Alvin, TX  
**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: Iredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

## VOC control

ADWEST TECHNOLOGIES, a CECO Environmental Company, Anaheim, CA

Anguil Environmental Systems, Inc., Milwaukee, WI  
BORSIG GmbH, Berlin, Germany  
Durr Systems, Inc., Clean Technology Systems, Plymouth, MI  
Environmental C&C, St. Charles, IL  
Hypercat Advanced Catalyst Products, West Chester, PA  
McGill AirClean LLC, Columbus, OH  
Munters Corporation, Zeol, Amesbury, MA  
Munters Corporation, Air Treatment, Amesbury, MA  
TMTS Associates, Inc., Combustion/Air Pollution Control, Atlanta, GA  
Turner EnviroLogic, Inc., Deerfield Beach, FL  
United Manufacturing International 2000, Red Bluff, CA

## Waste minimization & recycling

Clean Harbors, Norwell, MA  
Herbold Meckesheim USA, Resource Recycling Systems Inc., Slatersville, RI  
Progressive Recovery Inc., Duplo, IL  
Veolia Environmental Services, Chicago, Illinois

## Waste testing & analysis

Ambient Engineering Inc., Rocky Hill, NJ  
Turner Designs Hydrocarbon Instruments, Inc., Fresno, CA

## Waste transportation

Clean Harbors, Norwell, MA  
Veolia Environmental Services, Chicago, Illinois

## Waste treatment facilities, other

ADI Systems Inc., Fredericton, New Brunswick, Canada  
ADI Systems Inc., Wolfeboro, NH  
Biowater Technology, Cumberland, Rhode Island  
Clean Harbors, Norwell, MA  
GEA Niro PT B.V., 's-Hertogenbosch, Netherlands  
Veolia Environmental Services, Chicago, Illinois  
**WABASH POWER EQUIPMENT CO., 444 Carpenter Ave., P.O. Box C, Wheeling, IL 60090-0427 (800-704-2002; 847-541-5600; FAX: 847-541-1279; e-mail: info@wabashpower.com; web site: www.wabashpower.com)**

## Water-pollution control services

ADI Systems Inc., Fredericton, New Brunswick, Canada  
ADI Systems Inc., Wolfeboro, NH  
Dual/HEE, a CECO Environmental Company, Owosso, MI  
Entex Technologies Inc, Chapel Hill, NC  
Siemens Industry, Inc. - Water Technologies, Alpharetta, GA  
Spartan Chemical Services Inc., Jersey City, NJ  
TIGG Corporation, Oakdale, PA  
**TRINITY CONSULTANTS, 12770 Merit Drive, Suite 900, Dallas, TX 75251 (800-229-6655; 972-661-8100; FAX: 972-385-9203; e-mail: Iredmon@trinityconsultants.com; web site: www.trinityconsultants.com)**

## WASTE HANDLING EQUIPMENT & SYSTEMS

### Anaerobic treatment systems

ADI Systems Inc., Fredericton, New Brunswick, Canada  
ADI Systems Inc., Wolfeboro, NH  
Boerger Pumps, Chanhassen, MN  
Newman Regency Group, Stafford, TX  
ProSonic LLC, Milwaukee, WI

### Containers, hazardous waste

Assmann Corp. of America, Garrett, IN  
Associated Bag Company, Milwaukee, WI  
Environmental Compliance Products, Inc., Huntington Beach, CA  
Vector Technologies Ltd., Milwaukee, WI

### Disposal units, hazardous waste

Process Combustion Corp., Pittsburgh, PA

Vector Technologies Ltd., Milwaukee, WI

### Disposal units, liquid waste

Vector Technologies Ltd., Milwaukee, WI

### Disposal units, sewage

Vector Technologies Ltd., Milwaukee, WI

### Incinerators

ADWEST TECHNOLOGIES, a CECO Environmental Company, Anaheim, CA

Anguil Environmental Systems, Inc., Milwaukee, WI  
Process Combustion Corp., Pittsburgh, PA  
Turner EnviroLogic, Inc., Deerfield Beach, FL  
Zeeco, Inc., Broken Arrow, OK

### Incinerators, gas & liquid

Process Combustion Corp., Pittsburgh, PA  
Turner EnviroLogic, Inc., Deerfield Beach, FL  
Zeeco, Inc., Broken Arrow, OK

### Oxidizers, catalytic

Branch Environmental Corp., Somerville, NJ  
John Zink Hamworthy Combustion, Tulsa, OK  
Newman Regency Group, Stafford, TX  
Turner EnviroLogic, Inc., Deerfield Beach, FL

### Oxidizers, thermal

ADWEST TECHNOLOGIES, a CECO Environmental Company, Anaheim, CA

Anguil Environmental Systems, Inc., Milwaukee, WI  
Branch Environmental Corp., Somerville, NJ  
John Zink Hamworthy Combustion, Tulsa, OK  
McGill AirClean LLC, Columbus, OH  
Procedyne Corp., New Brunswick, NJ  
Turner EnviroLogic, Inc., Deerfield Beach, FL  
Zeeco, Inc., Broken Arrow, OK

### Spill collectors, tank car

Trans Environmental Systems, Inc., Greencastle, PA

## WATER POLLUTION CONTROL EQUIPMENT & SYSTEMS

### Aerators, water pollution

**DELTA COOLING TOWERS INC., 185 US Highway 206, Roxbury Township, NJ 07836 (973-586-2201; FAX: 973-586-2243; e-mail: info@deltacooling.com; web site: www.deltacooling.com)**

Elmridge Inc., Livonia, MI  
Newman Regency Group, Stafford, TX  
Team Industries, Inc., Kaukauna, WI

### Biological treatment

ADI Systems Inc., Fredericton, New Brunswick, Canada  
ADI Systems Inc., Wolfeboro, NH  
Biowater Technology, Cumberland, Rhode Island  
Dual/HEE, a CECO Environmental Company, Owosso, MI  
Entex Technologies Inc, Chapel Hill, NC  
Siemens Industry, Inc. - Water Technologies, Alpharetta, GA

### Bio-oxidation units

Ambient Engineering Inc., Rocky Hill, NJ  
Dual/HEE, a CECO Environmental Company, Owosso, MI  
Entex Technologies Inc, Chapel Hill, NC

### Chlorinators

Fluid Metering, Inc., Sysset, NY  
PCA GmbH, Heusweiler, Germany  
Pollution Control Systems, Inc., Milford, OH

### Diffusers, water pollution control

Newman Regency Group, Stafford, TX

### Digesters, sewage sludge

Pollution Control Systems, Inc., Milford, OH  
Westech Engineering Inc., Salt Lake City, UT

### Flocculation equipment

Newman Regency Group, Stafford, TX  
sera ProDos GmbH, Immenhausen, Germany

### Liners, pond

Trans Environmental Systems, Inc., Greencastle, PA  
Watersaver Co., a division of CDI, Commerce City, CO

### Oil skimmers

Sandvik Process Systems, Div. of Sandvik Materials Technology Deutschland GmbH, Fellbach, Germany

### Separators, oil-water

AMACS, Houston, TX

Boerger Pumps, Chanhassen, MN  
Faudi GmbH, Stadtlendorf, Germany  
Hilliard Corp., Elmira, NY  
**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)**

Newman Regency Group, Stafford, TX  
Pollution Control Systems, Inc., Milford, OH  
Siemens Industry, Inc. - Water Technologies, Alpharetta, GA

### Sewage treating units

Air Products and Chemicals, Inc., Allentown, PA  
Entex Technologies Inc, Chapel Hill, NC  
Microdyn Technologies, Inc., Raleigh, NC  
MICRODYN-NADIR GmbH, Wiesbaden, Germany  
Pollution Control Systems, Inc., Milford, OH

### Sludge dewaterers

AKW Apparate + Verfahren GmbH, Hirschau, Bavaria, Germany  
Boerger Pumps, Chanhassen, MN  
GEA Mechanical Equipment US, Inc, GEA Westfalia Separator Division, Northvale, NJ

**GEA WESTFALIA SEPARATOR GROUP GMBH, Werner-Habig-Str. 1., Oelde, Germany 59302 (+ 49-2522-77-0; FAX: + 49-2522-77-2488; e-mail: ws.info@gea.com; web site: www.gea.com)**

**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**

See our ad on page 135

**WYSSMONT CO. INC., 1470 Bergen Blvd., Fort Lee, NJ 07024 (201-947-4600; FAX: 201-947-0324; e-mail: sales@wyssmont.com; web site: www.wyssmont.com)**

See our ad on page 133

### Sludge dryers

Busz-SMS-Canzler GmbH, Butzbach, Germany  
**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

Encon Evaporators, Hooksett, NH  
Gebuerder Loedige Maschinenbau GmbH, Paderborn, Germany

**GIG KARASEK GMBH, Neusiedlerstrasse 15-19, Gloggnitz-Stuppach, Austria 2640 (+43-2662-42780-0; FAX: +43-2662-42824; e-mail: office@gigkarasek.at; web site: www.gigkarasek.com)**

**HEYL & PATTERSON INC., RENNEBURG DIVISION, PO Box 36, Pittsburgh, PA 15230 (412-788-9810; FAX: 412-788-9822; e-mail: info@heylpatterson.com; web site: www.heylpatterson.com)**

