

MATERIALS/PRODUCTS

Handy & Harmon, Fairfield, Connecticut: *Ecologically safe silver-tin oxide for electrical contacts*; superior formability/ductility; excellent erosion/corrosion characteristics; effective alternative to silver-cadmium oxide; easy workability, less tool wear, superior current-carrying capability—higher per volume of material than silver-cadmium oxide and safer; for DC automotive relays, low-voltage AC applications; additional arc-quenching ability, anti-welding properties at low-to-moderate currents. **Circle 1**

Kindt-Collins Co., Cleveland, Ohio: *Reproducing thermosetting plastic, Master Cast 710, simulates aluminum finish*; tough, easily machined; ideal for prototypes, models, molds, patterns, low pro-



Kindt-Collins Co.

duction parts; no silicon or glass for less tool wear; knits to itself, making parts easy to repair/alter; five-minute pot life at 70 °F, easy to cast; ideal for models/prototypes, without expensive tooling, for making parts to evaluate/develop prior to tooling up for long production runs. **Circle 2**

Diamonite Products, Shreve, Ohio: *New ceramic for industrial applications*; excellent thermal shock resistance; patented zirconium aluminum titanate (ZAT) contains aluminum titanate (Al_2TiO_5), zirconium titanate (ZrTiO_4), zirconia (ZrO_2); unique microchemistry enables stable composition at high temperature, no phase decomposition; improved flexure strength; stability after 100- to 200-hour soaks in air temperatures 1000 to 1250 °C; remains constant after rapid water quenching from over 700 °C to room temperature; ideal for engine portliners, thermal lin-

ings, catalyst supports, casting plumbing fixtures. **Circle 3**

MMI Systems, Boulder, Colorado: *Ultradispersed diamond powder (UDP) through explosive synthesis*; rounded grains with average size 30 Å; purity 90 to 100%; diverse structural enhancer—significantly increases wear resistance of rubber; decreases friction in polyimide ball bearings by factor of 10, while increasing maximum load six times; use with cluster diamonds (40 to 70 Å) as effective optical lens/mirror polishing medium for special uses/lasers. **Circle 4**

Maintenance Technology, Ltd., Teignmouth, England: *New corrosion control technology, TFT (Thin Film Technology), prevents corrosion/deterioration in aluminum alloy products*; 5-µm thickness; exceptional performance/durability against oxidation/chemical attack. **Circle 5**

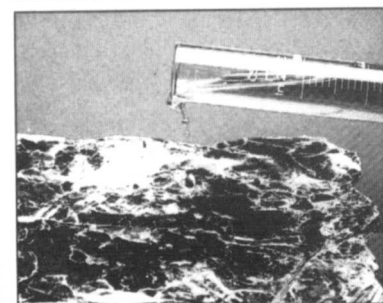
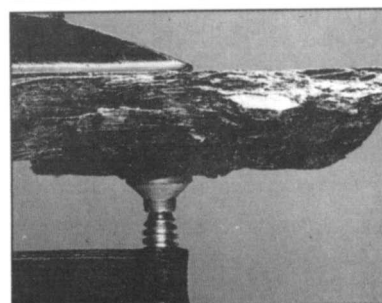
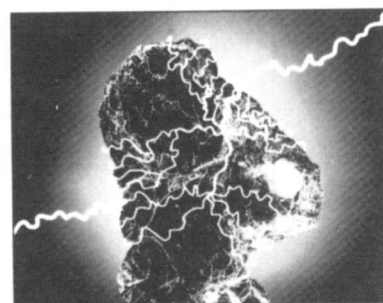
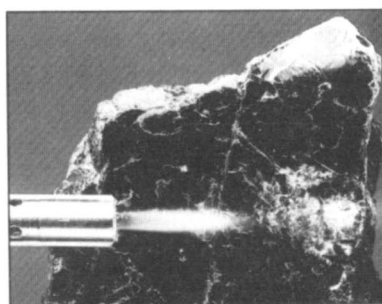
Cogebi, Inc., Dover, New Hampshire: *Mica; harmless, effective replacement for asbestos*; heat resistance to 1850 °F; low heat conductivity, insulating strength exceeding 25 kV/mm; inert to most chemical agents; very good compression resistance, tensile/bending strength; large

modulus of elasticity; superior thermal, electrical, chemical, mechanical properties. **Circle 6**

Valley Design Corp., Westford, Massachusetts: *Completely flat, stress-free ceramic substrate*; 96% or 99.6% lapped/polished alumina; 100, 125, 150, 200 mm diameter; meets polished silicon wafer SEMI Standards for flatness; reduced losses from cracking during lasering of intricate patterns; overall better performance, reliability, yields. **Circle 7**

ORPAC, Inc., Oak Ridge, Tennessee: *New exotic ceramic refractory pastes for applications over 2000 °C*; yttrium oxide, silicon nitride, silicon carbide, boron nitride, zirconium oxide, aluminum nitride, more; for filling, lining, stuccoing; increase chemical/thermodynamic stability of substrates; repair/fill surfaces, joints; use in any atmosphere; high chemical purity; safe, easily applied. **Circle 8**

Wall Colmonoy Corp., Madison Heights, Michigan: *New, faster-drying brazing cements, Microbraz®*; contain nonflammable, non-ozone-depleting solvents that dry faster than conventional brazing cements for higher productivity; mix with brazing



Cogebi, Inc.

filler metal powders for firm bond with powder-to-metal surfaces; excellent shock/vibration resistance during handling; completely volatilize in high-purity, dry atmospheres, vacuum; two viscosities offered. Circle 9

