
News

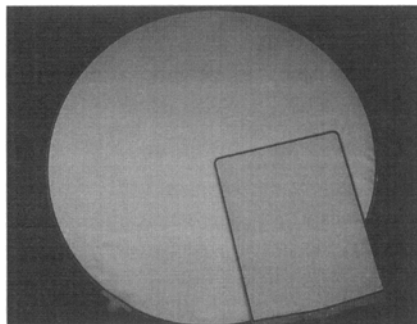
Materials/Products

Balston filters, manufactured by **Whatman**, *remove 99.99% of oil, water, rust, and pipescale particles of 0.01 mm size and larger from compressed air and other gases*. The filter's coalescing design removes all liquid contaminants for an unlimited time without loss of efficiency or flow capacity. Constructed of anodized aluminum and stainless steel, the filters accommodate line sizes from 0.25 to 2 in. at flow capacities of up to 2500 SCFM. For more information, contact: Whatman Inc., 260 Neck Rd., Box 8223, Haverhill, MA 01835-0723; tel: 508/374-7400; fax: 508/374-7070.



Whatman Inc.

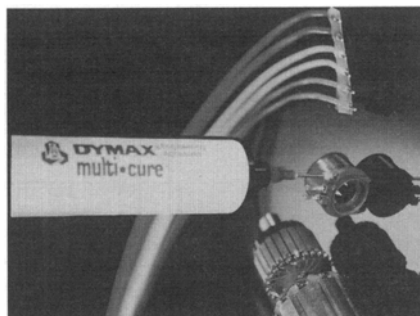
SGO/NOMET manufactures *leaves for pressure leaf filters*, custom designed



SGO/NOMET

with the D.E. precoat minimized or eliminated. The design reduces maintenance costs because the leaf surface screen can be repaired or changed in-plant. A tight, smooth surface screen keeps cleaning easy. A leaf is approximately half the weight of a metallic leaf. For more information, contact: Sheldon O'Rourke, SGO/NOMET, 24 Windswept Dr., Arnold, MO 63010; tel: 314/296-4793; fax: 314/296-8090; e-mail: sorou78908@aol.com.

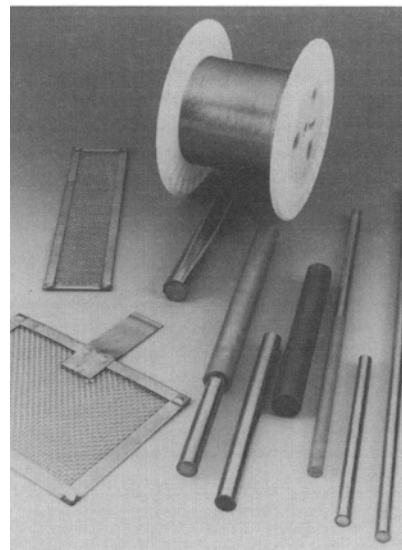
Light Weld UV adhesives and Ultra Light-Weld UV visible *adhesives fully cure in seconds*, for use in wire and coil assembly, unitizing, strain relief, coating, and terminating. These **Dymax** adhesives have better durability than tapes, cyanoacrylates, solvent-activated adhesives, hot melts, or epoxies. For more information, contact: Dymax Corp., 51 Greenwoods Rd., Torrington, CT 06790; tel: 860/482-1010; fax: 860/496-0608.



Dymax Corporation

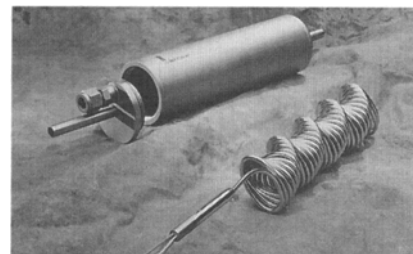
Platinum-clad anodes are available from stock at **Anomet Products** in rod, wire, and woven mesh, for electroplating and cathodic protection applications. Permitting simple electrical connections, their copper core provides greater conductivity for uniform plating and reduced power use. The anodes can use niobium or titanium substrates, and platinum thickness can be specified to meet customer requirements. For more information, contact: Robert Gallant, Anomet Products Inc., 830 Boston Tpke.

Rd., Shrewsbury, MA 01545; tel: 508/842-3069; fax: 508/842-0847.



Anomet Products Inc.

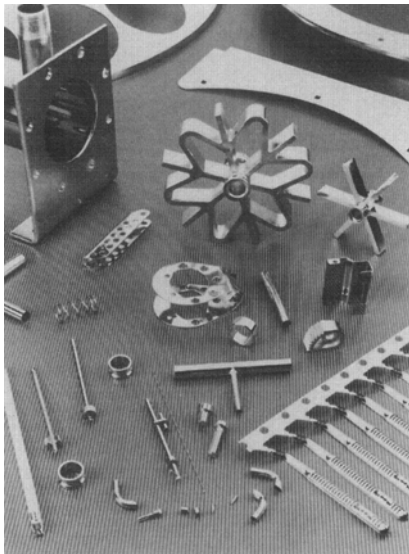
An in-line electric heater for air/nitrogen gas from **Watlow** uses continuous elevated-temperature gas streams to dry and cure circuit boards. The unit heats a flowing gas stream to temperatures up to 760 °C. Because the heating element is sheathed, the heater can operate in gas streams that need a clean environment as well as atmospheres that contain contaminants and moisture. The unit is made from electropolished stainless steel, and thermocouple type J and K options are available for precise control. For more information, contact: Watlow Electric Manufacturing Co., 12001



Watlow Electric Manufacturing Company

Lackland Rd., St. Louis, MO 63146; tel: 314/878-4600; fax: 314/878-6814; web: <http://www.watlow.com>.

Electropolishing, a service of **New England Electropolishing Company Inc.**, improves the surface finish of stainless steel parts without buffing or tumbling to remove burrs and provide a smooth appearance. Surface finishes are available down to RA 2, and electropolishing removes the high points on stainless steel parts with 0.0001 in. precision. The process also improves corrosion resistance by removing contaminants and redepositing a chemically bonded oxide layer. For more information, contact: New England Electropolishing Co. Inc., 220 Shove St., Fall River, MA 02724; tel: 800/672-6616 or 508/672-6616; fax: 508/673-5252.



New England Electropolishing Company Inc.

Loctite Corporation has released three products; Thread Sealant 5772, for sealing threaded metal pipes and fittings against vibration and temperature cycling in low- and high-pressure applications; Threadlocker 2432, for locking and sealing threaded metal fasteners against shock and vibration; and Retaining Compound 6482, for retaining nonthreaded, cylindrical metal parts such as shafts, gears, bearings, and bushings to form a solid, one-piece assembly. The products were designed with extremely low amounts of halogen and sulfur, allowing them to be used in critical applications in fission reactor plants where intergranular stress-corrosion cracking could occur. For

more information, contact: Loctite Corp., 1001 Trout Brook Crossing, Rocky Hill CT 06067; tel: 860/571-5100; fax: 860/571-5465.

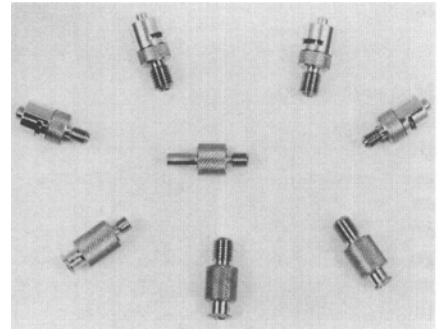
Pyrotek offers oxidation-treated graphite flux tubes. Available with lead times as short as three weeks, the tubes are suited for fluxing and degassing molten aluminum in transfer ladles, and melting and holding furnaces. Straight pipe tubes can be threaded to support porous graphite dispersion heads that better distribute chlorine, nitrogen, or argon treatment gas. Both oxidation-treated and untreated flux tubes are available. The tubes have a 2 in. outer diameter and a 0.5 in. inside diameter. Standard lengths are 72, 84, 96, 108, and 120 in. With a 1.80 g/cm³ density, the tubes are less prone to breakage than thinner tubes. For more information, contact: Anna Henry, Pyrotek, E. 9502 Montgomery Ave., Spokane, WA 99206; tel: 509/926-6212; fax: 509/927-2408.

