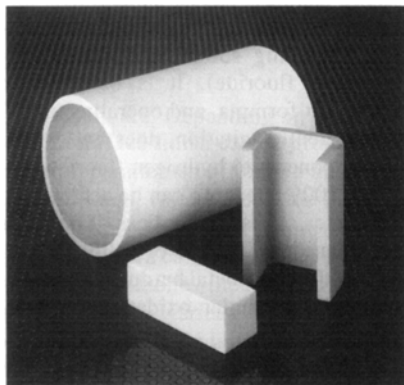


## MATERIALS/PRODUCTS

A propeller with elastic properties has been designed by **Strömberg Engineering**, Halmstad, SWEDEN. Dubbed Flex-prop, it has been tested on both commercial and naval vessels and has proved to reduce the load on the blades, thus making the ships run quieter due to less vibration in the shaft and hull. The propeller is manufactured of a composite material with a core of fiberglass according to a pattern designed so that the *elastic properties of the blades lead to a deformation* which reduces the load variations occurring when the blades are rotating in the unequal flow behind a ship. The load stress variations are transmitted to the shaft and further to the hull, resulting in a corresponding reduction of the vibrations.

Circle (2)

Fibers and Materials Division, **BP Chemicals (Hitco), Inc.**, Santa Ana, California, announces the introduction of an exciting new class of heat resistant materials. The SM8000 family of materials offers a *balance of processing and properties unique in the advanced materials industry*. They can be processed in a similar manner to conventional polymeric prepreg. Fabrication of laminates or parts can be done in a simple press or autoclave of 375 °F. When subjected to high heat or flame impingement, the polymeric matrix undergoes an organic to inorganic transition. The resulting ceramic exhibits outstanding thermal resistance. The laminate retained its structural integrity and exhibited only surface charring when subjected to a flame of 4500 °F for 60 seconds. The SM8000's are



BP Chemicals (Hitco), Inc.

supplied as a prepreg on reinforcements of carbon, glass, or silica fiber. Material forms include fabric, mat, unidirectional tape, single strand and molding compound. Applications already identified include: foundry (molten metal handling), holding fixtures for high temperature processing, oil rig crew housing protection, aircraft engine heat shields, fire doors, and thermal barriers for composite structures.

Circle (3)

The Tufram family of surface enhancement treatments from **General Magnaplate Corp.**, Linden, New Jersey, gives metal parts *performance properties equivalent to or better than those of steel*. Applied in a process by which the Tufram coating becomes an integral part of the top



General Magnaplate Corp.

layers of the aluminum surface, the enhanced metal parts have increased hardness, wear, corrosion and abrasion resistance, permanent dry lubricity, improved mold release, and high dielectric strength. They provide scratch resistance without chipping or peeling. A wide variety of formulations is available to achieve the special performance specifications required, and custom formulations are also available.

Circle (4)

**Lukens Steel Co.**, Coatesville, Pennsylvania, has introduced Hardwear™ 500F, an abrasion-resistant steel for *use in applications requiring superior formability, weldability, and toughness*, with a surface hardness range of 460 to 534 HB. A quenched and tempered alloy plate steel, 500F has been used in the fabrication, repair, and modification of heavy equipment in such applications as truck body liners, chutes, bucket lips, and hopper and crusher liners. It is designed for through-thickness hardness, while maintaining minimum carbon. To enhance cold forming characteristics, the sulfur content is reduced to a maximum of 0.005% and the steel is calcium-treated for inclusion shape control.

Circle (5)

A revolutionary new boron nitride material that is the *ultimate machinable and formable ceramic* has been announced by **Orpac, Inc.**, Oak Ridge, Tennessee. Ceralbond-BN is a unique ceramic that is a low-cost, size and shape unrestricted product that offers all of the unique thermal, electrical, chemical, and lubricating qualities of BN. Initially produced as a wet clay, the compound is readily formed to any complex shape and, after drying, can be machined more easily than any ceramic. It is usable from below ambient to over 1800 °C for extreme chemical resistance applications such as handling of molten metals, glasses, and salts. It also resists attack by plastics, rubbers, and organic solvents such as acetone, alcohol, and benzene. Crucibles, sintering plates, molds, evaporative boats, reaction chambers, gas inlet jets, dies, seal plates and protection tubes are but a few practical applications of the innovative material. The addition of beneficial materials such as ceramic fibers or material modifiers such as TiB<sub>2</sub> for electrical conductivity can be added to produce custom ceramics.

Circle (6)

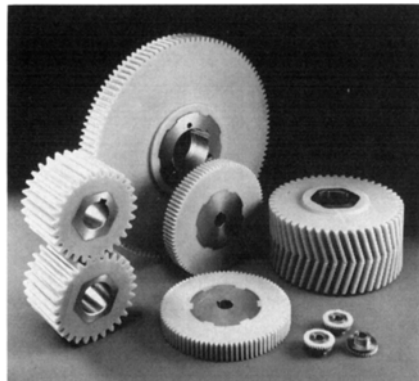
A new family of controlled chemistry, ferritic 8 and 12% chromium-iron alloys for potential *application in the magnetic cores of automotive relays and solenoids* has been developed by **Carpenter Technology Corp.**, Reading, Pennsylvania. Chrome Core™ 8 and 12 alloys are candidates for applications where corrosion resistance superior to that of pure iron, low

carbon steel and silicon-iron alloys is desired, without the substantial decrease in saturation induction associated with the 18% Cr ferritic stainless steels. Both alloys are available in free-machining grades, known as Chrome Core 8-FM and 12-FM alloys. Circle (7)

