

Materials and the Environment

Just published, "Scientific Basis for Nuclear Waste Management XV" from the **Materials Research Society**, Pittsburgh, Pennsylvania, is the newest in a series recognized for *promoting the technical aspects of nuclear waste management, and fostering discussion of a wide range of topics* at the international level. The book documents the Fifteenth International Symposium where nearly 500 participants representing 36 countries gathered in Strasbourg, France. Edited by Claude G. Sombret (Commissariat à l'Énergie Atomique, Marcoule, France), the volume covers the topics of glass leaching mechanisms, glass environment interactions, glass properties, ceramics, actinide chemistry, spent fuel, canisters, natural analogues, buffer and backfill materials, flow and transport in the repository environment, and repository. It contains 89 papers in 766 pages, and is available in hardcover or microfiche.

Circle No. (39) on reader service card.

Dexter Aerospace Materials Div., Pittsburg, California, has a *new water-based adhesive bonding primer* called Hysol EA 9289, with low VOC's and no chrome. It was specifically formulated to meet the standards of the South Coast Air Quality Management District Rule 1124, and offers an alternative to existing adhesive bonding primers which have VOC contents of 700 to 900 g/l. The primer also incorporates a non-chromate based corrosion inhibition system.

Circle No. (40) on reader service card.

Can *municipal waste combustor residue (ash) be turned into products that are environmentally benign and economically useful* on a commercial scale? Determining the answer is the goal of a technology demonstration program, undertaken in April by the **Center for Research and Technology Development of the American Society of Mechanical Engineers (ASME)**, New York, New York. Working at the U.S. Bureau of Mines Research Center at Albany, Oregon, ASME and Bureau investigators will study the conversion of residue from municipal solid waste and sewage sludge combustion facilities into a black, glassy substance

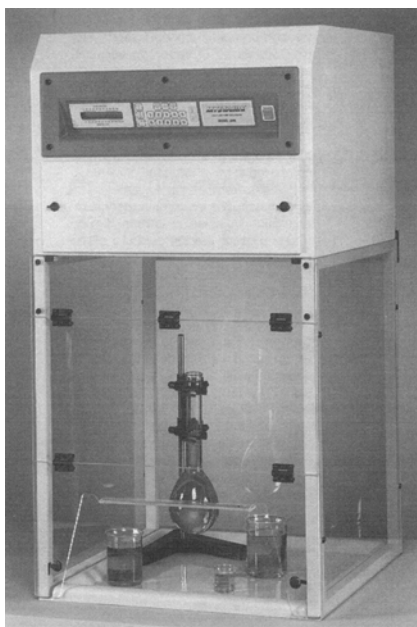
through vitrification. The new substance is dense and grainless, resembling onyx.

Previous research in the U.S. and abroad suggests that vitrification can convert combustion residues into a chemically stable and environmentally acceptable new material that may be usable as architectural tile, construction aggregate, and other applications, in lieu of disposal by burial.

The objectives of the commercial-scale demonstration are: to determine the technical feasibility of the process; to provide information on operating parameters and possible constraints; to confirm the technology's environmental acceptability; to identify and characterize the process effluents or emissions; to identify a number of beneficial uses for the vitrified products, and develop economic data.

Circle No. (41) on reader service card.

The **Mystaire® Filtration Enclosure**, from **Heat Systems**, Farmingdale, New York, *eliminates dangerous fumes, vapors, and particulates*. The unit is compact and can be used at more than one location. The filtration enclosure incorporates the new



Heat Systems

EverSafe Monitoring System. This system provides audible and visual alarms for low airflow and filter condition. A twenty pound filter provides for significant contaminant capacity. A full range of filter materials are available from activated carbon, chemisorptive filters, and HEPA filters.

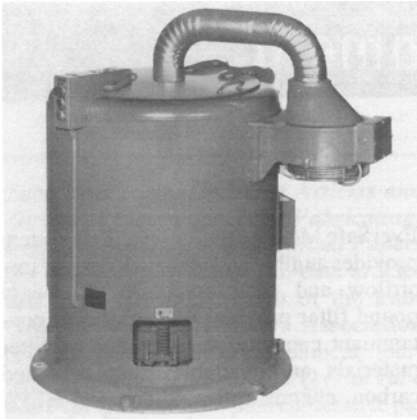
Circle No. (42) on reader service card.