**KOMLINE-SANDERSON ENGINEERING CORP., 12 Holland Ave., Peapack, NJ 07977 (800-225-5457 North American; 908-234-1000; FAX: 908-234-9487; e-mail: info@komline.com; web site: www.komline.com)**

See our ad on page 135

### Spill prevention equipment

Trans Environmental Systems, Inc., Greencastle, PA

### Strippers, air

Branch Environmental Corp., Somerville, NJ  
Dual/HEE, a CECO Environmental Company, Owosso, MI  
Environmental C&C, St. Charles, IL

**KIMRE, INC., 744 SW 1st Street, Homestead, FL 33030 (305 233-4249; FAX: 305 233-8687; e-mail: sales@kimre.com; web site: www.kimre.com)**

### Tanks, settling

Charles Ross & Son Co., Hauppauge, NY

### Waste-recovery treating systems

ADI Systems Inc., Fredericton, New Brunswick, Canada  
**DELTA COOLING TOWERS INC., 185 US Highway 206, Roxbury Township, NJ 07836 (973-586-2201; FAX: 973-586-2243; e-mail: info@deltacooling.com; web site: www.deltacooling.com)**

Encon Evaporators, Hooksett, NH  
Lyntek, Inc., Lakewood, CO  
Progressive Recovery Inc., Duplo, IL

### Wastewater neutralization systems

Acrison Inc., Moonachie, NJ

# **11**

# **PROCESS CHEMICALS**

**175 Process chemicals**



## PROCESS CHEMICALS

### Acids, inorganic

AIC, Framingham, MA  
 Bayer MaterialScience LLC, Pittsburgh, PA  
 Cole Chemical, Houston, TX  
 De Dietrich Process Systems GmbH, Mainz, Germany  
 Transene Co. Inc., Danvers, MA

### Acids, organic

Pfaltz & Bauer, Inc., Waterbury, CT

### Activated carbon

Environmental C&C, St. Charles, IL  
 Jacobi Carbons, Inc., Columbus, OH  
 Siemens Industry, Inc. - Water Technologies, Alpharetta, GA  
 TIGG Corporation, Oakdale, PA  
 United Manufacturing International 2000, Red Bluff, CA

### Active pharmaceutical ingredients

AIC, Framingham, MA  
 VanDeMark Chemical Inc., Lockport, NY

### Adsorbents, for carbon dioxide

Arkema Inc., King of Prussia, PA  
 BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
 CellMark Deutschland GmbH, Duesseldorf, Germany  
 Jacobi Carbons, Inc., Columbus, OH

### Adsorbents, for hydrocarbons

Environmental C&C, St. Charles, IL  
 Jacobi Carbons, Inc., Columbus, OH

### Adsorbents, for oil

Jacobi Carbons, Inc., Columbus, OH

### Adsorbents, for PCBs

Jacobi Carbons, Inc., Columbus, OH

### Adsorbents, nonpolar

TankLink, a wholly-owned subsidiary of Telular Corporation, Chicago, IL

### Adsorbents, polar

CellMark Deutschland GmbH, Duesseldorf, Germany

### Adsorbents, spill control

Cole Chemical, Houston, TX

### Adsorbents, zeolites

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Alcohols, other

Cole Chemical, Houston, TX  
 Pfaltz & Bauer, Inc., Waterbury, CT

### Alkalies

Cole Chemical, Houston, TX

### Antioxidants

Cachat, M. F., Co., Headquarters, Lakewood, OH  
 Cole Chemical, Houston, TX  
**LANXESS CORPORATION, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

### Argon

Air Products and Chemicals, Inc., Allentown, PA

### Biocides, halogenated

**LANXESS CORPORATION, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

### Biocides, inorganic

Cachat, M. F., Co., Headquarters, Lakewood, OH

### Biocides, other

**LANXESS CORPORATION, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

### Biocides, phenolics

# LANXESS

Energizing Chemistry

**LANXESS CORPORATION, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

### Catalyst supports & systems

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
 CAI Catalysts, Gwynedd Square, PA  
 CellMark Deutschland GmbH, Duesseldorf, Germany  
 Christy Catalytics LLC, St. Louis, MO  
 CPI Wirecloth & Screens Inc, Pearland, TX

### Catalysts, acid

Haldor Topsøe A/S, Lyngby, Denmark

### Catalysts, cracking

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Catalysts, custom

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
 CAI Catalysts, Gwynedd Square, PA

### Catalysts, dehydrogenation, spent

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Catalysts, desulfurization

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
 CellMark Deutschland GmbH, Duesseldorf, Germany  
 Haldor Topsøe A/S, Lyngby, Denmark

### Catalysts, hydrogenation

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
**COMESSA, 101 rue du Rhin-Napoleon, Strasbourg, France 67100 (33-3-88-79-41-41; FAX: 33-3-88-79-02-04; e-mail: comessa@comessa.fr; web site: www.comessa.com)**

### Catalysts, hydrotreating

Haldor Topsøe A/S, Lyngby, Denmark

### Catalysts, organic synthesis

Pfaltz & Bauer, Inc., Waterbury, CT

### Catalysts, other

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
 CAI Catalysts, Gwynedd Square, PA  
 CellMark Deutschland GmbH, Duesseldorf, Germany

### Catalysts, oxidation

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
 Cachat, M. F., Co., Headquarters, Lakewood, OH  
 Haldor Topsøe A/S, Lyngby, Denmark  
 Hypercat Advanced Catalyst Products, West Chester, PA  
 KDF Fluid Treatment, Inc., Three Rivers, MI

### Catalysts, palladium

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Catalysts, platinum

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
 Hypercat Advanced Catalyst Products, West Chester, PA

### Catalysts, polymerization

Arkema Inc., King of Prussia, PA  
 BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
**LANXESS CORPORATION, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

### Catalysts, polyolefin production

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Catalysts, precious metal

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
 CAI Catalysts, Gwynedd Square, PA  
 Hypercat Advanced Catalyst Products, West Chester, PA

### Catalysts, Raney nickel

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Catalysts, reforming

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
 CAI Catalysts, Gwynedd Square, PA  
 Haldor Topsøe A/S, Lyngby, Denmark

### Catalysts, rhenium

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Catalysts, rhodium

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Catalysts, ruthenium

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Catalysts, urethane production

Air Products and Chemicals, Inc., Allentown, PA  
 Cachat, M. F., Co., Headquarters, Lakewood, OH

### Catalysts, vinyl production

Arkema Inc., King of Prussia, PA

### Catalysts, zeolite

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

### Chelating agents

AIC, Framingham, MA  
 Cole Chemical, Houston, TX

### Defoamers

Arkema Inc., King of Prussia, PA  
 Cachat, M. F., Co., Headquarters, Lakewood, OH  
 Momentive Performance Materials Inc., Waterford, NY

### Defoamers, chemical

Air Products and Chemicals, Inc., Allentown, PA  
 Momentive Performance Materials Inc., Waterford, NY  
 Spartan Chemical Services Inc., Jersey City, NJ

### Degreasers

Summit Industrial Products, Tyler, TX

### Desiccants

Arkema Inc., King of Prussia, PA  
 BASF Corporation, Catalysts & Adsorbents, Iselin, NJ  
 Cachat, M. F., Co., Headquarters, Lakewood, OH  
 Cortec Corp., St. Paul, MN  
 VanDeMark Chemical Inc., Lockport, NY

### Dewatering agents

VanDeMark Chemical Inc., Lockport, NY

### Dispersing agents, leather

**LANXESS CORPORATION, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

### Dispersing agents, other

**AOC RESINS, 955 Highway 57 East, Collierville, TN 38017 (800-238-7536; 901-854-2800; FAX: 901-854-1183; e-mail: sales@aoc-resin.com; web site: www.aoc-resins.com)**

Arkema Inc., King of Prussia, PA  
 Momentive Performance Materials Inc., Waterford, NY  
 Spartan Chemical Services Inc., Jersey City, NJ

### Dispersing agents, pigment

Cachat, M. F., Co., Headquarters, Lakewood, OH

### Dispersing agents, rubber

Cachat, M. F., Co., Headquarters, Lakewood, OH  
**LANXESS CORPORATION, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

### Dispersing agents, textile

Momentive Performance Materials Inc., Waterford, NY

### Emulsifiers

**LANXESS CORPORATION, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

### Flame retardants

Arkema Inc., King of Prussia, PA  
 Cachat, M. F., Co., Headquarters, Lakewood, OH  
 CellMark Deutschland GmbH, Duesseldorf, Germany  
**LANXESS CORPORATION, 111 RIDC Park West Drive, Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

### Helium

Air Products and Chemicals, Inc., Allentown, PA

### Hydrogen

Air Products and Chemicals, Inc., Allentown, PA  
 ThyssenKrupp Industrial Solutions AG, Business Unit Process Technologies, Dortmund, Germany

## Hydrogen peroxide

Transene Co. Inc., Danvers, MA

## Inhibitors, corrosion

Cachat, M. F., Co., Headquarters, Lakewood, OH  
CellMark Deutschland GmbH, Duesseldorf, Germany  
Cortec Corp., St. Paul, MN