**Epoxy Technology, Inc.**, Billerica, Massachusetts, has introduced epoxy designed to replace solder in SMT and other microelectronic applications. EPO-TEK E-2036 is a *two-component, silver-filled, electrically conductive epoxy* that exhibits a volume resistivity of 0.00008 to 0.0003 ohm-cm. The epoxy is suited for screen printing or stenciling through metal masks. The high thixotropy allows for fine pitch resolution, less than 20 mils, with virtually no bleed-out. Components bonded to substrates with E-2036 pass thermal and humidity cycling with no evidence of delamination or adhesive cracking. Circle (8)

Its newest line of nearly 60 paintable *high temperature ceramic coatings* for R&D use has been introduced by **Zyp Coatings, Inc.**, Oak Ridge, Tennessee. In addition to Y<sub>2</sub>O<sub>3</sub>, ZrO<sub>2</sub>, BN, Er<sub>2</sub>O<sub>3</sub>, HfO<sub>2</sub>, Si<sub>3</sub>N<sub>4</sub> and eight other oxides, nitrides, and carbides offered, 12 liquid binder systems are available, so that researchers can produce their own custom coating or paste by simply adding the material of choice. Circle (9)

**Intech Corp.**, Closter, New Jersey, machines its Power-Core™ high performance



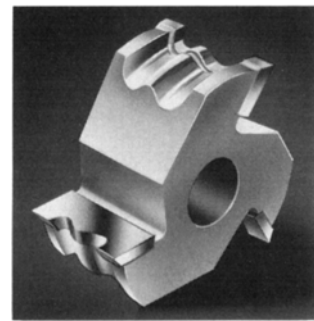
Intech Corp.

gears from a unique cast Lauramid® composite material. The proprietary cast bonding process unitizes a metal hub and cast nylon 12 body into a long-wearing, true-running, self-lubricating gear. The strong metal-to-metal transmission of torque is carried through the nylon body which offers *special appeal in difficult applications* in which moisture, vibration, noise, lubrication, stress, chemicals, and abrasion present a problem for conventional gears. Circle (10)

A worldwide leader in thin film materials, **Tosoh SMD**, Grove City, Ohio, has introduced a patented, enhanced profile indium tin oxide (ITO) sputtering target. Designed for applications requiring a coating of *superior electrical conductivity, clarity, and film uniformity*, such as flat displays for HDTV, AMLCD displays and

aircraft windshields, this high-density ITO target offers lower sheet resistivity and higher optical transmission, especially at low substrate deposition temperatures. Circle (11)

A boron-modified paste flux that *can remove refractory oxides* is now available from the **Superior Flux & Mfg. Co.**, Cleveland, Ohio. No. 601B/3411 flux is designed for brazing ferrous alloys, stainless steels, high-chromium alloys and carbides, including tungsten carbide. The



Superior Flux & Mfg. Co.

boron-modified flux is especially effective on alloys containing nickel, cobalt, or chromium, which form refractory oxides that can interfere with brazing. It is recommended for use with high silver-containing filler metals and is active between 1050 to 1700 °F (565 to 925 °C). Residues are completely removed by washing with hot water. Circle (12)

## PROCESSING/EQUIPMENT

The 9200D from **Microscience, Inc.**, Norwell, Massachusetts, is designed for *prototype coating research of diamond and diamond-like coatings using microwave plasmas*. It combines three process regimes into a single system. These are high-pressure, high-temperature, polycrystalline diamond processes, and medium temperature (300 to 500 °C), low pressure processes for polycrystalline diamond and diamond-like coatings on temperature-sensitive substrates. The system is designed so that a development engineer may work across all three regimes with a wide range of temperatures and plasma conditions. A sample up to 6 in. in diameter may be processed. Applications include low temperature coatings on plastics, optical coatings, heat sinks, medical instruments, wafers, and magnetic media. Circle (13)

**Neocera, Inc.**, College Park, Maryland, has introduced an *automated, computer-controlled system for creating superlattices* and other multilayered structures by pulsed laser deposition. Known as AMDA (Automated Multilayer Deposition Accessory), it is comparable with laser deposition systems manufactured by the company and other suppliers. The system includes a menu-driven software program which allows researchers to specify the number of layers, the composition and thickness of each layer, the frequency of the laser, and the deposition rate. With the ability to control the positions of the various targets and trigger the laser, multilayered structures are created automatically. AMDA will be particularly useful for basic and applied research in superconductors, semiconductors, ferroelectrics, magnetic materials, and optical materials. Circle (14)

A system for the *quick removal of fluorinated polymers* from dies, screws, spinnerettes and extrusion componentry, has been introduced by **Kolene Corp.**, Detroit, Michigan. The system effectively cleans a variety of metallic substrates, including stainless steels, superalloys, and tool steels, and will remove many polymers, including solidified PVDF (polyvinylidene fluoride). It is based on a molten salt formula, and operating at 650 °F with gentle agitation, does not expose the components to hydrogen fluoride corrosion. 100% cleaning can be achieved in 30 minutes or less, regardless of polymer accumulation or degree of solidification, with no effect on metal hardness or formation of intergranular oxidation on spinnerettes. Circle (15)

The B-Series surface modification system from **Advanced Plasma Systems**,