News Briefs

MATERIALS/PRODUCTS

Flow International Corp., Kent, Washington, introduces PASER™ Garnet, ***a line of garnets selectively processed for abrasive waterjet machining.*** Two years in development, PASER Garnet offers the highest level of purity, and the tightest screening of particle size and optimal geometric shape, resulting in excellent cost-saving performance.

Circle No. (2) on reader service card.

French chemists at the **Inorganic Materials Laboratory, National School of Chemistry,** Mulhouse, France, have synthesized Cloverite, ***a new molecular sieve in the gallophosphate family.*** The crystalline material has pores shaped like four-leafed clovers and features unique catalytic properties that could facilitate synthesis of high-value-added products, such as pharmaceuticals. Cloverite is an enhancement of Zeolyte Y, another microporous solid, and the most widely used catalyst in petroleum cracking and reforming.

Circle No. (3) on reader service card.

Subcommittee B04.06 on Composite Contacts of the **American Society for Testing and Materials,** Philadelphia, Pennsylvania, is seeking members to join in its work of ***developing standards on composite contact materials.*** It is a subcommittee of ASTM Committee B-4 on Materials for Thermostats, Electrical Heating and Resistance, and Contact and Connectors. Work is currently centered on revising the ASTM "Guide for Silver/Cadmium Oxide Contact Material." Plans are to develop a new standard on silver/tin oxide contact materials, as well as a new guide for checking contacts for surface contamination.

Circle No. (4) on reader service card.

The **ESAB Group, Inc.** announces WELDCALL, ***toll-free technical assistance for Alloy Rods, L-Tec, and ESAB Welding Consumables.*** Experts will be available to answer questions about product selection, applications, troubleshooting, or welding consumables in general for sixteen hours every business day, from 7:00 a.m. to 11:00 p.m. EST.

Circle No. (5) on reader service card.

The **COPPERDATA file** is now available through the Materials Property Data (MPD) Network on ***STN International,*** Columbus, Ohio. It is the online version of the Standards Handbook of the Copper Development Association and ***contains physical and mechanical property data for 166 wrought and 95 cast U.S. copper alloys.*** In addition to property data, COPPERDATA includes common names for the alloys, typical uses, suppliers, and fabrication practices.

Circle No. (6) on reader service card.

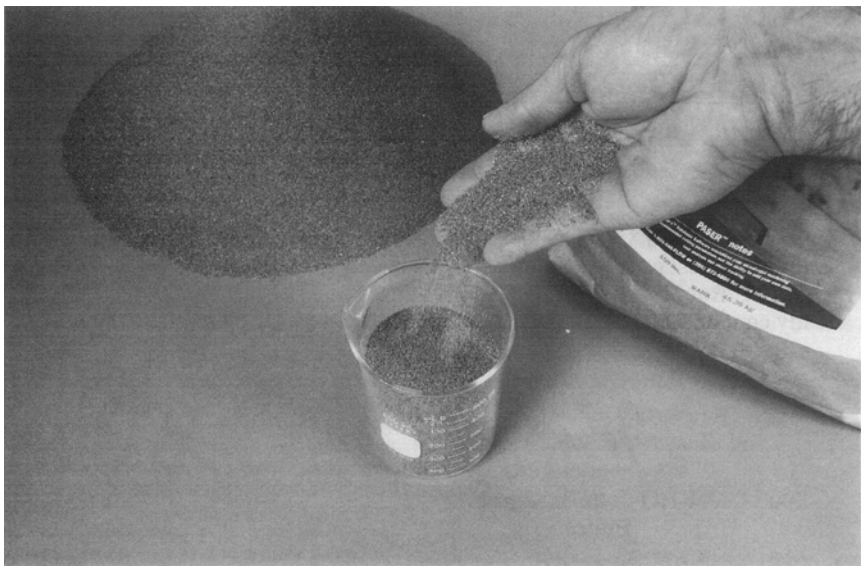
The new carbon fiber reinforced nylon thermoplastic composite prepreg material, FIBEROD®, manufactured by **Polymer Composites Inc.,** Winona, Minnesota, was recently recognized as a top award winner in a competition at the National Design Engineering Show and Conference in Chicago, Illinois. FIBEROD replaces traditional pylon construction materials used in prosthetic devices. It absorbs the twist or torsion about the vertical axis as a foot is planted, due to its unique properties, eliminating the additional parts traditionally required for this protheses with metal pylons.