EarthRight Technologies, Eastlake, Ohio: *Five seed oil-based, biodegradable fluids replace traditional mineral oil-based hydraulic fluids*; different viscosity levels; degrade completely within 21 days of disposal/spillage; no environmental/dermatological side effects; outperform mineral oil fluids. Circle 10

Biakowski International, Charlotte, North Carolina: *New, high-purity, submicron mullite powders*; average particle size 0.65 μm ; customized stoichiometry to either a 1.5 or 1.75 alumina/silica; use in ceramics, composites, coatings for high-temperature, structural, electronic components. Circle 11

H.C. Starck GmbH & Co., Goslar, GERMANY: *New yttrium oxide powder, grade Y_2O_3 'B; fineness of approximately 1.0 μm FSSS*; between Y_2O_3 grade A (standard) and grade C (fine) powders; use as additive for intermediates such as Si_3N_4 , "SiALON", ZrO_2 , AlN for wear resistance in engine parts and electronic components. Circle 12

Superior Flux & Mfg. Co., Cleveland, Ohio: *High-temperature brazing flux, No. 612, for ferrous alloys, stainless steels, tungsten carbide compositions, specialty (including high-chromium) alloys*; active between 1400 to 2200 $^\circ\text{F}$ (760 to 1205 $^\circ\text{C}$); good with low-silver-content brazing alloys, nickel-silver, low-fuming



Superior Flux & Mfg. Co.

bronze filler metals; especially well-suited for manganese-containing filler metals; use for brazing carbide tools, large steel parts, when long heating cycles are required; residues removed with hot water; no potassium bifluoride, low fluorine content. Circle 13

International Carbide Data, East Berne, England: *Instructional text, Hardmetals and Other Hard Materials, published*; K.J.A. Brookes; cutting-tool/wear-resistant materials; carbide, carbonitride hardmetals, ceramics, superhard materials; manufacturing of sintered hardmetals, hardmetal compositions, structures/properties, testing/quality control, specifications, component design, joining/attachment methods, nonmachining applications, ceramic tool materials, grinding/postsintering operations, including coating; keyword index. Circle 14

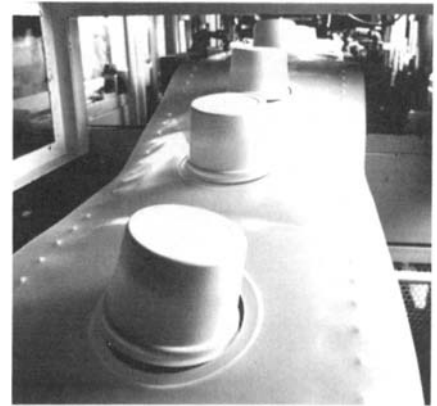
Integrated Polymer Industries, Inc., R.S. Margarita, California: *Extremely chemical resistant coating, IPI-Superbarrier, for concrete, asphalt, metal secondary containment areas*; protects against severe chemical attack, concentrated sulfuric acid; two-component, room-temperature cure, brushable/sprayable, self-leveling; based on IPNs, solventless; bypasses Environmental Protection Agency (EPA) regulations on VOC or AQMD rules on air quality/groundwater pollution; improves handling efficiency of fluid systems; combats cavitation/corrosion; creates microsmooth, glossy surface with low surface tension; bonds chemically between consecutive layers; renders primers/topcoats obsolete. Circle 15

Englehard Corp., Carteret, New Jersey: *Iridium, iridium alloys, applications*; new catalog; photos, tables, charts of physical/mechanical properties, corrosion resistance, fabrication. Circle 16

Miles Inc., Pittsburgh, Pennsylvania: *1993 Engineering Polymers Properties Guide*; property, performance data on range of engineering thermoplastics. Circle 17

Textron Specialty Materials, Lowell, Massachusetts: *Revolutionary boron/graphite prepreg, Hy-borTM*; small diameter graphite fibers between 3- or 4-mil boron fibers in epoxy matrix; exceptional properties; unmatched strength in tension, compression, bending; greater fiber density pays in less material and weight savings. Circle 18

Amoco Chemical Co., Chicago, Illinois: *New proprietary polypropylene resin, ACCPROTMET*; enhanced thermoform-



Amoco Chemical Co.

mability on polystyrene wide-web (40-in.) equipment; cycle times equivalent to polystyrene with higher heat resistance, no microwave deformation; reduced sheet sag; better temperature dimensional stability; increased crush strength; use for opaque cups, containers, trays. Circle 19

Zyp Coatings, Inc., Oak Ridge, Tennessee: *No VOCs, high-temperature, water-based paint, ZYP-COAT-2000*; tolerates severe flexing, temperature cycles, quenching, molten metal/salt/chemical/solvent attack; will not melt, become tacky, dust, chalk out at high temperatures; air dries at room temperature, no curing; use on metals, ceramics, graphite; brush/spray. Circle 20

MMI Systems, Boulder, Colorado: *Osmium Isotope 187; enhances structural performance of materials—mostly metals—in specialty applications*; concentration of 99.6% with chemical purity of 99.99%; excellent bonding capability; ideal for applications requiring extreme hardness—components for machine/aerospace industries. Circle 21

