

AMERICAN CERAMIC SOCIETY

bulletin

emerging ceramics & glass technology

DECEMBER 2010



ceramicSOURCE

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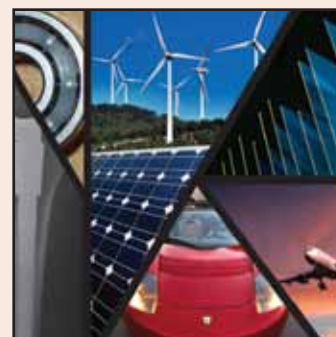
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Photo courtesy of: Corning



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Executive Staff

Charles G. Spahr, Executive Director and Publisher,
cspahr@ceramics.org

Editorial and Production

Peter Wray, Editor
ph: 614-794-5853 fx: 614-794-4505
pwwray@ceramics.org

Ann Spence, Assistant Editor
ph: 614-794-5825 fx: 614-794-5822
aspence@ceramics.org

Michael Greenman, Contributing Editor
Tess M. Speakman, Graphic Designer

Editorial Advisory Board

James C. Marra, Chair, Savannah River National Lab
Kristen Brosnan, General Electric
Alexis Clare, Alfred University
Olivia Graeve, Alfred University
Linda E. Jones, Alfred University
Venkat Venkataramani, GE Research

Customer Service/Circulation

ph: 866-721-3322 fx: 301-206-9789
customerservice@ceramics.org

Address

600 North Cleveland Avenue, Suite 210
Westerville, OH 43082-6920

Advertising Sales

adsales@ceramics.org

National Sales

Patricia A. Janeway, Associate Publisher
pjaneway@ceramics.org
ph: 614-794-5826 fx: 614-794-5822

Europe

Richard Rozelaar
media@alaincharles.com
ph: 44-(0)-20-7834-7676 fx: 44-(0)-20-7973-0076



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American Ceramic Society Bulletin covers news and activities of the Society and its members, includes items of interest to the ceramics community and provides the most current information concerning all aspects of ceramic technology, including R&D, manufacturing, engineering and marketing.

American Ceramic Society Bulletin (ISSN No. 0002-7812). ©2010. Printed in the United States of America. *ACerS Bulletin* is published monthly, except for February, July and November, as a "dual-media" magazine in print and electronic format (www.ceramicbulletin.org).

Editorial and Subscription Offices: 600 North Cleveland Avenue, Suite 210, Westerville, OH 43082-6920. Subscription included with American Ceramic Society membership. Nonmember print subscription rates, including online access: United States and Canada, 1 year \$75; international, 1 year \$131.* Rates include shipping charges. International Remail Service is standard outside of the United States and Canada. *International nonmembers also may elect to receive an electronic-only, e-mail delivery subscription for \$75.

Single issues, January–November: member \$6.00 per issue; nonmember \$7.50 per issue. December issue (*ceramicSOURCE*): member \$20, nonmember \$25. Postage/handling for single issues: United States and Canada, \$3 per item; United States and Canada Expedited (UPS 2nd day air), \$8 per item; International Standard, \$6 per item.

POSTMASTER: Please send address changes to *American Ceramic Society Bulletin*, 600 North Cleveland Avenue, Suite 210, Westerville, OH 43082-6920.

Periodical postage paid at Westerville, Ohio, and additional mailing offices. Allow six weeks for address changes.

ACSBA7, Vol. 89, No. 9, pp 1–136. All feature articles are covered in *Current Contents*.

‘Fathers of graphene’ awarded Nobel Prize



Andrei Geim and Konstantin Novoselov were awarded the Nobel Prize in Physics 2010 for their groundbreaking research in two-dimensional graphene.

Two University of Manchester (U.K.) researchers have been awarded this year's Nobel Prize for Physics for their work on graphene.

A well known story, Andrei Geim and Konstantin Novoselov extracted graphene from a piece of graphite using regular adhesive tape. They were able to confirm that a flake of carbon on their tape was in the graphene form, which at the time, 2004, was thought to be unstable.

Novoselov was a postdoctoral associate working with Geim in 2004 when the researchers discovered that they could repeatedly make atomically thin slabs of carbon by cleaving graphite with tape. Their 2004 *Science* paper describing the material and its electrical properties has already been cited more than 3,000 times.

Graphene, the one-atom-thick mesh of carbon atoms, shows astonishing electron mobility and may be the eventual route to superfast electronics—particularly as it is more applicable to planar processing than for example, carbon nanotubes.

“Graphene transistors are predicted to be substantially faster than today's silicon transistors and result in more-efficient computers,” the academy said in the citation. “Since it is practically transparent and a good conductor, graphene is suitable for producing transparent touch screens, light panels and maybe even solar cells.”

The Nobel Prize comes with an award of about \$1.5 million.

A review by Geim and Novoselov on the rise of graphene is now available for free at *Nature Materials*.

Visit: www.nature.com/nmat/journal/v6/n3/full/nmat1849.html ■

Five new research sites to be built with \$50M in NIST grants

NIST waded through more than 100 proposals during the past few months and has now approved proposals and funding for five new scientific research facilities, including two that will concentrate on nanotechnologies.

The institute will give a total of \$50 million for centers that will construct new labs or expand existing ones. Each sponsoring institution is matching the NIST dollars with at least 20 percent of the annual project costs.

The research centers' purposes, locations, funding and timetables are as follows:

- Center of Excellence in Nano Mechanical Science & Engineering (nanoscale engineering and science), University of Michigan; \$9.5 million of \$41.2 million construction budget, to open summer 2013.
- Western Institute of Nanotechnology on Green Engineering and Metrology (microtechnology and nanotechnology for advanced energy applications), UCLA; \$6 million of \$30 million construction budget, to open spring 2014.
- Golisano Institute for Sustainability Research Building (green-building research), Rochester Institute of Technology; \$13.1 million of \$35 million construction budget, to open fall 2012.
- Center for Civil Engineering Earthquake Research (earthquake simulation), University of Nevada, Reno; \$12.2 million of \$15.3 million expansion budget, to open fall 2013.
- Center for Ocean Health (role of



Credit: Steniors Associates Architects

Architect's drawing of the planned Western Institute of Nanotechnology on Green Engineering and Metrology at UCLA.

microbial life in marine ecosystems), Bigelow Laboratory for Ocean Sciences, West Boothbay Harbor, Maine; \$9.1 million of \$11.4 million construction budget, to open summer 2012.

University of Michigan's 63,000 square-foot nano center will focus on several areas, including the dynamics of DNA molecules, nanoscale energy conversion, nanomanufacturing and nano/micro electromechanical systems for medical research and diagnostics. It also will house eight special ultralow-vibration specialized laboratory chambers designed to meet NIST specifications for vibration, air quality, temperature and humidity control. It also plans to have labs dedicated to imaging and optics; biosystems; nanoengineering; microbioengineering; materials,

mechanics and mechanical testing; microdynamics; and nanostructures. Planned research projects for the new facility range from the analysis of single biomolecules to metrology of nanoparticle-based composites, and to precision nanomanufacturing and assembly.

The UCLA WIN-GEM center will focus on "low-dissipation, nonvolatile electronics." One of the particular angles mentioned is low-cost, high-yield, energy-efficient nanoscale semiconductor manufacturing. The facility also will serve as one of DOE's Energy Frontiers Research Centers that will look at creating inexpensive nanoscale materials for use in polymer-based solar cells, electrochemical supercapacitors (for energy storage) and carbon capture applications. There will be 35,000

square feet of labs, including wet chemistry energy/nano labs, plus separate facilities for quantum metrology, microscopy and electron and spintronic transport.

NIST announced its Construction Grant Program in February. The five winners were selected based on scientific and technical merit of the proposed use of the facility and the need for federal funding, quality of the design of the facility, and adequacy of the construction project management plan.

Visit: www.nist.gov ■

Saint-Gobain to open new PV facility in Korea

Saint-Gobain announced the building of its third high-efficiency photovoltaic panel facility in Korea. Saint-Gobain is partnering up with Hyundai Heavy Industries Co. to form a 50-50 joint venture called Hyundai Avancis.

The facility is expected to produce an annual volume of 850,000 modules based on copper indium gallium selenide thin-film technology designed for roofs and solar fields. The site is expected to be fully operational by mid-2012.

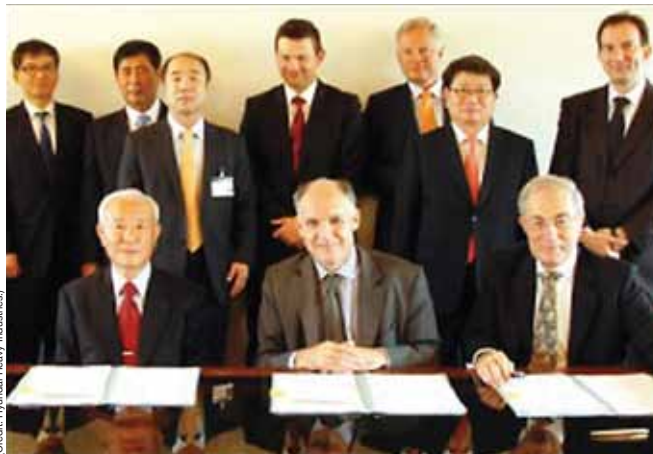
HHI says that upon completion, the solar cell factory will have an annual production capacity of 100 megawatts of CIGS units. The plant is a step toward HHI's target of being among the global top-five solar power producers by 2015 (when it hopes to have an annual capacity of 400 megawatts). The new plant also will make HHI the only Korean company that can produce thin-film and crystalline solar cells.

Saint-Gobain will provide high-quality glass for the production of the CIGS solar cells through its Korean unit, HanGlas. "Based on depositing coatings of CIGS on a glass substrate, the technology developed by Avancis avoids using traditional crystalline silicon, the company says in a press release. "This technology makes it possible to imagine production costs as low as other thin-film-based techniques, while its

electrical efficiency (above 12 percent industrially and up to 20 percent in the laboratory) is close to the higher yields achieved using polycrystalline silicon cells. As well as being suitable for solar fields, CIGS thin-film-based modules are especially recommended for roof installations, because of their simplicity of assembly, their attractive appearance and their reliability.”