Circle No. (7) on reader service card.

Materials and Electrochemical Research (MER) Corp., Tucson, Arizona, has formed an independent affiliate, Fullerene Technologies International (FTI), ***to produce commercial quantities of carbon-60—called fullerenes, or buckeyballs.*** The soccerball-shaped molecules are the third form of carbon besides diamond and graphite. C60, invented in 1990 by researchers at the University of Arizona and the Max Planck Institute opens new avenues of research in diamond films, optical materials, superconducting materials, and exotic compounds. MER, licensed to make and sell research quantities of fullerenes, compounds, thin films and molded shapes, will transfer the production to FTI, which will also sell several grades of fullerenes, including pure C60 or C70, extracts containing mixed molecular weights, and soots containing extractable buckeyballs in various molecular weights. The company will emphasize long-term alliances with other firms to develop new applications.

Circle No. (8) on reader service card.

Bayblend FR 110 resin, ***a new flame-retardant polycarbonate/ABS blend that is free of bromine and chlorine additives*** is available from **Miles, Inc.,** Pittsburgh, Pennsylvania. The new grade surpasses two commercial grades of the blend in important physical properties, and in certain flame-retardant properties. It contains a special toughening system, and has ex-



Flow International Corp.

ceptional weld line strength, as well as improvements in impact strength.

Circle No. (9) on reader service card.

A ***new construction material, suitable in particular for erecting one-and two-story buildings,*** has been developed by Björn Larsson, in cooperation with the **Lund Institute of Technology,** Palsboda, Sweden. Called the ISO-beam, it is a sandwich type consisting of two wooden flanges surrounding a styrofoam block. The components are joined together with a two-component polyurethane glue. The material contains no CFC's. The ISO-beam can be used to replace solid wooden beams of larger dimensions, which are the most expensive cuts of wood in the building industry today. It saves up to 65% of the wood in a conventional beam and weighs only about one-third, while at the same time being stable in form and dimension. The low weight makes cranes unnecessary; trusses can easily be hoisted into position by two men only during construction.

Circle No. (10) on reader service card.

PROCESSES/EQUIPMENT

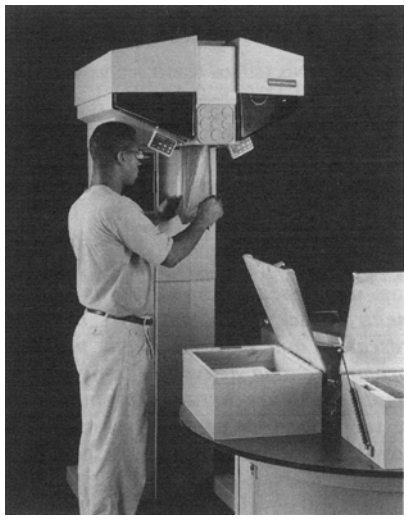
A high energy linear electron accelerator called Unipolis is being used by **Aerospatiale Aquitaine,** Bordeaux, France, to ***cure large, composite parts for airplanes and spacecraft.*** The 10-megavolt, 20-kilowatt ionization facility cures a 13' X 33' part by electron beam or X-ray in one-tenth the time needed for heat curing. There are no problems related to thermal expansion of materials and tools are eliminated. Parts can be made of resins that leave no waste and have an unlimited shelf life, simplifying production schedules. Electron beams can be precisely adapted for repairs of composite parts by repolymerization or spot polymerization.

Circle No. (11) on reader service card.