Electric Power Research Institute (EPRI), Palo Alto, California: *New vanadium-containing stainless steel resists sulfidation/aqueous corrosion in coal gasification plants*; in 26% Cr, 3.25% V, 38% Ni, 0.3% Nb, balance iron, substitution of V for Mo decreases high-temperature corrosion; fully austenitic; no embrittlement during long-term 600 to 800 $^\circ\text{C}$ aging; creep rupture strength at 550 to 600 $^\circ\text{C}$ higher than type 347 stainless steel; welding/bending tests demonstrate fabricability. Circle 22

Plasma Powders, Marlboro, Massachusetts: *New composite nickel-aluminum wire, BONDRITETM, as bondcoat material*; solid nickel wire core with aluminum sheath; no spitting, for homogeneous

spray pattern; bond strength over 12,000 psi on grit-blasted surface; 80-20/95-5 compositions for arc-spraying. Circle 23

Wall Colmonoy Corp., Madison Heights, Michigan: *Nickel-based surfacing alloy, Colmonoy®227, formulated for improving service life of glass mold compo-*

nents; particularly effective on aluminum-bronze, carbon steels, cast iron; good bonding/fluxing characteristics, weldability; low-temperature application; consistent machinability from lot-to-lot; smooth, nonporous finish; wall chart selection guide. Circle 24

PROCESSING/EQUIPMENT

Hawthorne Machine Mfg., Inc., Gresham, Oregon: *New heavy-duty vertical tilt*



Hawthorne Machine Mfg., Inc.

head saw, HS-2018, cuts faster than conventional band saws; cuts through 1 x 4 in. solid bar in approximately eight seconds; capacity to 20 in. H x 18 in. D. Circle 26

MHU Robotics, Täby, Stockholm, SWEDEN: *New "pick-and-place" robot, MHU Junior (7 kg)/Senior (15 kg), for materials handling, machine tending operations in narrow spaces*; for moving components between magazines, pallet conveyors, processing machines; compact, one-leg stand suitable for overhead beam; multiprogram functions; approximate 4-s cycle time to pick up and place part in fixture; may be series-linked for simultaneous, independent operation of more than one unit. Circle 27

Cubital America Inc., Troy, Michigan: *Three-dimensional CAD files, Solider 5600, create rapid prototyping from three-dimensional CAD files*; faster than traditional methods; brochure as aid to precise, functional physical models including working mechanisms, up to 20 x 14 x 20 in. requiring no assembly. Circle 28

The Electric Materials Co., North East, Pennsylvania: *Centrifugal casting of copper/copper alloy rings yields greater density, better microstructure*; greater strength, more uniform electrical conduc-

tivity than conventional casting methods; molten metal spun at controlled rpm, water-cooled to provide near-net shapes; machining for collector/slip/rotor end rings follows. Circle 29

Carlisle Geauga Co., Chardon, Ohio: *Detailed description of process, Designer's Guide to Blow Molding*; brochure identifying potential cost-savings applications; mold design, material selection, important product design considerations. Circle 30

Rautomead USA, Bristol, Connecticut: *Continuous casting with RX Series Hollow Billet Continuous Casting Machine eliminates several manufacturing steps*; upgrades product quality, improves production efficiency; direct, indirect extrusion of tube, pipe; ±1% concentricity; efficient alternative to static, semicontinuous direct chill (DC) casting of solid non-ferrous billets; improves yields up to 98%. Circle 31

Hypertherm, Inc., Hanover, New Hampshire: *New air plasma cutting system, MAX70, uses inexpensive compressed air*; easy mobility; inverter power supply



Hypertherm, Inc.

INTERZINC, Cleveland, Ohio: *Case history book, Engineering Solutions with Zinc, published*; advantages for design, production of electronic components. Circle 25

system; cutting capacity up to 3/4 in. (20 mm) on mild/stainless steels, aluminum; gouging capability; continuously adjustable output power from 30 to 70 A; reliability features—conformal coating of PC boards, fan filters, input surge/low-line circuit protection. Circle 32

Astro Plastics, Covington, Georgia: *New system, Astrowood™, for wood-look profile extrusions*; finely detailed, wood-grain surface extruded onto substrate of 80 to 90% recycled material; textured surface accepts wood-tone stains; durable; costs less than and preserves natural wood resources. Circle 33

Bridgeport Machines, Inc., Bridgeport, Connecticut: *New information booklet, "Tips to Improve Your Grinding Operation,"*; maximize grinding tolerances, overall quality/productivity; complete product line. Circle 34

Enthone OMI, Inc., New Haven, Connecticut: *New trivalent chromium plating process, UDYLITE®, exceeds OSHA regulations, effluent discharge requirements*; high-quality chrome finish indistinguishable from hexavalent chrome; few rejects from burning/whitewash; no additives with strong oxidants, extremely low metal concentration; single-cell configuration; no sulfuric acid contamination. Circle 35

Surface Conversion Technologies, Inc., Cumming, Georgia: *New patent process for depositing diamondlike coatings (DLC) on substrates up to 200 °C*; continuous 5-μm-thick monofilm with diamond properties; surface characteristics reproduced on metals, carbides, ceramics, high-temperature plastics regardless of shape or geometry; harder than tungsten carbide, ultralow coefficient of friction, improved electrical conductivity, extremely good adhesion to substrate. Circle 36

Weartech, Inc., Santa Fe Springs, California: *New state-of-the-art horizontal continuous casting units/turnkey operations*; computer controlled; creates 3/32 to 1/2 in. cobalt, nickel, iron-base alloy rods;

multi-strand capability; environmental compliance. Circle 37

Edison Welding Institute, Columbus, Ohio: *New variation of conventional hot pressure welding saves energy, minimizes*

material loss, reduces cycle time; upset/forged-type weld for large sections (up to 15 sq in.); interfacial heating uses less power, minimizes thermal damage/material loss; no spatter, component rotation;

wide range of materials/geometries; potential for large structural components—pipe, landing gear, railroad rails. Circle 38