**LANXESS CORPORATION, 111 RIDC Park West Drive,  
Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

## US Nitrogen

Air Products and Chemicals, Inc., Allentown, PA

## Organic intermediates

**LANXESS CORPORATION, 111 RIDC Park West Drive,  
Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

Pfaltz & Bauer, Inc., Waterbury, CT  
VanDeMark Chemical Inc., Lockport, NY

## Oxygen

Air Products and Chemicals, Inc., Allentown, PA  
AirSep Corporation, A Chart Industries Company, Buffalo, NY

## Ozone

Air Products and Chemicals, Inc., Allentown, PA  
AirSep Corporation, A Chart Industries Company, Buffalo, NY

## Pigments

**AOC RESINS, 955 Highway 57 East, Collierville, TN  
38017 (800-238-7536; 901-854-2800; FAX: 901-854-1183; e-mail: sales@aoc-resin.com; web site: www.aoc-resins.com)**

Cachat, M. F., Co., Headquarters, Lakewood, OH  
Cristal, Hunt Valley, MD

**LANXESS CORPORATION, 111 RIDC Park West Drive,  
Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

## Preservatives

AIC, Framingham, MA  
Cachat, M. F., Co., Headquarters, Lakewood, OH

**LANXESS CORPORATION, 111 RIDC Park West Drive,  
Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**

## Resins, water-soluble

**AOC RESINS, 955 Highway 57 East, Collierville, TN  
38017 (800-238-7536; 901-854-2800; FAX: 901-854-1183; e-mail: sales@aoc-resin.com; web site: www.aoc-resins.com)**

Bayer MaterialScience LLC, Pittsburgh, PA  
Cachat, M. F., Co., Headquarters, Lakewood, OH  
Dymax Corp., Torrington, CT

## Solvents, alcohols

Cole Chemical, Houston, TX  
Transene Co. Inc., Danvers, MA

## Solvents, drug extracting

Pfaltz & Bauer, Inc., Waterbury, CT

## Solvents, electronic

Transene Co. Inc., Danvers, MA

## Solvents, glycol ether

Cole Chemical, Houston, TX

## Solvents, high flash

Spartan Chemical Services Inc., Jersey City, NJ

## Solvents, hydrocarbons

Cole Chemical, Houston, TX

## Solvents, insecticide

Pfaltz & Bauer, Inc., Waterbury, CT

## Solvents, ketones

CellMark Deutschland GmbH, Duesseldorf, Germany  
Cole Chemical, Houston, TX

## Solvents, nontoxic

Spartan Chemical Services Inc., Jersey City, NJ

## Solvents, odorless

Summit Industrial Products, Tyler, TX

## Solvents, other

Summit Industrial Products, Tyler, TX

## Static eliminators

Newson Gale Ltd, Nottingham

## Surface active agents, anionic

Cachat, M. F., Co., Headquarters, Lakewood, OH

## Surface active agents, nonionic

Air Products and Chemicals, Inc., Allentown, PA  
Cachat, M. F., Co., Headquarters, Lakewood, OH

## Surface active agents, not further specified

Momentive Performance Materials Inc., Waterford, NY

## Surface active agents, other

Air Products and Chemicals, Inc., Allentown, PA  
Cachat, M. F., Co., Headquarters, Lakewood, OH

## Thickeners, cellulose ethers

Cachat, M. F., Co., Headquarters, Lakewood, OH

## Thickeners, other

Cachat, M. F., Co., Headquarters, Lakewood, OH

## Thickeners, thixotropes

Cachat, M. F., Co., Headquarters, Lakewood, OH

## Water treatment chemicals

CellMark Deutschland GmbH, Duesseldorf, Germany  
Cortec Corp., St. Paul, MN

# LANXESS

Energizing Chemistry


**LANXESS CORPORATION, 111 RIDC Park West Drive,  
Pittsburgh, PA 15275 (800-526-9377; 412-809-1000; e-mail: info@lanxess.com; web site: www.US.LANXESS.com)**  
Spartan Chemical Services Inc., Jersey City, NJ

## Zeolites

BASF Corporation, Catalysts & Adsorbents, Iselin, NJ

SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE  
SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE  
SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE  
SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE  
SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE  
SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE

SUBSCRIBE TO **CHEMICAL ENGINEERING**



**Written for engineers, by engineers**

More and more, business in the Chemical Process Industries (CPI) is not local, it's global. To keep up with this rapidly evolving marketplace, you need a magazine that covers it all, not just one country or region, not just one vertical market, but the whole CPI.

With editorial offices in Europe, Asia, and North America, CHEMICAL ENGINEERING is well-positioned to keep abreast of all the latest innovations in the equipment, technology, materials, and services used by process plants worldwide. **No other publication even comes close.**

**To subscribe, please call 1-847-564-9290  
or visit [clientservices@che.com](mailto:clientservices@che.com)**

[www.chemengonline.com](http://www.chemengonline.com)

**The #1 choice  
of worldwide  
CPI organizations**



**CHE**mploy

The Career Catalyst for Chemical Engineers

[chemengonline.com/chemploy](http://chemengonline.com/chemploy)

## Looking for that dream job in the chemical process industries?



Chemploy job center focuses exclusively on jobs in the CPI.

Post your resume and cover letters at [chemengonline.com/chemploy](http://chemengonline.com/chemploy) today!

Receive job alerts that will notify you by email of new jobs posted that match your search preferences. Create one now and never miss a new opportunity!

Access our Career Resources library which offers you valuable coaching and career guides.

**Don't let the competition score that perfect position you deserve.**

**Let Chemploy work for you.**

If interested in posting a job, please contact  
**DIANE BURLESON | Direct: 512-337-7890 | [dburleson@accessintel.com](mailto:dburleson@accessintel.com)**

Process  
Technology  
Grinding



www.neuhaus-neotec.de

Circle 202 on p. 180 or go to  
adlinks.che.com/50982-202

When a plugged  
drain line would  
mean disaster...



Model A100  
Plug Resistant  
Orifice for critical  
drain lines



CU Services LLC

725 Parkview Cir,  
Elk Grove Vlg, IL 60007

Phone 847-439-2303

cronfel@cuservices.net

www.cuservices.net

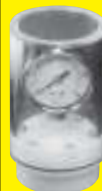
Circle 201 on p. 180 or go to  
adlinks.che.com/50982-201

DIAPHRAGM SEALS/  
GAUGE GUARDS

Protect pressure or vacuum  
instruments from clogging,  
corrosion and damage.

Compact and Economical, Plast-O-Matic  
Gauge Guards prevent dangerous leaks and  
allow dependable instrument readings from  
full vacuum to 250 psi.

- PTFE or FKM diaphragms.
- PVC, Polypro or PVDF bodies.
- Available with or without gauges.
- Gauge Shields for harsh environments.



FREE  
Catalog

TRUE BLUE™  
Volume Pricing

PLAST-O-MATIC VALVES, INC.

CEDAR GROVE, NJ 07009  
(973) 256-3000 • Fax: (973) 256-4745

www.plastomatic.com • info@plastomatic.com

Circle 203 on p. 180 or go to  
adlinks.che.com/50982-203

NEW & USED EQUIPMENT

HEAT EXCHANGERS



FOR GASES & LIQUIDS!

Talk Directly with  
Blower Cooling

INDUSTRIAL HEAT EXCHANGERS

**XCHANGER**

(952) 933-2559 info@xchanger.com

Circle 253 on p. 180 or go to  
adlinks.che.com/50982-253

HEAT EXCHANGER TUBE PLUGS

SS 304,316,317, Alloy20, Monel, ChromeMoly, Titanium,  
Brass, Steel, Duplex... IN STOCK, MADE IN USA

JOHN R. ROBINSON INC.

Phone #1-800-726-1026

www.johnrobinsoninc.com

sales@johnrobinsoninc.com



Circle 247 on p. 180 or go to  
adlinks.che.com/50982-247

TOLL SCREENING

With the screening experts

- From 100 to 1,000,000 LBS
- The solution for problematic products
- As fine as 10 Micron
- Excellent yields with quick turn around
- Super high efficiencies



ELCAN  
TOLL PROCESSING

TEL:(914)381-7500 or Toll Free:1-800-AT ELCAN  
20 MARBLEDALE ROAD, TUCKAHOE, NY 10707  
SALES@ELCANINDUSTRIES.COM

Circle 242 on p. 72 or go to  
adlinks.che.com/50982-242

DUAL SHAFT  
MIXERS

New 50, 100 & 200 gal.  
mixers in stock!



Scan to learn  
more & get a  
free quote.

Free Tag Reader:  
http://gettag.mobi

1-800-243-ROSS

www.DualShaftMixers.com



Circle 249 on p. 180 or go to  
adlinks.che.com/50982-249

KnightHawk Engineering

Specialists in design, failure analysis  
and troubleshooting of static  
and rotating equipment


www.knighthawk.com

Contact Jim Salter 281-282-9200

Circle 248 on p. 180 or go to  
adlinks.che.com/50982-248





# SOFTWARE

# EQUIPMENT



**HTRI**  
**Xchanger Suite 7**

New module for plate-fin exchangers: *Xpfe*<sup>®</sup>  
 New materials of construction database  
 Significantly improved graphing capabilities  
 Many new and improved features in *Xist*<sup>®</sup> including

-  Ten new methods backed by proprietary research
-  New data entry form based on TEMA input sheet
-  Enhanced tube layout capabilities backed by ASME mechanical design
-  3D visualization of exchangers

**HTRI**  
www.htri.net

**We're changing the future of heat transfer™**

Circle 245 on p. 180 or go to [adlinks.che.com/50982-245](http://adlinks.che.com/50982-245)

**VisiMix Saves Millions of Dollars per Year**

VisiMix Mixing Simulations deliver proven return on investment.

