Glenn S. Daehn, professor of materials science and engineering, both of **The Ohio State University,** Columbus, Ohio, have each received the Lumley Engineering Research Award, named for OSU alumnus John H. Lumley, ceramic engineering, 1927. The award is intended to promote and enhance research within the college. Adler's areas of research interest include: ultrasonic wave propagation, characterization of diffusion and friction welds, evaluation of fiber/matrix interface quality in composite materials. Daehn has planned, proposed, and initiated 12 sponsored research projects during the past four years dealing with electrohydraulic forming of sheet metal, formability of metals in bulk forming, creep and dreep damage of austenitic stainless steel. He has also received the 1992 Hardy Gold Medal of TMS, a national award given annually to the most promising young engineer or scientist in the field of materials.

The Board of Director of **Lindberg Corp.,** Rosemont, Illinois has named ***Michael W. Nelson,*** Vice President, Central Region, and ***Roger J. Fabian,*** Vice President, Eastern Region. Each is responsible for Company operation within his respective geographical region.

David W. Dickinson, **The Ohio State University,** Columbus, Ohio, was elected President of the American Welding Society for 1992-93, effective 1 June. In 1985, Dickinson helped establish the Edison Welding Institute and served as its first director of research until 1987.

Materials and the Environment

In an effort to preserve and maintain the fragile ecology of our planet, these selected abstracts are presented to help readers of Journal of Materials Engineering and Performance stay current on legislation and compliance with global environmental issues and regulations. They are reprinted from Metals Abstracts and Materials Business File with permission from Materials Information, a joint service of ASM International®, Materials Park, Ohio, and The Institute of Materials, London, England.

January - June, 1992

Regulating Cadmium in the Work-Place-Some Observations on the Background and Current Position in Europe. (Retroactive Coverage). The background to and the current position of European Regulations related to Cd are briefly outlined. The clinical aspects are reviewed historically and an attempt is made to relate some of these with biological and environmental changes over the past 40 years. The information presented is based largely on alkaline (Ni-Cd) battery manufacture.

R. Adams. Cited: *Cadmium 89. Sixth International Cadmium Conference,* 1989, 43-46, [in English]. PHOTOCOPY ORDER NUMBER: 9205.

Wastewater Treatment. Federal metal finishing regulations that are applicable to all electroplating shops except independent printed circuit board shops and job shops are described. The most comprehensive and expensive pollution control law affecting metal finishers is reported to be the Resource Conservation and Recovery Act (RCRA). This law controls hazardous wastes from cradle to grave. Originally passed in 1976 the law was greatly expanded in 1984 to regulate small quantity generators. Fines for noncompliance can be up to $1 million. Systems which can be used to treat plating wastes and, thereby, meet standards set for waste water are reviewed. Guidelines which can be used to select an appropriate system for a specific application are given. Treatment systems described include both batch and continuous types. The chemistry of conventional treatment processes such as hexavalent chrome reduction, cyanide oxidation, and neutralization is detailed.

C.T. Philip. Cited: *Metal Finishing 90, (1A), (Guidebook and Directory),* 762-785, 1992, [in English]. ISSN: 0026-0576. PHOTOCOPY ORDER NUMBER: 9205.

Environmental Regulations and Paint Sludge Management Alternatives for Compliance. Proposed regulations by the US Environmental Protection Agency forced the automotive industry to seek alternatives to landfilling of paint sludge. To the benefit of the automotive industry the final regulations were relaxed and the disposal alternatives would be acceptable only if cost-effective. More effective dewatering of the paint sludge provides flexibility in the ultimate disposal and cost efficiencies.

G.P. Nassos. Cited: *Finishing West '90,* 1990, 13. Paper No. FC90-635, [in English]. PHOTOCOPY ORDER NUMBER: 9205.

Environment/Health/Safety. Federal laws, coupled with rules of the Environmental Protection Agency, regulate practically every actual and potential industrial and municipal pollution source. State and local laws and regulations place further restrictions on discharges to the air, water, and land. A review covers brief descriptions of the major federal environmental laws that affect foundries including: the Comprehensive Environmental Response, Compensation and Liability Act of 1980; Resource Conservation and Recovery Act; the Federal Water Pollution Control Act (Clean Water Act); Toxic Substances Control Act; Clean Air Act of 1990; storm water regulations; and liquid materials storage. Other issues addressed are the cost of solid waste, solid waste alternatives, worker health issues, higher OSHA penalties, and ergonomics.

Cited: *Foundry Management and Technology,* 119, (12), 1991, [in English]. ISSN: 0360-8999. PHOTOCOPY ORDER NUMBER: 9204.

How Environmental and Waste Disposal Issues Influence Formulation of [Forming] Lubricants. Hazardous waste characteristics include ignitability (flash point < 60 °C), corrosivity (pH > 12.5), reactivity (potential for forming harmful vapors or for explosion), and toxicity (capability to leach hazardous material into the water table). Chlorine in the form of chlorinated paraffin is a widely used extreme pressure lubricant additive. The Cl in the wax, under the heat and pressure of the forming or stamping operation, reacts with metal surfaces to form ir on chloride which acts as a physical barrier to prevent metal-to-metal contact. Chlorinated paraffin is not currently listed

or considered a hazardous material by the US EPA. In November of 1985, the EPA had proposed to list all used oil, including used lubricants, as hazardous waste, but reconsidered and currently classifies used oils as nonhazardous. If and when the EPA changes its classification of used oils, synthetic stamping and forming fluids may become alternatives. Systems which split waste into a solid which can go to an approved landfill and water which is acceptable to public operated treatment works and ultrafilter wastes to concentrate them reduce waste disposal costs.