Formplast 2000, manufactured by A.L. Hyde Company, and distributed by **Cadillac Plastic**, is a thermoplastic composite material for thermoforming plug assist applications. The material works well with the following plastics: PP, SP, K-Crystal, Styrene, PE, PET, PET-G, vinyl, PVC, HIPS, ABS, and HDPE. For more information, contact: Cadillac Plastic, 143 Indusco Ct., P.O. Box 7035, Troy, MI 48007-7035; tel: 810/582-1200.

D/W 200T, produced by **Dewal Industries**, is a film based on a modified homopolymer PTFE resin that has a tensile strength of 20 ksi. Because it has five times the life of polyethylene, it could be used as a covering for greenhouses. With a dielectric strength of 6,000, the material can also be used as fusible insulation for high-voltage, high-temperature cable applications. For more information, contact: DeWal Industries, 15 Ray Trainor Dr., P.O. Box 372, Saundertown, RI 02874; tel: 401/789-9736.

A line of adapters has been introduced by **Popper and Sons**. Manufactured from 316 stainless steel, they meet ANSI/HIMA MD70.1 specifications. Final assemblies are water tested at 45 psi. The adapters are available with female, male Luer, and Luer-lock ends in 10-32, 0.25 in.-28, and 0.25 in.-32 standard thread sizes. For further information, contact: Popper and

Sons Inc., 300 Denton Ave., P.O. Box 128, New Hyde Park, NY 11040-0134.



Popper and Sons Inc.

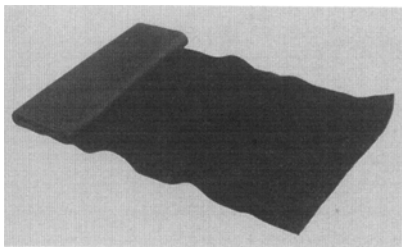
Pace Inc. has available a Fume Extraction Canopy to remove harmful fumes from the working environment. The 10 x 16 in. canopy attaches to any of the company's 2.5 in. diam articulated extraction arm, and it is transparent for distortion-free visibility to the workstation. When used with the company's Multi Arm-Evac Central Filtration Unit, it removes fumes over a large work area, filters contaminants, and recirculates clean air back into the workplace. For more information, contact: Pace Inc., 9893 Brewers Ct., Laurel, MD 20723-1990; tel: 301/490-9860; fax: 301/498-3252.



Pace Inc.

Ferrite Polymer Composite film, from **Siemens Components Inc.**, is 80 mm wide, 0.2 mm thick, and made of ferrite material C350 and polymer. Initially developed for use in automobile immobilizers, the thin,

mechanically flexible film is effective for electromagnetic shielding, flexible coils (coils can be printed right on the film), and field focusing (especially for flat coils and "coil-on-chip" technology). FPC film can also be injection molded into typical ferrite core shapes. Advantages over conventional ferrite solutions are: stable magnetic properties, low weight (density is 40% lower than ferrite), high mechanical strength and durability, and a wide choice of geometric designs for custom uses. For more information, contact: Siemens Components Inc., Special Products Division, 186 Wood Ave. S., Iselin, NJ 08830; tel: 800/888-7728.

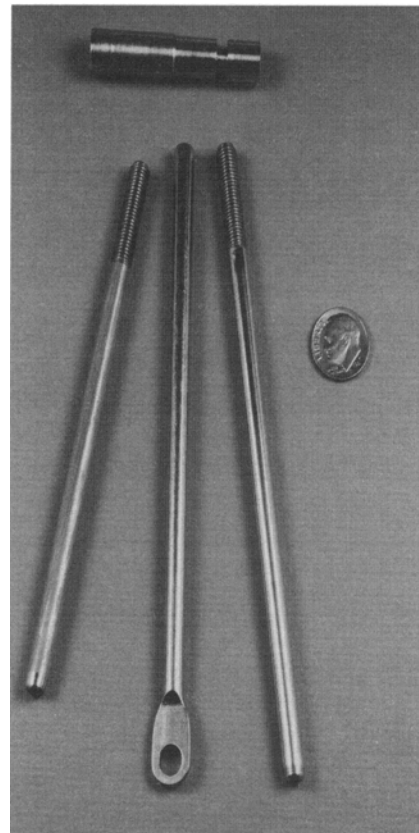


Siemens Components Inc.

Project 7000 *stainless steels 303 and 304*, has been designed by **Carpenter Tech-**

nology Corporation for use in machining small, complex parts. The steels have been turned at speeds 50+% higher than conventional stainless grades. One company, Imperial Specialty Inc., that switched to the 7000s from Carpenter's 70 stainless steels found that the number of parts it could make in an eight-hour shift on the same machinery rose from 650 to 1000 and that the 0.081 in. diam drills lasted for 1800 parts before wearing out, up from 650 with the 70s. For more information, contact: Jan Musser, Carpenter Technology Corp., P.O. Box 14662, Reading, PA 19612-4662; tel: 610/208-2524; fax: 610/208-2858.

The Mini AC/DC converter from **Megapower** was originally designed for Kodak's Ektapro Motion Analyzer 1000, a camera used in the Olympic diving competition. The Mini is a *five-output converter for the 600 to 10,000 W range*. The Micro-series converters are designed to serve the 300 to 600 W range. Gamma N+1 redundant power supplies are also manufactured by the company. For more information, contact: Megapower, 1033 N. Fair Oaks Ave. Sunnyvale, CA 94408; fax: 408/376-3672; e-mail: solutions@megapwr.com.



Carpenter Technology Corporation

Processing/Equipment

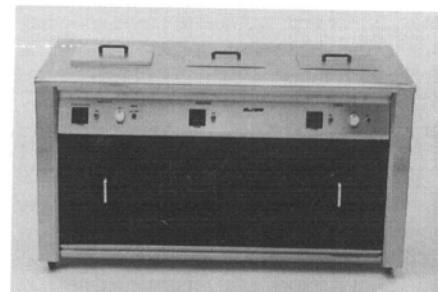
Liebert Corporation has released *an addition to its transistorized Series 600T Uninterruptible Power Supply* product line. The 450 kVA has a host of improvements over previous models: a smaller footprint (72 in. wide), provision for both top and bottom cable entry, better dynamic response, lower acoustic noise (69 dBA measured at 5 ft), and greater system efficiency. In addition, some 375 kVA units are available that can be upgraded to 450 kVA at a later date. For more information, contact: Liebert Corp., 1050 Dearborn Dr., P.O. Box 29186, Columbus, OH 43229; tel: 614/888-0246 or 800/877-9222; fax: 614/841-6973; web: <http://www.liebert.com>.

In *reflow soldering surface mount components* such as crystal oscillators, ferrite transformers, and tantalum capacitors, Falcon 5 x 5, 8/C and 12/C furnaces, made by **Sikama International Inc.**, are able to limit the time the solder paste is liquid to 10 s or less and keep the temperatures on the components to no more than 250 °C.

The temperature is controlled by placing the heating and cooling platens in direct contact underneath the substrate and by sweeper bars that move the substrate through heating and cooling zones. The systems' capabilities for temperature limiting the reflow process to precise levels mean that board assemblers no longer need to hand solder such components, thus saving time and labor. For more information, contact: Sikama International Inc., 118 E. Gutierrez St., Santa Barbara, CA 93101-2314; tel: 805/962-1000; fax: 805/962-6100.