“With this investment, Saint-Gobain significantly accelerates its growth on the solar market, by banking on a competitive and innovative technology,” says Pierre-Andre de Chalendar, chairman and CEO of the glass company.

Visit: www.saint-gobain.com ■



Hyundai Heavy Industries Chairman Min Keh-sik, front left, sits with Compagnie de Saint-Gobain SA Chairman Pierre-Andre de Chalendar, center, after HHI and Saint-Gobain agreed to build a new CIGS solar module plant.

Credit: Hyundai Heavy Industries

DuPont PV revenue reaches \$1B one year ahead of schedule

A recent announcement from DuPont gives some indication of just how rapidly the solar energy industry has grown in a relatively short period of time.

According to the company, it expects to report \$1 billion in revenue from photovoltaic sales in 2010 alone – a goal that will be reached one year ahead of schedule. A substantial portion of this growth was said to come from innovations improving the efficiency of solar modules.

“Our broad portfolio of offerings spans crystalline silicon cells and modules as well as thin-film modules, putting us in an ideal position to capitalize on market growth in both segments of the photovoltaics industry,” says DuPont president David Miller.

Among the DuPont solar-related products Miller cites are its Solamet metallization paste, Tedlar backsheets and a line of encapsulant resins and films that make modules more efficient.

Miller also indicated that DuPont continues to invest in greater production capabilities for solar energy products, with customers and partners, to keep on top of higher demand



Credit: DuPont

DuPont screen-printable thick film enables solar cell manufacturers to reduce cost per watt by achieving higher cell efficiencies and production yields and lower material consumption.

from around the world. He added that renewable energy generation is expected to be the fastest-growing

part of the energy market during the next two decades.

Visit: www.dupont.com ■

Spahr new ACerS executive director; 30-year business veteran assumes new post in Society



ACerS Board of Directors announced the selection of someone within ACerS's staff, Charles Spahr, to be the new executive director.

Spahr is the president of

ACerS' ceramic arts publishing unit (Ceramic Publishing Company), a branch of the Society that he took over about five years ago when he first joined ACerS staff.

CPC publishes two world-leading magazines for the ceramic arts community, *Ceramics Monthly* and *Pottery Making Illustrated*. Both of these publications have grown in prestige and reach under his leadership.

Moreover, he has led the CPC group in bridging the gap between print and electronic platforms. As a result, CPC has developed a huge online presence, new online tools and forums, and many new products for its audience.

Before coming to ACerS, Spahr spent most of his career with Reed Elsevier, a publishing entity well-known to the science and business communities. He worked on content related to construction, manufacturing, metal-working software development, food science, architecture and engineering.

Spahr also has a wealth of international experience, having managed several international subsidiaries, including operations in Scandinavia, Brazil and Australia. Much of the online knowledge he brought to CPC he gained while working as Senior Vice President of Electronic Products for Reed Elsevier, a post that made him responsible for implementing a common platform serving more than 120 publications in 10 major-market sectors.

ACerS president Edwin Fuller said

that besides what Spahr brings in management and publishing acumen "the selection of an existing Society staffer – someone who already worked extensively with many ACerS leaders, has participated in our retreats and understands our governance system – provides a great way to have a fast transition that is minimally disruptive to current staff and members." ■

Beth Judson, husband die in plane crash

Ceramist, materials engineer and university-business technology partnership expert Beth Judson and her husband, Jim, were killed Oct. 26, when their plane crashed north of Tupelo, Miss.



Besides her science and engineering work, Judson was also known for her efforts on the Alfred University Board of Trustees, and with the Engineering Accreditation Commission and the Board of Directors of the Accreditation Board for Engineering and Technology. She also had just completed her term as president of ACerS/National Institute of Ceramic Engineers.

Judson had been working for the University-Industry Demonstration Partnership, an organization of universities and businesses, sponsored by the National Academies, which seeks "to enhance the value of collaborative partnerships between university and industry in the United States."

Previously, Judson was general manager for Verco Materials LLC, a Georgia Tech VentureLab company formed to commercialize technology to pressureless sinter boron carbide. She

also worked on other Georgia Tech projects, including a manual on forming and operating research centers, and organizing a site visit for a science and technology center proposal to the National Science Foundation on biologically enabled advanced materials and micro/nano-devices.

For several years she was director of industry relations for Yamacraw, a Georgia economic development initiative in the form of a multiuniversity broadband chip design research center. She also had more than 10 years of industrial experience with Alcoa Chemicals, Technical Ceramics Laboratories and Applied Ceramics, in sales, product management and research.

Judson received a B.S. in ceramic science and a B.A. in mathematics magna cum laude from Alfred University in 1982, and M.S. and Ph.D. degrees in ceramic engineering from the Georgia Institute of Technology in 1991 and 1999, respectively.

She was a member of the Board of Trustees of Southern Catholic College as well as a member of the Advisory Boards of the School of Materials Science and Engineering at Georgia Tech and Clemson University, and the Alfred University Women's Leadership Center.

Colleague and friend Kathleen Richardson, a professor at Clemson, notes that, "Beth was truly an inspiration to all who worked with her – loving, giving and committed to whatever cause she was leading. She contributed greatly to all parts of our ceramic engineering profession – but perhaps has made the most impact on the many women in engineering she touched and [in] support of their future leadership opportunities. She was a gifted woman, dedicated wife and mother, and a dedicated supporter of ceramic engineering and science education."

John Marra, another one of Judson's colleagues in ACerS adds, "Beth was one of those rare individuals who could electrify a room just by walking in. She was a tireless advocate for the ceramics profession and always helped encourage

students and young professionals. It is truly a sad day; the community has lost one of its brightest lights." ■

Society award nomination deadline: Jan. 15, 2011

The deadline for Society awards that will be presented to deserving winners in October 2011 in Columbus, Ohio, at the ACerS 113th Annual Meeting/MS&T'11 is coming up. Jan. 15, 2011, is the date that nominations are due for awards, such as Kingery, Jeppson, Coble, Distinguished Life Member and many more. Get those nominations started now so that you don't have to work on them over the holidays!

For more information, visit the ACerS website and the individual award pages at www.ceramics.org/acers-community/award-winners-resources ■

"Additives for Monolithics" symposium

The St. Louis Section and the Refractory Ceramics Division of ACerS will sponsor the 47th Annual Symposium on the theme "Additives for Monolithics" on March 23–24, 2011. The meeting will be held in St. Louis, Mo., at the Hilton St. Louis Airport Hotel. Coprogram chairs are Dave Tucker of CE Minerals and Ben Markel of Resco Products. For more information, visit www.ceramics.org/sections/st-louis-section. ■

More than 35 job listings in ACerS's new Career Center

ACerS just launched a brand new online Career Center at www.careers.ceramics.org. The site now hosts both employers (35 current openings) and job seekers. Job seekers can create a profile, upload résumés and apply for posted jobs. Companies posting jobs as well as job seekers can take advantage of the site's features free of charge. Visit www.careers.ceramics.org ■

Call for nominations: The Toledo Glass and Ceramics Award

The Michigan Northwest Ohio Section of ACerS is soliciting nominations for its Toledo Glass and Ceramic Award. The deadline for submitting a nomination is Dec. 17, 2010.

The Award recognizes distinguished scientific, technical or engineering achievements in glass or ceramics. There are no limitations regarding age, nationality, sex or membership in ACerS or the Section. A nominee must be living, but exceptions may be made on the recommendation of the Selection Committee and the Officers of the Section.

This is a singular award. Nominations for multiple awardees will not be accepted. Selection of the winner will be based on the nomination and accompanying evidence of achievements in glass or ceramics. Sponsors should send a one-page cover letter setting forth the qualifications of the nominee with no more than three additional pages of supporting information.

The Award consists of a frameable certificate and an engraved glassware piece. It will be presented at an award meeting in April 2011.

If a nominee is not selected for the Award in the year following nomination, that nominee is put on an Active List and the nomination is reconsidered with all other active nominations in each of the following three years. If unsuccessful after three years, a new nomination must be submitted for the candidate to continue to be considered.

Mail nominations to:
Janet Bailey
17680 Lake View Circle
Northville, MI 48168
email: jebailey@wowway.com

January short course offered

Society members can further their knowledge and careers by participating in the upcoming ACerS short course offerings. For more information, visit www.ceramics.org/shortcourses.



ACerS Short Courses provide rapid, in-depth training in small group settings.

Mechanical Properties of Ceramics and Glass

Date: Jan. 27–28, 2011

Instructors: George D. Quinn, NIST, and Richard C. Bradt, University of Alabama

Course site: Held in conjunction with ICACC'11 in Daytona Beach, Fla.

This course will teach:

- Fundamentals of mechanical properties of ceramics and glasses for elastic properties, strength measurements, fracture parameters and indentation hardness.
- Fundamentals of properties for each topical area.
- Relate properties to structure and crystal chemistry of the materials.
- Standard test methods.

Students will learn how the structures of ceramics and glasses determine their properties. Students will become acquainted with standard test methods for the listed mechanical properties and be able to complete those tests and understanding the results. (Continuous fiber ceramic matrix composites are not included.) Students also will learn how the results of some tests may be used to design with ceramics and glasses as well as learn about postmortem analyses of failures. Finally, students will gain a basic understanding of the mechanical properties of ceramics and their measurement. ■

In Memoriam

Yoshiro Harada 1913–2009
Elizabeth "Beth" Judson 1959–2010

Some detailed obituaries also can be found on the ACerS website, www.ceramics.org/in-memoriam

Fellow Suresh new NSF director

ACerS Fellow Subra Suresh was sworn in as the new director of the National Science Foundation. He is the 13th director and will hold a six-year term.