R. Klann. Cited: *Worldclass Productivity*. Vol. 1, No. 2, 1991. 529-537, [in English]. PHOTOCOPY ORDER NUMBER: 9202.

Regulatory Impediments to the Use of the Beneficial Values of Spent Potliner From Aluminum Reduction Facilities. The US Envornmental Protection Agency (EPA) listed spent potliner, a byproduct of primary Al production, as a hazardous waste under provisions of the Resource Conservation and Recovery Act (RCRA) in September 1988. Virtually all of the technologies utilized by the industry to reclaim and reuse spent potliner ceased as a result of the hazardous listing. Instead, spent potliner is being landfilled and/or stored in buildings. Valuable resources are being squandered-the energy and material values of spent potliner, and hazardous waste landfill capacity. Some of the regulations that serve as disincentives to recycling a byproduct, such as spent potliner, which has valuable energy and material values, are examined.

J.H. Goldman. Cited: *Light Metals 1991*, 1991, 521-526, [in English]. PHOTOCOPY ORDER NUMBER: 9201.

Proposed Changes to Ontario's Legislation and Regulations Relating to Air Emissions: Their Effect on the Iron and Steel Industry. An analysis of the total package of environmental protection measures in use in Ontario resulted in identification of problems which were still resulting from air emissions. This analysis led to a total review of the air management program being undertaken. The review revealed that the existing system was inadequate to deal with a number of key items including: long range transport of air pollutants; long term deposition of contaminants which do not disperse in the environment (i.e. heavy metals); short term effects caused by contaminants with acute effects including odors and highly toxic contaminants; bioaccumulation and persistence of contaminants such as dioxins and furans; and additive and synergistic effects associated with contaminants which combine in the atmosphere (e.g. nitrogen oxides and volatile organics). Initiatives undertaken prior to drafting proposals for changing the existing program to address these issues and the proposed new Ontario Clean Air Program are described. The Program is designed to provide a comprehensive framework in which changes to existing legislation and regulations can be undertaken.

J.M. Hewings. Cited: *Electric Furnace Conference Proceedings Vol. 49*, 1991, 147-149, [in English]. PHOTOCOPY ORDER NUMBER: 9206.

Greenpeace Moves to Return Waste to Sender. Confusion over what constitutes good environmental intentions has sparked a confrontation between Greenpeace International and German chemical group Metallgesellschaft. At the centre of the conflict is a Danish-owned ship, the Cito, which moved a cargo of waste PE and PP car battery components from Germany to a cement factory in Egypt. Greenpeace argues that the cargo comprises a toxic waste shipment, and is now negotiating for the waste to be transported by barge back to its original source. The group says the case is an important example of the return-to-sender principle that it has been campaigning for. However, Metallgesellschaft subsidiary Blei-und-Silberhuette Braubach (BSB) denies the toxicity charge, emphasising the shipment had been sent for hand sorting for recycling and the residue would be destroyed using high-tech thermal destruction techniques at the cement factory.

Cited: *European Chemical News*, 57, (1518), 1992, 27, [in English]. ISSN: 0014-2875. PHOTOCOPY ORDER NUMBER: 9206.

CFC Phaseout Efforts Set to Beat Deadline. Worldwide efforts to phaseout CFCs look set to gain a three-year advance on the schedule set by the amended Montreal Protocol. Worldwide consumption of CFCs is now 40% below 1986 levels, and developed country consumption may be 50% lower by the end of this year. A statement issued jointly by the World Meteorological Organisation and the United Nations Environment Programme (Unep) praises the significant efforts made by developing countries to reduce their consumption of ozone-depleting substances. Drawing on the weight of scientific evidence that has recently emphasised increasing and spreading ozone depletion, Unep says an advance of the phaseout deadline to 1 January 1996 is essential.

Cited: *European Cemical News*, 57, (1518), 1992, 25, [in English]. ISSN: 0014-2875. PHOTOCOPY ORDER NUMBER: 9206.

SPI Group Sees Threat to Plastic Fuel Tanks. US companies with an interest in the market for plastic fuel tanks have joined under the aegis of SPI's Automotive Market Council to address that which the group calls a serious threat to the market: the development of more stringent auto emissions standards under the Clean Air Act. Standards currently being considered by a number of states could reduce by > 80% the limits on fuel-vapor emissions. Auto manufacturers are questioning whether monolayer HDPE fuel tanks in particular will be able to meet these stricter emissions limits, especially with higher permeation methanol fuel coming into the picture. The Plastic Fuel Tank Committee will gather data and identify the technologies that will enable plastic fuel-handling systems to meet proposed standards.

Cited: *Plastics Engineering*, 48, (4), 1992, 6, [in English]. ISSN: 0091-9578. PHOTOCOPY ORDER NUMBER: 9206.

Practical Application and Experience Concerning the German Technical Guideline for Air Pollution Control in NF Metallurgie. Germany has approx 80 producers of non-ferrous metals with a total annual capacity in the range of 3 000 000 tons. This industry is subject to the control regulations which reinforce those of 1983. The various sections of this regulation, as they apply to activities in the industry are reviewed. Specific emission limits for dust and noxious elements are listed.