User friendly mixing simulations for chemical engineers, process engineers, and chemists deliver fast results.

Now available: VisiMix RSD: Rotor Stator Dispenser for high-shear mixing

See how customers are successfully using VisiMix. Contact Marcie Forrest for a live demo at: [mforrest@visimix.com](mailto:mforrest@visimix.com) or call: 877-33-8888/1124

Visit our website and download our free demo at [visimix.com](http://visimix.com)



Circle 251 on p. 180 or go to [adlinks.che.com/50982-251](http://adlinks.che.com/50982-251)

Engineering e-material, e-solutions, e-courses and e-seminars for energy conversion systems:

- Physical Properties
- Steam Approximations
- Power Cycles
- Power Cycle Components/Processes
- Compressible Flow

#### ENGINEERING SOFTWARE

Phone/FAX: (301) 540-3605

Web Site: <http://www.engineering-4e.com>

Visit the web site to check out free demos, etc.!

Circle 243 on p. 180 or go to [adlinks.che.com/50982-243](http://adlinks.che.com/50982-243)

**www.ae-sim.com**  
**Process Simulators**

Material Balance - Process Control  
 Power Plant Steam Cycles  
 Free Demo Downloads

Circle 241 on p. 180 or go to [adlinks.che.com/50982-241](http://adlinks.che.com/50982-241)

## ADVERTISE IN THE CLASSIFIED

Contact Diane Burleson  
 Tel: 512-337-7890  
 Fax: 512-213-4855  
 Email: [dburleson@accessintel.com](mailto:dburleson@accessintel.com)

## CONSULTING

### CRYSTALLIZATION & PRECIPITATION



**Dr. Wayne J. Genck**

Genck International  
 3 Somonauk Court, Park Forest, IL. 60466  
 Tel (708) 748-7200 Fax (708) 748-7208  
[genckintl@aol.com](mailto:genckintl@aol.com) – <http://www.genckintl.com>

- Design/Scale-up
- Purity
- Size Distribution
- Caking
- Laboratory Investigations
- Drying
- Filtration
- Particle Habit
- Troubleshooting
- Polymorphism
- Product Micro-Analysis
- Kinetics Studies

◆◆◆ Industrial Seminars ◆◆◆

Circle 244 on p. 180 or go to [adlinks.che.com/50982-244](http://adlinks.che.com/50982-244)

Stop dry start problems with Vesconite Hilube bushings

- Low friction
- No swell
- Increase MTBR
- Reduce electricity
- Quick supply

CALL FOR SAMPLE

Tel: +27 11 616 11 11  
[vesconite@vesconite.com](mailto:vesconite@vesconite.com)  
[www.vesconite.com](http://www.vesconite.com)

Circle 250 on p. 180 or go to [adlinks.che.com/50982-250](http://adlinks.che.com/50982-250)

## BOILERS

Available Immediately



Lease • Rental • Sale

**800.446.3325**

250,000-800 PSI / 750 Deg. F.  
 180,000-750 PSI / 750 Deg. F.  
 165,000-1025 PSI / 850 Deg. F.  
 165,000-395 PSI  
 150,000-750 PSI / 750 Deg. F.  
 135,000-750 PSI / 750 Deg. F.  
 120,000-350 PSI  
 120,000-725 PSI / 750 Deg. F.  
 110,000-395 PSI  
 90,000-395 PSI  
 75,000-750 PSI / 750 Deg. F.  
 75,000-395 PSI  
 70,000-395 PSI  
 70,000-350 PSI  
 60,000-750 PSI / 750 Deg. F.  
 50,000-395 PSI  
 40,000-750 PSI  
 30,000-395 PSI  
 20,000-1600 PSI  
 10-1,000 HP - 15-250 PSI

Trailer Mounted  
 80K-395 PSI  
 75K-395 PSI  
 70K-395 PSI  
 70K-350 PSI  
 60K SH-750 PSI  
 60K-395 PSI  
 40K-395 PSI  
 40K-350 PSI  
 36K-300 PSI  
 30K-300 PSI  
 24K-300 PSI

Emergency Service  
**24HR**  
 Emergency Service

**INDECK**

Indeck can custom design and build for you too!

Indeck Power Equipment Company  
 847.541.8300  
[info@indeck-power.com](mailto:info@indeck-power.com)  
[www.indeck.com](http://www.indeck.com)

Circle 246 on p. 180 or go to [adlinks.che.com/50982-246](http://adlinks.che.com/50982-246)

### WABASH SELLS & RENTS Boilers

20,000 - 400,000 #/Hr.

**Diesel & Turbine Generators**

50 - 25,000 KW

**Gears & Turbines**

25 - 4000 HP

**We stock large inventories of:**  
 Air Pre-Heaters • Economizers • Deaerators  
 Pumps • Motors • Fuel Oil Heating and Pump Sets  
 Valves • Tubes • Controls • Compressors  
 Pulverizers • Rental Boilers & Generators

**24/7 Fast Emergency Service**

**800-704-2002**

Phone: 847-541-5600 Fax: 847-541-1279

[www.wabashpower.com](http://www.wabashpower.com)

**wabash POWER EQUIPMENT CO.**  
 444 Carpenter Ave., Wheeling, IL 60090

Circle 252 on p. 180 or go to [adlinks.che.com/50982-252](http://adlinks.che.com/50982-252)

## JustFAXit! or go to [www.chemengonline.com/adlinks](http://www.chemengonline.com/adlinks)

Fill out the form and circle or write in the number(s) below, cut it out, and fax it to 800-571-7730.

Go on the Web and fill out the online reader service card.

Name				Title			
Company							
Address							
City	State/Province			Zip/Postal Code			
Country	Telephone			Fax			
Email							

### FREE PRODUCT INFO (please answer all the questions)

#### YOUR INDUSTRY

- 01 Food & Beverages
- 02 Wood, Pulp & Paper
- 03 Inorganic Chemicals
- 04 Plastics, Synthetic Resins
- 05 Drugs & Cosmetics
- 06 Soaps & Detergents
- 07 Paints & Allied Products
- 08 Organic Chemicals
- 09 Agricultural Chemicals
- 10 Petroleum Refining, Coal Products
- 11 Rubber & Misc. Plastics
- 12 Stone, Clay, Glass, Ceramics
- 13 Metallurgical & Metal Products

- 14 Engineering, Design & Construction Firms
- 15 Engineering/Environmental Services
- 16 Equipment Manufacturer
- 17 Energy incl. Co-generation
- 18 Other \_\_\_\_\_

#### JOB FUNCTION

- 20 Corporate Management
- 21 Plant Operations incl. Maintenance
- 22 Engineering
- 23 Research & Development
- 24 Safety & Environmental
- 26 Other \_\_\_\_\_

#### EMPLOYEE SIZE

- 28 Less than 10 Employees

- 29 10 to 49 Employees
- 30 50 to 99 Employees
- 31 100 to 249 Employees
- 32 250 to 499 Employees
- 33 500 to 999 Employees
- 34 1,000 or more Employees

#### YOU RECOMMEND, SPECIFY, PURCHASE (please circle all that apply)

- 40 Drying Equipment
- 41 Filtration/Separation Equipment
- 42 Heat Transfer/Energy Conservation Equipment
- 43 Instrumentation & Control Systems
- 44 Mixing, Blending Equipment
- 45 Motors, Motor Controls
- 46 Piping, Tubing, Fittings

- 47 Pollution Control Equipment & Systems
- 48 Pumps
- 49 Safety Equipment & Services
- 50 Size Reduction & Agglomeration Equipment
- 51 Solids Handling Equipment
- 52 Tanks, Vessels, Reactors
- 53 Valves
- 54 Engineering Computers/Software/Peripherals
- 55 Water Treatment Chemicals & Equipment
- 56 Hazardous Waste Management Systems
- 57 Chemicals & Raw Materials
- 58 Materials of Construction
- 59 Compressors