According to NSF, Suresh will lead with a \$7.4 billion budget, an 8 percent increase over 2010, which supports Barack Obama's goal of increasing the nation's total public and private investment in research and development to at least 3 percent of the gross domestic product. NSF funding accounts for more than half of all nonmedical science and engineering basic research at American academic institutions.

Suresh holds a bachelor's degree from the Indian Institute of Technology in Madras, a master's degree from Iowa State University and earned his Sc.D. from the Massachusetts Institute of Technology in 1981. From 2000 to 2006, Suresh served as the head of the MIT Department of Materials Science



ACerS Fellow Subra Suresh was sworn in as the new director of the National Science Foundation.

and Engineering. Prior to his NSF appointment, Suresh was dean of the engineering school and Vannevar Bush Professor of Engineering at MIT.

Besides his Fellowship at ACerS, Suresh is also a Fellow of The Minerals, Metals and Materials Society, ASM International, American Society of Mechanical Engineers, Indian Institute of Metals and the Materials Research Society of India. ■

Mueller joins EMSL as lab fellow



Mueller

ACerS member Karl Mueller, a leader in solid-state magnetic resonance research, has joined the Environmental Molecular Sciences Laboratory as a laboratory fellow.

In his new role, Mueller will establish a research program that uses novel nuclear magnetic resonance methods to address multidisciplinary research

objectives at Pacific Northwest National Laboratory.

As a scientific leader in the development and implementation of novel magnetic resonance methods, Mueller will engage the EMSL user community to foster innovative research. Before joining the staff, Mueller was an active EMSL user.

Mueller spent the past 17 years at Pennsylvania State University. At Penn State, Mueller oversaw research involving the development of solid-state NMR techniques using cutting-edge instrumentation as well as studies of oxide surface reactivity, subsurface

transport and environmental kinetics measurements and modeling.

"[Mueller] has an affinity and appreciation for what EMSL and its capabilities mean to research advancement and scientific breakthroughs and has been a potent voice as part of the EMSL user community," says Ray Teller, EMSL's associate director for scientific resources. "As a laboratory fellow, he will be an even more vital and influential resource in progressing EMSL's science and technology strategies."

Laboratory fellow is the highest rank awarded to scientists and engineers at PNNL. ■

ACerS past president Jantzen awarded Don Orth Award of Merit

ACerS past president and Fellow Carol Jantzen of Savannah River National Lab has been selected as the 2010 recipient of the Don Orth Award of Merit.



Jantzen

This award is the highest distinction at the Savannah River Site to recognize the ideals of technical excellence and leadership.

Jantzen is recognized throughout the Department of Energy and internationally for her expertise in high-level waste vitrification, the transformation of waste into a stable glass form for disposal. In particular, she is known for her contributions to the development of the Savannah River Site's Defense Waste Processing Facility. She is also recognized for the development of the geochemical-based process control model to prevent aluminosilicate scaling in the SRS evaporators.

Jantzen was the first woman president of ACerS. She is a recipient of the society's Distinguished Life Membership, Alfred Victor Bleining Award of Excellence, D.T. Rankin Award from the Nuclear and Environmental

Technology Division. She is also the winner of the Citizens for Nuclear Technology Awareness Distinguished Scientist Award, Waste Management Symposium's Wendell Weart Lifetime Achievement Award, SRS Career Achievement Award for Technical Achievement and honorary professorship at University of Aberdeen, Scotland.

The Don Orth Award is named for the internationally known nuclear chemist. Orth was often consulted on actinide chemistry, plutonium processing operation, criticality concerns and nuclear wastes issues. He served as consultant to nuclear facility licensing and review groups, and as a key player in major DOE program reviews and special investigations. ■

Corning's Mauro honored for glass research

ACerS member and Corning Inc. researcher John Mauro recently received international acclaim for his research on the relaxation behavior of glass. He was presented with the 2010 Woldemar A. Weyl International Glass Science Award, presented every three years to a young glass scientist by Pennsylvania State University and the International Commission on Glass.

Mauro picked up the prize at the XXII International Congress on Glass held in Salvador, Brazil, Sept. 22–25, 2010. At the conference, he presented a lecture entitled "Recent Advances in Liquid and Glassy Dynamics."

Corning also honored Mauro, along with ACerS members Douglas Allan and Marcel Potuzak, with the company's 2009 Outstanding Publication Award. Corning designated the trio's paper, "Nonequilibrium Viscosity of Glass," as the best technical paper published by company employees in 2009. Published in the *Journal of Physical Review B*, it addressed issues in glass



Fabiano Nicoletti, President, International Commission on Glass (left), John Mauro, and Carlo Pantano, Penn State University at the XXII International Congress on Glass.

relaxation studies.

"Corning offers the ideal environment for pursuing fundamental research in glass science, which at the same time can be applied for solving practical problems of industrial interest," says Mauro. ■

Goyal named *R&D Magazine* 'Innovator of the Year'

ACerS Fellow Amit Goyal of Oak Ridge National Lab was named Innovator of the Year by *R&D Magazine*. An ACerS member since 1998, Goyal's work is focused on high-temperature superconductivity.

R&D Magazine has singled out Goyal's work several times in recent years, including his contributions to five R&D 100 Award-winning projects. Just this past year Goyal received two awards, one for his work on "High-Performance, High- T_c Superconducting Wires Enabled via Self-Assembly of Nonsuperconducting Columnar

Defects" and one for "Flexible, Large-Area, Single Crystal-Like, Semiconductor Substrates."

According to ORNL, Goyal's technical contributions have been in the area of large-area, low-cost, high-performance "flexible electronic" devices, including superconductor-based and semiconductor-based devices, 3D self-assembly of nanodots of complex materials within another complex material for device applications and controlled synthesis of 1D and 3D nanoarrays for application.

Goyal's contributions to the field of high-temperature superconducting materials includes solutions to achieving single-crystal-like behavior in long lengths of superconducting material. The greatest impact has been achieving these solutions in cost-effective and large-scale manners, so as to make them viable in manufacturing and viable in the marketplace. Goyal has also patented solutions to create self-assembled nanoscale defects within superconductors to enhance their performance.

"It is a tremendous honor," Goyal told *R&D Magazine*. "The award represents an implicit responsibility of continuing to strive toward full commercialization of the innovations I have been involved with."

Goyal, who also serves as vice-chair of ACerS's Electronics Division, joined ORNL as a postdoctoral fellow in 1991 after completing his doctorate at the University of Rochester. He earned a bachelor's degree from the Indian Institute of Technology (Kharagpur) and received executive business training from Purdue University and the Sloan School of Management, Massachusetts Institute of Technology. ■



Goyal

Save
the date!

www.ceramics.org/cls2011

Ceramic Leadership Summit

August 1–3, 2011 • Baltimore, MD



CLS 2011 benefits:

- Materials company executives
- Senior researchers
- Senior academics
- Senior managers
- University administrators
- Government agencies
- ACerS leaders

Do you know a rising star?

Nominate a young professional from your organization to take part in the **Future Leaders Program** at CLS 2011. The program offers young professionals the opportunity to better understand their strengths & development areas.

Google invests in windpower ‘superhighway’

Internet giant Google recently announced it will be investing \$5 billion to build an undersea, wind energy transmission backbone along 350 miles of the Atlantic seaboard.

Google’s project would involve designing and building a connection system for offshore wind farms. The idea is that by connecting wind farms that lie along the Eastern Seaboard, the overall output would stabilize despite vastly different weather conditions along the 1,500 miles of coastal ocean.

“This system will act as a superhighway for clean energy,” says Rick Needham, Google’s green-business operations director.

The “Atlantic Wind Connection” will lie 15–20 miles off shore and run from New Jersey to Virginia. Google predicts the cable will be able to carry 6,000 megawatts of wind power and supply 1.9 million households.

The AWC backbone will be built around offshore power hubs that will collect the power from multiple wind farms and deliver it efficiently via subsea cables to the strongest, highest capacity parts of the land-based transmission system. This system will act as a superhighway for clean energy.

The AWC project is led by independent transmission company Trans-Elect and is financed by Google, Good Energies and Marubeni Corporation.

“We are investing 37.5 percent of the equity in [an] initial development stage, with the goal of obtaining all the necessary approvals to finance and begin constructing the line,” says Needham. “Although the development stage requires only a small part of the total estimated project budget, it represents a critical stage for the project.”

This isn’t Google’s first investment in wind energy technology. Back in May, the Internet search giant invested \$39 million in two North Dakota wind farms.

Charlie Hodges, a wind industry analyst at Bloomberg New Energy Finance,



(Credit: Mariusz Pazdron, Wikimedia Commons)

Google will be investing \$5 billion to build an undersea wind-energy transmission backbone along 350 miles of the Atlantic seaboard.

says, “The North American wind industry hasn’t had any players involved with the motivation and financial heft to really move this market forward. Google could play that role.”

Whether Google can be successful in projects that – at least at first glance – are remote from its core business, such as this wind project and its self-steering car project, remains to be

seen. Needham shrugs off these concerns. He is quoted in *Financial Times* as saying, “We believe in investing in projects that make good business sense and further the development of renewable energy. ... We’re willing to take calculated risks on early stage ideas and projects that can have dramatic impacts while offering attractive returns.”

Visit: www.googleblog.blogspot.com ■

Tesla unveils new battery pack

Tesla Motors, best known for its all-electric Roadster sports car, says its Model S sedan will be released soon, and the company recently unveiled the sedan’s battery pack.

Although the battery pack for Tesla’s Roadster is essentially a large box containing thousands of conventional lithium-ion battery cells, the Model S battery pack is flatter and nearly the width and length of the car. It lies beneath the floor of the car’s cabin and can be swapped out as needed.

Tesla plans to manufacture 20,000 Model S sedans. This jump in manufacturing is expected to offer about

500 new jobs.

“The Model S battery is perfectly flat,” says Peter Rawlinson, vice president and chief engineer for vehicle engineering. “We’re using the battery pack as a structural element of the car.”

Rawlinson explains that the battery position allows the sedan to have enhanced aerodynamic styling.

