

Materials Engineering Newslines . . . Items of Interest to JME Readers

U.S. aluminum producers could reduce their electrical consumption nearly 30 percent by using inert anodes and cathodes being developed at the U.S. Department of Energy's **Pacific Northwest Laboratory**. Inert anodes and cathodes are made of a combination of metals and ceramics and are used to conduct electricity during the electrochemical production of aluminum in electrolytic cells. For more information, contact Mary H. McGregor, Pacific Northwest Laboratories, Battelle Blvd., Richland, WA 99352, USA.

The Specialty Polymers and Additives Group of the Plastics and Rubber Chemicals Division of **Mobay Corp.**, Pittsburgh, PA, has reported that recent improvements were obtained in the dispersibility of Porofor™ ADC/M, an azodicarbonamide chemical blowing agent used in the formulation of foamed plastics. The development resulted in productivity gains and better foam uniformity. For more information, contact Specialty Polymers and Additives Group, Plastics and Rubber Div., Mobay Corp., Mobay Rd., Pittsburgh, PA 15205-9741, USA, or call (412) 777-9741.

The **American Society of Mechanical Engineers (ASME)** announces the publication of *Safety Standards for Pressure Vessels for Human Occupancy*, a newly reissued standard (ASME/ANSI PVHO-1-1987) which provides minimum requirements to ensure the integrity of diving bells and hyperbaric chambers. This standard is related to Section VIII: Pressure Vessels of the *ASME Boiler and Pressure Vessel Code*. Contact: Stuart M. Goldstein, Public Information, ASME, 345 E. 47th St., New York, NY 10017, USA, or call (212) 705-7740 for more information.

The **National Bureau of Standards** announces the availability of the second commercial space-made product, Standard Reference Material (SRM) 1961, 30-Micrometer Polystyrene Spheres. The reference material is an important quality control tool for chemists using powders for the manufacture of pharmaceuticals, chemicals, industrial compounds, and other products. For further information, contact the Office of Standard Reference Materials, B311 Chemistry Building, National Bureau of Standards, Gaithersburg, MD 20899, USA, or call (301) 975-6776.

Silicone Antifoam from **General Electric Co.**, Silicone Products Div., Waterford, NY, helps increase productivity in rare earth chemical extraction process. The extraction process initially involves the production of a slurry, a thin mixture of the crushed ore with water. Because foam can slow down the reduction process and affect productivity, a non-contaminating antifoam agent is desirable. For additional information, contact GE, Silicone Products Div., Rubber & Fluid Products Dept., Waterford, NY 12188, USA.

A recent **Edison Welding Institute** meeting highlighted the interest of the aerospace industry in the potential use of high-performance thermoplastic composites and the status of work on the joining of these materials. As a result of major efforts, small-scale laboratory samples can be produced using a wide range of joining processes. However, before joining can be implemented in future aerospace applications, several critical areas must be studied: further process developments; scaling up of processes; joint design and evaluation of welds. The conclusions of this meeting are currently being summarized. To receive a copy, contact Dr. Robert Rivett (614) 486-9400.

Actual detailed case studies of fluidized bed boiler applications at Portland Cement, Campbell Soup, Nucla Generating Station, and a state university are among the highlights of the just-released proceedings from the 5th National Conference on Evaluating the Fluidized Bed Combustion Option (1987 Edition). The proceedings also contain the most extensive and up-to-date summary of FBC vendors and equipment available anywhere, as well as papers on FBC utilization, and are available for \$88.00 from Government Institutes, Inc., 966 Hungerford Dr., #24, Rockville, MD 20850, USA, or call (301) 251-9250.

Sermatec Technical Services, Limerick, PA, has published a new brochure on its advanced, high temperature coating SermaLoy JTM. Equally effective against both high and low temperature hot corrosion and hot oxidation, SermaLoy JTM is an inexpensive, easily applied coating, that protects a wide range of alloys. For more information, contact Bill McCune (215) 948-5100.

More efficient and longer-lasting diesel engines may result from the application of a novel type of thermocouple device developed at the Commerce Department's **National Bureau of Standards** (NBS) that monitors critical internal temperatures of diesel engines. Researchers at the NBS Center for Chemical Engineering are experimenting with "thin films" of noble, chemically inactive metals such as platinum and gold that are deposited directly onto engine parts. For additional information, contact John Henkel (301) 975-2762.

A new color chart and data sheet are now available for silicone paste dispersions, for use in designing heat cured rubber compounds, room temperature vulcanized systems, emulsions and injection molded or extruded elastomeric products. Contact FRP Coatings, Coatings Div., **Ferro Corp.**, 4150 East 56th St., Cleveland, OH 44105, USA, or call (216) 641-8580 for more information.

A practical and versatile management tool, *Diamond Films: Evaluating the Technology and Opportunities*, contains a detailed overview of the state-of-the-art-to-expert analysis of the latest advances in the science, plus expensive bibliographies, a comprehensive survey of applications, a list of key seminars and symposia, and a complete patent listing. Contact Gary G. Reibsamen, **Technical Insights, Inc.**, P.O. Box 1304, Fort Lee, NJ 07024, USA, or call (201) 568-4744.

A new experimental silicon nitride engineered for use in high temperature gas turbine applications has been developed by **Norton/TRW Ceramics**, a joint venture established by Norton Co., and TRW, Inc., in 1985. The new material, Noralide^R XL-144, has demonstrated superior strength retention in components tested to 1400° C, as well as high load carrying capability, excellent thermal shock resistance and low oxidation. For additional information, contact Steve Cardone (401) 456-1625.