TESTING/MEASUREMENT/EVALUATION

Krautkramer Branson, Lewistown, Pennsylvania: *Free 33 × 24 in. Ultrasonic Testing Wall Chart*; basic ultrasonic equations/concepts; fundamental principles illustrated, described—basic wave theory, probe construction, sound field, bandwidth, Snell's Law, reflection equations, distance-grain-size (DGS) system of flaw evaluation; applications—plate/weld testing, wall thickness measurement, immersion/through-transmission testing. Circle 39

Mectron Engineering Co., Inc., Ann Arbor, Michigan: *New inspection system, Qualifier, Q-4000, with advanced high-speed gaging/sorting*; mixed parts, distortions, metallurgical defects; laser array for multi-axis dimensional gaging; MI9000 instrument uses magnetic signature for defects/hardness inspection; up to 200+ parts per minute, depending on size. Circle 40

Phase Shift Technology, Tucson, Arizona: *Full-field noncontact flatness measurement system, Optiflat XAM, for reflective/semireflective surfaces*; rolled metals, plastics, glass; height resolution better than 0.0005 in., measurement range of several inches; standard statistical software for quality, process control; maintenance-free, rugged design. Circle 41

Fred V. Fowler Co., Inc., Newton, Massachusetts: *Portable, digital hardness tester, Rangemaster, features American, British, German standards*; hardness values in Vickers, Brinell, Rockwells B/C, tensile strength; 15 kg mechanical load applied in two stages to diamond indenter through special preloaded springs; maximum depth penetration of 0.005 in.; reduced damage, consistently accurate results; RS232C output for connection to SPC equipment/serial printer for data collection; storage capacity of 400+ readings; downloads for test reports; large digital readout, tolerance indicators, last reading recall facility. Circle 42

Advanced Technology Materials, Inc., Danbury, Connecticut: *First portable fiber optic x-ray diffraction (XRD) system for in situ monitoring of chemical vapor-deposited (CVD) diamond thin films*; position-sensitive scintillation detector

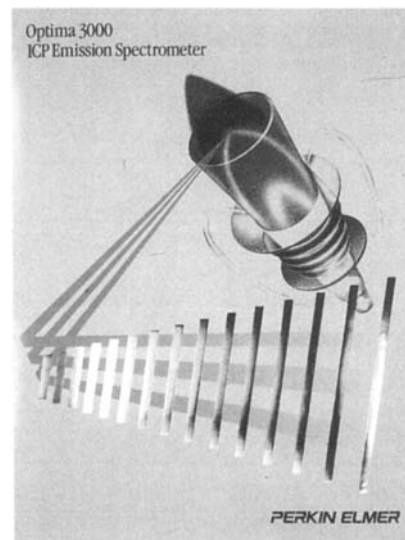
(PSSD) modified for reactor environment; simultaneously measures critical film parameters—phase composition, degree crystallinity, texture (preferred orientation), thickness, residual stress; monitors effects of variables on physical structure instantly; real-time analysis of vapor-deposited metal/metal-oxide films under development. Circle 43

Instron Corp., Canton, Massachusetts: *Full-featured materials testing software package, Series IX, for the Windows operating system reduces testing time*; data is automatically acquired during test; automatic calculations, reporting; results instantaneously available on screen, in database; predefined library of 680+ calculations—yield, maximum, break/present point, 280 ASTM test methods; report output customized to individual needs, including color. Circle 44

CMI International, Elk Grove Village, Illinois: *New, inexpensive hand-held electronic gage with "Soft-Touch" probe accurately measures surface copper instantly, eliminates surface damage*; measures 0.5 to 0.4 oz laminates, regardless of core thickness; factory calibrated, no standards/training required; out-of-spec copper laminate at incoming inspection reduces scrap, rework; $3\frac{7}{8}$ (H) × $2\frac{3}{8}$ (W) × 1 (D) in., 4.2 oz. Circle 45

UBM Corp., Roselle, New Jersey: *Micro-focus Measuring System measures surface alloy composition area profiles with high speed/accuracy*; observe measurement point and surrounding region at once with observation window in sensor, microscope/video camera; location of sputter hole extremely simple with joystick-operated translation stage control; menu-driven on IBM-compatible PC; wide range of applications. Circle 46

Perkin Elmer Corp., Norwalk, Connecticut: *New brochure featuring Optima 3000 Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES)*; patented detector, new optical system; measures spectral background and each analyte line simultaneously; 60 elements in less than one minute at multiple wavelengths; Segmented array, Charge-cou-



Perkin Elmer Corp.

pled device Detector (SCD) included; matching echelle-based polychromator, 40-MHz free-running generator with True Power Control (TPC); flexibility of over 5000 emission lines, low noise, robust/stable plasma. Circle 47

Amray, Inc., Bedford, Massachusetts: *Obtain uncompromised, high resolution, field emission SEM capabilities at extremely low cost with new 1910 FE scanning electron microscope*; unique three-element Model 305 Schottky field emission gun; no complicated maintenance required to maintain a 10^{-10} torr range vacuum; no outgassing contamination; large specimen chamber, five-axes, 4 in. motion universal specimen stage, automatic image focus/contrast/brightness, digital image processing; extensive computer control/image archiving available with the "Power Windows" SEM control package; Energy Dispersive X-Ray (EDX) compatible. Circle 48