H.U. Steil. Cited: *Metall*, 45, (9), 1991, 922-927, [in German]. ISSN: 0026-0746. PHOTOCOPY ORDER NUMBER: 9206.

Cadmium Revisited. Cadmium is a common metal in the jewelry workplace, primarily in solders and white metal casting alloys. It's certainly not illegal, but it is closely regulated. In fact, the Occupational Safety and Health Administration (OSHA), Washington, USA, is in the process of forming new regulations for Cd that are far more restrictive than the current requirements. That means jewelry manufacturers and designers who use Cd-bearing products will really have to be on their toes when using this potentially harmful metal. But use it they will. In solder, Cd enhances the flow, reduces the melting temperature, and produces a yellow hue.

M. Plotnick. Cited: *American Jewelry Manufacturer*, 40, (3), 1992, 89-98, [in English]. ISSN: 0002-9041. PHOTOCOPY ORDER NUMBER: 9205.

European Waste Shipments Row Grows. The metals trade could be devestated by restrictive new legislation in the European parliament concerning the trans-shipment of waste material. The worry is that waste destined for recovery operation might be controlled as waste destined for disposal. However, an alternative is the legislation may follow discussion at OECD level on "Trans-frontier Movements of Wastes Destined for Recovery Operation."

Cited: *Metal Bulletin*, (7655), 1992, 19, [in English]. ISSN: 0026-0533. PHOTOCOPY ORDER NUMBER: 9205.

Environmentalists Threaten Dust Exports. Each year, steelmakers in the southern US export > 40 000 tons of electric arc furnace dust to Mexico. Although the furnace dust is considered a hazardous waste, Zn is extracted from it for re-use. It seems to be an ideal situation: US steelmakers get rid of the waste in an economical and ecologically safe manner, and Zinc Nacional Co., Monterrey, Mexico, mixes the material with other raw materials for production of a number of products, including animal feed and rubber. However, there have been calls from environmentalists to require that exports of hazardous waste be allowed only to countries with hazardous waste laws at least as strict as those in the US.

B. Boyle. Cited: *American Metal Market*, 100, (33), (Suppl. Environmental Management), 1992, 7A-11A, [in English]. ISSN: 0002-9998. PHOTOCOPY ORDER NUMBER: 9204.

Geneva Steel Meets Tough New Emission Rules. In late August 1987, when Geneva Steel Co. started up, the last thing on its executives' and backers' minds were environmental issues. While its startup probably ranked as one of the most successful-and profitable-that the American steel industry had seen in years, new and tighter standards were promulgated by the US Environmental Protection Agency just about the time the plant restarted. These regulations are widely referred to as PM 10 because they involve particulates under 10 μm in size. To resolve these environmental issues, Geneva applied some novel approaches to answer what, in addition to its steelmaking modernization, outsiders viewed as the biggest question about its long-term viability. Among the solutions it chose were Ninja bugs, a fierce

brand of organism with a taste for ammonia, and a sulfur-treatment system originally developed for the petroleum industry rather than steel industry.
F. Haflich. Cited: *American Metal Market*, 100, (33), (Suppl. Environmental Management), 1992, 4A-5A, [in English]. ISSN: 0002-9998. PHOTOCOPY ORDER NUMBER: 9204.

Europe Lowers the Heat on Brominated FRs. The chances for regulations banning the use of polybrominated diphenyl ether (PBDE) flame retardants by the European Community (EC) in the near future have faded substantially during the past year. What's more, it appears that whatever restrictions eventually are adopted will be limited to the PBDEs-notably the decabromo compound-leaving unscathed other brominated FRs not associated with the dioxin-furan furor. The changing PBDE climate is the result of two crucial meetings of EC officials in fall 1991. National legislation is still possible, however, particularly in Germany and the Netherlands, where the anti-PBDE pressure is highest.
Cited: *Plastics World*, 50, (4), 1992, 45, [in English]. ISSN: 0032-1273. PHOTOCOPY ORDER NUMBER: 9204.

Chile Gets Tough on Polluting Copper Smelters. New Chilean anti-pollution regulations for Cu smelters due this year will cause Codelco to invest $22 million between 1992-1996 in environmental protection projects as part of an 18 year, $410 million clean-up programme. Codelco are concerned that some customer countries, obliged to meet rigid environmental protection rules, might ban materials coming from countries that are known heavy polluters. Codelco plans to reduce emissions of sulphur dioxide, arsenic, and other toxic substances at its Cu smelters by replacing inefficient reverberatory furnaces with flash furnace and Teniente modified converters for roasting Cu concentrates. The gases produced will be treated and converted into sulphuric acid.
Cited: *Metal Bulletin*, (7648), 1992, 7, [in English]. ISSN: 0026-0533. PHOTOCOPY ORDER NUMBER: 9204.