A ***revolutionary new robot concept*** has been unveiled by **The Robotix Corp.,** Torrance, California. The new family of industrial robots are completely modular, highly accurate and can be configured for any job and any payload. They are highly reliable and cost less than equivalent robots. The controller is an IBM-compatible personal computer with state-of-the-art software that allows the robots to be programmed off-line.

Circle No. (12) on reader service card.

Sealed Air Corp, Danbury, Connecticut, offers the Instamolder™ Cushion Molding System to provide optimum product protection on a just-in-time basis. It produces ***custom-shaped polyurethane foam cushions that provide packaging consistency and exact product positioning.*** The customer can produce the highly protective cushions on site and on demand, saving valuable time, labor and storage space.



Sealed Air Corp.

Circle No. (13) on reader service card.

A patented injection/compression machine designed to bring ***the benefits of injection molding to the compression industry*** has been introduced by **Gluco, Inc.,** Pittsburgh, Pennsylvania. It is highly beneficial in shaping of items such as O-rings, where gate vestige is prohibited. The Gluco process automatically lays a pre-masticated/heated and precisely measured preform into the cavity. The extrudate is automatically shaped to the final part. The molding pattern, which is electronically programmed, can vary from part to part in the same operation.

Circle No. (14) on reader service card.

Giddings & Lewis Tooling Systems, Fond du Lac, Wisconsin, now offers a ***'hole-making system' of self-centering Stellram unidrills with replaceable inserts.*** The Stellram holders and customized bodies for carbide and high-speed steel unidrills perform counterboring, chamfering and spotfacing in the same operation with drilling. In addition to reduced tooling costs/inventory and faster retooling through the elimination of conventional drill re-grinding, advantages claimed for the Stellram unidrills include higher machine utilization and truer hold location.

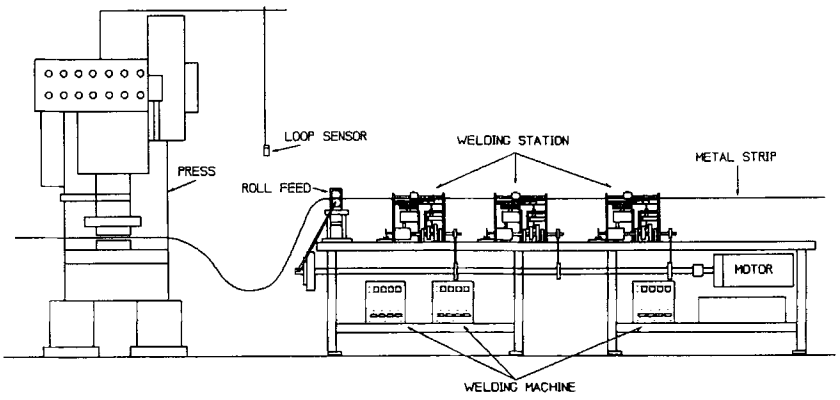
Circle No. (15) on reader service card.

Scientists at the Research and Development Center of **General Electric Co.,** Schenectady, New York, have discovered ***an improved technique for nickel-plating LEXAN® polycarbonate resin, a high-strength engineering plastic.*** The advanced plating technique is expected to improve product quality and reduce production costs for a wide variety of metal-coated LEXAN resin applications. The advanced process makes use of proprietary conditioners that chemically alter the surface of the plastic in a way that makes it extremely receptive to nickel.

Circle No. (16) on reader service card.

UNIVERSITY VIEW

Illinois Institute of Technology Research Institute (IITRI), Chicago, Illinois, and the **U.S. Defense Logistics Agency (DLA)** are collaborating on the first step in a new program to ensure that gear making specifications required by



University of Rhode Island's Robotics Research Center

forging suppliers, gear cutters, and gearbox and engine assemblers are brought together via computer for rapid information exchange. "The Next Generation Manufacturing System for Precision Gear Manufacturing" is a long-range project designed ***to enhance the flexibility of the gear manufacturing process and reduce the time required to produce precision gears.*** The goal of the Next Generation System is to speed up the development and production of new components, particularly in the aerospace—notably rotor wing aircraft—industry.