1	16	31	46	61	76	91	106	121	136	151	166	181	196	211	226	241	256	271	286	301	316	331	346	361	376	391	406	421	436	451	466	481	496	511	526	541	556	571	586
2	17	32	47	62	77	92	107	122	137	152	167	182	197	212	227	242	257	272	287	302	317	332	347	362	377	392	407	422	437	452	467	482	497	512	527	542	557	572	587
3	18	33	48	63	78	93	108	123	138	153	168	183	198	213	228	243	258	273	288	303	318	333	348	363	378	393	408	423	438	453	468	483	498	513	528	543	558	573	588
4	19	34	49	64	79	94	109	124	139	154	169	184	199	214	229	244	259	274	289	304	319	334	349	364	379	394	409	424	439	454	469	484	499	514	529	544	559	574	589
5	20	35	50	65	80	95	110	125	140	155	170	185	200	215	230	245	260	275	290	305	320	335	350	365	380	395	410	425	440	455	470	485	500	515	530	545	560	575	590
6	21	36	51	66	81	96	111	126	141	156	171	186	201	216	231	246	261	276	291	306	321	336	351	366	381	396	411	426	441	456	471	486	501	516	531	546	561	576	591
7	22	37	52	67	82	97	112	127	142	157	172	187	202	217	232	247	262	277	292	307	322	337	352	367	382	397	412	427	442	457	472	487	502	517	532	547	562	577	592
8	23	38	53	68	83	98	113	128	143	158	173	188	203	218	233	248	263	278	293	308	323	338	353	368	383	398	413	428	443	458	473	488	503	518	533	548	563	578	593
9	24	39	54	69	84	99	114	129	144	159	174	189	204	219	234	249	264	279	294	309	324	339	354	369	384	399	414	429	444	459	474	489	504	519	534	549	564	579	594
10	25	40	55	70	85	100	115	130	145	160	175	190	205	220	235	250	265	280	295	310	325	340	355	370	385	400	415	430	445	460	475	490	505	520	535	550	565	580	595
11	26	41	56	71	86	101	116	131	146	161	176	191	206	221	236	251	266	281	296	311	326	341	356	371	386	401	416	431	446	461	476	491	506	521	536	551	566	581	596
12	27	42	57	72	87	102	117	132	147	162	177	192	207	222	237	252	267	282	297	312	327	342	357	372	387	402	417	432	447	462	477	492	507	522	537	552	567	582	597
13	28	43	58	73	88	103	118	133	148	163	178	193	208	223	238	253	268	283	298	313	328	343	358	373	388	403	418	433	448	463	478	493	508	523	538	553	568	583	598
14	29	44	59	74	89	104	119	134	149	164	179	194	209	224	239	254	269	284	299	314	329	344	359	374	389	404	419	434	449	464	479	494	509	524	539	554	569	584	599
15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	375	390	405	420	435	450	465	480	495	510	525	540	555	570	585	600

If number(s) do not appear above, please write them here and circle: \_\_\_\_\_

## Fax this page back to 800-571-7730

### ADVERTISING SALES REPRESENTATIVES

#### North America

##### Terry Davis

Sales Director

Chemical Engineering

2276 Eastway Rd., Decatur, GA 30033

Tel: 404-634-5123; Fax: 832-201-8823 E-mail: [tdavis@che.com](mailto:tdavis@che.com)

Alabama, Canada, Connecticut, Delaware, Georgia, Idaho, Kentucky, Latin America, Maine, Maryland, Massachusetts, Mississippi, Montana, Nebraska, New Hampshire, New Jersey, New York, North and South Carolina, North and South Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Utah, Vermont, Virginia, Washington D.C., West Virginia, Wyoming

##### Jason Bullock,

District Sales Manager

Chemical Engineering

8325 Broadway, Ste. 202/PMB 261

Pearland, TX 77581

Tel: 281-485-4077; Fax: 281-485-1285

E-mail: [jbullock@che.com](mailto:jbullock@che.com)

Arizona, Arkansas, California, Colorado, Florida, Kansas, Louisiana, Missouri, Nevada, New Mexico, Oklahoma, Texas, Washington

##### Dan Gentile

District Sales Manager

Chemical Engineering

Tel: 512-918-8075

E-mail: [dgentile@che.com](mailto:dgentile@che.com)

Alaska, Hawaii, Illinois, Indiana, Iowa, Michigan, Minnesota, Wisconsin,

##### Diane Burleson

Inside Sales Manager

Chemical Engineering;

11000 Richmond Ave, Suite 690,

Houston, TX 77042

Tel: 512-337-7890

E-mail: [dburleson@che.com](mailto:dburleson@che.com)

Product Showcase, Literature Reviews, Classified Display Advertising

#### International

##### Petra Trautes

Chemical Engineering

Zeilweg 44

D-60439 Frankfurt am Main

Germany

Phone: +49-69-58604760

Fax: +49-69-5700-2484

Email: [ptrautes@che.com](mailto:ptrautes@che.com)

Austria, Czech Republic, Benelux, Eastern Europe, Germany, Scandinavia, Switzerland, United Kingdom

##### Dipali Dhar

Chemical Engineering

88 Pine Street, 5th floor, New York, NY 10005

Tel: 718-263-1162

E-mail: [ddhar@accessintel.com](mailto:ddhar@accessintel.com)

India

##### Katshuhiro Ishii

Chemical Engineering

Ace Media Service Inc., 12-6, 4-chome

Nishiiko, Adachi-ku, Tokyo 121, Japan

Tel: 81-3-5691-3335; Fax: 81-3-5691-3336

E-mail: [amskatsu@dream.com](mailto:amskatsu@dream.com)

Japan

##### Ferruccio Silvera

Chemical Engineering

Silvera Pubblicita

Viale Monza, 24 Milano 20127, Italy

Tel: 39-02-284-6716;

Fax: 39-02-289-3849

E-mail: [ferruccio@silvera.it](mailto:ferruccio@silvera.it)/[www.silvera.it](http://www.silvera.it)

Andorra, France, Gibraltar, Greece, Israel, Italy, Portugal, Spain

##### Rudy Teng

Sales Representative

Chemical Engineering;

8F-1 #181 Wulin Road

Hsinchu 30055 Taiwan

Tel: +86 13818181202, (China),

+886 921322428 (Taiwan)

Fax: +86 21 54183567

E-mail: [rudy.teng@gmail.com](mailto:rudy.teng@gmail.com)

Asia-Pacific, Hong Kong, People's Republic of China, Taiwan

# Advertisers' Index

Advertiser Phone number	Page number Reader Service #
<b>Abbe, Paul O.</b> 1-800-524-2188 <i>adlinks.che.com/50982-03</i>	<b>3</b>
<b>AMACS Process Tower Internals</b> 1-281-716-1179 <i>adlinks.che.com/50982-04</i>	<b>45</b>
<b>American Elements</b> <i>adlinks.che.com/50982-38</i>	<b>66</b>
<b>ARC Advisory Group</b> <i>adlinks.che.com/50982-05</i>	<b>24</b>
<b>Beumer Group GmbH &amp; Co. KG</b> <i>adlinks.che.com/50982-07</i>	<b>7</b>
<b>Brookfield Engineering</b> 1-800-628-8139 <i>adlinks.che.com/50982-07</i>	<b>19</b>
<b>Bürkert Werke GmbH</b> <i>adlinks.che.com/50982-08</i>	<b>15</b>
<b>Chemstations</b> <i>adlinks.che.com/50982-16</i>	<b>09</b>
<b>Cleaver-Brooks, Inc.</b> 1-800-250-5883 <i>adlinks.che.com/50982-10</i>	<b>37</b>
<b>Corzan HP Piping Systems</b> 1-216-447-7397 <i>adlinks.che.com/50982-21, 42</i>	<b>21, 81</b>
<b>Dechema E.V.</b> <i>adlinks.che.com/50982-11</i>	<b>8</b>
<b>Eastman Chemical Company</b> 1-800-426-2463 <i>adlinks.che.com/50982-12</i>	<b>3</b>
<b>Ekato Group</b> 49 7622 29-0 <i>adlinks.che.com/50982-39</i>	<b>147</b>
<b>Emerson Process Management</b>	<b>4</b>
<b>Endress + Hauser</b> 1-888-ENDRESS <i>adlinks.che.com/50982-13</i>	<b>13</b>
<b>Federal Equipment Co.</b> 1-877-503-9745 <i>adlinks.che.com/50982-14</i>	<b>30</b>
<b>Flexim GmbH</b> <i>adlinks.che.com/50982-15</i>	<b>63</b>
<b>Fluid Line Products</b> 1-440-946-9470 <i>adlinks.che.com/50982-16</i>	<b>57</b>
<b>GEA Westfalia</b> 49 2522 77-0 <i>adlinks.che.com/50982-17</i>	<b>9</b>
<b>* GEA Wiegand GmbH</b> 49 7243 705-0 <i>adlinks.che.com/50982-18</i>	<b>27-1</b>
<b>GIG Karasek GmbH</b> <i>adlinks.che.com/50982-19</i>	<b>35</b>
<b>Komline-Sanderson</b> 1-800-225-5457 <i>adlinks.che.com/50982-40</i>	<b>135</b>
<b>Körting Hannover AG</b> <i>adlinks.che.com/50982-41</i>	<b>107</b>
<b>Load Controls</b> 1-888-600-3247 <i>adlinks.che.com/50982-20</i>	<b>62</b>

\* International Edition

See bottom of opposite page  
for advertising  
sales representatives'  
contact information



Advertiser Phone number	Page number Reader Service #
<b>Miller-Stephenson</b> 1-800-992-2424 <i>adlinks.che.com/50982-22</i>	<b>64</b>
<b>Müller GmbH</b> 49 (0) 7623/969-0 <i>adlinks.che.com/50982-23</i>	<b>20</b>
<b>Orion Instruments</b>	<b>FOURTH COVER</b>
<b>Otek Corporation</b> 1-520-748-7900 <i>adlinks.che.com/50982-25</i>	<b>31</b>
<b>Paharpur Cooling Towers</b> 91-33-4013 3000 <i>adlinks.che.com/50982-43</i>	<b>82</b>
<b>Pentair Separation Systems</b> 1-888-896-6300 <i>adlinks.che.com/50982-26</i>	<b>34</b>
<b>Pfeiffer Vacuum GmbH</b> 49 6441 802-0 <i>adlinks.che.com/50982-27</i>	<b>25</b>
<b>* Plast-O-Matic Valves, Inc.</b> 1-973-256-3000 <i>adlinks.che.com/50982-28</i>	<b>6-1</b>
<b>Plymouth Tube Co.</b> <i>adlinks.che.com/50982-29</i>	<b>26</b>
<b>Pompetravaini Spa</b> 39.0331.889000 <i>adlinks.che.com/50982-30</i>	<b>39</b>
<b>RedGuard</b> 1-855-REDGUARD <i>adlinks.che.com/50982-01, 02</i>	<b>18, 63</b>
<b>Rembe GmbH</b> 49 (0) 29 61-7405-0 <i>adlinks.che.com/50982-31</i>	<b>19</b>