Once confined to pottery, houseware and building materials, ceramics may now hold the key to solving many of Earth's most pressing environmental problems. Since 1976, scientists at Salt Lake City-based **Ceramatec, Inc.** have been searching for ways to improve the environment while solving large-scale business and industrial problems. The answers appear to lie in basic electrochemistry and fine grade ceramics.

Applying an electrical charge to certain ceramic materials has been found to break many harmful substances down into a non-toxic or useful state. For example, nitrous oxides, nasty byproducts of gasoline engines that are the building blocks of acid rain, can be electrically ruptured into electrically charged atoms (ions) which can recombine to form free-standing oxygen and nitrogen. A similar process may allow pulp and paper mills to create closed-loop systems and recycle their toxic byproducts into materials they can use again and again. The alternatives are releasing the waste water into the environment or long-term storage, both costly and dangerous solutions.

Circle No. (43) on reader service card.

The Worcester, Massachusetts, **Barrett Centrifugals' Washer-Dryer** *removes oil, dirt, and grease from irregularly shaped metal and plastic parts* without the use of hazardous and expensive cleaning solvents. Vapor and degreasing and related EPA concerns are completely eliminated. A basket filled with parts is loaded into a centrifuge. A hot detergent wash floods the basket, saturating the parts. As the high velocity spray wash is introduced, the centrifuge spins, reaching a speed of 1200 rpms. This is followed by a spin cycle with or without heat, to dry the parts. The dry cycle minimizes water marks or spotting.



Barrett Centrifugal

A typical wash and dry cycle lasts approximately five minutes.

Circle No. (44) on reader service card.

A new safety solvent, Dynasolve M-30, is now being offered by **Dynaloy**, Hanover, New Jersey, for use in general cleaning applications. Dynasolve M-30 is a *low-toxicity, non-chlorinated, non-flammable solvent* designed to replace solvents such as MEK, acetone, methylene chloride, and 1,1,1-trichloroethane. It is especially suited for degreasing and clean-up of uncured polymers, such as epoxies, urethanes, and silicones. Safer to use and transport, it features a high flash point (230 °F) and a low vapor pressure, also minimizing evaporative losses. And with the use of a simple vacuum distillation pot, it is completely recyclable.

Circle No. (45) on reader service card.

A joint **U.S./Russian Center for Energy Efficiency (CENEf)**, based in Moscow, joins centers in Poland and Czechoslovakia created by Battelle Pacific Northeast Laboratories. Funding from the U.S. Department of Energy, Environmental Protection Agency, the World Wildlife Fund, and the Conservation Foundation will support the centers in the *study and development of monitoring and controlling the rate of carbon emissions associated with the "greenhouse effect."* Each center will promote energy efficiency and the development of private joint ventures in efficiency technology. The centers are expected to become self-sufficient within three years by providing contract services to government and industry.

Circle No. (46) on reader service card.

Westinghouse Hanford Co., Richland, Washington, has recently opened the new

International Environmental Institute at the U.S. Department of Energy's old weapons production site there. The Institute's mission is the new task of *environmental remediation*. It will help identify, adapt, and share environmental cleanup technologies available throughout the world and provide the necessary training to use them. The Institute will operate in partnership with DOE, other Hanford contractors, regulatory agencies, colleges, universities, and private industry.

Circle No. (47) on reader service card.

The **U.S. Department of Energy Inspector General** and the **Assistant Secretary for Environment, Safety, and Health** operate a 24-hour hotline to receive *employee concerns on environment, safety, or health*: The number is for use by all

DOE and DOE contractor employees: Outside Washington, DC call 1-800-541-1625; within the Washington, DC metropolitan area call 586-4073.