Circle No. (17) on reader service card.

Jewelry manufacturers, who have long maintained that assembly defies automation because the parts are so small, are delighted in the giant steps taken toward automating jewelry manufacturing by the **University of Rhode Island's Robotics Research Center,** Kingston, Rhode Island. Prof. Philip Datseris has designed ***a novel computer-controlled assembly system that welds earring posts at revolutionary speeds*** of up to 1,200 posts per minute, or 12 times the industry average per station.

Circle No. (18) on reader service card.

At the **University of Michigan,** Ann Arbor, Michigan, a team of researchers headed by Asst. Prof. Levi T. Thompson, Jr. has identified the key structural features in a new class of catalysts that remove nitrogen compounds from crude oil, coal-derived liquids, and other fossil fuels. Because molybdenum nitride catalysts—made from a combination of molybdenum, nitrogen, hydrogen, and oxygen atoms—concentrate their catalytic activity at tiny defects of grain boundaries within molybdenum nitride particles, they are being studied to determine the connection between structure (defect concentrations) and catalytic activity. The goal is ***rational design of the catalysts for effectiveness and efficiency,*** particularly in removing contaminants like sulfur, nitrogen and oxygen from crude oil and coal-derived liquid fuels.

Circle No. (19) on reader service card.

Supercomputer simulations of wriggling hydrocarbon molecules and jumping gold atoms are giving scientists at **Georgia Institute of Technology,** Atlanta, Georgia, ***dramatic new insights into the complex interactions that occur when materials contact each other.*** This new perspective will give researchers information about behavior that could produce a better understanding of a wide range of mechanical contact phenomena and lead to the development of improved lubricants.

Circle No. (20) on reader service card.

The $3 million Training Research Isotope General Atomics (TRIGA) Mark II fission reactor at the **University of Texas,** Austin, Texas, Nuclear Engineering Teaching Laboratory is four times more powerful than its 1963-model predecesor. Its teaching and research ***applications include neutron activation analysis, materials research and neutron depth profiling, prompt gamma activation analysis, and neutron capture therapy.*** Current projects at the laboratory are an assessment of a low-level radioactive waste disposal site, thermal analysis of nuclear shipping containers and development of a cold neutron source. The reactor's extreme sensitivity allows the researcher to determine trace amounts of many elements, and is used extensively for environmental studies.

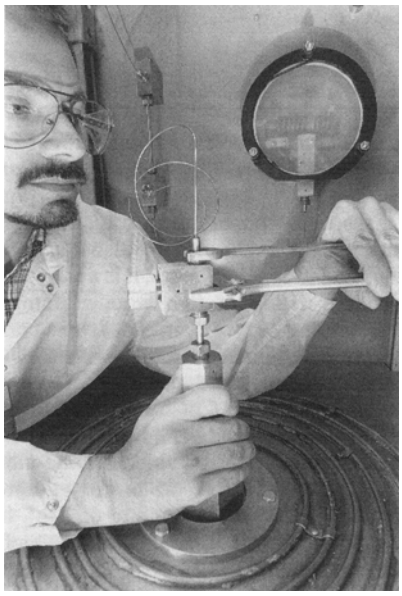
Circle No. (21) on reader service card.

Increased recirculation of air in sealed structures, such as office buildings, has pushed up the concentration of air contaminants such as formaldehyde, traces of solvents, benzene, toluene, and even tobacco odors. These ***contaminants can now be "zapped" away in a combustion process similar to that used in emission control in cars,*** according to Prof. David F. Ollis, Chemical Engineering, **North Carolina State University,** Raleigh, North Carolina. Using a system with titanium dioxide-coated surfaces, the process is activated with ultraviolet light. Photocatalysis occurs similar to that activated by sunlight in the upper atmosphere, economically burning away the contaminants at room temperature.

Circle No. (22) on reader service card.