Land Infrared, Bristol, Pennsylvania: *Process thermal imaging system, Landscan, provides noncontact temperature measurement from 575 to 2550 °F over entire surface of object*; easy setup with laser alignment; short wavelength sensor minimizes effects of uncertain

emissivities/target obscuration; variable scan speeds/angles for maximum process adaptability; optional IBM-compatible processing software includes acquisition of up to 1000 temperature samples per scan at up to 50 scan per second; real-time image transfer/display. Circle 49

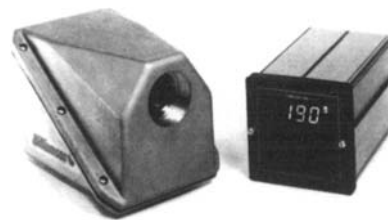
Balzers, Hudson, New Hampshire: *New convenient, self-contained, battery-powered Pirani gage, Model TPG 200, for simple/immediate pressure measurement from 100 to 10^{-3} mbar*; lightweight module requires no electrical connections; up to 100 hours of continuous-use battery operating life; ideally suited for service/maintenance work, central vacuum systems, laboratory use; 110V-9V socket adaptor provided. Circle 50

Allied High Tech Products, Inc., Rancho Dominguez, California: *Model 4000 Precision Sectioning Machine designed to prepare wide variety of laboratory specimens for metallographic sample examination*; variable speed from 100 to 4000 rpm; fully enclosed cutting compartment; 3 to 8 in. blade capacity; $\frac{1}{2}$ hp high-torque dc motor; filtered recirculating coolant

system; motorized sliding table advances sample into blade automatically. Circle 51

Tencor Instruments, Mountain View, California: *New multiple wavelength laser technology designed into FLX-2900 allows film stress to be measured at high temperatures on all types/thicknesses of materials*; metals, oxides, nitrides; dual-wavelength-design laser scanning technology; proprietary signal processing technique eliminates ambient light to ensure accurate measurement at all temperatures; very low noise; reaches 900 °C in under one hour; comprehensive data displays—stress difference, bow, reflected light intensity. Circle 52

Williamson Corp., Concord, Massachusetts: *Measure surfaces accurately from 300 to 5000 °F (150 to 2800 °C) in less-than-optimum conditions with new TEMPMATIC 8000*; dual-wavelength design, choice of infrared filters; convenient with low/varying emissivity, dirty atmospheric conditions, contaminated windows, small/unsteady targets, flame temperature; calculation achieved through ratio of radiant energy within two narrow spectral bands; simple solution to complicated,



Williamson Corp.

confusing problems; cement/steel mills, CVD diamond coatings, wire processing, glass streams, flame monitors. Circle 53

Welch Allyn, Inc., Skaneateles Falls, New York: *First totally portable measurement system, VideoProbe XL, with repeatable measurement capability*; integration of the probe, monitor; image delivered to 4 in. LCD screen by small CCD imager at distal tip of probe; high-resolution, real-time, full-screen color image for accurate analysis, problem identification; One-hand operation; 32 lb. Circle 54

UNIVERSITY VIEW

University of Kentucky, Lexington, Kentucky: Using innovative chemistry a research team has successfully converted plastics of many kinds (polyethylene, poly(ethylene terephthalate), as well as actual plastic wastes from milk jugs, soft drink bottles and the like, into oil. Senior Research Associate at the University's Institute for Mining and Minerals Research, M. Medhi Taghiei, reports that additionally, coal has been successfully coliquefied with waste plastics. The oil produced from plastic liquefaction is similar to imported crude oil, but lighter and easier to refine for use as a transportation oil; also, it is free from sulfur and therefore more environmentally benign in processing. Circle 55

University of Rochester, Rochester, New York/**University of Minnesota**, Minneapolis, Minnesota: The world's fastest silicon photodetector yet reported that can sense up to 75 billion light signals per second (75 gigahertz), compared to 1 to 2 gigahertz of the best commercial detectors in use, has been developed in a cooperative effort. Headed by Professor of Electrical Engineering, Thomas Hsiang, Senior Scientist at Rochester's Laboratory for Laser Energetics, the group also determined

the exact limiting factors of such detectors in applications such as in fiber-optic telecommunications systems and local computer networks where information is transmitted via a light pulse down an optical fiber. The detectors play a key role in translating signals from optical to electrical form, and vice versa. Using today's technology, it would take over two weeks to transmit the contents of the U.S. Library of Congress via telephone line; using Hsiang's device, it would take one working day. The key to the new MSM (metal-semiconductor-metal) detector is the speed of its recovery rate after signal detection—less than 20 trillionths of a second (picoseconds) after each signal. Circle 56

Clemson University, Clemson, South Carolina/**South Carolina State Universities**: Research teams will study superconducting materials and establish a superconductivity research laboratory at SCSU, building upon the earlier development and study of a crystal filament that can act as a "high-temperature" superconductor at about -175 °C—almost 100 degrees warmer than the chill needed for earlier superconductors, the filaments are made of bismuth, strontium, calcium, cop-

per, and oxygen. Known as BiSCCO, they were first developed by Guebre Tessema, Associate Professor of Physics. Although other labs can make the crystals, Clemson's lab consistently produces the best—nearly perfect. The purity of the filaments aids in acquiring more accurate descriptions and measurements of the material's properties. However, weighing only several millionths of a gram each, their tiny size makes them difficult to work with. A human hair is used to manipulate them for examination under a microscope. The study teams will attempt to grow equally pure crystals 10 times larger for easier assessment and application. Circle 57