A vapor recovery system that offers a *cost-effective alternative to existing air pollution control systems* is the subject of new literature from **Liquid Carbonic**, Chicago, Illinois. The new data sheet tells how the company's carbon dioxide (CO₂) vapor recovery system uses the inherent cryogenic refrigeration qualities of CO₂ to reduce VOC's in plant emissions. An illustration of the system is included, as well as line graphs which show condenser temperature and calculated CO₂ usage. Unlike incineration systems, the CO₂ system does not consume fossil fuels to operate, and thus adds no pollutants to the atmosphere. Power requirements are low compared to

CO₂

Efficient and Economical Recovery of Volatile Organic Compounds

- Low Capital Investment
- Easy Operation and Maintenance
- No Secondary Pollutants
- CO₂ for Secondary Applications
- Economical—No Fuel Gas Costs

Increasingly strict environmental legislation is forcing U.S. industries to reduce emissions of volatile organic compounds (VOCs). One method of accomplishing this is to recover the VOCs through cryogenic condensation. Liquid Carbonic's CO₂ vapor recovery system offers a cost-effective alternative to existing air pollution control systems for meeting the provisions of the 1990 Clean Air Act Amendments.

Liquid Carbonic's CO₂ recovery system requires a low capital investment compared to other methods of eliminating VOCs from exhaust gases. The system uses the inherent cryogenic refrigeration qualities of carbon dioxide (CO₂) to lower the temperature of the solvent-laden gas, causing the volatile organic compounds to condense. The VOC condensate is separated from the exhaust gas for possible reuse.

Recovery system tests at Liquid Carbonic's Technical Research Center, using methylene chloride as the solvent, achieved a 98% recovery rate. Emissions in the range of 1800-2200 ppm are readily attainable. Since most solvents are less volatile than methylene chloride, this means that lower emissions of other solvents are attainable.

CONDENSER TEMPERATURE

Indirect System, Methylene Chloride

Inlet Concentration (% Volume)	90% Recovery (°F)	98% Recovery (°F)
0	-100	-100
10	-85	-95
20	-70	-80
30	-55	-65
40	-40	-50
50	-25	-35

CALCULATED CO₂ USAGE

Indirect System, Methylene Chloride

Inlet Concentration (% Volume)	90% Recovery (U.S. CO ₂ /lb. Solvent)	98% Recovery (U.S. CO ₂ /lb. Solvent)
0	28	28
5	15	15
10	8	8
20	4	4
30	3	3
40	2.5	2.5
50	2	2

LIQUID CARBONIC
CARBON DIOXIDE CORPORATION
10 SOUTH LA SALLE STREET • CHICAGO, ILLINOIS 60604
IN CANADA: LIQUID CARBONIC INC.
225 BRIMLEY ROAD, SCARBOROUGH, ONTARIO, CANADA M1W 3J2

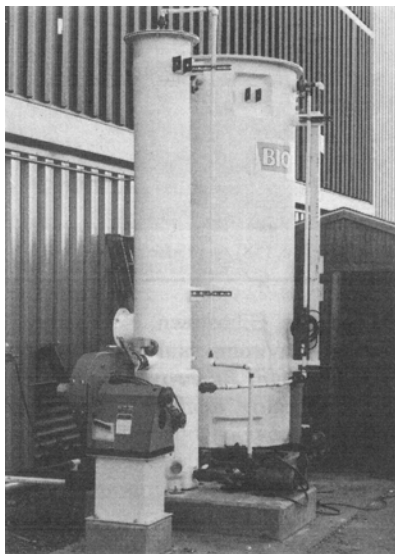
Form No. 8940 12/91 ©1991 Liquid Carbonic Printed in U.S.A.

Liquid Carbonic

mechanical refrigeration systems, and the CO₂ cryogen can be recaptured for secondary gas applications such as pH control in plant water.

Circle No. (48) on reader service card.