GOVERNMENT LABORATORY NOTES

Hi-tech methods for finding flaws in ceramics will be studied under a cooperative research and development agreement announced by Caterpillar, Inc. and the U.S. Dept. of Energy's **Argonne National Laboratory,** Argonne, Illinois. The work aims at developing technologies for potential use in evaluation of manufactured components for high-efficiency, low-heat-rejection diesel engines being developed by Caterpillar. The research will focus on two specific technologies—infrared imaging and microfocus X-ray imaging—to detect flaws in ceramics without destroying them. The ongoing aim is to arrive at a non-destructive method for finding defects in "think thermal-barrier coatings" on pistons and valves in diesel engines. The coatings are multiple layers of ceramic that permit engines to operate at higher efficiencies. The joint project will also examine use of a new microfocus X-ray imaging system to detect flaws in single-piece ceramic components. The system uses a point source of X-rays to enable detection of the smallest possible flaws.



Argonne National Laboratory

Also at **Argonne**—***a new family of high-temperature superconductors was created from copper and gallium.*** In a high-pressure synthesis chamber, oxygen is forced into the material under pressure up to 4,000 psf.

Circle No. (23) on reader service card.

An optical sensor developed at **Los Alamos National Laboratory,** Los Alamos, New Mexico, ***measures high concentrations of acid more efficiently than any acidity measurement technique on the market, while generating no waste.*** Applications include accurate measurements of acidity in batteries, computer chip baths and chemical waste streams. The sensor is part of a rugged instrument that incorporates recent developments in polymer chemistry, optics, and spectroscopy—and functions for months in acidic environments. It simplifies acid level adjustments before acidity fluctuations become a problem and eliminates the need to reprocess materials processed incorrectly due to insufficient acidity data.

Also, holding promise for the nuclear industry, as well as municipal sewage treatment, chemists at Los Alamos report a technique that uses large molecules called polymers to separate plutonium, americium, and other toxic metals from liquid waste. Experiments show that specific water-soluble polymers in ultrafine filters remove specific metals for analysis and on a large scale could purify contaminated liquid waste streams.

Further work is being conducted with research on a transmutation process applied to radioactive technetium that would convert it to nonradioactive ruthenium, thus converting radioactive waste into environmentally benign substances.

Circle No. (24) on reader service card.

The **Ilyushin Aircraft Association Design Bureau and Russian Federation Dept. of Aviation Industry** have signed a protocol agreement with United Technologies Pratt & Whitney, E. Hartford, Connecticut, that establishes a working relationship among the principals in support of the Ilyushin IL96M transport program. The ***protocol addresses industrial participation with the Russian aeropropulsion industry, participation in marketing and development of several critical materials programs and mutual certification interests.*** The IL-96M is a four-engine, wide body, long-range transport that will carry up to 386 passengers on routes of up to 12,500 kilometers, nonstop.

Circle No. (25) on reader service card.

VISIONS

Dr. Hans Conrad at **North Carolina State University,** Raleigh, North Carolina, is developing ***a metal beam that can sense a load and become stronger to bear it.*** In response to vibrations that would otherwise break it, the special beam stiffens. When the force producing the vibrations calms, the beam relaxes like a muscle. Curiously, Conrad's beam is made up mostly of fluid, which is poured into a hollow aluminum beam. Known as electrorheological fluid, or ER for short, the free-flowing fluid transforms into a rigid, solid-like material when exposed to an electric field. After the transformation, the beam's resistance to vibrations equals that of a material one million times stronger.

Circle No. (26) on reader service card.

Superstrong, lightweight composites are one of the major objectives of materials research today. A team of ceramists, including Dr. Alfred P. "Hap" Wheeler, **Clemson University,** Clemson, South Carolina, is studying the processes by which living organisms make composites, such as teeth, bones, oyster shells—mineralized structures similar to ceramic composites made by engineers. According to Wheeler, "Technology is looking to biology for instruction—how do organisms make such elegant composites, and, at low temperatures?" Ceramic engineers use extreme conditions, including high heat, to create composites. Biological composites are blends of mineral and organic components, with their own special properties. The organic material which, in living creatures includes protein, controls the mineral's growth and makes the end product resilient, strong, and of the appropriate shape. The researchers don't expect to approach the capabilities of a cell, but to identify critical steps in the biological process that could be employed in designing and processing ceramic materials.