L&R Manufacturing Company has available the Aquatrex *ultrasonic cleaning system*, a system that replaces solvent cleaning with an aqueous process. The units have three chambers: one for cleaning, the second for a multispray rinse, and the last for forced hot-air drying. Items can be transferred from chamber to chamber with an optional stainless steel basket. For more information, contact: L&R Manu-

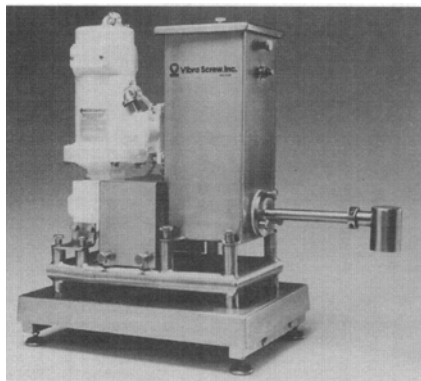
facturing Co., 577 Elm St., Kearny, NJ 07032-3604; tel: 201/991-5330.



L&R Manufacturing Company

Vibra Screw Inc. has introduced a *loss-in-weight screw feeder* capable of feed rates as low as 0.03 lb/min at accuracy measuring ± 0.25 g/min at 2 sigma. The screw feeder has load cells with a built-in tare adjustment that cancels out the feeder's own weight and reduces the capacity of the load cell required to weight it. Load cell capacity therefore need

only accommodate the weight of the material passing through the system. Smaller load cell capacities lead to lower feed rates. An internal damper in the controller filters out plant and process vibration for high accuracy on small weight increments. For further information, contact: Vibra Screw Inc., 755 Union Blvd., Totowa, NJ 07511; tel: 201/256-7410; e-mail: info@vibrascrewinc.com.



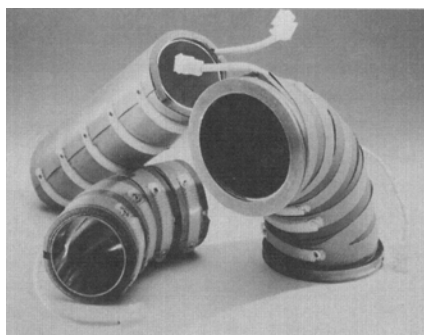
Vibra Screw Inc.

The Spectrum System 2000 from Leco Corporation is a *grinder/polisher for use by metallography labs*. The system can be upgraded: The modular base unit can be attached to a grinder/polisher head and another base unit. Each base unit has a variable speed, 2 hp motor, and accommodates 8, 10, and 12 in. disks. Sample holders accommodate six 1 in., 1.25 in., or 1.5 in., or three 2 in. samples. Holders permit preparation of single samples without blanks. For more information, contact: Leco Corp., 3000 Lakeview Ave., St. Joseph, MI 49805-2396; tel: 616/982-5496; fax: 616/982-8977; web: <http://www.lecousa.com>.



Leco Corporation

Pump line heating systems, manufactured by Watlow Electric Manufacturing Company, work to reduce the buildup of solids on LPCVD, PECVD, and metal etch vacuum piping systems. Reduction in buildup reduces particle generation, improves the consistency of yields, and eliminates unscheduled maintenance downtime. The heaters keep heat distributed evenly along the entire inside surface of the system. This eliminates small cold areas where solids can build up. The heaters can be customized to conform to the exact fit of a line. For technical information, contact: Watlow Columbia, 2102 Pennsylvania, Columbia, MO 65202; tel: 573/474-9402; fax: 573/474-5859; web: <http://www.watlow.com>.



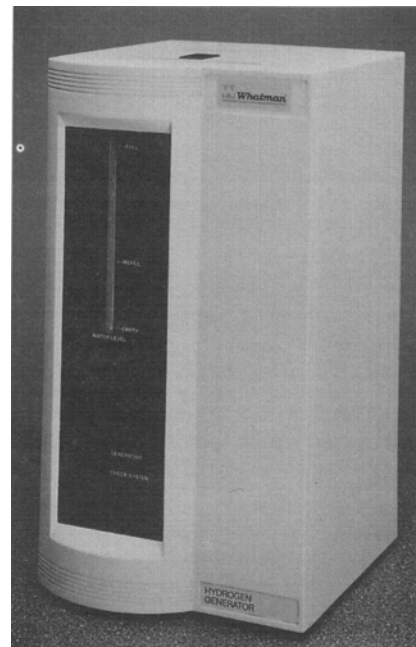
Watlow Electric Manufacturing Company

Monovat 02 *Rectangular Slit Valves*, from Vat Inc., for 300 mm (12 in.) cluster tools and wafer transfer systems have a variable-speed gate closure that operates at high speed with low force to protect the valve gate and robotic arm and achieves a vacuum-tight seal at the end of the stroke. The valves operate without closing shock and have only one moving part in vacuum. For more information, contact: VAT Inc., 500 W. Cummings Pk., Woburn, MA 01801; tel: 617/935-1446; fax: 617/935-3940.



Vat Inc.

The model 75-36 Hydrogen Gas Generator from Whatman Inc. produces 550 cm³/min of 99.99999% pure hydrogen gas at regulated pressures from 0 to 60 psi, *eliminating the need to change hydrogen gas cylinders*. The generator produces hydrogen gas through the electrolytic dissociation of water. The resultant hydrogen stream passes through a palladium membrane that only lets through hydrogen and its isotopes, hence the high purity. For more information, contact: Whatman Inc., 260 Neck Rd., P.O. Box 8223, Haverhill, MA 01835-0723; tel: 800/343-4048 or 508/374-7400; fax: 508/374-7070.



Whatman Inc.

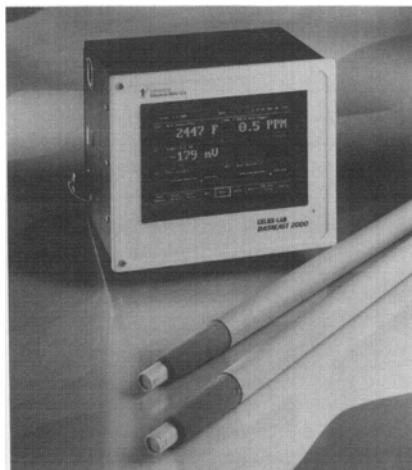
Pillar Industries has released the Mark 21 Transistorized R.F. *induction heating power supply*. Available in power ratings to 600 kW for applications that use frequencies of 10 to 350 kHz, the power supply is for applications that require high-frequency power to deliver case depths in the range of 0.02 to 0.04 in., such as small diameter shafts and gears. For more information, contact: Frank Wilson, Pillar Industries, N92 W15800 Megal Dr., Menomonee Falls, WI 53051; tel: 414/255-6470 or 800/558-7733; fax: 414/255-0359.

DTM Corporation has been testing RapidTool/SR, an application for Sinterstation rapid prototyping systems that *creates metal injection molds from CAD*

models in three days. The process can create complex molds with thin walls, standing ribs, and fine detail. For more information, contact: DTM Corp., 1611 Headway Cir., Bldg. 2, Austin, TX 78754; tel: 512/339-2922; fax: 512/339-0634.

Measurement/Testing/Evaluation

The Celox-Lab Datacast 2000 was designed by **Heraeus Electro-Nite** as a programmable **digital analyzer of molten metal** that uses multiple microprocessors to gather, analyze, display, and graph information on bath oxygen, temperature, carbon, and slag activity. Two RS-232 serial communication ports interface with printers, remote displays, or a plant's computer network. For further information, contact: Heraeus Electro-Nite, 9901 Blue Grass Rd., Philadelphia, PA 19114-1080; tel: 215/464-4200; fax: 215/698-7793.



Heraeus Electro-Nite

The IA-3001 from **Leco Corporation** is a **Windows 95-compatible image analyzer**. A Visual Report Designer creates custom reports with graphs, tables, statistics, and bit maps from within the pro-



Leco Corporation

A multidisk **crusher feeder** feeds and meters high tonnages of coal or other material into crushers. The machine has multiple discharge outlets, with level feeding widths up to 9 ft, and it provides accurate throughput tonnage data for accounting. For more information, contact: **Stamet**

gram. An optional Inclusion Expert software will automatically size, focus, and rate samples. The analyzer can be field retrofitted for use with the company's AMH-3000 microindentation hardness tester. For more information, contact: LECO Corp., 3000 Lakeview Ave., St. Joseph, MI 49085-2396; tel: 616/982-5496; fax: 616/982-8977; web: <http://www.lecousa.com>.