The BIOTON Biofiltration System from **Ambient Engineering Inc.**, Matawan, New Jersey, uses *over 100 strains of naturally occurring bacteria, individually and in various combinations, to transform industrial waste gas odors and VOC pollutants* into a clean, harmless, odorless air stream. Treatable pollutants include odor components, solvents, and hydrocarbons ranging from alcohols to complex aromatics—even pollutants traditionally regarded as non-biodegradable can now be removed. Unlike the more common fuel-based or afterburner systems, the BIOTON uses no complex, expensive fuel-burning procedures; its operating costs are vastly lower and it contributes virtually no heat or pollutants of its own into the environment. It has a wide range of industrial applications such as flavors and fragrances, chemicals and petrochemicals, textiles, food, brewing, paints, plastics, printing, and sewage treatment plants.



Ambient Engineering Inc.

Circle No. (49) on reader service card.

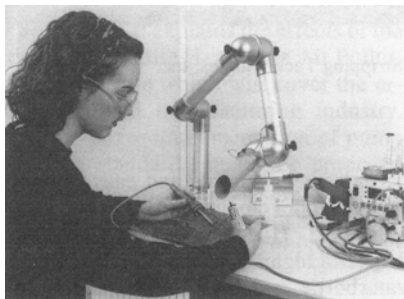
Environmental experts from industry, government, non-profit, and scientific organizations exchanged ideas and debated the latest topics and issues regarding pollution control technology during **ECO WORLD® '92** held 14-17 June, Washington DC. The reauthorization of the U.S.

Government Resource Conservation and Recovery Act, discussions on environmental emissions mitigation, and debate on emerging trends in solid waste management, were among the key activities featured during the technical conference. The program served as a *forum for international technical principals to present their latest research findings and to discuss meaningful solutions* for pollution control technology development and implementation.

Circle No. (50) on reader service card.

A way to clean up a Valdez-size oil slick in three days at a fraction of the cost is being investigated by the **U.S. National Science Foundation**, Washington, DC. The method involves *treating oil slicks on seawater so the sun can dissolve* them in a matter of days. Sunlight is used instead of detergent to help bacteria in the water biodegrade the oil.

Circle No. (51) on reader service card.



Pace, Inc.

The new **PACE® Arm-Evac™** fume extractor arm from **Pace, Inc.**, Laurel, Maryland, enables the operator to *pull fumes away from soldering operations and other activities where harmful fumes are generated*. This arm features articulated joints which can be positioned in a variety of ways to suit particular applications. The arm can be mounted on a bench or, to conserve space, installed on an adjacent wall with a mounting bracket. For facilities concerned about electrostatic discharge, conductive arm versions are also available, and in addition, a wide range of quick-fit nozzles and hoods meet a variety of extraction applications. To conserve energy, a convenient butterfly valve is supplied to shut off air flow when the arm is not in operation.

Circle No. (52) on reader service card.

At the request of the U.S. Environmental Protection Agency, the **American Association for Laboratory Accreditation (A2LA)** has developed a *program to certify reference materials* to meet EPA-A2LA jointly developed product specifications for neat, synthetic, or natural matrix reference materials. The program requires reference materials suppliers be registered by A2LA/ASQC Q91 or Q92 (ISO 9001 or 9002) quality system standards. Each supplier meeting these requirements will be formally registered and may advertise that its materials are registered. Each lot of reference materials for which the supplier seeks certification will be accompanied by test data from a laboratory meeting the requirements of ISO Guide 25, "General Requirements for the Competence of Calibration and Testing Laboratories" and supported by data from a referee laboratory meeting those same requirements.

Circle No. (53) on reader service card.

Nederman, Inc., Westland, Michigan, continues to offer *ideal alternative air extraction to the workplace environment* with the promotion of the **GS Mobile Fume Extractor**. Capturing more than just airborne particles in the form of nuisance fumes, smoke, and dust, it offers exceptional quality and high performance capabilities. The unit features a self-supporting fume extractor arm, complete with an easy-to-position collection hood for absolute capture of welding smoke, machining mist, grinding dust and more. A separate inlet hose can be used for capturing fumes and dust from difficult-to-reach places or from vehicle exhaust. A trolley and fan complete the package, with the fan as an



Nederman, Inc.

ideal solution for blowing fresh air into tanks.

Circle No. (54) on reader service card.