Circle No. (27) on reader service card.

A crucial milestone on the road to creating crops that will make high-quality biodegradable plastics has been reported. Scientists at **Michigan State University,** E. Lansing, Michigan, and James Madison University have announced they are growing a plastic called PHB (polyhydroxybutyrate) in an experimental plant. PHB is much like polypropylene, except that it is biodegradable. Likely commercial uses include containers, wraps, coatings, and plastic liners for disposable diapers. Prof. Christopher Somerville of the MSU/U.S. Dept. of Energy Plant Research Laboratory explains that for the first time, ***a plant has been genetically engineered to make something other than a protein***—something no other plant has ever made before. PHB is naturally made by soil bacteria, but is relatively expensive. Somerville estimates the cost of manufacturing biodegradable plastics could be reduced tenfold by using genetically engineered PHB grown in farm crops.

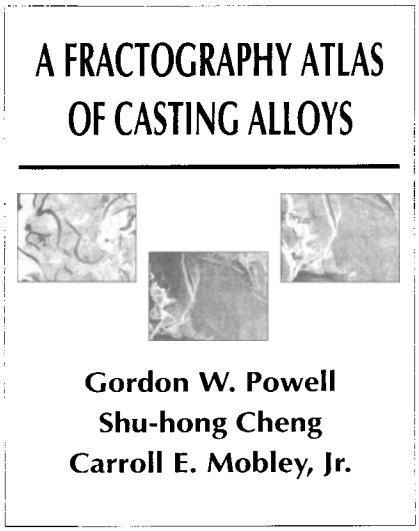
Circle No. (28) on reader service card.

LITERATURE

A new wall chart gives scientists, designers, and engineers ***a complete technical guide for more than 60 solders and fluxes.*** The chart answers the most common questions about 43 Indalloy solders and 18 fluxes and is available free from the **Indium Corp. of America,** Utica, New York.

Information on solders includes liquidus and solidus temperatures, chemical composition, plastic range, specific gravity, electrical and thermal conductivity, tensile strength and bond strength. The chart also lists maximum solder temperatures, specific gravity, flash point, solids content, water resistivity, cleaning method, tac strength and viscosity.

Circle No. (29) on reader service card.



Battelle Press

A Fractography Atlas of Casting Alloys, by G.W. Powell, S-H. Cheng, C.E. Mobley, Jr., from **Battelle Press,** Columbus, Ohio, is a new reference for engineers and failure analysts who examine fracture surfaces to determine the causes of failures. The Atlas provides optical and SEM photomicrographs at various magnifications of representative, commonly used casting alloys which have been broken under documented loading conditions. It features 471 photo- and SEM micrographs, plus tables, figures, and explanatory text and represents the culmination of three years of research in the Dept. of Materials Science and Engineering at The Ohio State University, under the direction of the **Edison Materials Technology Center,** Kettering, Ohio.

Circle No. (30) on reader service card.

The Brinc Report, an informative ***4-page rheological newsletter,*** is free from **Bohlin Instruments, Inc.,** Cranbury, New Jersey.

Circle No. (31) on reader service card.

Gear Tolerance Guide, from **Milwaukee Gear Co., Inc.,** Milwaukee, Wisconsin, is based on AGMA established standards and allows for specification of AMA quality number and normal diametrical pitch. It

provides detail on profile, lead and runout tolerances and may be used to determine total composite, tooth-to-tooth, and pitch tolerances to 0.0001 in.

Circle No. (32) on reader service card.

Tube Producing: Collected Articles and Technical Papers and ***Tube Fabricating: Collected Articles and Technical Papers*** are both comprised of up-to-date articles that have appeared in two of the **Fabricators & Manufacturers Association (FMA) International's** technical journals—*The Fabricator* and *TPQ (The Tube and Pipe Quarterly)*—plus conference papers from FMA, the Tube and Pipe Fabricators Association and the American Tube Association. Each book contains complete author contact information for further study.