Mikron Instrument Company Inc. has designed the M9000 Pyrovision Infrared Imaging System for **monitoring continuous casting**. It provides information on temperature distribution to identify inadequately cooled strands on the caster. The system has a narrow band of spectral response in the near-infrared region that minimizes measurement errors due to variations in target emissivity. For more information, contact: Mikron Instrument Co. Inc., 16 Thornton Rd., Oakland, NJ 07436; tel: 800/631-0176; fax: 201/405-0090.



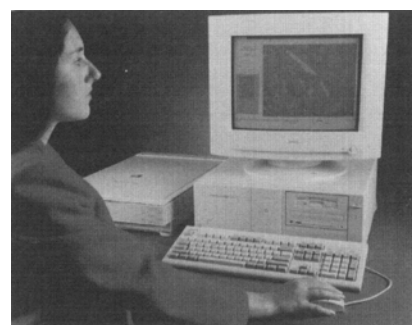
Mikron Instrument Company Inc.

The Link Semistem, produced by **Oxford Instruments Inc.**, is an **x-ray mapping accessory for revealing elemental distributions on JEOL 2010 and 3010 transmission electron microscopes**. The system adjusts scan size across a range of magnifications. In thin film samples beam spreading is small so that the spa-

Inc., 17244 S. Main St., Gardena, CA 90248-3130; tel: 310/719-7110; fax: 310/523-1920.

tial resolution is greater than can be obtained with bulk samples in a scanning electron microscope alone. For further information, contact: Oxford Instruments Inc., Microanalysis Group; tel: 508/369-9933; fax: 508/369-8287; e-mail: magnifo@oxford.usa.com.

The Optomax Speck Check II Dirt/Ink Counter is a **high-resolution paper inspection system that conforms to the TAPPI proposed provisional method for the measurement of equivalent black area of dirt in pulp and paper using image analysis**. Designed by **Optomax**, this Windows 95- and NT-compatible, Pentium-based (166 MHz minimum) computer system combined with a 600 dpi flatbed scanner uses an algorithm that measures specks with different intensities within the same sample. It can also separate specks and shives by shape and detect specks as small as 0.002 mm². The system can perform EBA, count dirt per mm², and count precision and size distribution by speck number or PPM (up to 50 classes). For more information, contact: Optomax, 9 Ash St., P.O. Box 840; Hollis, NH 03049; tel: 603/465-3385; fax: 603/465-2291.



Optomax

The MIDAS/1000 system, from **Advanced Peripherals Inc.**, is a **chart recorder for thermocouple systems that uses an interface to a Windows PC**. The system takes temperature readings and in-

serts them into a Microsoft Access database for charting, analysis, or storage. Administrative data such as job numbers can also be entered and combined with the temperature readings. For further information, contact: John Williams, Advanced Peripherals Inc., 24400 Highland Rd., #106, Richmond Heights, OH 44142; tel: 216/383-1703; fax: 216/383-0801; e-mail: info@ap-inc.com.

In Situ Electron and Tunneling Microscopy of Dynamic Processes, a 226-page book printed by the **Materials Research Society**, focuses on time-resolved electron microscopy, including diffraction and spectroscopy, as well as instrumentation for temperature and pressure control. Microscopy imaging techniques covered include: scanning tunneling, high-resolution electron, dark field transmission and reflection electron, Lorentz, scanning electron, low-energy electron, and photoemission electron. For more information, contact: Materials Research Society, Customer Services Dept., 9800 McKnight Rd., Pittsburgh, PA 15237-6006; tel: 412/367-3012; fax: 412/367-4373.

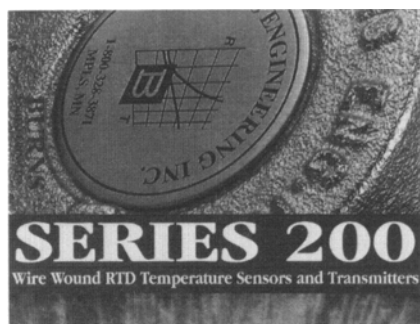
The TC-436Dr Nitrogen/Dual-Range Oxygen determinator performs low- and high-range oxygen measurement, along with simultaneous nitrogen determination. The instrument, made by **Leco Corporation**, reduces oxygen interference with nitrogen measurement in inorganic materials. Furnace options include an optional temperature sensor and an automatic electrode cleaning system. For more information, contact: LECO Corp., 3000 Lakeview Ave., St. Joseph, MI 49085-2396; tel: 616/982-5496; fax: 616/982-8977; web: <http://www.lecousa.com>.



Leco Corporation

The 200 Series RTD temperature sensors are covered in a catalog produced by **Burns Engineering**. The sensors have

been designed in a way that enhances the vibration and shock resistance of the platinum wire wound coil without interfering with its ability to expand or contract. The sheath construction technique virtually eliminates lead wire short-out and when encapsulated with compacted ceramics assures durability and 4 s time response over the life of the sensor. The head has a moisture-resistant seal and is compatible with terminal-block- or DIN-sized temperature transmitters. For more information, contact: Jim Sulciner, Burns Engineering Inc., 10201 Bren Rd. E., Minnetonka, MN 55343; tel: 612/935-4400; fax: 612/935-8782.

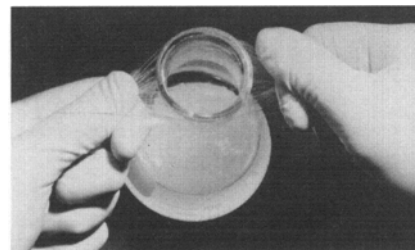


Burns Engineering

CT3500 Cryotransfer system from **Oxford Instruments** allows *frost-free transfer of both specimen and holder when used in conjunction with a transmission electron microscope (TEM)*. It is both a stable low-temperature sample holder and a cryo transfer workstation. With cryotransfer of TEM specimens, examination of frozen, hydrated, or low melting point materials in the form of vitrified suspensions or cryo-sections with the potential for 3-D reconstruction of biological macromolecules by integrating images obtained at different orientations is possible. X-ray mapping of unfixed cryo sections allows the detection of ionic concentrations. In addition, following sample preparation and coating, the system enables Cryo SEM to be performed in the STEM. For more information, contact: Oxford Instruments, Microanalysis Group, 130 A Baker Ave. Ext., Concord, MA 01742; tel: 508/369-9933; fax: 508/369-8287; e-mail: maginfo@oxford.usa.com.

Seal-View film, from **Norton Performance Plastics Corporation**, *protects stored samples by not cracking its seal in temperatures to -85 °C*. Glass, metal, or plastic containers are sealed by stretching

the film over the edge and down each side. After the film is stretched, there is no need to twist or wrap the excess material. Samples containing solvents such as dichloromethane or methylene chloride can be stored with no compromise of the seal through chemical attack. For more information, contact: Norton Performance Plastics Corp., 150 Dey Rd., Wayne, NJ 07470-4699; tel: 201/696-4700 or 800/798-1545; fax: 201/696-4056.