A summary of *two new regulations* as amendments to Annex I of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) is available from the **Marine Environmental Protection Committee of IMO**. One regulation, designated 13F, requires that all new oil tankers must have a double hull configuration, mid-deck design, or other equivalent alternative. The other, 13G, calls for all crude oil tankers above 20,000 dwt and product tankers above 30,000 dwt to be phased out after specified time periods, unless fitted with a double hull, mid-deck or equivalent.

Circle No. (55) on reader service card.

E/M Corp., West Lafayette, Indiana, announces that recent testing by the U.S. military demonstrated that its Perma-Slik® 1460W Dry Lubricative Material meets or exceeds all the performance requirements of MIL-L87132A, Type III. It is a *new water-based cetyl alcohol coating that offers* for the first time an environmentally viable alternative to the solvent-based formulations widely used as installation lubricants on metal fasteners. It is very low in VOCs and performs as well as the original solvent-based product.



E/M Corporation

Circle No. (56) on reader service card.

Automotive aftermarket coatings that meet California clean air regulations, yet



Stripping Technologies, Inc.

are extremely durable and easy to apply, have been developed by **Herberts**, a subsidiary of **Hoechst Celanese**, Auburn Hills, Michigan. The new Standex® line of waterborne and high solids paints, specially formulated for the automotive aftermarket contain dramatically reduced VOCs, dropping from 40% to about 3.5%. The new coatings are easy to apply either by conventional spray guns or the latest high-volume low-pressure spray equipment. Lab tests have demonstrated superior long-term performance—especially in resistance to acid rain and corrosion spotting.

Circle No. (57) on reader service card.

Stripping Technologies, Inc., Tucson, Arizona announces the commercial availability of its Contamination Control Booth™. Its broad applications include wherever fumes, dust or other airborne particles are generated from welding, materials handling, metal grinding, wood/composite/fiberglass sanding, or other surface preparation and metal finishing tasks. The booths are available in standard widths of 8, 13-1/2, 16, and 20 feet and utilize a revolutionary reverse pulse-jet dust collector. They can be configured with 10,000-24,000 CFM, creating linear

air flows of approximately 200 fpm with clean filters. With these velocities, *contaminated air is removed rapidly from the workplace*, increasing worker productivity and eliminating hazardous fumes and airborne dust and particles.

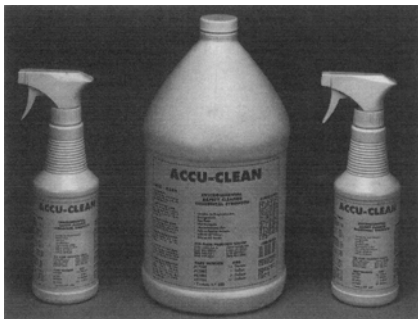
Circle No. (58) on reader service card.

EM Science, Gibbstown, New Jersey, is offering "Environmental GC Standards" for *calibration, linearity, conformation and quantitative analysis of unknown*. These multicomponent standards are supplied in single ampule units or multiple ampule packs. The standards are designed to replace the free chemical reference materials no longer provided by the U.S. EPA's Environmental Monitoring Systems Laboratory. Each standard comes with a certificate of analysis detailing quantitative information on each component in the mixture. Each is subjected to a multiple analytical tests to ensure quality and accuracy. In addition to a broad range of multicomponent volatile and semi-volatile standards, AM also offers TCLP Standards, PCB Standards, C5-C18 Hydrocarbon Standards, and Ethanol Standards. Recognizing that companies need this critical information on a daily basis EM

Science ships the orders for GC standards with 24 hours of receipt.

Circle No. (59) on reader service card.

A new safety solvent for use in cleaning residues from equipment used in the urethane foam industry is now being offered by **Dynaloy, Inc.**, Hanover, New Jersey. Dynaflush is a non-chlorinated, non-flammable, non-carcinogenic, non-ozone depleting solvent designed to replace solvents such as methylene chloride, acetone, MEK, and 1,1,1-trichloroethane. It is especially effective for cleaning and flushing mixing and metering equipment, feed lines, and chemical holding tanks, as it quickly and completely dissolves polyols, isocyanates, and other urethane intermediates. It is also very effective in penetrating, loosening, and removing cured urethane foam deposits and build-up from mixing heads, troughs, conveyor parts, side walls, rollers, foam cutting devices and molds, and will dissolve all types of urethanes: flexible, rigid, elastomer, or molded.