University of Nottingham, University Park, Nottingham, ENGLAND: Scrap polymer composite materials from automotive components, previously written off as impossible to recycle, may play a useful role in cement production and as a fertilizer. A research team is developing recycling techniques based upon energy recovery from the thermosetting plastic, combined with recovery and utilization of the reinforcement material/fillers of the scrap components. Commercial-scale combustion trials have resulted in the composites being burned in an environ-

mentally safe manner. One potential use for the ash remaining after combustion is as an effective treatment for soils of high acidity. Successful tests have also proven that composites filled with limestone can be utilized in coal-fired fluidized bed energy plants to supplement the heat from coal and to absorb sulfur, thus reducing emissions of sulfur dioxide. Circle 58

Georgia Institute of Technology, Atlanta, Georgia: Researchers have developed a new ceramic coating technique which could simplify production of certain oxide, nitride, carbide, and boride thin films, while lowering their processing costs. Called combustion chemical vapor deposition, the technique combines features of chemical vapor deposition and thermal spray technology. It can produce high-quality thin films in open-air processing. Circle 59

... A lightweight metal best known for its use in advanced aircraft structures may provide the adhesive needed to hold together groups of integrated circuits in multichip modules—and the layers to build high-speed circuits. Titanium oxide will help electronic designers employ high-conductivity metals such as copper and gold, which are now difficult to use be-

cause other electronic materials don't bond well to them. Circle 60

... A thin coating of liquid on the surface of a solid can act like a nanometer-scale "mattress" to cushion the forces generated by the high-speed impact of atomic and molecular clusters. The density of the liquid controls the disposition of impact energy, determining whether the clusters make a "soft landing," or melt and then "freeze" into a glassy form. The technique could allow production of new nanostructured surface coatings consisting of individual clusters. Circle 61

Pennsylvania State University, University Park, Pennsylvania: A new corrosion-resistant aluminum alloy for use in the aerospace/automotive and other industries is under development. Considering the current problems of alloying aluminum with copper, magnesium, or zinc wherein, for instance, the copper-rich phase can accelerate corrosion of the aluminum-rich phase, researchers are using titanium, molybdenum, and tantalum to achieve a more homogeneous distribution of the elements. The most promising results have come from tungsten and molybdenum. Circle 62

... The Advanced Processing via Powder Injection Molding Consortium has been formed by the Particulate Materials Center at PSU. Powder, binder, and process development issues in the manufacturing of automotive components, ceramics, high-performance steels, bonded magnets, refractories, superalloys, titanium, and other powder injection moldable materials will be studied. Improvements in quality control, ease of processing, feedstock development, contamination, and wear are areas of focus by the multisponsor consortium. Participants will address the needs of industries involved with products made of particles, including metal powders, ceramics, photographic emulsions, organic pigments, and metal catalysts and fumed silicas. Circle 63

Michigan State University, East Lansing, Michigan: Advances in the research and development of composite materials will be the focus of work performed at the new Advanced Materials Laboratory, a major laboratory facility—previously known as the Polymer Composite Laboratory—and recently acquired from Michigan Molecular Institute (MMI), Midland, Michigan. Circle 64

LITERATURE/DATA SOURCES

Precision Metal Design, Cleveland, Ohio: *Newsletter for metal component design, enhanced performance, production efficiency*; series describes precision workstation using standard tooling; production of custom parts with short lead times; medical instrument component with 69% cost reduction; fineblanking with case history replacing cast iron in hydraulic transmission adaptor. Circle 65

Royal Institute of Technology, Department of Physical Metallurgy/Ceramics, Stockholm, Sweden: *Newly developed thermodynamic database for steel*; three-year collaborative European project, COST 507; experimental/evaluated data aluminum-, magnesium-, titanium-based alloys; provides industrial access to evaluated data, calculated equilibria, simulated transformations for existing/new alloys; reports improved properties. Circle 66

The Cadmium Council, Reston, Virginia/**The Cadmium Association**, London England: *Jointly operated NiCd Electric Vehicle Information Center brochure, "Nickel-Cadmium Batteries—The Performance Choice for Electric Vehicles"*; authoritative source of information on electric vehicle battery technol-

ogy; information package on nickel-cadmium batteries for electric vehicles; detailed information on NiCd battery performance, cost, recyclability, health/environmental issues, material supply. Circle 67

ASM International®, Materials Park, Ohio: *New video course, "Understanding ISO 9000 for Metalworking/Materials Companies"*; three, one-hour tapes; overview of ISO 9000/Q90, continuous improvement, international/external audits, quality manual development, market access, certification requirements, expense/manpower/resource allocations, program maintenance; compliance/certification. Circle 68

Teltech Resource Network, Minneapolis, Minnesota: *Sentry® Intelligence Updates track technical/business topics*; searches thousands of electronic sources; produces/delivers quarterly, monthly, weekly update reports with published information on the subject since last report; format includes author/source, complete table of contents; tracks market conditions/trends, evolution of critical/potential technologies; follows patent activity (by company, inventor, technical area); tracks competi-

tors/acquisition candidates, legislative/regulatory issues. Circle 69

Casti Publishing, Inc., Edmonton, Alberta, Canada: *The Metals Black Book, Volume 1, Ferrous Edition, pocket-sized reference published*; metals designations for ASTM, ASME, UNS, AISI, SAE, CSA, AWS, DIN, BSI, JIS, AFNOR; chemical compositions, mechanical properties, physical properties, base metals, weld filler metals. Circle 70