A New Approach to Potliner Disposal. A recent ruling by the US Environmental Protection Agency has opened the gate for the processing of spent potliner by the Al industry. For well over ten years, Al producers have been struggling with the disposal of this high-volume waste product. In September 1988, because of concerns that the cyanide, fluoride and organics, would leach out into the groundwater, the EPA listed spent potliner as a hazardous waste. On 19 December 1991 the EPA agreed to the conditional delisting of the residue from spent potliners that have been processed using Reynolds' thermal treatment technology. This process involves feeding the spent potliner through big kilns that have been heated at an elevated temperature. Sand and limestone are added to the feed, chemically binding with the fluoride to form calcium fluoride.
M. Pinkham. Cited: *American Metal Market*, 100, (33), (Suppl. Environmental Management), 1992, 6A-8A, [in English]. ISSN: 0002-9998. PHOTOCOPY ORDER NUMBER: 9204.

US Moves Up CFC Phaseout by Four Years. President Bush has unilaterally moved up the deadline for the US to cease production of chlorofluorocarbons (CFCs) and other ozone-depleting chemicals to the end of 1995. That's four years earlier than required by 1990 amendments to the Montreal protocol. Bush also called on other nations to agree to accelerate the phaseout schedule. Under terms of the 1990 Clean Air Act, he can impose the new policy in the US without Congress' consent. Bush's action was prompted by recent bad news about the stratospheric ozone layer. In February, The National Aeronautics & Space Administration released data showing that ozone erosion is faster and more widespread than earlier believed, with a high likelihood of an ozone hole developing in the Northern Hemisphere.
P. Zurer. Cited: *Chemical and Engineering News*, 70, (7), 1992, 5-6, [in English]. ISSN: 0009-2347. PHOTOCOPY ORDER NUMBER: 9203.

SPI Tracks Enforcement of Clean Air Regs. In the US, SPI has significantly expanded its monitoring of federal and state implementation of the 1990 Clean Air Act Amendments in an effort to promote the interests of plastics processors, an industry group likely to be subject to increasing regulatory burdens under the new law and one that largely has not been required to comply with air emission regulations. Expanded efforts at the federal level include greater interaction between SPI and key staff at the US Environmental Protection Agency (EPA). State monitoring activities have also been increased. SPI's state government affairs staff has begun a series of visits with state officials responsible for air regulations. Other activities have been aided by SPI's Clean Air Response System, a computer-based data bank established to help track regulatory developments in the states and local air districts.
Cited: *Plastics Engineering*, 47, (12), 1991, 5, [in English]. ISSN: 0091-9578. PHOTOCOPY ORDER NUMBER: 9202.

MOCA Study Flawed. A panel of cancer experts has concluded that scientific evidence does not support a suggestion that 4,4'-methylene bis(2-chloroaniline), also known as MOCA, is a confirmed human carcinogen. The report-commissioned by the US Polyurethane Manufacturers Association-will be presented to the American Conference of Governmental Industrial Hygienists, which is currently considering changing its classification of MOCA to a confirmed human carcinogen from a suspected human carcinogen-a status it has held since 1974. The PMA has been fighting attempted MOCA regulations since the early 1970s and is heading the current battle against the ACGIH. MOCA is the main curing agent of the cast polyurethane industry; strict regulation of the material would be crippling. The curative is currently regulated by the Occupational Safety and Health Administration at a permissible exposure level of 0.02 parts/million with a notation concerning skin contact.
S. Walters. Cited: *Urethanes Technology*, 8, (5), 1991, 14, [in English]. ISSN: 0265-637X. PHOTOCOPY ORDER NUMBER: 9202.

Reassessing Government Control of Precious Metals. The economic, environmental, and international trade issues that will affect the precious metal industry are discussed. The secondary metal recovery industry can expect additional regulation or, at best, more scrutiny. Two bills have been introduced. The Baucus bill recognizes that recycling does not require the same type of regulation as waste disposal. In contrast, the Chafee bill would give the Environmental Protection Agency authority to regulate recycling activities by amending the definition of solid waste to include recyclable materials. The Organization for Economic Cooperation and Development feels that emphasizing the inherent value in scrap for recycling will help ensure sound environmental management, and reduce the need for Basel-type regulations for trade in secondary materials which fails to distinguish between hazardous wastes earmarked for disposal and scrap materials destined for recycling.
R.J. Garino. Cited: *Scrap Processing and Recycling*, 48, (5), 1991, 127-132, [in English]. ISSN: 0036-9527. PHOTOCOPY ORDER NUMBER: 9202.

Lead Faces Tough Times. Discussion of the US secondary Pb smelting industry is made. Secondary Pb smelters claim that they must deal with more than just the economic recession; their metal is also burdened with potentially crippling legislation, ever-more-stringent regulations, and negative public opinion. Retailers currently have an expanding role. Battery wholesalers, retailers, and manufacturers collect close to 75% of all scrap batteries destined for recycling in the US. New secondary players are discussed. Stricter environmental regulations and legislation is putting pressure on existing Pb smelters. Some new and current markets are promising, including electric cars, radiation and radon applications, earthquake shock absorbers in building foundations, and generators.
K. Kiser. Cited: *Scrap Processing and Recycling*, 48, (5), 1991, 111-115, [in English]. ISSN: 0036-9527. PHOTOCOPY ORDER NUMBER: 9202.