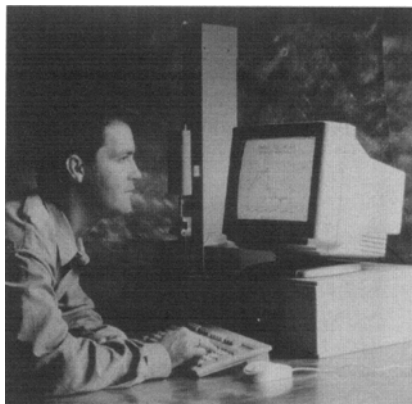


Norton Performance Plastics Corporation

Software, from **Lumonics Corporation**, *enables the company's laser marker vision systems to automatically receive and compute pertinent information from the laser marking system, information that allows the vision system to determine what the characteristics (stroke width, contrast, character formation) should be of the mark when it is applied*. Before this development, the operator would have to physically place a perfectly marked part under the vision system's camera to teach the system what mark and mark quality to look for. For more information, contact: Lumonics Corp., P.O. Box 9010, Oxnard, CA 93031-9010; tel: 805/485-5559; fax: 805/485-3310.

The Layout Pro 6.0 for Windows is described in a brochure from **Micro Estimating Systems**. *The software performs documentation of machine cycle-time calculations*. For more information, contact: Micro Estimating Systems, 11217 W. Forest Home Ave., Franklin, WI 53132; tel: 414/427-8300; fax: 414/427-8301.

AutoTest software, designed by **Chatillon**, *automates force testing with the company's digital TCD stands and DFGS force gages*. When used with a PC, the software controls all operations of the stand and gage through RS-232 connections. In addition, it automates every other step in the force testing process, including test setup, data gathering, and data analy-



Chatillon

sis. The software requires the user to define each test once; the test is then retained

in memory and can quickly be recalled to automatically run successive tests or to modify the procedure to accommodate changing specifications. For more information, contact: Chatillon, 7609 Business Park Dr., Greensboro, NC 27409; tel: 800/527-9999.

AutoSimulations Inc. has released Auto-Mod for Windows NT, a *3-D simulation software tool*. The program has been redesigned for the NT system, because of its ease of use, lower hardware and software costs, security reliability, and data integrity. For more information, contact: Auto Simulations, 655 Medical Dr., Bountiful,

UT 84010; tel: 801/298-1398; fax: 801/298-8186.

A four-page brochure, from **Selcom**, covers the Laser Sensor 5000 and 6000 series *noncontact industrial dimensional gaging sensors*. The sensors can be integrated to a Selcom Signal Processor or to a PC/PLC system. The brochure describes applications, technical specifications, and design of the sensors. For more information, contact: Selcom, 21654 Melrose Ave., Southfield, MI 48075; tel: 810/355-5900; fax: 810/355-3283.

International Research/Manufacturing Centers

The United States and Russia, through the **Russian-American Fuel Cell Consortium**, will develop *commercially viable fuel cells*, a power source that converts the energy released by oxidation of a fuel directly into electricity. All fuel cells will be studied: solid oxide, molten carbonate, phosphoric acid, and polymer electrolyte membrane. Individual projects will focus on creating high-temperature sealants, improved bipolar plate materials, pore-free separator plates, and catalysts. The Department of Energy's Sandia National Laboratories first proposed the consortium in 1994 as an efficient way of combining the expertise and resources of Russian nuclear institutes, DOE national laboratories, and U.S. industry. For further information, contact: Sandia National Laboratories, Albuquerque, NM 87185-0167; tel: 505/844-7767; fax: 505/844-6367.

The *International Yearbook of Industrial Statistics 1996* from the **United Nations**

Industrial Development Organization (UNIDO) contains statistical indicators from 120 countries to help with international manufacturing comparisons. The data were compiled bearing in mind the requirements of international comparability. The data can be used to analyze patterns of growth, structural change, and industrial performance in individual industries. For information, contact: Edward Elgar Publishing, 8 Lansdown Place, Cheltenham, Glos. GL50 2HU, U.K.; tel: 44/1/242/226934; fax: 44/1/242/262111; e-mail: publicity@e-elgar.co.uk.

An insight by scientists at **Sandia National Labs** may lead to *the replacement of liquid crystal display screens by phosphor field emission displays*. LCDs have the tendency to go blank if looked at from angles other than straight on, placed in direct sunlight, subjected to rapid changes in temperature, or accelerated rapidly. In addition, their batteries run down quickly

because the entire screen is backlit and then blocked out in sections to provide images. On the other hand, a phosphor field emission display only energizes pixels that provide information. This insight came during a study of the mechanism by which a phosphor emits light. The amount of green light emitted by zinc oxide does not depend on the thickness of the crystal but on the density of a defect: oxygen atoms missing from their places in the crystal. Single electronics that remain in the vacant spaces emit green light when a mild electric current is introduced. The study showed from the first time that the electronic properties at a material's surface have a dominant effect on its luminescent efficiency. The scientists are now working on changing the chemistry of the surface to achieve the greatest luminescence. For further information, contact: Sandia National Laboratories, Albuquerque, NM 87185-0167; tel: 505/844-7767; fax: 505/844-6367.

University View

<http://www.columbia.edu/cu/matsci/files/matscinet.html> at **Columbia University**, New York, NY, is *a proposal to set up a "MatSciNet" for professionals in the field of Materials Science*, to create a unified base for the community. Such a site might have a forum to discuss topics of interest, career information, electronic journals with nearly zero publication time

(a reviewed section, and an unreviewed section), discussion groups, an industry/academia interface, and a checklist of Materials Science sites. Further suggestions are welcome. The Columbia site already has links to materials science job opportunities, electronics journals, newsgroups, and societies.

Donald R. Sadoway, a professor in the Materials Science and Engineering Department at **MIT**, Cambridge, MA, is working on *a cleaner way to make steel, a process whose principal by-product is oxygen, rather than carbon dioxide or silicon dioxide*. The technology, called pyroelectrolysis, involves zapping a molten mixture of iron ore and other materials

with electricity. The iron oxide is fed into a reactor called an electrolysis cell, where it is made to dissolve in a solution of other molten oxides. An electric current is passed through the cell from the anode to the cathode. At the interface of the molten oxides and the cathode, pure liquid iron—the steel—is formed. The principal by-product (oxygen) bubbles off the anode. For more information, contact: MIT News

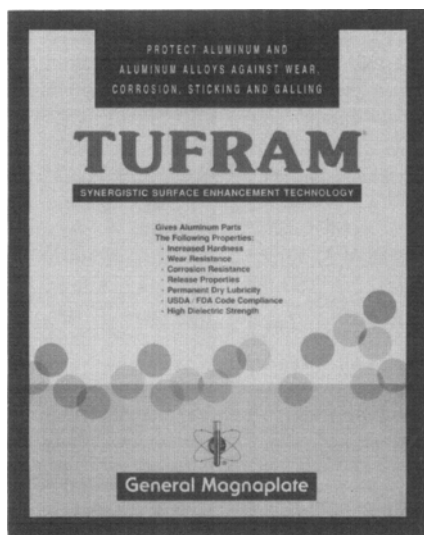
Office, Room 5-111, 77 Massachusetts Ave., Cambridge, MA 02139-4307; tel: 617/253-2700.

The **National Technology Transfer Center** has signed a Memorandum of Understanding with the Idaho National Engineering Laboratory, Idaho Falls, ID, to *pool their resources in transferring and*

commercializing technologies developed by federal and university laboratories. For more information, contact: National Technology Transfer Center, Wheeling Jesuit College, 316 Washington Ave., Wheeling, WV 26003; tel: 304/243-2455; fax: 304/243-2463; web: <http://www.nttc.edu>.

Literature/Data Sources

A six-page brochure, "Tufram Synergistic Surface Enhancement Technology," covers surface enhancement treatments designed by **General Magnaplate Corporation** that give *aluminum parts a surface that is harder than steel*. The coatings vary in equivalent hardness from 40 to 65 HRC, depending on the process and the substrate alloy. The brochure includes information on the multistep coating process, equilibrium wear rates, salt spray test results, and coating thicknesses. For a copy, contact: General Magnaplate Corp., 1331 Rte. 1, Linden, NJ 07036; tel: 908/862-6200 or 800/852-3301; fax: 908/862-6110; e-mail: info@magnaplate.com.