Advertiser Phone number	Page number Reader Service #
<b>Ross, Charles &amp; Son Company</b> 1-800-243-ROSS <i>adlinks.che.com/50982-32</i>	<b>10</b>
<b>Saint-Gobain Ceramics</b> 1-716-278-6233 <i>adlinks.che.com/50982-44</i>	<b>158</b>
<b>Sandvik Materials Technology</b> 46 26 26 00 00 <i>adlinks.che.com/50982-45</i>	<b>67</b>
<b>Sandvik Process Systems</b> 49 711 5105-0 <i>adlinks.che.com/50982-33</i>	<b>33</b>
<b>Sulzer Chemtech AG</b>	<b>SECOND COVER</b>
41 61 486 3737 <i>adlinks.che.com/50982-34</i>	
<b>Team Industrial Services</b> 1-800-662-8326 <i>adlinks.che.com/50982-35</i>	<b>23</b>
<b>TLV Corporation</b> 1-800-TLV-TRAP <i>adlinks.che.com/50982-46</i>	<b>100</b>
<b>Uniflux/Exotherm Corporation</b> 1-713-981-9100 <i>adlinks.che.com/50982-47</i>	<b>68</b>
<b>United Rentals</b> <i>adlinks.che.com/50982-36</i>	<b>29</b>
<b>Wysmont Company Inc.</b> 1-201-947-4600 <i>adlinks.che.com/50982-48</i>	<b>133</b>
<b>YS Inc.</b> 1-888-356-3343 <i>adlinks.che.com/50982-37</i>	<b>64</b>

## Classified Index November 2014

Advertiser Phone number	Page number Reader Service #
<b>Applied e-Simulators Software</b> <i>adlinks.che.com/50982-241</i>	<b>179</b>
<b>CU Services LLC</b> 1-847-439-2308 <i>adlinks.che.com/50982-201</i>	<b>178</b>
<b>Elcan Industries</b> 1-914-381-7500 <i>adlinks.che.com/50982-242</i>	<b>178</b>
<b>Engineering Software</b> 1-301-540-3605 <i>adlinks.che.com/50982-243</i>	<b>179</b>
<b>Genck International</b> 1-708-748-7200 <i>adlinks.che.com/50982-244</i>	<b>179</b>
<b>Heat Transfer Research, Inc.</b> <i>adlinks.che.com/50982-245</i>	<b>179</b>
<b>Indeck Power Equipment Co.</b> 1-847-541-8300 <i>adlinks.che.com/50982-246</i>	<b>179</b>
<b>John R. Robinson, Inc.</b> 1-800-726-1026 <i>adlinks.che.com/50982-247</i>	<b>178</b>
<b>KnightHawk Engineering</b> 1-281-282-9200 <i>adlinks.che.com/50982-248</i>	<b>178</b>
<b>Neuhaus Neotec</b> <i>adlinks.che.com/50982-202</i>	<b>178</b>

<b>Advertiser's Product Showcase</b> . . .	<b>178</b>
<b>Computer Software</b> . . . . .	<b>179</b>
<b>Consulting</b> . . . . .	<b>179</b>
<b>Equipment, New &amp; Used</b> . . . .	<b>178-179</b>

Advertiser Phone number	Page number Reader Service #
<b>Plast-O-Matic Valves, Inc.</b> 1-973-256-3000 <i>adlinks.che.com/50982-203</i>	<b>178</b>
<b>Ross, Charles &amp; Son Company</b> 1-800-243-ROSS <i>adlinks.che.com/50982-249</i>	<b>178</b>
<b>Vesconite Bearings</b> 27 11 616 11 11 <i>adlinks.che.com/50982-250</i>	<b>179</b>
<b>VisiMix</b> 972 52 383 4174 <i>adlinks.che.com/50982-251</i>	<b>179</b>
<b>Wabash Power Equipment Co.</b> 1-800-704-2002 <i>adlinks.che.com/50982-252</i>	<b>179</b>
<b>Xchanger, Inc.</b> 1-952-933-2559 <i>adlinks.che.com/50982-253</i>	<b>178</b>

Send Advertisements and Box replies to: **Diane Burleson**  
Chemical Engineering, 11000 Richmond Ave, Houston, TX 77042  
E-mail: [dburleson@che.com](mailto:dburleson@che.com) Tel: 512-337-7890

## People

### WHO'S WHO



Kipphardt



Kuehlbrey



Griffiths



Castella



Oosterlinck

**GEA Refrigeration Technologies GmbH** (Bochum, Germany) names *Nadine Kipphardt* marketing manager.

*Ralph Exton*, chief marketing officer, water and process technologies, for **GE Power & Water** (Schenectady, N.Y.), has been appointed to serve as the 2014–2015 treasurer on the board of trustees for the **Water Environment Federation** (Alexandria, Va.).

*Eberhard Kuehlbrey* becomes manager of the product management

group for **List Group** (Arisdorf, Switzerland), a provider of dry processing solutions for the CPI.

**Berjé, Inc.** (Carteret, N.J.), a producer of essential oils and aromatic chemicals, appoints *Terri Romeo* as vice president of sales.

*Mark Griffiths*, CEO of both **Dishman Pharmaceuticals and Chemicals** (Ahmedabad, India), a provider of outsourced services for the pharmaceutical industry and its subsidiary **Carbogren Amcic AG**

(Bubendorf, Switzerland), a developer of pharmaceutical processes and active ingredients, has joined the board of directors of Dishman.

**Akzo Nobel N.V.** (Amsterdam, the Netherlands) welcomes current chief financial officer *Maelys Castella* to the company's board of management.

**Fike Corp.** (Blue Springs, Mo.) welcomes *Frank Oosterlinck* as managing director of Fike Europe, based in Herentals, Belgium. ■

*Suzanne Shelley*

#### Statement of Ownership, Management, and Circulation (Requester Publications Only)

1. Publication Title: Chemical Engineering 2. Publication Number: 0009-2460 3. Filing Date: 9/29/14 4. Issue Frequency: Monthly 5. Number of Issues Published Annually: 12 6. Annual Subscription Price \$149.97. Complete Mailing Address of Known Office of Publication: Access Intelligence, 4 Choke Cherry Road, 2nd Floor, Rockville, MD 20850-4024 Contact: George Severine Telephone: 301-354-1706 8. Complete Mailing Address of Headquarters or General Business Office Publisher: Access Intelligence, LLC, 4 Choke Cherry Road, 2nd Floor, Rockville, MD 20850-4024 9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor: Publisher: Michael Grossman, 4 Choke Cherry Road, 2nd Floor, Rockville, MD 20850-4024 Editor: Dorothy Lozowski, 4 Choke Cherry Road, 2nd Floor, Rockville, MD 20850-4024 10. Owner if the publication is owned by a corporation, give the name and address of the corporation immediately followed by the names and addresses of all stockholders owning or holding 1 percent or more of the total amount of stock: Veronis Suhler Stevenson, 55 East 52nd Street, 33rd Floor, New York, NY 10055 11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or other Securities: None 12. Non-profit organization: not applicable. 13. Publication: Chemical Engineering 14. Issue Date for Circulation Data: September 2014.

#### 15. Extent and Nature of Circulation:

	Average No. of Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Nearest to Filing Date
	15. Extent and Nature of Circulation:	
a. Total Number of Copies (Net press run)	36,436	36,342
b. Legitimate Paid and/or Requested Distribution		
(1) Outside County Paid/Requested Mail Subscriptions	31,508	30,831
(2) Inside County Paid/Requested Mail Subscriptions	0	0
(3) Sales Through Dealers and Carriers, Street Vendors, Counter Sales or Other Paid or Requested Distribution Outside USPS	2,394	2,257
(4) Requested Copies Distributed by Other Mail Classes	148	141
c. Total Paid and/or Requested Circulation	34,050	33,229
d. Nonrequested Distribution (By Mail and Outside the Mail)		
(1) Outside County Nonrequested Copies	799	780
(2) Inside-County Nonrequested Copies	0	0
(3) Nonrequested Copies Distributed Through the USP by Other Classes of Mail	0	0
(4) Nonrequested Copies Distributed Outside the Mail (Include Pickup Stands, Trade Shows, Showrooms and Other Sources)	728	1,448
e. Total Nonrequested Distribution	1,527	2,228
f. Total Distribution (Sum of 15c and 15e)	35,577	35,457
g. Copies not Distributed (Office, Returns, Spoilage, Unused)	859	885
h. Total (Sum of 15f and g)	36,436	36,342
i. Percent Paid and/or Requested Circulation	95.71%	93.72%

16. Electronic Copy Distribution: None Reported

17. Publication of Statement of Ownership for a Requester Publication is required and will be printed in the November 2014 issue of this publication

18. Signature of Fulfillment Manager: George Severine

Date: 9/29/14

PS Form 3526-R, July 2014



## BUSINESS NEWS

## PLANT WATCH

**Kemira inaugurates its largest water-treatment chemicals plant**

October 9, 2014 — Kemira Oyj (Helsinki; [www.kemira.com](http://www.kemira.com)) has inaugurated its biggest manufacturing plant for water-treatment chemicals. Located in Dormagen, Germany, the facility will produce 14 different specifications of acidic and alkaline aluminum salts, says the company.