ITW Fluid Products Group

Circle No. (60) on reader service card.

Accu-Clean, a *new non-toxic, biodegradable, non-caustic cleaner* for heavy-duty cleaning, has been introduced by **ITW Fluid Products Group**, Irvine, California. It safely removes oil, grease, petroleum products, dirt, soil and other tough stains from virtually any surface including cement, all metals, all painted surfaces, upholstery, clothing and all plastics. However, it contains no hazardous ingredients or solvents such as butyl cellosolve, found in other prominent cleaners and reported by the Registry of Toxic Effects of Chemicals (RTEC) to cause severe health problems in laboratory animals and humans.

Circle No. (61) on reader service card.

SMOG-HOG® Air Pollution Control Systems collect contaminants created by processes within the textile, plastic, asphalt, and food industries before they are emitted into Earth's atmosphere. Manufactured by **United Air Specialists, Inc.**, Cincinnati, Ohio, the system is a two-stage electrostatic precipitator that is highly efficient in capturing contaminants across a wide range of particle sizes including sub-micronic down to .01 microns. Each unit has a specifically designed in-place cleaning system that minimizes involvement of maintenance personnel, and is guaranteed to meet all federal, state, and local air quality standards at the time of purchase. Compliance with opacity and particulate regulations is assured.

Circle No. (62) on reader service card.

In order to help pump users interpret and respond to the Clean Air Act Amendments of 1990 and the resulting regulations being drafted, **The Duriron Co. Pump Div.**, Dayton, Ohio, has published an all new, full color, four-page brochure. The flyer *reviews the Title III Air Toxics portion of the CAA and lists 189 specified hazardous air pollutants.* It explains the effects of the anticipated Volatile Hazardous Air Pollutant (VHAP) rule which will cover the organic chemical manufacturing industry. The three-phase implementation of pump inspection standards, including proposed emission limits and inspection procedures, are discussed along with leak detection and repair and quality improvement programs.

Circle No. (63) on reader service card.

Obnoxious odors from sewage, agricultural, or industrial plants and sites can be controlled using **AIRGUARD**, an environmentally safe chemical from **Effluent Control Systems**, Bury St. Edmunds, United Kingdom. It is *water-soluble, biodegradable and leaves no residues to accumulate in the environment.* AIRGUARD contains powerful oxidizing

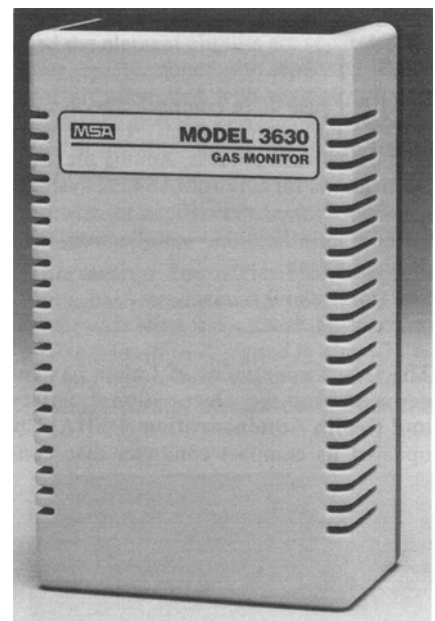


Effluent Control Systems

agents which break down the substances causing the unpleasant smell into end products that are odorless and harmless. The chemical retains its activity in the presence of organic matter and in hard water. Concentrated AIRGUARD has a low mammalian toxicity and, at its recommended dilution of 1:150 with water, is completely harmless to livestock, domestic animals, wildlife, and people.

Circle (64) on reader service card.