For the Roadster, Tesla strung together nearly 7,000 Li-ion laptop batteries into one battery pack. However, for the Model S, Panasonic and other Li-ion vendors are creating batteries specifically for an electric vehicle. Tesla has yet to choose a bat-

ceramics in the environment



A new flat battery pack will allow Tesla's upcoming Model S luxury sedan to run up to 300 miles on a charge.

tery vendor for the Model S.

Practically every company that makes a Li-ion battery has sent its cells to Tesla, which puts them through rigorous testing, with a focus on extending their life and safety.

Tesla has specified that the energy density of the Model S battery pack will exceed 135 watt-hours per kilogram. The sedan, which the company says will be capable of going from 0 to 60 miles per hour in 5.6 seconds, will come with a choice of three battery options, capable of ranges of 160, 230 or 300 miles.

Tesla estimates the base price for the entry-level Model S with a 160-mile range will be \$49,000 (after a \$7,500 federal tax credit).

Visit: www.teslamotors.com ■

Sandia research to forecast solar plant output

Sandia National Lab researchers are testing a new system that may ultimately provide a way for utility companies to predict and prepare for fluctuations in solar power output caused by changes in weather. The idea is that by observing cloud shape, size and movement, the system can monitor and predict how clouds will affect large-scale photovoltaic power plants and there by allow utility systems to respond appropriately.

The impact of clouds on small PV arrays are well documented, but there is little research on how large-scale arrays

interact and function under cloud cover. A small system can be completely covered by a cloud, which drastically reduces its power output, but what's less well understood is what happens when only part of a large system is covered by a moving cloud shadow, while the rest stays in sunlight.

Sandia researchers' work is currently focused at the 1.2-megawatt La Ola Solar Farm on the Hawaiian island of Lana'i.

"As solar power continues to develop and take up a larger percentage of grids nationwide, being able to forecast power production is going to become more and more critical," says Chris Lovvorn, director of alternative energy of Castle & Cooke Resorts, which owns 98 percent of the island. "Sandia's involvement and insight has been invaluable in our efforts to meet 100 percent of the island's energy needs with renewable resources."

Sandia engineers connected 24 small, nonintrusive sensors to the plant's PV panels and used a radio-frequency network to transmit data. The sensors took readings at one-second

intervals to provide researchers with unprecedented detail about cloud direction and coverage activity.

"These techniques will allow a developer to place a sensor network at a proposed site, make measurements for a period of time and use that to predict plant output variability," says Sandia researcher Josh Stein.

La Ola was commissioned in December 2008 by Castle & Cooke and SunPower Corp., a manufacturer of high-efficiency solar cells. The project uses SunPower's Tracker technology. Panels rotate on a single axis to follow the sun, which increases energy capture by up to 25 percent. Since February, Sandia Labs has held a cooperative research and development agreement with SunPower to conduct research on integrating large-scale PV systems into the grid. This CRADA is funded with about \$1 million of combined Department of Energy and SunPower funding. Sandia says it expects to achieve significant results that will be disseminated through joint publications over the next two years.

Visit: www.sandia.gov ■



Sandia researcher Josh Stein studies how clouds impact large-scale solar photovoltaic power plants.

Berkeley Lab nets stewardship for U.S.–China energy-efficient construction consortium

The DOE announced the details on the third of three United States–China Clean Energy Research Centers, a multiyear joint consortium on energy-efficient building technologies. The agency says that the Lawrence Berkeley National Lab will lead the effort and will receive \$12.5 million over the next five years.

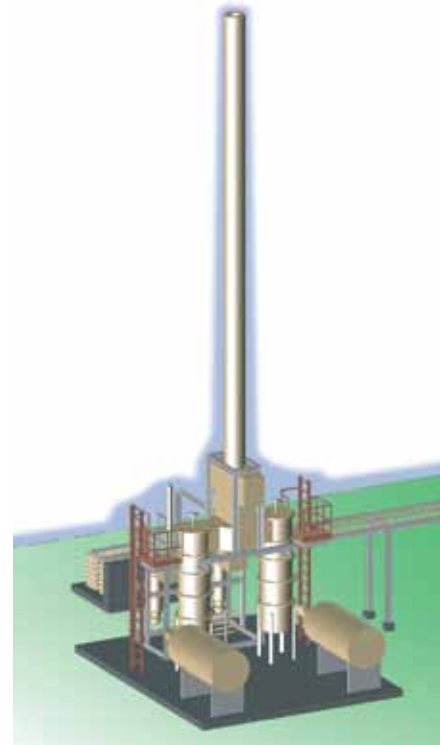
As with the first two CERCs that were announced early in September, this project will end up with a total of \$50 million in funding over five years (including \$12.5 from nongovernmental U.S. sources and \$25 million from China to support that nation's researchers).

Consortium members include Oak Ridge National Lab, MIT, University

of California-Davis, National Resources Defense Council, Energy Foundation, ICF International, National Association of State Energy Officials, Association of State Energy Research and Technology Transfer Institutions, Dow Chemical, Honeywell, General Electric, Saint-Gobain, Bentley, ClimateMaster and Pegasus Capital Advisors.

Assistant Secretary of Energy for Policy & International Affairs David Sandalow predicts the CERCs will “create new export opportunities for American companies, ensure the United States remains at the forefront of technology innovation, and help to reduce global carbon pollution.”

Visit: www.energy.gov/news ■



The Energy Research Center of the Netherlands is making significant advances with hydrogen separation membrane technology.

flux (or hydrogen yield per square meter of membrane) and the purity of the product. It says these indicators have remained steady through 500 hours of operation and more than 50 thermal cycles.

Besides operating at lower temperatures, ECN's membranes require low-cost starting materials and standard fabrication technologies. ECN says that it is pleased that, as the work shifted from the lab to field production, good results continued. It says it will continue with the long-term stability testing under field conditions to “demonstrate the membrane technology as a market-ready technology.” ■

Novel electrochemical strain microscopy developed to study Li-ion movement

Oak Ridge researchers have developed a new type of scanning probe microscopy called electrochemical strain microscopy that examines the movement of lithium ions through a battery's cathode material.



(Credit: DOE)

The DOE announced the third U.S.–China Clean Energy Research Center, led by Lawrence Berkeley National Lab, to further energy-efficient building technologies.

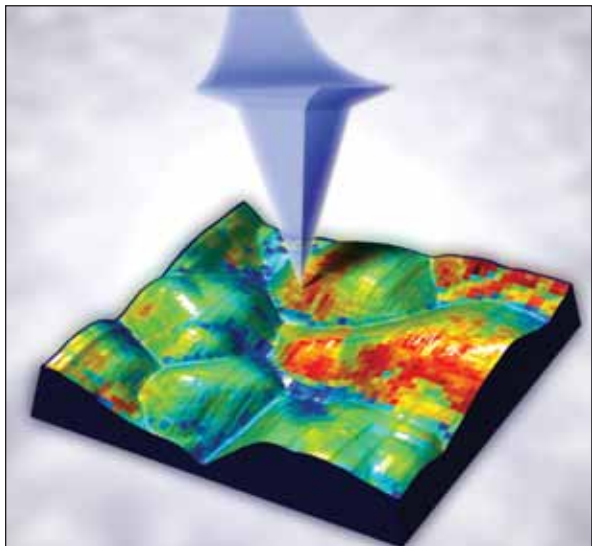
Dutch report advances with low-cost, low-temp Pd-film-on-ceramic hydrogen production membrane

The nonprofit Energy Research Center of the Netherlands reports that it is making significant advances with hydrogen separation membrane technology at an experimental plant in Italy. An ECN 0.4-square-meter Hysep 108 module composed of thin-film palladium layers on ceramic supports is being tested in partnership with Italy-based Tecnimont KT, at the company's Chieti test site. Tecnimont KT, a subsidiary of the larger Maire Tecnimont

S.p.A., is a process-engineering firm that specializes in applications for the chemical, petrochemical and refining industries.

ECN says the hydrogen plant employs a reformer-and-membrane-module configuration that integrates membrane separation and reaction modules. ECN says that data so far confirms the feasibility of running these modules at a lower operating temperature. Instead of working in the costlier 850°C–900°C range, the RMM runs at less than 650°C, yielding 20 normal cubic meters per hour.

ECN says that two performance indicators are being closely monitored: the



(Credit: ORNL)

A new electrochemical strain microscopy technique developed at Oak Ridge National Laboratory can map Li-ion flow through a battery's cathode material. This 1 micrometer x 1 micrometer composite image demonstrates how regions on a cathode surface display varying electrochemical behaviors when probed with ESM.

Results were achieved by applying voltage with an ESM probe to the surface of the battery's layered cathode. By measuring the corresponding electrochemical strain, scientists are able to visualize how lithium ions flowed through the material.

"These are the first measurements, to our knowledge, of Li-ion flow at this spatial resolution," says research team member Sergei Kalinin.

Kalinin explains that ESM is a scanning probe microscopy-based method. He says it maps "ionic currents in solid-state ionics based on the measurement of dynamic strains induced by coupling between ionic concentration and molar volume."

Kalinin suggests one way to conceive of the differences that will now exist among microscopy methods is that scanning tunneling microscopy probes electronic currents; atomic force microscopy probes forces; and ESM is scanning probe microscopy that specifically probes ionic currents for time and voltage spectroscopies.

The research group believes the method will improve measurements by many orders of magnitude, because mea-

suring atomically small strains is much easier than atomically small currents. "The simple estimates suggest that we can probe ionic transport and electrochemical processes in volumes 10^6 – 10^8 times smaller than conventional electrochemical methods," says Kalinin, "and, hence, can be extended to probing ionic transport and electrochemical activity down to the level of single defect."

The researchers hope to extend Li-ion battery performance by lending engineers a finely tuned knowledge of battery components and dynamics.

The team's ESM imaging can display features such as individual grains, grain clusters and defects within the cathode material. The high-resolution mapping showed that the Li-ion flow can concentrate along grain boundaries, which could lead to cracking and battery failure. Researchers say these types of nanoscale phenomena need to be examined and correlated to overall battery functionality.