Carpenter Technology Corp., Reading, Pennsylvania: *52-page "Guide to Selecting Specialty Metals" provides technical data/selection criteria on approximately 400 alloys*; stainless steels, corrosion-resistance alloys, aerospace/high-temperature alloys, tool/die/gear/valve/bearing/high-strength alloy steels; nickel-copper alloys, magnetic/controlled expansion/electrical alloys, resistance/heating element/thermocouple alloys, high-nickel alloys; chemical compositions, alloy characteristics, product applications; tables show forms of availability on each. Circle 71

The Powder Coating Institute, Alexandria, Virginia: *A slide chart for estimat-*

ing/comparing costs of liquid finishing and powder coating; aids in estimating applied cost of liquid finishing, while considering variables—percentages of volume solids/deposition efficiency, amount of coverage, thickness of the finish, cost of the paint; corresponding variables for estimating applied cost of a powder coated finish on back; developed by the PCI Application/Recovery Equipment Subcommittee. Circle 72

Materials Information, ASM International® Materials Park, Ohio: **Over 900 case histories from 800 corporate organizations in Corrosion Case Histories 1993—Processes/Prevention**; up-to-date, comprehensive review of corrosion processes, current/developing strategies to identify/counteract corrosive mechanisms; technical/business developments; derived from databases January 1992 to March 1993; extensive study of development, characterization, selection of corrosion-resistant materials to meet requirements of high-technology industries; steels, ferrous/nonferrous alloys, engineered plastics, polymers, composites, intermetallics; current research efforts provide the highly resistant materials required by aerospace, automotive, nuclear power, and petrochemical industries. Circle 73

Oxford & IBH Publishing Co., Ltd., New Delhi, INDIA: **Fifty-seven papers in "Advances in Materials and Processes, as proceedings of the International Advances in Materials and Processes Conference and Exhibition"**; 16-19 February 1992, Bombay, India; P. Ramakrishnan, Ed.; 24 technical sessions organized by India Chapter/ASM International®; all aspects of advanced materials—metals, ceramics, polymers, composites; advanced manufacturing/processing technologies; solicited contributions from 18 countries focus on emergence of new materials age wherein economic developments are based on the development/efficient utilization of high-performance materials. Circle 74

The Platt Brothers & Co., Waterbury, Connecticut: **New eight-minute video, "Cathodic Protection of Steel-Reinforced Concrete Using Zinc Thermal Spraying"**; impressed/passive systems using zinc metallizing; use of zinc in cathodic protection systems; field work done to date in Oregon/Florida. Circle 75

STN International, Columbus, Ohio: **Numeric database, METALCREEP, for 144 aluminum alloys/steels**; creep/rupture stress properties; high-temperature tensile properties; test environment data—creep

rate, time, strength, strain; exposure temperature/time, elongation at break, creep rupture strength, rupture life, tensile yield/ultimate strength; CAS registry numbers; on-line thesaurus. Circle 76

Industry Services, Lansing, Michigan: **New Stephens' Electronic Plastics Directory**; 6600+ companies in five plastics-rich states—Illinois, Indiana, Michigan, Ohio, Wisconsin; comprehensive, accurate listing available by state or combined on a 3½ or 5¼ in. diskette; multiple search/sort capability for targeting customers; easy multiple-client personalized correspondence in WordPerfect. Circle 77

M Squared Technologies, Apopka, Florida: **New version of Lab-Trac Materials Engineering Software for databasing projects, formulations**; instant analysis; weight/volume fractions for density/solids content; 24 components per formulation possible, one billion formulation storage; customizes properties for components; calculates mass, volume, weight/volume fraction; formulation analysis, fabrication work sheet, variance analysis between formulated material, fabricated specimen; labor/formulation costs automatically calculated; produces eight reports. Circle 78

IN BUSINESS

ManLabs Testing Services, Cambridge, Massachusetts, has merged with **Altran Materials Engineering**, Boston, Massachusetts forming **ManLabs Testing Services Division of Altran Materials Engineering, Inc.**, Cambridge, Massachusetts, in order to expand the dimension of its services to include interpretation of materials test results and recommendations for materials or process changes to solve materials problems.

A customer service center has been opened in Singapore by **Parker Berteau Aerospace**, Irvine, California, in support of its customers in the Pacific Rim area, with immediate response to customer inquiries and 24-hour rotatable exchange support.

The Reinforcement Fabrics Group of Hexcel Corp., Pleasanton, California, and the Industrial Materials Group of **Owens-Corning** will begin operations immediately in Seguin, Texas, as **Kynex**, a joint venture to produce specialty fabrics that provide exceptional strength-to-weight ratios and design flexibility.

Vacuum Inc., Boulder, Colorado, has established a **Vacuum Coating Consultants** division to provide contract process development services to worldwide industrial companies that want to utilize high deposition rate technology, particularly in the areas of planar magnetron processes, enhanced arc deposition, and electron beam technology.

Aerodyne Alloys, Inc., Hartford, Connecticut, has been acquired by **Ulbrich Stainless Steels & Specialty Metals, Inc.**, North Haven, Connecticut, to form **Aerodyne Ulbrich Alloys**.

XXsys Technologies, Inc., San Diego, California, has agreed to purchase **Century Design, Inc. (CDI)**, San Diego, in order to enable joint ventures in developing nondefense markets for composite materials applications in China.