Austria Targets Polyvinyl Chloride; EC Free-Trade Issue Could Stop Proposed Laws. Strict legislation limiting the use of polyvinyl chloride (PVC) is once again being introduced in Austria, but the Austrian PVC industry is fighting back through its new lobby group, Arbeitsgemeinschaft PVC Kunststoffindustrie (API). The new legislation would: reduce vinyl chloride monomer (VCM) levels in PVC applications to 1 ppm, beginning in 1992; ban the use of Ba in any form in PVC compounds, beginning 1 January 1995; ban Cd use in PVC compounds, beginning 1 January 1992; and outlaw disposable products, single-trip packs, and children's toys containing PVC, beginning in 1993. Although still in draft form, the legislation needs only the final signature of Austria's industry minister before it goes before the full parliament.
Cited: *Plastics & Environment*, 1991, 1-4, [in English]. PHOTOCOPY ORDER NUMBER: 9201.

EPA Exempts Precious Metal Refining From BIF Rule. On 16 August 1991, the US EPA issued a technical amendment exempting precious metal refining from new regulations regarding the burning of hazardous waste in boilers and industrial furnaces (BIF). This exemption has been a major goal of the Environmnet and Regulatory Affairs Committee for four

years, because a great deal of precious metal refining of materials, such as spent catalyst, would have had to literally shut down under a literal application of the BIF rule. The exemption saves a great deal of disruption to the secondary precious metal markets. The exemption states that burning of hazardous waste for recovery of precious metal is conditionally exempt, the conditions being a one-time notification by refiners of such activity to EPA, sampling to demonstrate that substantial precious metal recovery is actually taking place, and record-keeping.
Cited: *IPMI News & Review*, 15, (11), 1991, 6, [in English]. ISSN: 0730-1901. PHOTOCOPY ORDER NUMBER: 9201.

The Impact of UK and European Community Environmental Legislation. The European Community (EC) has a role in environmental policy because pollution knows no boundaries and all industries should operate under the same legislative rules. The EC has established 280 measures since 1973, and the UK in 1987 established Her Majesty's Inspectorate of Pollution. However, the Al industry and the scrap metal trade were beset by regulations regarding Al scrap as waste material. Because of the advantages in Al recycling, secondary Al refiners do not need to register as waste processors. However, in the EC's Waste Directive 75/442/EEC Al scrap is defined as waste. The labelling of dangerous materials may make an Al alloy containing > 0.1% Be or Ni be labelled as dangerous, since beryllium and Ni are classified as dangerous materials. Interpretation of the Environmental Protection Bill and its definition of a component is also a contentious point. D.A. Harris. Cited: *Aluminium Industry*, 10, (5), 1991, 21-23, [in English]. ISSN: 0268-5280. PHOTOCOPY ORDER NUMBER: 9201.

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"Sax's Dangerous Properties of Industrial Materials, Eighth Edition," by Richard J. Lewis, published by **Van Nostrand Reinhold,** New York, New York, will be relied on by all professionals who need ***detailed data on hazardous substances in the workplace and environment.*** Featuring over 1,500 new entries, 14,000 revised entries, and up-to-date information on 20,000 chemicals in all, the Eighth Edition continues a 40-year tradition of what has been called "an extraordinary work" by Hazmat World. Professionals responsible for regulatory compliance, safety, disaster control, or transportation, storage, or manufacture of industrial material will find updates of 70% of the entries, accompanied by new data on substances not previously believed to pose hazards.

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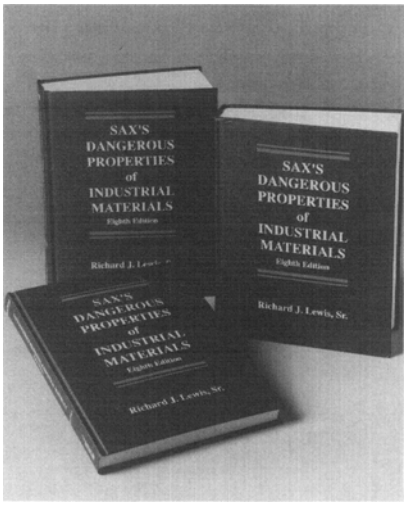

Van Nostrand Reinhold

Solid oxide fuel cells may provide a compact energy conversion device with higher power density and reliability at less cost to consumers than existing power sources. SOFC's are also proven to drastically reduce environmental pollution levels of carbon dioxide and nitrogen oxides currently expelled by today's energy conversion devices. Scientists at **Ceramatec,** Salt Lake City, Utah, have developed a planar fuel cell designed to convert methane into electricity, as a clean source of energy. The present design can provide the basis for a 25kW commercial unit the size of a refrigerator. The SOFC works like a battery, but the fuel is supplied and converted to electricity continuously rather than stored. By using a pure oxygen ion conductor as the electrolyte, the cell can be used like a battery. One advantage of SOFC's is that they produce hot exhaust gases that can be used to heat water or generate steam for secondary operations.

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L&R Manufacturing Co.

Solvent-based cleaning methods are a thing of the past with the new Aquatrex™ system from **L&R Manufacturing Co.,** Kearny, New Jersey. This ***unique three-chamber system replaces solvent-based cleaning with a safer, multi-function aqueous system.*** As a result, environmental hazards are eliminated and work-related and disposal hazards are reduced. The system features multiple chambers—an ultrasonic cleaning chamber, a multi-spray rinse chamber and a forced hot air chamber for drying. Components can be moved from chamber to chamber with an optional stainless steel basket. The system is adaptable to automated or robotic applications. Custom-designed systems are available, as well as units with additional chambers and/or large tank capacities.