Although the research focused on Li-ion batteries, the team expects that its technique could be used to measure other electrochemical solid-state systems, including other battery types, fuel cells and similar electronic devices that use nanoscale ionic motion for information storage.

Visit: www.ornl.gov ■

DOE announces \$57M in new SBIR/STTR programs, \$9.6M for 'transformational energy'

The DOE announced nearly \$67 million in new grants, including \$57 million for small-business-oriented

efforts and nearly \$10 million for ARPA-E research projects.

The DOE is funding 33 Phase III "Xlerator" awards to projects "led by small businesses in partnership with universities, national labs and large businesses." The agency says these awards – ranging from \$500,000 to \$3 million – include funding for renewable energy resources, advanced vehicle technologies, industrial and building energy efficiency, modernized electricity grid, cleaner fossil fuels and next generation nuclear power technologies.

All of the projects selected had made it through Phase I and II of DOE's SBIR or STTR initiatives. This new round of funding is meant to help these projects continue to lower costs and eliminate scale-up hurdles, with the ultimate purpose being to deliver marketable products. With this announcement, it appears the DOE essentially doubled the \$30 million Xlerator opportunity it unveiled in July.

The ARPA-E grants are going to six R&D projects related to building improved air-conditioner efficiency, next-generation permanent magnets, novel wind turbines, novel carbon-capture strategies, lower-cost tracking systems for concentrated solar power installations and improved molten-salt energy storage systems. Most of these projects involve significant ceramic, glass and composite materials.

Visit: www.science.energy.gov/sbir/PhaseIII.html ■



(Credit: Makani)

Makani's Airborne Wind Turbine project is being funded by a new ARPA-E grant.

Silicon nanomesh demonstrated as thermal conductivity barrier for improving thermoelectrics

Thermoelectric materials have great promise – if they can be made relatively simply and with inexpensive, safe materials. Just imagine the endless list of applications where waste heat energy could be converted to electrical energy. One problem, however, is that when the thermal conductivity of a material increases, its electrical conductivity tends to decrease. This lack of independence becomes a major problem when scientists and engineers are trying to develop more-efficient thermoelectric devices.

Now, Caltech researchers say they have devised a way to create a special silicon nanoscale mesh that can be used to slash thermal conductivity without affecting the flow of electrons. The Caltech team makes the barrier from a 22-nanometer-thick sheet of silicon, which is then given a highly regular array of 11- or 16-nanometer-wide holes spaced 34 nanometers apart.

The nanomesh changes the way phonons (heat travels in material via phonons) behave, slowing them down.

Although the electrical conductivity of the nanomesh remained comparable with regular (bulk) silicon, the researchers say thermal conductivity was reduced to near its theoretical lower limit.

The researchers say they are setting their sights even higher. “Now that we’ve showed that we can slow the phonons down,” says James Heath, “who’s to say we can’t slow them down a lot more?” Heath is a professor of chemistry and leader of a research group at Caltech.

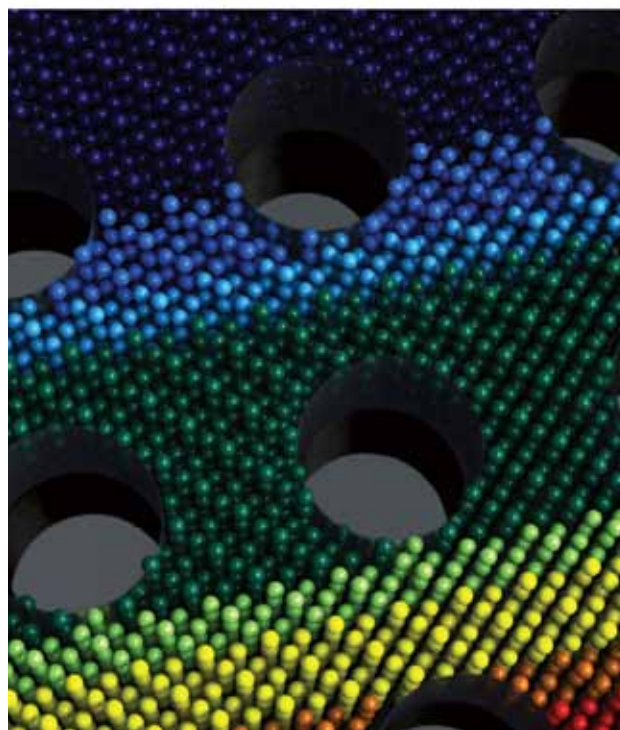
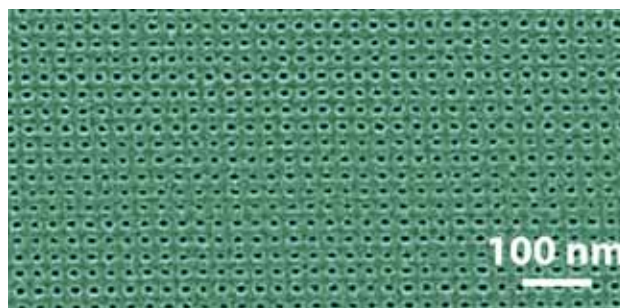
Slobodan Mitrovic, a postdoctoral chemistry investigator at Caltech, explains, “The nanomesh no longer behaves in ways typical of silicon.” Mitrovic and Heath are coauthors of a paper on the topic that appears in *Nature Nanotechnology* (doi: 10.1038/nmat1849).

The key to their discovery exploits the fact that thermal conductivity and electrical conductivity behave independently at scales associated with phonons. Researchers change the phonon band structure of a semiconductor thin film via the design of the grid of holes in the silicon film, which are comparable with, or shorter than, the phonon mean free path.

Mitrovic says the basic idea behind such structures is they provide a coherent mechanism for reducing thermal conductivity that doesn’t depend on interface scattering, because they are made of a single-crystal continuous material. He says that bulklike electrical conductivity of the silicon is preserved by the nanomesh and the development is a step toward a coherent mechanism for lowering thermal conductivity.

Heath’s group had previously demonstrated that it could create independence between thermal and electrical conductivity. However, those methods used silicon nanowires that exploit interface scattering of phonons to separately decrease thermal conductivity.

According to the authors, the benefit of the nanomesh structure is that it exhibits a substantially lower thermal conductivity than an equivalently pre-



Top: A scanning electron microscopy image shows the grid of tiny holes in the nanomesh material. **Bottom:** In this drawing, each sphere represents a silicon atom in the nanomesh. The color bands show the temperature differences on the material, with red being hotter and blue being cooler.

pared array of silicon nanowires, even though this array has a significantly higher surface-to-volume ratio. ■

Paper-grown ZnO nanorods, nanoneedles

Researchers in Taiwan claim to show, for the first time, that they can directly grow vertically aligned, highly

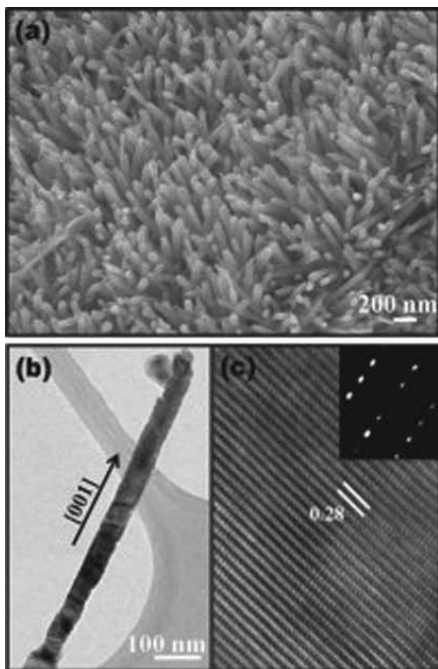
crystalline and defect-free single-crystalline zinc oxide nanorods and nanoneedles on paper.

Researchers from the Department of Materials Science and Engineering at National Tsing Hua University have fabricated prototype hybrid junction diodes and ultraviolet photodetectors based on ZnO nanorod arrays on paper.

The team synthesized aligned ZnO nanowires on paper that predominantly contained cellulose and calcium carbonate. These surface modifications provide a conducting platform and also reduce surface roughness and damage occurring during synthesis, and they greatly enhance the alignment and uniformity of ZnO nanowires on the paper substrate.

According to an article on Nanowerk.com:

In order to demonstrate the potential for organic/inorganic hybrid junction devices on paper substrates, the team fabricated p-n junction diodes with an average active junction of 1 centimeter × 1



(a) FESEM image of aligned ZnO nanorods. (b) TEM image of a single nanorod. (c) HRTEM image taken from the edge of the ZnO nanorod. Inset: corresponding SAED pattern.

centimeter using ZnO nanowires with 90-nanometer diameter and 1.5-micrometer length, grown on a 50-nanometer gold-coated paper substrate.

The researchers point out that stable electrical performance of hybrid devices at various bending or twisting positions is a critical challenge for flexible substrates. For this reason, they measured the electrical/mechanical fatigue properties of the diode at various bending positions across the junction area.

They found that there is only negligible difference in the turn-on

voltage of the devices while the forward current at high voltage is slightly decreased with increase of bending angle. Repetitive bending of the diode affected the performance only marginally.

“The intrinsically rough nature of paper’s surface, its insulating properties, damage and instability during the synthesis process are sizable inconveniences in realizing potential nanoelectronic devices on paper substrates,” explains Lih-Juann Chen, who led the research. “In order to overcome these difficulties, we have shown that the paper surface can be modified to different platforms,

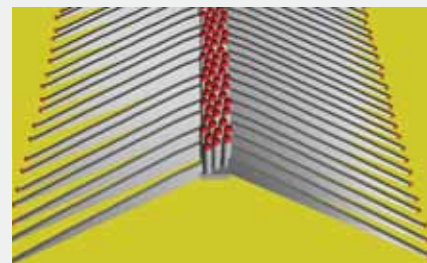
Nano LEDs accidentally produced during NIST nanowire research

Chemists at NIST who were perfecting new methods of creating nanowires report that they have stumbled upon a way to create light-emitting nanowires that operate similar to very tiny LEDs.