The American Vacuum Society (AVS), New York, New York, has recently moved from 335 East 45th St., to larger headquarters at the Association Building, 120 Wall St., 32nd Floor, New York, New York 10005, USA.

Morton International Advanced Materials, Chicago, Illinois, has joined in a cooperative research and development agreement (CRADA) with the Chemical Science and Technology Laboratory at the **U.S. National Institute of Standards and Technology (NIST)**, Gaithersburg, Maryland, to design an on-line monitoring system that will identify and measure metalorganics flowing into a chemical vapor deposition (CVD) reactor.

The Electric Power Research Institute (EPRI), Palo Alto, California, and **Solarix Corp.**, Newtown, Pennsylvania, recently formed an industry alliance to reach a goal of 15% stabilized efficiency in solar cell modules for bulk power applications before the end of the decade.

Plans to construct a global aluminum nitride ceramic powder manufacturing facility have been announced by **The Dow Chemical Co.**, Midland, Michigan. The plant will be located in Midland with extensive inventory capability in Japan, where demand is expected to be the greatest.

A new 80,000 sq ft facility in Las Vegas, Nevada, was recently opened by **Lustro Plastics Co.**, Evanston, Illinois. The plant will service the company's Western customers and replaces its Valencia, California operation.

Polygon Co., Walkerton, Indiana, has broken ground for a new pultrusion plant located near its main facility to provide the automotive, electronic, medical, and aerospace industries with pultrusions incorporating the latest reinforcement fibers and advanced resin formulations.

Metal Samples Co., Munford, Alabama, has opened a second affiliate named **Alabama Laser Technologies** to conduct la-

ser machining operations and focus on research into laser technologies for the future.

Georgia-Pacific Corp., Atlanta, Georgia, has purchased an engineered lumber manufacturing facility at Roxboro, North Carolina, from Fibreboard Technologies Corp., a subsidiary of **Fibreboard Corp., Inc.**, Standard, California. The new facility features state-of-the-art environmental facilities.

An international specialty chemicals company, **M.A. Hanna Co.**, Cleveland, Ohio, is expanding its strategic focus to include high-performance materials and has completed the acquisition of **Texapol Corp.**,

Bethlehem, Pennsylvania, and acquired certain assets of **Monmouth Plastics**, Asbury Park, New Jersey. Both businesses were part of the engineered materials division of Cookson America, Inc., Providence, Rhode Island.

The fluoroelastomer-to-metals bonding business of **3M Corp.**, St. Paul, Minnesota, has been acquired by **Lord Corp.**, Erie, Pennsylvania, who will market the product under the trade name Chemlok® 5150 adhesive, in a plan to broaden Lord's line of adhesives available for the dynamic seal market.

KUDOS to these ASM members on their recent awards and accomplishments. . .

Rejoining **Precision Metalsmiths, Inc.**, Cleveland, Ohio, as Director of Research and Development is **Robert A. Horton**. He was with PMI previously for 21 years, having left in 1981 for an affiliation with Duradyne Technologies, Inc. and TRW Castings Div., both of which were acquired by PCC Airfoils.

Scott K. Reiman has joined **Thermometrics, Inc.**, Edison, New Jersey, as Vice President/Operations. He will be responsible for supervising a 375-member production staff and for overall plant operations. He was previously Manager, Technical Services, Metallurgical Industries.

Climax Research Services, Farmington Hills, Michigan, has announced the appointment of **Robert L. Herbon, Jr.**, as Associate Metallurgical Engineer. Herbon recently completed his metallurgical studies for a BSE at Colorado School of Mines. He has 19 years experience in heat treating, ferrous/nonferrous casting, and refractory metals research.

Susan Borenstein has been named to the staff of **Structural Integrity Associates, Inc.**, San Jose, California. Her expertise is focused on microbiologically influ-

enced corrosion of piping and components and metal and ceramic coatings for turbine blades, in support of the construction and maintenance of nuclear, fossil, geothermal, and hydroelectric power plants.

A new Vice President/Research and Development, **Gerald J. Posakony**, has been added at **XXsys Technologies, Inc.**, San Diego, California. In the recently created position, Posakony will be responsible for directing the company's R&D activities, including inspection of advanced composite materials, medical instrumentation, and an EPA project for nontoxic testing of polymer composite materials.

Thermo Process Systems recently announced the appointment of **Frank A. Ragone** as President of **Holcroft**, Livonia, Michigan, a TPS division. Prior to the promotion, Ragone was Vice President/Operations.

Prior to being named Japanese Business Development Manager at **LNP Engineering Plastics**, Detroit, Michigan, **Ken Yasui Morgan** served as an international business consultant for U.S. and Japanese companies seeking opportunities abroad. He will use his experience to forge new relationships for the specialty com-

pounder with Japanese companies in the U.S. automotive industry.



Steve Maus

Steve Maus has been named to the position of metallurgist at **Lindberg**, A Unit of General Signal, Watertown, Wisconsin. He will be responsible for providing metallurgical process support in the manufacture of heat processing equipment, and

will direct government and institute-funded product development programs.

Norton Diamond Film, Northboro, Massachusetts, has appointed **George A. Fryburg** as Director/Manufacturing Operations. He will be responsible for transferring Norton's CVD technologies from the R&D environment into commercial products in its new 26,000 sq ft manufacturing facility. He was previously Director of Operations for Norton's PAKSO Industrial Ceramics, Latrobe and Glassport, Pennsylvania.