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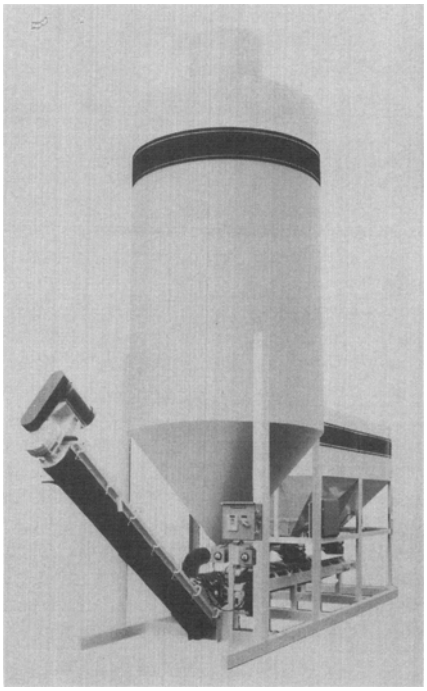
Now there's a way to reach top environmental leaders in any sphere of activity—quickly, easily, and efficiently. The Environmental Executive Directory, produced by **Carroll Publishing Co.** and the

Public Affairs Group, Inc., both of Washington, DC, is the ***first environmental resource tool that covers the complete spectrum of environmental leaders,*** throughout business, government, and the media. It provides instant access to more than 11,000 individuals in over 5,000 corporations and organizations, along with complete contact information, job titles and areas of environmental responsibility. Coverage also includes key environmental contacts in professional associations, consulting firms, law firms, lobbyist organizations, public interest groups, and international firms.

Circle No. 102 on reader service card.

Mixer Systems, Inc., Pewaukee, Wisconsin, has introduced the ***EnvironMASTER™ 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 materials. Because of its compactness, the system can be set up on-site, which greatly speeds up the treatment process. Among the applications ideal for the EnvironMASTER Series system are: desification, detoxification, neutralization, solidification, stabilization, and data recording.



Mixer Systems, Inc.

Circle No. 103 on reader service card.

Testing of its first Bold-Ark mobile retort unit has been completed by **Convenant Environmental Technologies, Inc.,** Memphis, Tennessee. The system, now in production reclaims and recycles used rubber ties, plastic material, and non-hazardous oilfield waste, reducing them to commercially valuable carboneous products. It is designed to be tranported to and operated at the clean-up site.

Circle No. 104 on reader service card.

Two ***Performance Test Codes addressing particulate-matter collection equipment and flue gas desulfurization devices*** have been published by the **American Society of Mechanical Engineers,** New York, New York. PTC21/Particulate Matter and PTC 40/Flue Gas are currently available to environmental and industrial engineers, educators, and regulatory officials seeking reliable technical criteria for determining the performance—in terms of efficiency and other parameters—of air pollution control equipment found in electric utilities, waste-to-energy plants, and other facilities.

Circle No. 105 on reader service card.

L&R Manufacturing Co., Kearny, New Jersey, announces the development of ***environmentally friendly buffing compound removers.*** Remover Concentrate is effective for removing most buffing compounds without the discoloration of metal. Water based, it is a powerful wetting and sequestering agent which can be used on most precision parts. It effectively removes buffing compounds, soils, oils, and dust. Special Compound Remover Concentrate provides the same results, plus it removes the corrosion inhibitor. Also water based, the biodegradable solution is ideal for plating metal surfaces directly after cleaning.

L&R Manufacturing Co.

Circle No. 106 on reader service card.

Researchers at the **U.S. National Institute of Standards and Technology,** Gaithersburg, Maryland, say that ***two refrigerant mixtures appear promising as environmentally safe replacements for R22,*** a refrigerant widely used in residential heat pumps. The two mixtures, R32/R134a and R32/R152a do not contain chlorine or bromine, the two main catalysts some believe are destroying the Earth's ozone layer. A study performed at NIST, using a computer simulation program called CYCLE11, and a laboratory version of a heat pump showed that the two mixtures could perform up to 15 percent better than R22.

Circle No. 107 on reader service card.

Calgon Carbon Corp., Pittsburgh, Pennsylvania, has announced the availability of a ***high performance pelletized activated carbon product for solvent recovery applications.*** The pellets are suitable for most types of solvents, but are especially effective for benzene, toluene, and xylene. The WS4 pellets offer the highest adsorption working capacity when compared to any other activated carbon products currently available on the market. This features offers the user a significant savings on operating costs. WS4 is a cylindrical pellet manufactured from selected hardwood to ensure high abrasion resistance and low dust content.

Circle No. 108 on reader service card.