**CB&I announces technology award in the Kingdom of Bahrain**

October 9, 2014 — Chevron Lummus Global, a joint venture (JV) between CB&I (The Woodlands, Tex.; [www.cbi.com](http://www.cbi.com)) and Chevron Corp., has been awarded a contract in excess of \$100 million by Bahrain Petroleum Co. (Bapco). The scope of work includes the license of its LC-Fining and IsoCracking technologies and engineering design packages for the new residue-hydrocracking and vacuum-gasoil hydrocracking units.

**Evonik boosts capacity for specialty silicas at its Rheinfelden site**

October 8, 2014 — Evonik Industries AG (Essen, Germany; [www.evonik.com](http://www.evonik.com)) has opened a new production line to manufacture surface-treated fumed silica. The new line will be located at Evonik's Rheinfelden, Germany site, and will boost the company's global production capacity for these products by 25%.

**Linde to construct air-separation unit for steelworks facility in eastern Germany**

October 8, 2014 — The Linde Group (Pulach, Germany; [www.linde.com](http://www.linde.com)) is set to build a new €85-million air-separation unit (ASU) in Eisenhüttenstadt, Germany. The ASU will supply the ArcelorMittal Eisenhüttenstadt steelworks plant, which is scheduled to go onstream in 2017, with oxygen and nitrogen.

**Neste Jacobs awarded EPCM contract for biopropane production plant**

October 8, 2014 — Neste Jacobs Oy (Porvoo, Finland; [www.nestejacobs.com](http://www.nestejacobs.com)) will provide engineering, procurement and construction management (EPCM) services for the new biopropane production plant at Neste Oil's Rotterdam refinery. When the new unit is complete, biopropane production is expected to total 30,000–40,000 metric tons per year (m.t./yr). The project will begin production by year-end 2016. The total value of the investment is approximately €60 million.

**Nippon Shokubai building production plant for superabsorbent polymers**

October 1, 2014 — Nippon Shokubai Co. (Osaka, Japan; [www.shokubai.co.jp](http://www.shokubai.co.jp)) plans to build a new production plant for superabsorbent polymers at its existing Himeji plant site. The plant will have a capacity of 50,000 m.t./yr. Mechanical completion is scheduled for June 2016.

**Ineos to provide PE process technology to Ascent's West Virginia facility**

October 1, 2014 — Ineos Technologies (Rolle, Switzerland; [www.ineos.com](http://www.ineos.com)) has entered into license agreements for its polyethylene (PE) process technologies to be used at the proposed Ascent (Appalachian Shale Cracker Enterprise) petrochemical complex currently being evaluated in West Virginia.

**Hexcel to produce carbon fibers and precursors at planned French plant**

September 30, 2014 — Hexcel Corp. (Stamford, Conn.; [www.hexcel.com](http://www.hexcel.com)) will build new precursor and carbon-fiber manufacturing lines in Roussillon, France. Construction of the \$250-million plant will begin by mid-2015, with startup planned for early 2018.

**Capacity expansion planned for MDI at Huntsman's Geismar facility**

September 29, 2014 — Huntsman Corp. (The Woodlands, Tex.; [www.huntsman.com](http://www.huntsman.com)) has commenced preliminary engineering work on additional production capacity at its Geismar, La. site for methylene diphenyl diisocyanate (MDI). The 400,000-m.t. expansion is expected to come onstream in 2018.

**ExxonMobil expanding hydrocarbon fluid production in Singapore and Antwerp**

September 25, 2014 — ExxonMobil Chemical Co. (Houston; [www.exxonmobilchemical.com](http://www.exxonmobilchemical.com)) is increasing production of its high-performance hydrocarbon fluids by about 10% through expansion projects at its Singapore and Antwerp facilities. The capacity expansion will be complete in 2016.

## MERGERS AND ACQUISITIONS

**Lion Copolymer acquires elastomers business from Ashland**

October 9, 2014 — Lion Copolymer Holdings, LLC (Geismar, La.; [www.lioncopolymer.com](http://www.lioncopolymer.com)) will purchase Ashland Inc.'s (Covington, Ky.; [www.ashland.com](http://www.ashland.com)) Texas-based elastomers business. The transaction is expected to close by year-end 2014.

**New JV formed for Porvoo power plant modernization**

October 7, 2014 — Borealis AG (Vienna, Austria; [www.borealisgroup.com](http://www.borealisgroup.com)) plans to partner with Neste Oil and Veolia in a JV to modernize and operate a power plant in the Kilpilahti petrochemical cluster in Porvoo, Finland. The JV, co-owned by Neste Oil (40%), Veolia (40%) and Borealis (20%), will implement a modernization program between 2015 and 2017. The result will be all-new generating facilities with three new steam boilers.

**Dow to take full ownership of PE licensing JV Univation from ExxonMobil**

October 2, 2014 — Univation Technologies, LLC, a 50/50 JV between The Dow Chemical Company (Dow; Midland, Mich.; [www.dow.com](http://www.dow.com)) and ExxonMobil Chemical Co. will become a wholly owned subsidiary of Dow. Univation Technologies is the licensor of Unipol PE process technology.

**Sigma-Aldrich acquired by Merck for \$17 billion**

September 22, 2014 — Merck KGaA (Darmstadt, Germany; [www.merckgroup.com](http://www.merckgroup.com)) and Sigma-Aldrich (St. Louis, Mo.; [www.sigma-aldrich.com](http://www.sigma-aldrich.com)) have entered into a definitive agreement under which Merck will acquire Sigma-Aldrich for \$17.0 billion (€13.1 billion). Closing is expected in mid-2015, subject to regulatory approvals and other customary closing conditions.

**Siemens to acquire turbomachinery provider Dresser-Rand for \$7.6 billion**

September 22, 2014 — Siemens AG (Munich, Germany; [www.siemens.com](http://www.siemens.com)) has entered into an agreement with Dresser-Rand (Houston; [www.dresser-rand.com](http://www.dresser-rand.com)), to acquire all of the issued and outstanding common shares of Dresser-Rand. The total transaction value is approximately \$7.6 billion (approximately €5.8 billion).

**Johnson Matthey acquires catalyst technology supplier Catacel**

September 18, 2014 — Johnson Matthey (London; [www.matthey.com](http://www.matthey.com)) has completed the purchase of the business and assets of Catacel Corp. (Ravenna, Ohio; [www.catacel.com](http://www.catacel.com)), a supplier of technology centered on the use of metal-foil-coated catalysts and sorbents. Catacel's products include high-heat-transfer catalysts and fuel-processing systems for stationary fuel cells. ■

Mary Page Bailey

FOR ADDITIONAL NEWS AS IT DEVELOPS, PLEASE VISIT [WWW.CHEMENGONLINE.COM](http://WWW.CHEMENGONLINE.COM)

November 2014; VOL. 121; NO. 11

Chemical Engineering copyright © 2009 (ISSN 0009-2460) is published monthly, with an additional issue in October, by Access Intelligence, LLC, 4 Choke Cherry Road, 2nd Floor, Rockville, MD, 20850. Chemical Engineering Executive, Editorial, Advertising and Publication Offices: 110 William Street, 11th Floor, New York, NY 10038; Phone: 212-621-4674; Fax: 212-621-4694. Subscription rates: \$59.00 U.S. and U.S. possessions, Canada, Mexico; \$179 International. \$20.00 Back issue & Single copy sales. Periodicals postage paid at Rockville, MD and additional mailing offices. Postmaster: Send address changes to Chemical Engineering, Fulfillment Manager, P.O. Box 3588, Northbrook, IL 60065-3588. Phone: 847-564-9290, Fax: 847-564-9453, email: [chemeng@meda.com](mailto:chemeng@meda.com). Change of address, two to eight week notice requested. For information regarding article reprints, please contact Angie Van Gorder at [angie.vangorder@theysgroup.com](mailto:angie.vangorder@theysgroup.com). Contents may not be reproduced in any form without written permission. **Publications Mail Product Sales Agreement No. PM40063731. Return undeliverable Canadian Addresses to: P.O. Box 1632, Windsor, ON N9A7C9.**

DOWNLOAD THE **CEPCI** TWO WEEKS SOONER AT [WWW.CHEMENGONLINE.COM/PCI](http://WWW.CHEMENGONLINE.COM/PCI)

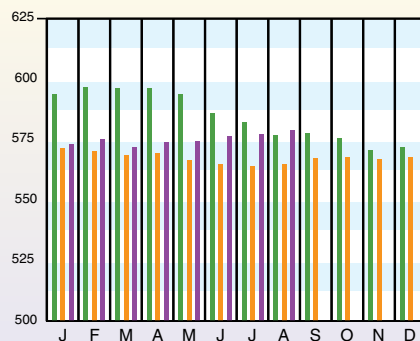
**CHEMICAL ENGINEERING PLANT COST INDEX (CEPCI)**