The chemists, Babak Nikoobakht and Andrew Herzing, had already found a way to grow ZnO nanowires horizontally across a substrate that was seeded with gold nanoparticles. These nanoparticles serve as growth sites and media for the crystallization of ZnO molecules: As the ZnO nanocrystal grows, it pushes the gold nanoparticle along the surface of the substrate (“surface-directed” fabrication).

While working with a gallium nitride substrate, Nikoobakht and Herzing unexpectedly found that when they increased the thickness of the gold nanoparticle from less than 8 nanometers to approximately 20 nanometers, the nanowires sprouted a secondary structure. Visually, the structure is said to look similar to a dorsal fin. Technically, it is a nanowall that forms where the ZnO portion is electron-rich and the gallium nitride portion is electron-poor.

At this location, the nanowall becomes a p-n heterojunction where electrons can flow across it when voltage is applied to the nanowire-



A single row of nano-wires (cylinders with red tops) with fin-shaped nanowalls extending outward.

nano-wall combination. This flow of electrons produces light, which led the researchers to dub it a “nano LED.”

According to NIST, “Unlike previous techniques for producing heterojunctions, the NIST surface-directed fabrication method makes it easy to locate individual heterojunctions on the surface. This feature is especially useful when a large number of heterojunctions must be grouped in an array so that they can be electrically charged as a light-emitting unit.”

The duo says the simple design of the nanowires means that it is scalable to virtually any platform size. For example, the nano LEDs, with further improvements, could be used as light sources and detectors in photonic devices or lab-on-a-chip.

The research was published in *ACS Nano* (doi: 10.1021/nn1019972). ■

such as conducting and semiconducting surfaces, and can be protected from the external environment by being coated with a protective polymer layer.”

“We anticipate versatile applications for these zinc oxide nanostructures on paper in flexible, portable electronic gadgets and display devices as well as in biomedical applications – these are under investigation,” says Chen. “We foresee a productive future for the direct growth of one-dimensional nanostructures on paper substrates, paving the way to low-cost, high-performance devices beyond the range of conventional technology. Innovative concepts and strategies are required to engineer materials and devices on such an exceptionally flexible platform.”

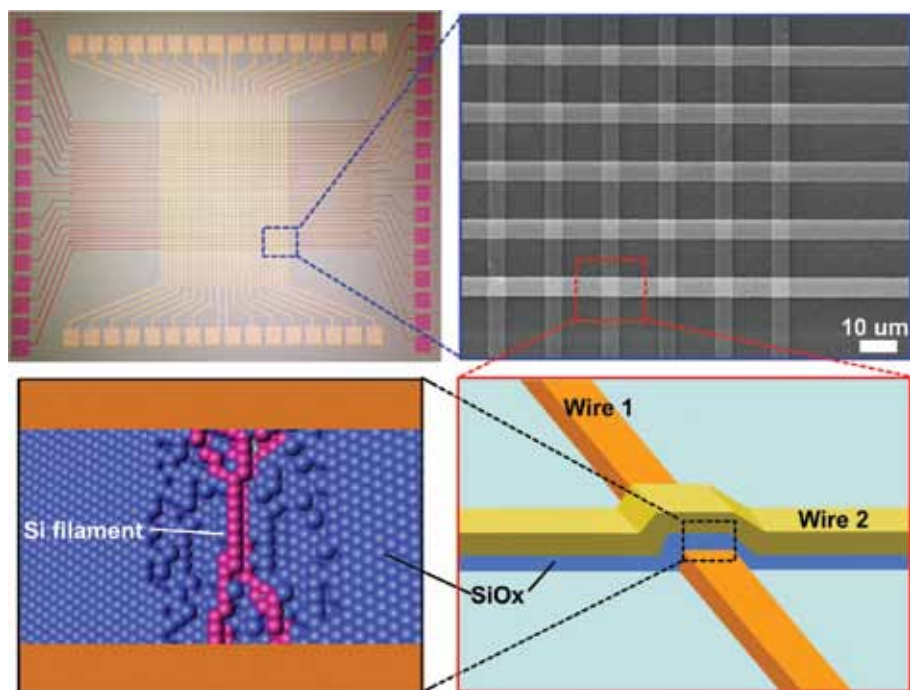
The findings were published in a recent issue of *Advanced Materials*. (doi: 10.1002/adma.201001289) ■

Reversible silicon/silicon-oxide nanowire switch developed for 3D storage

Rice University scientists announced that they have created the first two-terminal memory chips based on silicon oxide in a way that they say should be easily adaptable to nanoelectronic manufacturing techniques. The chips, they believe, will help to extend the limits of miniaturization subject to Moore’s law.

Their technique creates nanocrystal wires that are as small as 5 nanometers wide, far smaller than circuitry in even the most advanced computers and electronic devices. The Rice group believes its nanocrystal conductors could lead to massive, robust 3D storage.

“The beauty of it is its simplicity,” says James Tour, Rice’s T.T. and W.F. Chao chair in chemistry as well as a professor of mechanical engineering and materials science, and of computer science. That, he says, will be key to the technology’s scalability. Silicon oxide switches or memory locations require only two terminals, not three (as in flash memory), because the phys-



A 5-nanometer silicon nanowire can be repeatedly broken and reconnected by applying a pulse of varying voltage through the silicon oxide, creating a two-terminal resistive switch. A chip with 1,000 of these silicon oxide/silicon nanowire memory elements has been assembled as a proof-of-concept.

ical process doesn’t require the device to hold a charge.

A Rice press release reported that “[Graduate student] Jun Yao sandwiched a layer of silicon oxide, an insulator, between semiconducting sheets of polycrystalline silicon that served as the top and bottom electrodes.”

The release continued, “Applying a charge to the electrodes created a conductive pathway by stripping oxygen atoms from the silicon oxide and forming a chain of nanosized silicon crystals. Once formed, the chain can be repeatedly broken and reconnected by applying a pulse of varying voltage.”

Layers of silicon-oxide memory can be stacked in 3D arrays. “I’ve been told by industry that if you’re not in the 3D memory business in four years, you’re not going to be in the memory business. This is perfectly suited for that,” Tour says.

Silicon oxide memories are compatible with conventional transistor-manufacturing technology, says Tour,

who recently attended a workshop by the National Science Foundation and IBM on breaking the barriers to Moore’s law, which states the number of devices on a circuit doubles every 18 to 24 months.

PrivaTran, an Austin, Texas, tech design company, is already bench testing a silicon oxide chip with 1,000 memory elements built in collaboration with the Tour lab.

The findings were published in *Nano Letters* (doi:10.1021/nl102255r). ■

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My year in the U.S. Senate

As the 2009–2010 Materials Societies Congressional Fellow, I spent the past year working on U.S. energy and technology policy on the staff of Ohio Senator Sherrod Brown in Washington, D.C. And, what a year it was! I had the opportunity to advise the Senator on developing legislation, drafted briefings and wrote speeches, and met many interesting people. I even had the opportunity to meet many Washington officials, such as Energy Secretary Steven Chu, Undersecretary for Science Steven Koonin, plus many Senators that may be familiar to ACerS members, such as Jeff Bingaman from New Mexico and Bob Corker from Tennessee. I also met Ambassador Richard Benedick, who negotiated the Montreal Protocol that regulated ozone depleting gases, CEOs from companies large and small, and many constituents from across Ohio.

Reflecting back on my experience, it far exceeded my expectations in what I learned about the Senate as an institution and the effective communicating of science. There is no substitute for being on the other side of the door as decisions are being made, and in that way I was able to learn, hands-on, about the process under which law is formulated.

In particular, I learned a great deal about a range of issues important to the ACerS community, such as the debates on energy, the future of the space program and the Science, Technology, Engineering, and Mathematics education program. By contributing my unique perspective developed through my engineering training, I learned much about communicating technical issues to policy makers.

Perhaps the most pleasantly surpris-

ing part of my experience was just how many scientifically trained staffers there are in Congress and how many members are scientifically savvy. The thing to keep in mind is that for a member or a staff, to survive the rigors of Capitol Hill one must be a brilliant, well-rounded generalist (in contrast with scientific and engineering research, where focus and specialty has greater emphasis). This insight allowed me to communicate scientific concepts more efficiently and effectively.

With all the issues in society that the members from ACerS are addressing, it is a necessity to get involved in the policy-making process. Send a letter to your members of Congress. Better yet, stop by the local offices of your Senators and representatives and meet with them or their staffs. They need and want to hear from you. Scientists and engineers are routinely ranked at the top of admired professions, and with the increasing complexity of the modern world, policy makers need our thoughts and input more than ever on the issues of the day.

Recently, I was at a NSF fellowship program conference talking about my experience as a graduate student and how that experience translated to the public policy realm. At the end of my talk, I asked the audience, made up of about 200 current graduate students from across the country, how many of them had ever met, called, written



Edward Herderick, the 2010 Materials Societies Congressional Fellow, spent the past year working on U.S. energy and technology policy on the staff of Ohio Senator Sherrod Brown in Washington, D.C.

an email or letter to any of their members of Congress. About a third of the audience raised their hand. While this may be a reasonably high number compared with the general population, I think that we should focus on making sure that each and every one of those students tells their members of Congress about the great work they're doing. It is only through that type of involvement in the policy-making process that we in the ACerS community can truly maximize our effectiveness at reaching the goal of advancing society through materials research.

Herderick received his Ph.D. in materials science and engineering from Ohio State University in 2009. He is now an applications engineer at the Edison Welding Institute in Columbus, Ohio, applying his background in ceramic engineering to welding and joining technologies.

Sintering in a flash? Researchers show it's possible to do it in seconds with nanograin YSZ, heat and dc electric field

A new article published in the *Journal of the American Ceramic Society* (doi: 10.1111/j.15512916.2010.04089.x) reports that green-density yttrium-stabilized zirconia can be sintered to full density in only a few seconds at 850°C, when subjected to a dc electric field above a critical threshold. For a sense of what a radical difference this is, traditional sintering of YSZ would require several hours at 1450°C.