General Magnaplate Corporation

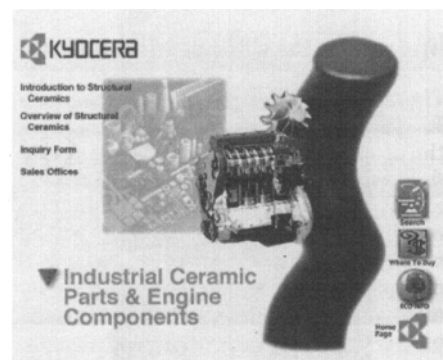
NACE International's new *web site*, at <http://www.nace.org>, has information on *corrosion*, including current government legislation and regulations. A section describes participation in standards-writing technical committee activities, and a calendar lists corrosion conferences and tech-

nical symposia. Visitors can order books, software, standards, and videos directly from the page. For further information, visitors can log on, or contact: NACE International, P.O. Box 218340, Houston, TX 77218-8340; tel: 713/492-0535 ext. 81; fax: 713/492-8254.

IndustryNet and **Industrial Fasteners Institute** have launched *Industrial Fasteners On-line*, at <http://www.industrial-fasteners.or> or <http://www.industry.net/ifi>. The services provides fasteners suppliers with information, education, business opportunities, an opportunity to promote their products and services on the World Wide Web, and a one-stop shopping outlet for products. For further information, contact: IndustryNet, 639 Alpha Dr., Pittsburgh, PA 15238; tel: 412/967-3500; fax: 412/967-3504; e-mail: info@industry.net; web: <http://www.industry.net>.

Kyocera Industrial Ceramics Corporation has built a *World Wide Web site dedicated to structural ceramics*. [Http://www.kyocera.com/kicc/micceramics.html](http://www.kyocera.com/kicc/micceramics.html) is the main page for the Structural Parts Group, with an introduction and an overview of products. [Http://www.kyocera.com/kicc/indceram.html](http://www.kyocera.com/kicc/indceram.html) is the industrial division's page, with links to examples of applications and types of ceramic materials. [Http://www.kyocera.com/kicc/enginecomp.html](http://www.kyocera.com/kicc/enginecomp.html) is the automotive division's page, with applications of ceramics for auto support industries. [Http://www.kyocera.com/kicc/heaters.html](http://www.kyocera.com/kicc/heaters.html) is the page for ceramic heaters, heater applications, and advantages. [Http://www.kyocera.com/kicc/structuralceramic.html](http://www.kyocera.com/kicc/structuralceramic.html) has lists of industries and applications served by the automotive and industrial divisions. [Http://www.kyocera.com/kicc/inquiry.html](http://www.kyocera.com/kicc/inquiry.html) is an inquiry form which users can fill out for more information on particular appli-

cations. For further information, contact: Kyocera Industrial Ceramics Corp., 25 Northwest Point Blvd., Elk Grove Village, IL 60007-1030; tel: 847/981-9494; fax: 847/981-9495.



Kyocera Industrial Ceramics Corporation

Fischer Technology is offering a catalog on the company's line of *coating thickness measurement and materials testing equipment*. Each instrument is described by copy, photos, and illustrations. Also included are a section on how to integrate measuring systems into a quality control system and a flow chart for quick selection of the correct coating thickness measurement device for a given application. For a copy, contact: Fischer Technology Inc., 750 Marshall Phelps Rd., Windsor, CT 06095; tel: 860/683-0781; fax: 860/688-8496.

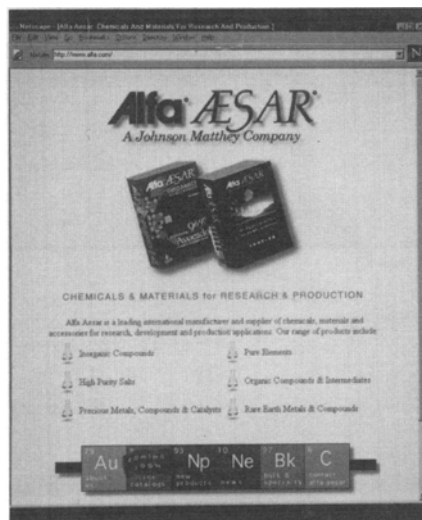
Two four-page brochures contain *descriptions of books* from **The Institute of Materials**. "Materials Science" covers *Plasticisers: Principles and Practice*; *Structural Materials: Engineering Application Through Scientific Insight*; *Toward the Millennium: A Materials Perspective*; *Materials Technology Foresight on Aerospace Structural Materials*; *Surface Modification Technologies IX, VII, and VIII*;

Guidelines on Materials Requirements for Carbon and Low Alloy Steels for H₂S-Containing Environments in Oil and Gas Production; Ceramic Films and Coatings; 21st Century Ceramics; Ceramic Oxygen Ion Semiconductors and Their Applications; A Guide to Surface Engineering Terminology; High-Temperature Materials Chemistry; Advanced Materials in the Marketplace; Guidelines for Methods of Testing and Research in High-Temperature Corrosion; Materials Technology Foresight for the UK Power Generation Industry; Predicting CO₂ Corrosion in the Oil and Gas Industry; and Superplasticity: 60 Years after Pearson. "Metals and Metallurgy" contains Fundamentals of Steelmaking; Clean Steel: Superclean Steel 6-7 March 1995 London, U.K.; An Atlas of Continuous Cooling Transformation (CCT) Diagrams Applicable to Low Carbon Low Alloy Weld Metals; Performance of Bolted Materials in High Temperature Plant Applications; Magnetism and Magnetic Materials (2nd ed.); A Guide to Surface Engineering Terminology; Chemical Bonding in Transition Metal Carbides; Investment Casting; Hydrogen Transport and Cracking in Metals; Mathematical Modelling of Weld Phenomena 2; An Introduction to Metallurgy; and Quenching and Carburising. For further information, contact: Institute of Materials, Dist. by Ashgate Publishing Co., Old Post Road, Brookfield, VT 05036-9704; tel: 800/535-9544 or 802/276-3162; fax: 802/276-3837; e-mail: inmat@ashgate.com.

The **Aluminum Extruders Council**, Wauconda, IL, has placed its entire membership roster on the World Wide Web, at <http://www.aec.org>. The listing includes addresses, production capabilities, and hypertext links to member homepages. For further information, log on or contact: Aluminum Extruders Council, 1000 N. Rand Rd., Ste. 214, Wauconda, IL 60084; tel: 847/526-2010; fax: 847/526-3993; e-mail: aec@mc.net.

Alfa Aesar's new World Wide Web home page, at <http://www.alfa.com>, has six branches. "About Us" and "News" give corporate information. "On-line Catalogs" will attach to a **catalog of 20,000 chemicals and materials**, beginning in Jan 1997. "New Products" leads to a page of products with hypertext links to descriptions. "Bulk & Specialty" lists products available in large quantities or to custom requirements. A final link lets the user "Contact Alfa Aesar." For further information, visitors can log on, or contact:

Alfa Aesar, 30 Bond St., Ward Hill, MA 01835-8099; tel: 508/521-6300; fax: 508/521-6350.



Alfa Aesar

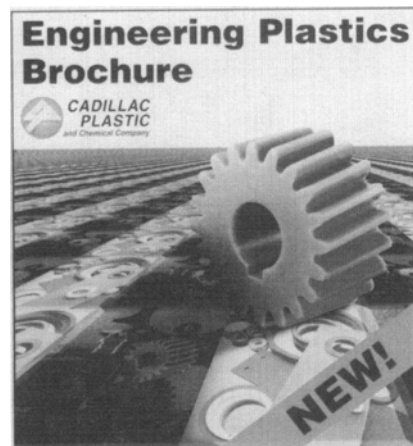
The CT-500 line of **water-based thermoplastic coatings**, formulated from Rytan polyphenylene sulfide, is the subject of a two-page product bulletin printed by **Corro Therm Protective Coatings Inc.** Resistant to chemicals, heat, impact, and abrasion, these coatings are suitable for use as an acid-resistant lining, a permanent mold release coating, or a low-friction automotive parts coating. CT-520 is also electrically conductive. For a copy, contact: Corro Therm Protective Coatings Inc., 175 Philmont Ave., Feasterville, PA 19053; tel: 800/726-7948; fax: 215/322-3023.