(1957-59 = 100)

CE Index	Aug. '14 Prelim.	July '14 Final	Aug. '13 Final
Equipment	703.7	700.4	682.8
Heat exchangers & tanks	648.7	640.3	615.8
Process machinery	668.0	667.6	653.1
Pipes, valves & fittings	877.1	878.2	871.2
Process instruments	414.1	413.3	410.7
Pumps & compressors	939.3	938.8	920.7
Electrical equipment	516.3	516.1	513.0
Structural supports & misc	773.7	771.1	736.3
Construction labor	320.8	322.2	320.9
Buildings	545.5	544.5	531.8
Engineering & supervision	321.4	320.6	325.1

**Annual Index:**

- 2006 = 499.6
- 2007 = 525.4
- 2008 = 575.4
- 2009 = 521.9
- 2010 = 550.8
- 2011 = 585.7
- 2012 = 584.6
- 2013 = 567.3



**CURRENT BUSINESS INDICATORS\***

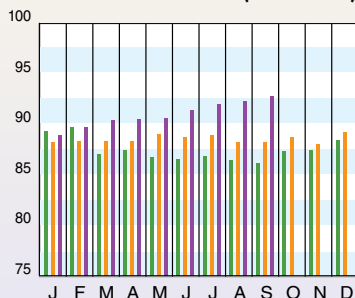
LATEST

PREVIOUS

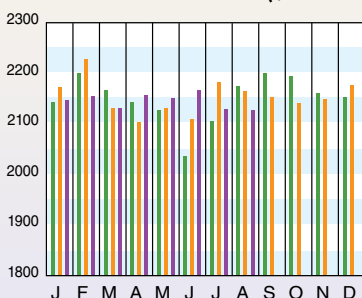
YEAR AGO

CPI output index (2007 = 100)	Sept.'14 = 92.7	Aug. '14 = 92.1	Jul. '14 = 91.8	Sept. '13 = 88.7
CPI value of output, \$ billions	Aug. '14 = 2,127.3	Jul. '14 = 2,137.0	Jun. '14 = 2,161.2	Aug. '13 = 2,160.8
CPI operating rate, %	Sept.'14 = 77.8	Aug. '14 = 77.4	Jul. '14 = 77.2	Sept. '13 = 75.3
Producer prices, industrial chemicals (1982 = 100)	Sept.'14 = 296.6	Aug. '14 = 293.9	Jul. '14 = 293.2	Sept. '13 = 298.7
Industrial Production in Manufacturing (2007 = 100)	Sept.'14 = 100.5	Aug. '14 = 100.0	Jul. '14 = 100.5	Sept. '13 = 96.9
Hourly earnings index, chemical & allied products (1992 = 100)	Sept.'14 = 157.4	Aug. '14 = 156.1	Jul. '14 = 156.9	Sept. '13 = 156.6
Productivity index, chemicals & allied products (1992 = 100)	Sept.'14 = 107.6	Aug. '14 = 107.4	Jul. '14 = 107.8	Sept. '13 = 106.5

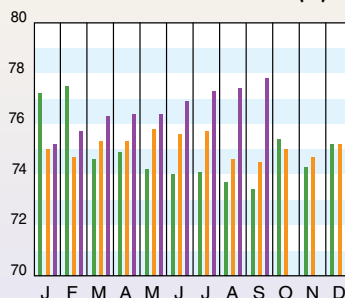
**CPI OUTPUT INDEX (2007 = 100)**



**CPI OUTPUT VALUE (\$ BILLIONS)**



**CPI OPERATING RATE (%)**



\* Current Business Indicators provided by IHS Global Insight, Inc., Lexington, Mass.

**HIGHLIGHTS FROM RECENT ACC ECONOMIC DATA**

Citing recent data from the U.S. Federal Reserve (Washington, D.C.; [www.federalreserve.gov](http://www.federalreserve.gov)), the American Chemistry Council (ACC; Washington, D.C.; [www.americanchemistry.com](http://www.americanchemistry.com)) said that overall industrial production, as well as production within the chemical industry, rose in September.

In one of its recent ACC Weekly Chemistry and Economic Reports, the ACC said production in the business of chemistry rose by 0.8% in September to 90.3% of its average level from 2007. The September rise follows a 1.1% gain in August and a 0.5% gain in July.

In September, "production of basic chemicals rose 0.4%, with a 1.3% gain in inorganic chemicals and a nominal 0.1% gain in bulk petrochemicals and organic intermediates offsetting weakness in plastic resins, synthetic rubber and manufactured fibers," the ACC report said, adding that production of specialty chemicals jumped 2.0% in September, with gains in adhesives and sealants, coatings and most other specialty segments.

Meanwhile, overall industrial production rose 1.0% in September to 105.1% of its average 2007 level, according to Federal Reserve data discussed in the ACC report. "Manufacturing output continues to climb to record levels," the report said, although "within manufacturing, performance was mixed."

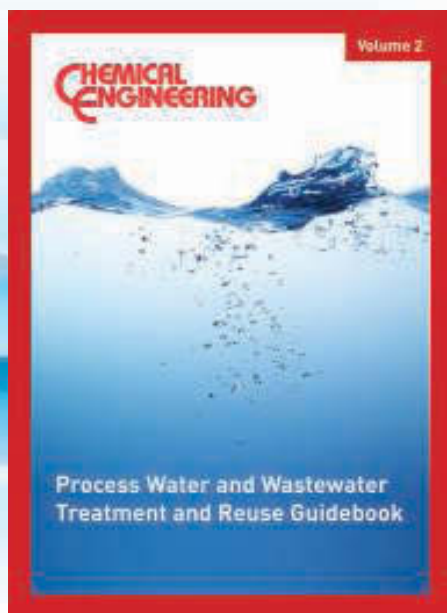
Shale-gas-driven investment in the U.S. by chemical companies continues to expand, according to records maintained by ACC. A recently updated list of chemistry industry projects totals 208, up from 188 in July. The cumulative capital investment for these projects totals \$127.5 billion, with 63% being foreign direct investment. □

**CURRENT TRENDS**

The preliminary value for the August CE Plant Cost Index (CEPCI; top; the most recent available) rose 0.35% from the final July value, continuing a string of five consecutive monthly increases. The Equipment subindex saw the largest month-to-month gain, while the Buildings and Engineering & Supervision subindices saw smaller increases, and the Construction Labor subindex had a small decline from the previous value. The overall August PCI value stands at 2.5% higher than its value from August of last year. Meanwhile, updated values for the Current Business Indicators (CBI) from IHS Global Insight (middle) show that the CPI output index rose in September, while the CPI value of output declined. □

# Now Available in the *Chemical Engineering* Store:

## Process Water and Wastewater Treatment and Reuse Guidebook- Volume 2



This guidebook contains how-to engineering articles formerly published in *Chemical Engineering*. The articles in Volume 2 provide practical engineering recommendations for process operators faced with the challenge of treating inlet water for process use, and treating industrial wastewater to make it suitable for discharge or reuse.

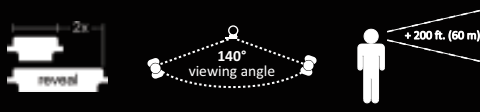
There is a focus on the importance of closed-loop or zero-discharge plant design, as well as the selection, operation and maintenance of membrane-based treatment systems; treating water for use in recirculated-water cooling systems; managing water treatment to ensure trouble-free steam service; designing stripping columns for water treatment; and more.

### Table of Contents

- Process Water Treatment – Challenges and Solutions
- Water Reuse and Conservation in the CPI
- Strategies to Minimize Wastewater Discharge
- Strategies for Water Reuse
- Wastewater: A Reliable Water Resource
- Membranes for Process Water Reuse
- Strategies for Controlling Membrane Fouling
- Fact at Your Fingertips: Membranes
- Facts at Your Fingertips: Membrane Configurations
- Facts at Your Fingertips: Controlling Membrane Fouling
- Biodegradation and Testing of Scale Inhibitors
- Keeping Cooling Water Clean
- Caring for Cooling Water Systems
- Purifying Coke-Cooling Wastewater
- Non-Chemical Water Treatment
- CPI Water and Steam Chemistry
- Designing Steam Stripping Columns for Wastewater

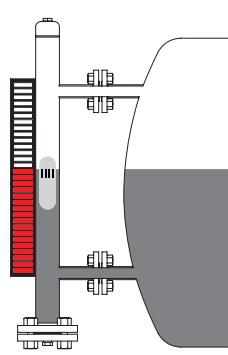
Order your copy today by visiting [store.che.com](http://store.che.com)

a better way to view  
**LEVEL**



[orioninstruments.com](http://orioninstruments.com)

High-visibility level indicators and transmitters from Orion Instruments are custom-engineered and built tough for the most demanding applications. Contact us to find out how maintenance frequency, cost of ownership, personnel safety, and reliability can all be improved over traditional sight glass gauges.



Voted #1 Magnetic Level Indicator and Magnetostrictive transmitter for 2014: *Control Magazine Readers' Choice Awards*

**Circle 24 on p. 180 or go to [adlinks.che.com/50982-24](http://adlinks.che.com/50982-24)**