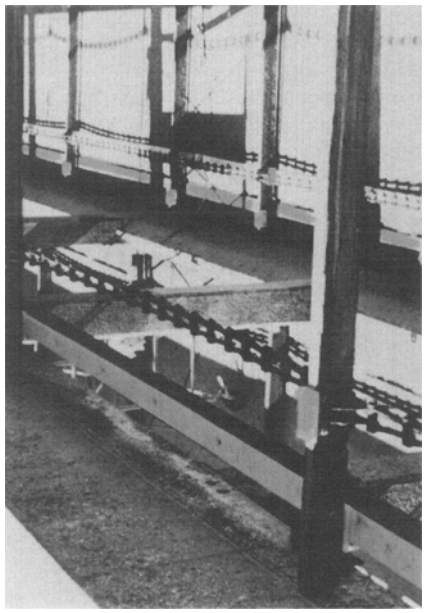
A way to clean up a Valdez-size oil slick in three days at a fraction of the cost has been described by a Adam Heller, heading a research group in the Chemical Engineering Department at the **University of Texas,** Austin, Texas. According to Heller, the laboratory developed ***a method for treating oil slicks on seawater so the sun can dissolve them in a matter of days.*** Sunlight is used instead of detergents to help bacteria in the water biodegrade the oil. Photocatalytic particles of palladium-activated titanium dioxide, a nontoxic pigment used in white paint, was attached to tiny hollow glass beads that allow the photocatalysts to float on top of and disperse the oil. There are two types of beads used in the process: one maximizes spreading of the photocatalysts over the spill. This type stays with the spill, efficiently harvesting sunlight and thereby accelerating dissolution of the oil. The other is designed to treat spills that imminently en-

danger shores or marine life. This type soaks up the oil and forms floating clumps which slowly disintegrate into white sand-like particles as the oil photo-oxides in sunlight. The beads are the same diameter as a human hair. Exposed to 10 hours of sunlight a day, a Valdez-size slick might be "photo-stabilized" in two weeks—at a cost of about one percent of that of the Valdez cleanup, and in three days at a cost of about five percent if treated more heavily.

Circle No. 109 on reader service card.

Industrial-grade ultra-high molecular weight plastic rails have consistently been replacing steel rails in waste water treatment plants across the country. Now ***new thicknesses and shapes*** are available, custom tailored to specific plant needs by the plastics division of **Garland Manufacturing Co.,** Saco, Maine. The tough material, known as GAR-DUR™, is a super-hard durable material that won't damage other equipment with which it comes in contact. It will not absorb moisture of any kind, never corrodes and waste materials won't adhere to its surface. So it is ideal for the wet and corrosive environments of waste water operations. An ultra-low coefficient of friction is highly desirable where moving parts are involved and because of this characteristic downtime is kept to a minimum. Thus, parts live longer and repairs are fewer. Overall strain and drag on the entire system is greatly reduced.

Circle No. 110 on reader service card.

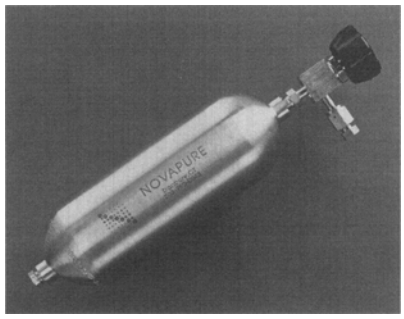


Garland Manufacturing Co.

The ***Ohio Supreme Court has cleared the way for a statewide ballot initiative in the November elections that would create a toxic chemical labeling or "right-to-know" law similar to California's controversial Proposition 65.*** Sponsored by the Ohio Public Interest Research Group, the proposal would require businesses to put warning labels on products that contain chemicals believed to cause cancer or birth defects. It also would require companies to send warning notices to everyone living or working within two miles of the plant, and it would give individuals the right to demand an environmental audit from the company. **The Composites Institute of the Society of the Plastics Industry, Inc.,** New York, New York, is following the development of the proposed legislation and will respond to specific inquiries.

Circle No. 111 on reader service card.

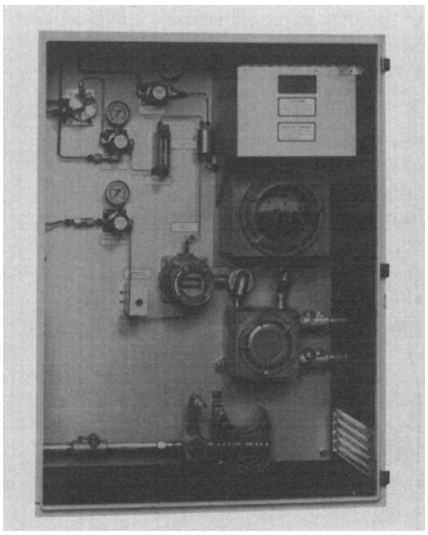
Novapure Corp., Danbury, Connecticut, announces the development of a ***new product to improve the safety of toxic hydride gases such as arsine and phosphine.*** The key feature of the Puragen™ Hydride Storage and Delivery System is its inherent safety: the ability to ship, store, install and operate hydride gas cylinders at zero psig or less. The system significantly reduces the risk of a sudden catastrophic release of toxic gas. Initial applications of this hydride storage and delivery technology are ion implant, MBE and certain CVD processes used in semiconductor manufacturing. Early studies in cooperation with the Naval Reseach Laboratory and Olin Corp. have shown that arsine could be physically absorbed into the microcavities of zeolite supports, reducing its vapor pressure dramatically. Novapure has further defined operating conditions and added purification capability, so that the storage and delivery approach can be used by the semiconductor industry.



Novapure Corp.

Circle No. 112 on reader service card.

Measure hydrogen sulfide in fuel gases of combustion devices to meet EPA compliance standards with the Model 722R/102/RES H_2 analyzer from **Houston Atlas,** Houston, Texas. The system's ***flexible design allows field calibration with either a span gas bottle or a permeation device.*** The sampling system uses a gas transfer unit, which features no moving parts. Its operation is based on the permeation of a gas through a membrane. By having a gas with a large H_2S concentration on one side of the membrane and a gas with no initial H_2S concentration on the other side of the membrane, it's possible to achieve continuous sampling without any moving parts.