Bridgeport Machines has available a six-page brochure on its DX-32 **control for CNC milling and turning**. This PC-based CNC control features an open architecture design that facilitates the addition of future hardware/software upgrades and provides Windows compatibility. The control has a graphics-based interface, with pop-up menus and dialog boxes, part verification, a teach mode, canned cycles, and real-time diagnostics. It also has a standard probe interface for digitizing. For a copy, contact: Bridgeport Machines Inc., 500 Lindley St., Bridgeport, CT 06606; tel: 800/243-4292.

An eight-page **product index catalog** from **Houghton International** profiles the company's line of industrial metalworking products, hydraulics fluids, and spe-

cialized lubricants, including the Die Kote synthetic die casting release agents for nonferrous castings. Another brochure, of six pages, profiles the company's line of die sprays and water glycol hydraulic fluids for die cast industry applications. For a copy of either brochure, contact: Richard Geiselman (metalworking index) or Richard Brasch (die sprays), Houghton International Inc., Madison & Van Buren Aves., Valley Forge, PA 19482-0930; tel: 610/666/4000; fax: 610/666-1376.

A brochure on "Engineering Plastics" from **Cadillac Plastic** covers **forty plastic materials commonly used in engineering applications**. Information on thermoset and thermoplastic products, as well as standard and high-performance plastics is included. The brochure describes each material with a table labeling FDA and USDA compliance, cost comparison data, and physical property comparisons. For a copy, contact: Cadillac Plastic, 143 Indusco Ct., P.O. Box 7035, Troy, MI 48007-7035; tel: 810/583-1200 or 800/274-1000.

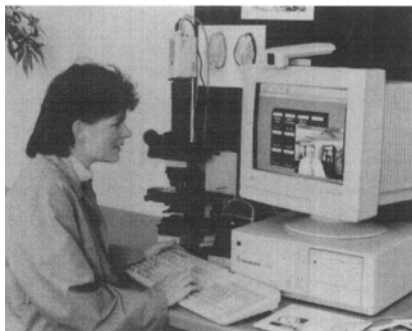


Cadillac Plastic

Consarc Corporation has printed a four-page brochure on its **vacuum arc remelt furnaces**, used for production of ingots to 27,000 kg (60,000 lb). The furnaces are automated, so continuous operator attendance is not required. Magnetic fields that cause uneven solidification are avoided, because the cathode-anode current is returned coaxially. Precisely controllable centering of the electrode within the melt chamber allows identical ingots to be produced. For a copy, contact: Consarc Corp., 100 Indel Ave., Rancocas, NJ 08073; tel: 609/267-8000; fax: 609/267-1366.

A report released by Battelle, NIST, and SSINA, estimates that one-third of the cost of corrosion could be avoided by broader application of corrosion-resistant materials and corrosion-control practices. The **1997 to 1998 Corrosion Control Buyer's Guide** from **NACE International**, Houston, TX, is a directory of 900 manufacturers, suppliers, and consultants of corrosion-control products and services. To order a copy (\$20), contact: NACE International, P.O. Box 218340, Houston, TX 77218-8340; tel: 713/492-0535 ext. 81; fax: 713/492-8254.

Image archiving software, designed by **Leco Corporation**, uses a visual directory of color images. Each image, captured in 24-bit color using RGB, S-Video, or composite signals, can be titled and described, and then exported to storage or a printer. For further information, contact: Leco Corporation, 3000 Lakeview Ave., St. Joseph, MI 49805-2396; tel: 616/982-5496; fax: 616/982-8977; web: <http://www.lecousa.com>.



Leco Corporation

[Http://www.sae.org/apn](http://www.sae.org/apn) is the World Wide Web address of **Auto Product News**, an SAE web publication that is an

In Business

To double production of Spectra composites for body armor and other applications, **AlliedSignal**, Petersburg, VA, is building a plant that will begin operations in third-quarter 1997, and be in full production a year later. Spectra fiber is an extended-chain polyethylene yarn with a diamond's molecular structure and ten times the strength of steel. Spectra shield uses the fiber in a patented composite

electronic library of the automotive industry's most recent product announcements. Announcements are posted for one week and then archived for one year. A similar service is Auto Headline News, which disseminates automotive news from published sources around the world via e-mail. For information, contact: SAE, 400 Commonwealth Dr., Warrendale, PA 15096-0001; tel: 412/772-7144; fax: 412/776-2103; e-mail: apn@sae.org.

Tri-Star Plastics Corporation, Shrewsbury, MA, has launched a World Wide Web site at <http://www.tstar.com>. The site focuses on plastics and bearings materials, plane bearings, fabrication, engineering, and spherical bearings. The site is intended as a reference tool for engineers and machinists. For more information, log on to the site, or contact: Tri-Star Plastics Corp., Bearings Division, 906 Boston Tpke., Shrewsbury, MA 01545; tel: 508/845-1111; fax: 508/845-1200 or 800/331-0320.

A 16-page brochure, titled "Cold Drawn Custom Profiles and Pinion Rod in Near Net Shapes," presents *the advantages of cold drawing parts from metals, instead of machining, to produce components in net shapes*. Printed by **Rathbone Precision Metals Inc.**, the brochure describes and gives examples of this cold-drawing process that produces shapes with tolerances to ± 0.005 cm (± 0.002 in.). For a copy, contact: Rathbone Precision Metals Inc., 241 Park St., Palmer, MA 01069; tel: 413/283-8961; fax: 413/283-9722.

Watts Current, is a quarterly newsletter published by **Watlow Electric Manufacturing Company**, to inform readers about *heaters, sensors, and controls*. The arti-

cles are application-specific and use company products. For more information, contact: Watlow Electric Manufacturing Co., 12001 Lackland Rd., St. Louis, MO 63146; tel: 314/878-4600; fax: 314/878-6814; web: <http://www.watlow.com>.



Watlow Electric Manufacturing Company

The **Society of Manufacturing Engineers** has produced a CD-ROM, **Fundamentals of Rapid Prototyping and Manufacturing**, for Mac or Windows. The CD-ROM brings together video, audio, animation, text, and graphics for an overview of this industry. It covers a history of rapid prototyping, the various processes in use, and case studies. For more information, contact: SME, One SME Dr., P.O. Box 930, Dearborn, MI 48121-0930; tel: 313/271-1500 or 800/733-4763; fax: 313/271-2861.

Laurel Industries Inc., Cleveland, OH, has been acquired from private investors by **Occidental Petroleum Corporation**. Laurel is North America's largest producer of antimony oxide, a material used as a polymerization catalyst in the manufacture of polyethylene terephthalate (PET) resins and as a flame retardant in plastics.

To establish higher-quality standards in the area of nondestructive testing, the

American Society for Nondestructive Testing, Columbus, OH, and the **Electric Power Research Institute** will create a benchmark for personnel performance of NDT applications in the electric power industry.

Neural Applications Corporation, Coralville, IA, in conjunction with **North Star Steel**, has won a Phase I research grant from the U.S. Department of Energy

for its proposal, "Intelligent Adaptive Systems for Optimal Energy Input in Steel-making." Neural applications will develop an intelligent system that optimizes the energy input from each major source on an electric arc furnace, automatically adapting to changing conditions.

The operations of **Remmele Engineering Inc.**, Automotive Division, St. Paul, MN, and **Dymax Corporation**, Torrington, CT, have both received ISO 9001 certification. Remmele builds custom machinery for manufacturing operations. Dymax creates and manufactures adhesives and adhesive curing systems.