Circle No. (33) on reader service card.

Introduction to SPC by Ed Jones, **Diversico Industries, Inc.** and published by the **Fabricators & Manufacturers Association, International** is intended for those who have little or no previous knowledge of SPC, but who seek specific, basic information. Only basic math skills are required to improve processes and make use of some of the more commonly available tools. It features chapters on basic skills review, basic SPC concepts, Pareto charts, frequency diagrams and histograms, X-R charts and how to interpret them, and process capability.

Circle No. (34) on reader service card.

Air Products' Additives for Flexible Molded Polyurethane Foams, from **Air Products and Chemicals, Inc.,** Allentown, Pennslyvania, highlights the company's broad line of ***silicone surfactants for use in molded polyurethane foam systems.*** The multilingual publication, which includes English, French, and German text, describes the physical properties and benefits of AP's silicone surfactants.

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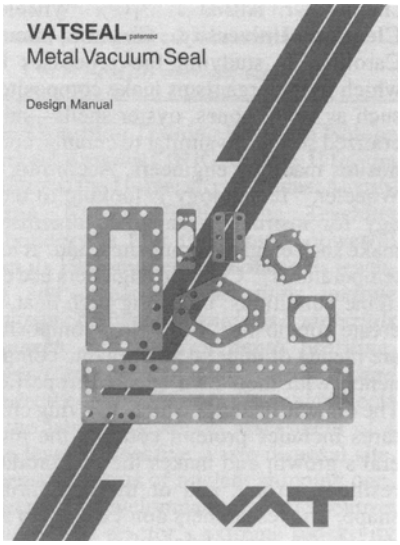

VAT Inc.

The Economics of Air Drying from **Sahara Air Dryer Div., Henderson Engineering Co.,** Sandwich, Illinois, is a free nine-page booklet ***comparing the costs of seven types of air dryers.*** Eight illustrations, five tables, and numerous formulas help the engineer understand various air drying methods, advantages of each, and operating costs.

Circle No. (36) on reader service card.

Catalog C2.000-CA from **Leeds & Northrup,** North Wales, Pennsylvania, presents its ***complete line of liquid analysis instrumentation:*** analyzers, electrodes, conductivity cells, and accessories, including the new ACCUGUARD™ module for automatic cleaning and calibration of pH electrodes. The 12-page brochure is illustrated and includes a helpful list of reference publications describing solutions to liquid analysis problems.

Circle No. (37) on reader service card.

A design manual that provides ***complete technical data and sizing information for a new line of all-metal vacuum seals*** that minimize flange machining requirements and degassing is offered by **VAT Inc.,** Woburn, Massachusetts. The VATSEAL Metal Vacuum Seal Design Manual describes a line of silver-plated copper seals that can be fabricated in any shape for sealing steel, stainless steel and aluminum flanges to leak rates $\times 10^{(-10)}$ torr/l/sec. Product descriptions, technical data, sizing information and a quotation request form is included.

Circle No. (38) on reader service card.

KUDOS

Leonard Mordfin, Silver Spring, Maryland, group leader of mechanical properties and performance at the **U.S. National Institute of Standards and Technology,** Gaithersburg, Maryland, has received the Charles W. Briggs Award for continuous and notable contributions to the American Society for Testing and Materials Committee E-7 on Nondestructive Testing.

The NASA Exceptional Service Medal has been presented to ***Bland A. Stein*** for outstanding contributions and leadership in the Agency's aerospace structural materials program. ***Thomas T. Bales*** has received the NASA Exceptional Engineering Achievement Medal for outstanding technical innovations in the processing and fabrication of advanced metallic structural materials. Stein and Bales are both with **NASA Langley,** Hampton, Virginia.

Inductotherm Corp., Rancocas, New Jersey, has promoted ***George Duncan*** to vice president and head of the company's Customer Service and Test Department. He was previously District Manager for Illinois and Indiana.