It is not clear to what extent this phenomenon extends to other materials, but it is interesting to ponder the savings in energy costs and production times that might be possible.

The authors, Marco Cologna, Borianna Rashkova and Rishi Raj, acknowledge they now are testing other materials and hope to report on this soon. But, in the meantime, they say their work is starting to provide insights on how other advanced sintering methods, such as spark plasma and microwave-assisted techniques, are cutting sintering costs and time.

The trio's technique was fairly straightforward. They made dog-biscuit-shaped samples from 3 mol percent nanograin YSZ. They then sintered samples in a vertical tubular furnace, applying a constant dc voltage, varying temperature and voltage. (See Figure 2.)

In the early stages of their tests, they encountered an exciting phenomenon that has recently been reported: accelerated sintering speeds at lower temperatures, dubbed field-assisted sintering or "FAST." (In fact, Raj, Di Yang and Hans Conrad had recently published another paper in *JACerS* about how low (20 volts per centimeter) dc electric fields could speed sintering and slow grain growth, noting, "It has not escaped our attention that these small electric fields, which consume very little power, can lead to huge savings in energy by lowering the processing temperature of ceramics.")

Then they took the tests a step further and started to increase the electric field. As the voltage increased, sintering onset temperatures dropped in a

fairly expected manner.

However, when they conducted a test at 850°C and upped the voltage to 120 volts per centimeter something very unexpected happened: Nearly instantaneously, the 3YSZ sample was completely sintered.

They described this phenomenon as "flash" sintering. The rates of sintering they encountered at the point where the electric field triggers this cascade effect is three orders of magnitude faster than FAST sintering.

Initially, they thought that the flash sintering events were the result of even smaller grain-growth rates, but SEM and TEM measurements showed that grains in the flash-sintered samples were approximately the same size as those in FAST-sintered samples. Certainly not enough difference was apparent to explain the speed of flash sintering.

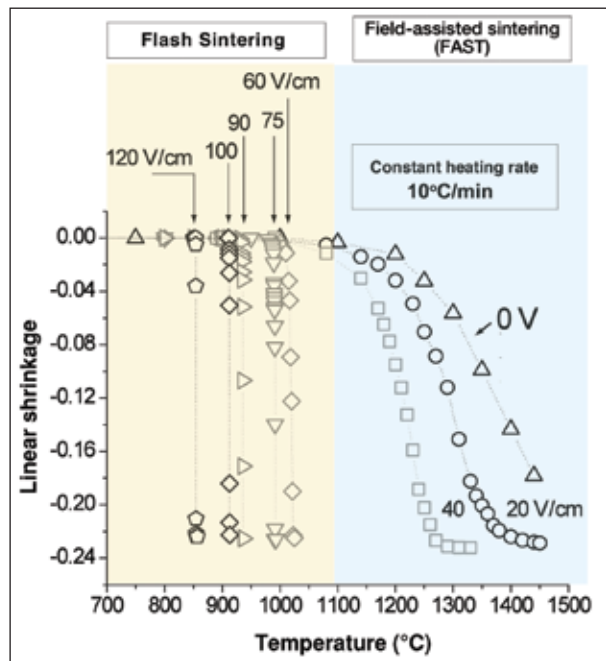


Figure 1 Dc electric fields enhance the rate of sintering in yttria-stabilized zirconia.

Raj says that they are uncertain about what is occurring. He said they suspect it may have to do with enhanced kinetics and that the threshold voltage triggers a rapid increase of temperatures at the grain boundaries, but said that several other explanations are possible.

Raj and the other authors describe

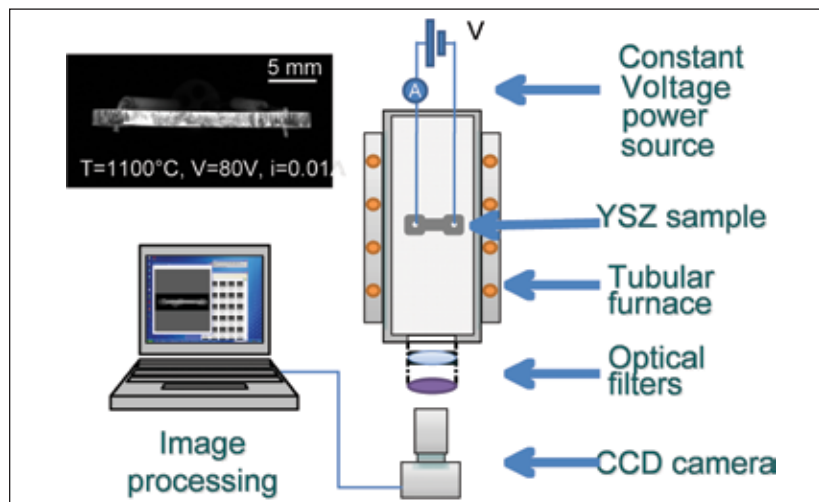


Figure 2 Researchers made dog-biscuit-shaped samples from 3 mol percent nanograin YSZ. They then sintered samples in a vertical tubular furnace, applying a constant dc voltage, varying temperature and voltage.

the findings as a “huge leap” but many questions remain. “About all we can say at this point for certain [is] that it is a new physics process,” Raj says. “It may not be a diffusion process. It may not even be sintering. But I expect some new science may come out of it.”

Raj also says that they are only beginning to test to what extent other materials can be flash sintered. “We are trying to find out how general this phenomenon is. We have flash sintered AlO_2 , and are starting to play with other oxides, doped and undoped zirconia, and some spinels. We think that flash sintering of silicon carbide may also be possible.”

If this pans out, Raj believes that

flash sintering could greatly simplify manufacturing processes. Besides reduced energy and capital costs, higher productivity and extended tool life, another advantage of short sintering times is that undesirable reactions between zirconia and other components might be avoided.

Raj warns, however that the flash techniques would pose a new paradigm and problems for ceramics manufacturing. “Quick implementation is most likely if the science of this new sintering process is integrated into the design and tooling of manufacturing processes, from the ground up,” Raj says. “The power surge associated with flash sintering requires special consideration.

For example, how will the current be supplied to the ceramic and how the transient heat will be dissipated? Manufacturers will also want to know if different tool designs and materials are needed, and if noncontacting electrodes can create, for instance, a plasma to provide the necessary current flow.”

Raj acknowledges that this will take development and investment of time and money, but predicts the payback will be considerable. “The question is how long it will be before these new methods are developed and implemented. If history is a guide it would take 10 to 20 years,” he says.

Visit: www.onlinelibrary.wiley.com ■

Graphene prodded to spin at 60M rpm rate

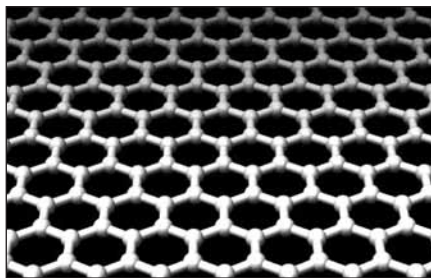
Scientists at the University of Maryland at College Park have managed to clock a floating piece of graphene at an astounding rate of 60 million rotations per minute, far faster than any other macroscopic object yet measured. Scientists believe this is only a fraction of its possible top speed, given the strength of the material.

To set the spinning speed record, scientist Bruce Kane took charged few-layer flakes of graphene only a micrometer wide, and sprayed them into a vacuum chamber, where they were trapped in midair by electric fields.

Kane then set them spinning using a light beam that is circularly polarized, meaning it passes its angular momentum to objects in its path. As a result, the flakes started spinning at their high rpm rate.

It is because of graphene’s amazing strength that the flakes are not pulled apart by the much higher spinning rate, Kane says.

The graphene flakes are only spinning at a thousandth of their theoretical maximum rate. Changgu Lee at the Sungkyunkwan University in Suwon, South Korea, who previously tested graphene’s strength, told *New Scientist*, “When spinning graphene at superhigh



Graphene flakes were recorded spinning at 60 million rotations per minute, faster than any other macroscopic object.

speed, it will be stretched like pizza dough, which will enable scientists to observe some interesting physics.”

In regard to this “interesting physics,” the UM groups think it will uncover new mechanical and electronic properties of graphene, plus suggest new approaches to graphene crystal growth, modification and manipulation, especially when the graphene is not attached to any supporting substrate.

Visit: www.nanocenter.umd.edu ■

KNBT promising as lead-free substitute for PZT in piezo applications

Materials engineers at the University of Leeds are investigating potassium sodium bismuth titanate as a lead-free ceramic piezoelectric material that might substitute for lead-containing materials, such as lead zirconium titanate.

They say KNBT shows many of the necessary electrical and chemical properties of an adequate replacement for PZT. Further, they say it is lightweight and usable at room temperature.

Tim Comyn, lead investigator on the project, says, “These results are very encouraging. Although harmless when in use, at the end of their lifetime these PZT gadgets have to be carefully disposed of because of their lead content and, as a consequence, there is significant interest in developing lead-free ceramics.”

According to a press release from the university, the researchers had great success using the U.K.’s Diamond Light Source synchrotron to investigate the structure and properties of lead-free piezoelectric ceramics. “With the ‘Extreme Conditions’ beamline at Diamond we were able to probe the interior of the [KNBT] to learn more about its piezoelectric properties. We could see the changes in crystal structure actually happening while we applied the electric field,” says Comyn.

While acknowledging that PZT is still the best material for the job at the moment, Adam Royles, a Ph.D. student on the project, has high hopes for KNBT. “This could make it an ideal choice for many applications,” he says.

Their research has been published this month in *Applied Physics Letters*.

Visit: www.leeds.ac.uk ■

Journal of the American Ceramic Society preview

All ACerS members are provided free *online* access to the *Journal of the American Ceramic Society* (searchable to 1918). Go to www.ceramics.org, enter your username and password and then go to the “Publications and Resources” menu. *Print* subscriptions to this journal (not free to members) are also sold online by Wiley–Blackwell Publishing, www.wiley.com.