Houston Atlas

Circle No. 113 on reader service card.

Pace, Inc., Laurel, Maryland, has released its new ***fume extraction video, which vividly shows the wide variety of systems available for the removal of hazardous fumes*** created during hand soldering and other electronic production processes. The ARM-EVAC Systems feature articulating arms which can be fitted with a wide variety of nozzles and hoods for convenient, localized fume extraction. Low-cost TIP-EVAC Systems extract soldering fumes right at the iron tip before they reach the operator's breathing zone. PRO-EVAC Systems provide high-capacity fume extraction in electronic production applications including wave soldering and infrared reflow. These systems freature a proven three-stage filtration process for removel of particulates, gas, and odors with an overall efficiency of 99.997%.

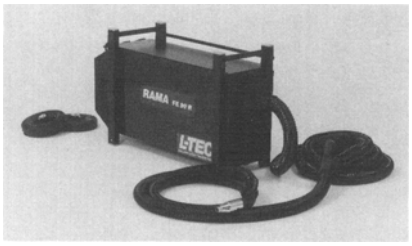
Circle No. 114 on reader service card.

A major international resource used by analytical chemists and environmental scientists to identify unknown substances now contains spectra for 62,235 chemical compounds. The ***new update of the NIST/EPA/NIH Mass Spectral Database is available on standard diskettes for personal computers or for lease in a magnetic tape format*** from the U.S. National Institute of Standards and Technology, Gaithersburg, Maryland. Since the last update in 1990, a large number of the spectra have been evaluated by NIST scientists in a major effort to upgrade the quality of the data collection and to locate, correct or eliminate all poor quality spectra. The database, originally put together in the early 1970s by scientists at the Environmental Protection Agency and National Institute of Health, is managed by the **NIST Mass Spectrometry Data Center,** Washington, DC.

Also available from NIST is the infrared absorption spectra of more than 5,300 chemical compounds in a database for personal computers. It will be particularly helpful to analytical chemists and environmental scientists who employ infrared spectroscopy to identify unknown substances. SRD35 is a collection of gas-phase Fourier transform infrared absorption spectra compiled by NIST in collaboration with the Environmental Protection Agency. It offers fast access to carefully evaluated infrared spectra on primarily organic substances and related data on the molecular structures of these compounds.

Circle No. 115 on reader service card.

Breathe easier with the new RAMA FE 90R Fume Extraction System for stainless steel, flux-cored wire Mig welding and more, from **L-TEC Welding and Cutting Systems,** Florence, South Carolina. It ***removes 90 percent of dust and particulate matter at the source, before it reaches the work zone.*** One-switch operation with stepless suction force makes it easy to tailor fume intake, while its compact size allows for easy maneuvering and low noise levels. The system offers variable suction and features a convenient swivel connection for flexibility with low wrist tension.



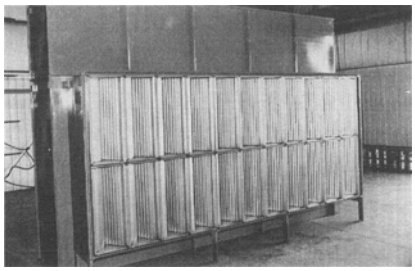
L-TEC Welding and Cutting Systems

Circle No. 116 on reader service card.

A new product currently being tested makes it ***possible to atomize straight mold release agent without a solvent or aqueous carrier,*** without using CFC or CFC-substitute propellants. The Fluid Application Control Technology (FACT™) was developed by **Kryptonics, Inc.** Boulder, Colorado, in conjunction with George Mann & Co., Providence, Rhode Island. The breakthrough comes at a time when CFC production faces elimination due to concern for the ozone layer, and molders using solvent-based releases are burdened with paperwork, high taxes and expensive ventilation systems due to the accompanying health hazards. It consists of an enclosed, self-contained chamber that houses proprietary nozzles capable of atomizing mold release using only low-pressure compressed air. Molds or mandrels are passed through the spray chamber where they are covered with a thin coating of release agent. In addition to the obvious environmental benefits and cost savings, the chamber provides a thin, totally uniform coating of release, which can be set using simple controls. Since overspray is contained in the chamber and reused, there is no waste. Pinholing in products due to solvent off-gassing is also eliminated.

Circle No. 117 on reader service card.

JBI, Osseo, Wisconsin, offers a new patented and proven ***paint recycle/reclaim system that reclaims 98% of paint overspray for recycling and reduces VOC emissions by 25%.*** The system is for use with high-solids thermosetting coatings and UV-curable coatings. A return on investment within three to six months is achieved with dramatic operating cost reductions. The systems are available as complete spray booths and retrofit outfits.



JBI

Circle No. 118 on reader service card.

The **Center for Advanced Material Processing's (CAMP) Environmental Services Program,** Cleveland, Ohio, now has a ***statewide 800 number to handle questions about waste minimization in Ohio.*** This hotline links companies with information about regulations, training programs, pollution prevention technology and waste reduction assessments. Questions about regulations, such as allowable discharge levels and waste classification, will be addressed by CAMP's environmental specialist. Companies that need help evaluating their pollution prevention practices and training, or would like an assessment of how to reduce their wastes, will be assisted by CAMP's engineers. Call 1-800-589-INFO.