For energy savings and improved control of fresh air levels in commercial buildings, *a technologically advanced low-cost monitor* is now available from the **Instrument Div. of Mine Safety Appliances Co.**, Pittsburgh, Pennsylvania. As compact and unobtrusive as a thermostat, the **Model 3630 Infrared Gas Monitor** detects carbon dioxide in low levels that may create a health hazard. Sensing with infrared photo-acoustic absorption technology, it

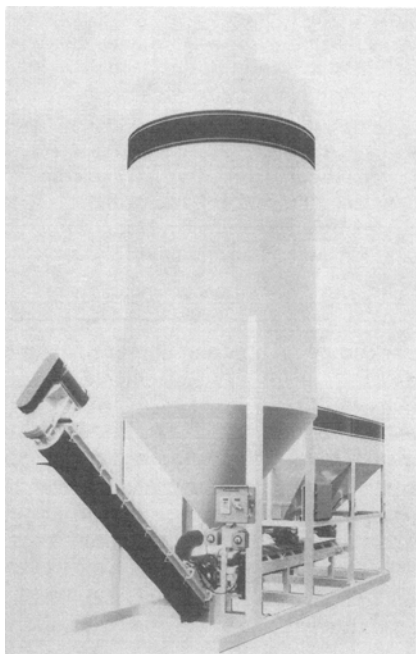


Mine Safety Appliances Company

works in conjunction with building ventilation systems to help ensure fresh air circulates through areas where people work.

Circle No. (65) on reader service card.

Mixers Systems, Inc., Pewaukee, Wisconsin, has introduced the **EnviroMASTER™** Series I unit, designed specifically for *soil remediation, processing dust, solid and liquid waste*—all at the job site. It is suitable for treating and stabilizing both hazardous and non-hazardous mate-



Mixers Systems, Inc.

rials. Because it is compact, the system can be set up on-site, which greatly speeds up the treatment process. Among the ideal applications for EnviroMASTER systems are desiccation, detoxification, neutralization, solidification, stabilization, and data recording.

Circle No. (66) on reader service card.

The U.S. Department of Labor has announced that the Occupational Safety and Health Administration (OSHA) has updated its compact computer disc con-

taining thousands of pages of documents, including all OSHA standards. Titled "OSHA Regulations, Documents, and Other Technical Information on CD-ROM", it is available to the public through the U.S. Government Printing Office (#729-013-00000-5) as part of a one-year subscription which includes four quarterly updates. As of the first pressing, the update contains agency documents, technical information and program information maintained in the OSHA Computerized Information System (OCIS)—previously only accessible by federal and state occupational safety and health professionals. Installation and user instructions and a description of information on the CD-ROM are included in an 8-page insert.

Circle No. (67) on reader service card.

To help meet OSHA requirements of *reducing fumes in a welder's breathing zone and adjacent areas*, Eutectic Corp., New York, New York, has introduced the AirLux® Model 2000 Welding Fume Eliminator. It is a portable unit that can be carried by the welder to each work location to enhance productivity by improving performance and visibility, especially

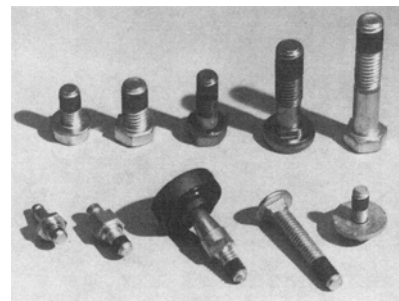


Eutectic Corporation

when welding in confined spaces. Air is filtered and recirculated within each unit, requiring no outside venting.

Circle No. (68) on reader service card.

ND Industries, Troy, Michigan, has developed a *powerful threadlocking/threadsealing epoxy that is completely solvent free and environmentally sound*. EPOXY-LOCK®, a factory-applied thread locker contains no CFC's. Unlike solvent-based threadlockers, it contains no toluene and trichloroethane, but is energy efficient due to a unique photocuring process. It provides two to four times the breakaway torque of conventional plastic pre-coatings. Though dry to the touch, its separate epoxy components are crushed and mixed during installation, setting up a chemical reaction that reaches its full strength after 72 hours. The epoxy exceeds all torque requirements, as well as rigid automotive industry specifications and is impervious to solvents, acids, salts, oils, and gasoline.



ND Industries

Circle No. (69) on reader service card.