A new brochure from **General Magnaplate**, Linden, NJ, offers technical and design information on coatings for metal parts. These coatings protect against corrosion and abrasion, offer wetting resistance, lubricate in high and low temperatures, and add wear life to steel, stainless steel, copper, magnesium, titanium, and many alloys. Copies may be obtained by requesting brochure #40 from General Magnaplate Corp., 1331 Route 1, Linden, NJ 07030.

Although silicone rubber characteristically rejects most adhesives, GE's new SR500 silicone primer makes it possible to bond silicone rubber to other types of materials. It can be applied by brush, roll coating, mayer rod, spray or reverse roll methods, curing with evaporation of its solvent. Transfer adhesive can then be applied directly to the rubber surface as soon as the cure is complete, usually in thirty minutes. For more information, contact Robert A. Mills, **General Electric Co.**, Silicone Products Div., Waterford, NY 12188, USA, or call (518) 233-3505.

Dylon Industries, Inc., Berea, OH, has recently developed a high strength bonding cement to join all forms of rigid and flexible carbon and graphite. Dylon Grade GC Graphite Cement forms a 100% carbonaceous bond that is 35% stronger than current graphite cements. It remains secure to 3000° C (5432° F) and has high electrical and thermal conductivity. For more information, contact W. H. Manrodt/Marketing Specialist, Dylon Industries, 120 First Ave., Berea, OH 44017, USA, or call (216) 234-1600.

A high thermal conductivity adhesive, Aremco-BondTM 568, bonds materials and provides elasticity after curing which permits its use in thermal shock applications where components with dissimilar thermal expansion must be joined such as ceramic substrates to aluminum heat sinks. A new ceramic coating kit is also available from **Aremco**, which includes four basic high temperature ceramic materials used as protective coatings at temperatures to 2500 degrees F. Write to Aremco Products, Inc., P.O. Box 429, Ossining, NY 10562-0429, USA, or call Herbert Schwartz (914) 762-0685.

Researchers in the **NBS Surface Science Division** have published one of the first papers on the electronic structure of the high-temperature superconducting ceramic YBa₂Cu₃O₇ electronic structure, which describes the permissible energy levels of electrons in the material, is a critical piece of information for understanding the still-mysterious mechanism of high-temperature superconductivity. "Resonant Photoemission Study of Superconducting Y-Ba-Cu-O" appears in the Rapid Communications section of the June 1 issue of Physical Review B.

The U.S. Patent Office recently issued **Armco** a patent for a new steel, an aluminum-coated stainless steel. Called **ARMCO ALUMINIZED 409TM**, the new material has muffler condensate corrosion resistance at least as good as type 409 Stainless. It also offers red rust protection to 1000° F, oxidation resistance to

1600° F and formability equal to standard Type 409 Stainless. For additional information contact Jim Weyers (513) 425-5876.

Aerospace manufacturers and other high-technology product producers will be interested in a new titanium-base alloy, Standard Reference Material (SRM) 647, Titanium-Base Alloy (6Al-2Mo-2Sn-4Zr) for use in quality assurance control programs. The new SRM is packaged in chip form to help users solubilize the material for checking the measurement accuracy of instruments that require solution standards. SRM 647 is available for \$93 per 50-gram unit from the **NBS Office of Standard Reference Materials**, B311 Chemistry Building, National Bureau of Standards, Gaithersburg, MD 20899, USA, or call (301) 975-6776.

The copper and brass industry's latest annual report on copper supply and consumption is available by writing the **Copper Development Association** at Greenwich Office Park 2, Box 1840, Greenwich, CT 06836, USA. "Annual Data 1987/Copper Supply & Consumption 1966-1986," is \$11 a copy in the U.S. and Canada and presents 21 years of data on more than sixty steps in the production and use of copper and copper alloy products in the U.S.

The cost-effective use of zinc thermal spraying to protect structural steel from corrosion is the subject of a multi-part information package now available from the **Zinc Institute**. "Zinc Thermal Spraying: Technology and Applications," contains five separate reports on how the zinc metallizing processing can solve long-term maintenance problems on bridges, highway overpasses and other large, outdoor steel structures. Single copies can be obtained by writing "Metallizing," Zinc Institute Inc., 292 Madison Avenue, New York, NY 10017, USA.

A new low-cost, copper-based, shape memory alloy which can operate at high temperatures has been successfully produced by **Kobe Steel**. Kobe eliminated the workability problem of a Cu-Zn-Al alloy by reducing the Al content, thus controlling the precipitation of the coarse phase. In addition, the Ni content was increased, Mn and Ti added to prevent the crystal grains from coarsening, and to improve the alloy's ductility. Contact Kobe Steel, 1-3-18, Wakinocho, Kobe, Hyogo Prefecture, Japan, or call 078-251-1551.

Thin (0.05 to 0.5 mm) zirconia sheet which can be bent and drilled is three times stronger in bending strength and two to three times tougher in fracture toughness than the alumina sheet. The newly-developed sheet, tradenamed "Ceraflex" was developed jointly by **Nikki Chemical Co.** and **Japan Fine Ceramics Co.**, and is expected to find a market in applications such as extremely thin substrates for hybrid IC's, precision instrument parts, electronic parts, and spring materials. Contact Nikki Chemical Co., Ltd., 2-1, Otemachi 2-chome, Chiyoda-ku, Tokyo, Japan, or call 03-278-5441.