Urethane Technologies Inc., Santa Ana, CA, has signed a letter of intent with **PMC Inc.**, Sun Valley, CA, to merge with IPI, a division of PMC. IPI is a supplier of two-component polyurethane systems, with annual sales of \$37 million. Urethane Technologies produces specialty polyurethane chemical systems and had \$26.6 million in sales in 1995.

Air Liquide America Corporation, Houston, TX, a subsidiary of Air Liquide Group, Paris, France, has decided to raise its price for liquid argon by an average of \$0.15 per hundred standard cubic feet. In addition, prices for carbon dioxide will be increased \$5.00 per ton. Reflecting the impact of rising energy prices on transportation and production costs, price discounts for liquid oxygen, nitrogen, and hydrogen will be eliminated or reduced.

Hoover Materials Handling Group Inc., Alpharetta, Ga., has signed a technology licensing agreement with **Mausser, Bruehl**, Germany, a packaging producer. The agreement provides for U.S. manufacture of the Mauser Repaltainer, a recyclable composite intermediate bulk container.

Videojet Systems International Inc., Wood Dale, IL, a subsidiary of The General Electric Co. Ltd., London, U.K., has acquired **Cueprint Ltd.**, U.K. Cueprint

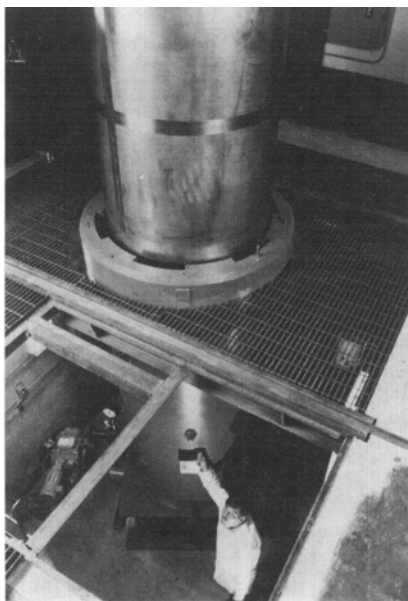
manufactures inkjet printer products based on impulse technology.



Videojet Systems International Inc.

PPG Industries, Pittsburgh, PA, has acquired W.L. Schwaab Lackfabrik KG, Weingarten, Germany, a producer of transportation and industrial coatings. The Weingarten-based subsidiary will be called PPG Industries Lackfabrik GmbH.

Ceradyne Inc., Costa Mesa, CA, has installed its second pressure sintering facility dedicated to fabricating the ceramic, sintered reaction bonded silicon nitride.



Ceradyne Inc.

The furnace will have an annual production capacity of 2 million pieces, doubling the company's capacity.

Meyer Instruments Inc., Houston, TX, will distribute the microscopy, microtomy, and cryomicrotomy products of **Leica Inc.**, Deerfield, IL, in Texas, Louisiana, and Mississippi. Meyer is a ten-year-old scientific imaging products dealership.

Ciba-Geigy Corporation, Newport, DE, and **Xiangtan Chemical Research Institute** will form a joint venture to produce quinacridone pigments in Hunan Province, China. Quinacridones are a family of pigments mainly used in automotive paints and plastics.

In a private placement, **Cadis Inc.**, Boulder, CO, raised \$10.7 million to finance its expansion. The company has a 70% share of the internal parts information management market.

Air Liquide America Corporation, Houston, TX, a subsidiary of Air Liquide Group, Paris, France, will build an air separation plant in Indianapolis, IN, to produce and supply oxygen, nitrogen, argon, and compressed air to Qualitech Steel Corporation's nearby steel minimill. In addition, the 350 ton/day facility will supply oxygen, nitrogen, and argon to the merchant market in the region.

3D Systems Corporation, Valencia, CA, has agreed to acquire **KelTool Inc.**, St. Paul, MN, a company that produces steel tooling for plastic injection molding machines using 3D's rapid prototyping systems. Under the acquisition agreement, 3D will acquire all of Keltool's assets for \$1.7 million, and Keltool will have an option to purchase 50,000 shares of 3D Systems at \$14.75 per share. Wayne Duescher, the sole stockholder of Keltool, will also enter into a five-year noncompetition agreement.

Kudos

David J. Gaines, a research engineer with **American Cast Iron Pipe Company**, Birmingham, AL, and **Donald A. Wakefield**, the president of **Masonry Information Services**, Sandy, UT, have been named 1996 recipients of ASTM's Award of Merit.

Michael Johnston has been promoted to Lexan Specialist for **Cadillac Plastic**, Troy, MI. Lexan, a trademarked product of General Electric Company, is a clear, high-impact-resistant polycarbonate material available in sheet and film form.



A.W. Goswick

Arthur W. Goswick has been named principal heat treat equipment analyst at **Timken Company's** Bucyrus Bearing Plant, Canton, OH. Mr. Goswick has spent thirty-two years with Timken, for the most part at the company's Columbus Bearing Plant.

The **Association of Formulation Chemists**, Wayne, NJ, an organization that promotes cross-industry technology exchanges on basic formulation science, has elected officers for 1996 to 1997. **Karl Krummel**, President; **Larry Augsberger**, Vice President; **Augustin Chen**, Secretary; **David Pritchard**, Treasurer; **Joseph Crudden**, Committee Chairman, Publications; **Ralph Magin**, Committee Chairman, Membership; **David Pritchard**, Committee Chairman, Program; and **George Beestman**, Committee Chairman, Science Advisory Panel.



Hideo Fukuchi

Nikon Inc., Melville, NY, the U.S. marketing and distribution subsidiary of Nikon Corp., a manufacturer of photographic and electronic imaging equipment, has named **Hideo Fukuchi** as President and Chief Executive Officer. Mr. Fukuchi has been with Nikon for thirty-two years and was previously president of Nikon Canada Inc.

Howmet Corporation, Greenwich, CT, has named **John C. Ritter** as Chief Financial Officer. Mr. Ritter, who holds an M.S. from MIT, had served most recently as Vice President of Finance and Contracts at AlliedSignal Corporation.

Thomas N. Tyrrell has been appointed President and Chief Executive Officer of **Bar Technologies Inc.**, the successor company to the Bethlehem Steel Bar, Rod & Wire Division. Mr. Tyrrell was President and CEO of American Steel & Wire Corporation before it was acquired by Birmingham in 1993.

Dr. Stuart Wolf, head of the Material Physical Branch of the **Naval Research Laboratory's** Material Science and Technology Division, Washington, DC, is the recipient of the Laboratory's 1995 E.O. Hulburt Award, the NRL's highest civilian award for scientific and engineering achievement. Dr. Wolf was recognized for his work in inhomogeneous superconductivity and in magnetic materials.

Owens Corning, Toledo, OH, has made several executive appointments: **Heinz-J. Otto**, president, Composites; **Efthimios O. Vidalis**, president, Insulation-North America; **Alan D. Booth**, process executive, Customer Fulfillment Process; **Rick DiPasquale**, president, the Latin American business unit; and **Bradford C. Oelman**, senior vice president, Government and Public Affairs.

PPG Industries Inc., Pittsburgh, PA, has given four of its executives new assignments to broaden their management skills and experience: **Donald W. Bogus** will be vice president of industrial coatings; **Thomas Von Lehman** will be vice president of specialty chemicals; **Michael A. Ludlow** will be vice president of purchasing and distribution; and **Ernest A. Hahn** will be vice president of automotive original equipment glass products. All four men had been vice presidents of other divisions before taking these positions.

Sidney Rosenberg has been named director of manufacturing operations at **Paramount Industries Inc.**, Langhorne, PA. Mr. Rosenberg will be in charge of the company's manufacturing operations, purchasing, supplier relations, and contract administration.

Pacific Scientific, High Yield Technology Division, Sunnyvale, CA, has appointed **Eric Leiser** as director of sales and **Jeff McDowell** as product marketing manager. Mr. Leiser holds a B.S. in Materials Science from MIT. Mr. McDowell holds a B.S. in Materials Science from Wright State University, Dayton, OH.