New papers are posted to the “**Online Early**” page as soon as they are ready for publication, even before the issue is printed. Below are samples of what’s coming.

Strontium- and Manganese-Doped Lanthanum Gallate as a Potential Anode Material for Intermediate-Temperature Solid Oxide Fuel Cells

Xihui Dong, Paul Gardner, Thomas L. Reitz, Kevin Huang and Fanglin Chen

This U.S.-based research team used glycine nitrate combustion to synthesize pure, single-cubic, perovskite-phase strontium- and manganese-doped LaGaO_3 . The team reports that, when it used LSGMn as an anode in an all-perovskite cell, the cell achieved a peak power density of 460 milliwatts per square centimeter and constant cell voltage of 0.7 volt at 800°C using wet hydrogen gas as fuel and ambient air as oxidant. The team also reports that the LSGMn anode exhibited reasonable sulfur tolerance.

Formation, Structure and Properties of Freeze-Cast Kaolinite–Silica Nanocomposites

Wenle Li, Kathy Lu and John Y. Walz

These Virginia Polytechnic researchers studied the effects of kaolinite content and freezing rate on the microstructure, surface area and flexural strength of freeze-cast kaolinite–silica nanoparticle composites. They report that the equibiaxial flexural strength of the composites is substantially higher than freeze-cast kaolinite or freeze-cast silica, probably because, during gel formation, the silica nanoparticles strongly adsorb to the much larger kaolinite platelets.

Nanograin Composite Model Studies of Nanocrystalline Gadolinia-Doped Ceria

Ted C. Yeh, Nicola H. Perry and Thomas O. Mason

This research team from Northwestern University used alternating-current impedance spectroscopy and the

nanograin composite model to study the electric properties of nanocrystalline gadolinia-doped ceria. The team reports that, despite modest increases in grain-boundary conductivity at the nanoscale, the total conductivity exhibits a monotonic decrease with decrease in grain size. It also reports an unusual “up-and-down” behavior in grain-boundary conductivity and effective grain-boundary width versus grain size.

Sol–Gel Preparation, Characterization, and Photocatalytic Activity of Macroporous TiO_2 Thin Films

Jianxi Yao, Yiming Bai, Noufu Chen, Masahide Takahashi and Toshinobu Yoko

This international team of researchers used the sol–gel method without surfactant or colloidal template to prepare macroporous TiO_2 films. The TiO_2 films deposited from the precursor solutions contained photomonomer and were irradiated by ultraviolet light, which induced the monomer to polymerize. The team reports that these films exhibit much higher photocatalytic activity for the photodecomposition of methylene blue dye than do films prepared without monomer polymerization.

Fabrication of Dense β -SiAlON Ceramics with ZrO_2 Additions Via a Rapid Reaction-Bonding and Postsintering Route

Hideki Hyuga, Naoki Kondo and Hideki Kita

This Japanese research team fabricated reaction-bonded and postsintered β -SiAlON ceramics using rapid nitridation with monoclinic- ZrO_2 added to the starting powder. The team reports that the β -SiAlON thus fabricated had microstructure and mechanical properties comparable with those fabricated by conventional reaction bonding and postsintering.

Sol–Gel Combustion-Derived CoCuMnO_x Spinel as Pigment for Spectrally Selective Paints

Qing-Fen Geng, Xin Zhao, Xiang-Hu Gao and Gang Liu

These Chinese researchers used sol–gel combustion synthesis to prepare spinel CoCuMnO_x powders that had a deep-black color. They used the powders as a solar-energy-absorbing additive for a spectrally selective paint coating. The researchers report that the coating has ideal optical properties and excellent long-term stability, which might make it an alternative to present materials on the market.

MS&T'10 Review

Society inducts new Distinguished Life Members, Fellows and officers; Roy remembered

Measured by attendance at the MS&T'10 conference in October in Houston, Texas, interest in materials science and related industries continues unabated. And, with the conference as a backdrop, ACerS successfully held its 112th Annual Meeting, banquet and honorary lectures.

"Despite economic conditions, attendance at MS&T'10 was on par with 2009," says Mark Mecklenborg, the Society's director of technical publications and meetings. "The industry exhibition actually grew and we added the participation of NACE International as a cosponsoring society, so the opportunities to network and share research and business information were better than ever."

Despite the continued strong congregation at MS&T'10, there was one notable absence. The recent death of Rustum Roy, a luminary in ceramics and other material sciences, was marked at several points during

the week including a special reception prior to the Frontiers of Science and Society lecture, an event Roy had sponsored each year. In honor of Roy, Arun Seraphin,



As part of the Society's annual meeting activities, volunteer leaders met to continue discussion of strategic improvements to ACerS.

a defense programs advisor for the White House's Office of Science and Technology Policy, delivered a lively



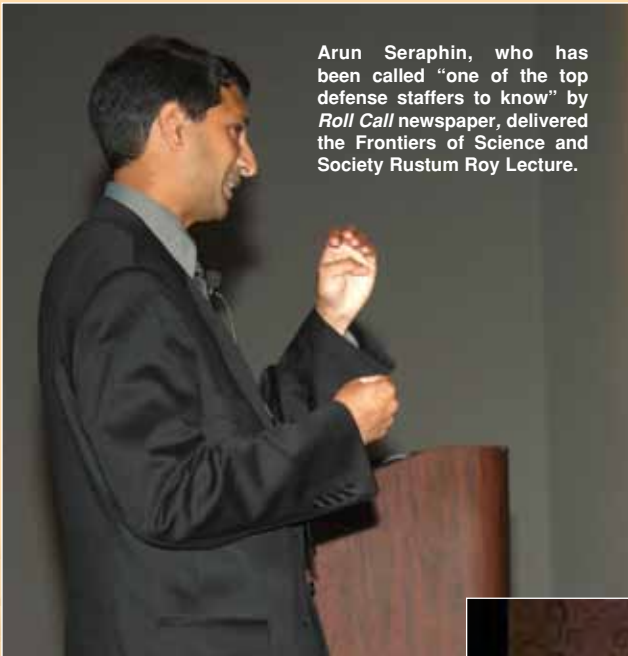
The new Career Pavilion, above, in the Exhibition hall helped company recruiters and job seekers connect.

lecture regarding the status and future challenges to the United State's system of research, development and manufacturing.

Mecklenborg said that MS&T'10 included attendees from more than 70 countries and around 1,700 oral presentations and posters (800 on ceramic materials).



Class of 2010 Fellows: From left, Yanchun Zhou, Lance L. Snead, Makio Naito, Pavol Šajgalik, Hai-Doo Kim, Murli H. Manghnani, Mohamed N. Rahaman, Dongming Zhu, ACerS Past President Ed Fuller, Quanxi Jia, Bruce Aitken, Vikram Jayaram, Mario Affatigato, Junichi Hojo, Paolo Colombo, Elizabeth Dickey, Sanjay Sampath and ACerS President Marina Pascucci. (Not pictured are Fellows Alan Atkinson, Dunbar P. Birnie III and Ali Sayir.)



Arun Seraphin, who has been called "one of the top defense staffers to know" by *Roll Call* newspaper, delivered the Frontiers of Science and Society Rustum Roy Lecture.



Friends and colleagues frequently crossed paths in the main corridor of the Houston Convention Center.

There were three other outstanding ACerS-sponsored lectures, plus presentations by representatives from Corning and GE Healthcare (each company won one of the Society's Corporate Technology Achievement Awards).

The ACerS annual banquet was again a gala affair that provided a spotlight for saluting the Society's new Distinguished Life Members (L. David Pye and Louis J. Trostel Jr.), Fellows and division and class award winners.

Besides hundreds of technical presentations, MS&T featured a plenary session focused on "Energy, Climate and Global Security," with presentations by Terry Michalske (Sandia National Lab), Robert T. McGrath (Ohio State University) and Diran Apelian (Worcester Polytechnic



The annual banquet allowed ACerS leaders and award winners, such as (from left) Gary Messing, Jay Singh, Bill Lee and Paul Becher, to exchange information, discuss projects and renew friendships.

Institute).

As in 2009, the Exhibition featured an expanded poster session, plus a new Career Pavilion

was introduced that provided an opportunity for materials-oriented companies to offer information about professional opportunities in their firms. ■



Competitors in the Ceramographic contest showed off their graphic flare, and some poster session participants (right) found new ways to present their findings.



MS&T'10

Playing rocket scientist for a day: MS&T

By David Shahin, Claire Weiss, Jaime George and Eric Patterson

A number of fun and educational programs awaited the many ceramists-in-training who flocked to Houston, Texas, in mid-October for the MS&T 2010 conference, coordinated by members of the ACerS President's Council of Student Advisors.

Students were allowed to play rocket scientist for an afternoon on the student tour of NASA's Johnson Space Center. About 30 students got an inside look at the space center's materials research and testing labs, where NASA researchers discussed some of



PCSA delegates (from left to right) top: Eric Patterson (Oregon State University), David Shahin (Missouri University of Science and Technology), Cory Bomberger (Pennsylvania State University); bottom: Victoria Knox (Alfred University), Claire Weiss (University of Connecticut), Chris Dosch (University of Florida; GE Global Research), Jaime George (Missouri S&T), Erica Marden (Pennsylvania State University) and Dan Buck (University of Washington).

their current projects. Students were also treated to a look at mission control for the International Space Station, featuring live camera feeds of astronauts on the ISS as well as of the Earth from the station. At the end of the tour, students toured the vehicle mock-up facility where mock-ups of the space shuttle, space station modules and vehicles are kept and used for astronaut training.

Students also found several symposium sessions directed at the topics of professional development and university outreach. The student career development symposium session featured a number of speakers who covered the

important professional questions that invariably cross every student's mind. Topics included:

- Planning for and applying to graduate school.
- How to successfully apply for jobs.
- What to expect as a young engineer, and how to advance one's career.
- What professors really do with their time and what to expect if entering into academia.
- Professional development through membership in technical and professional societies, extracurricular activities and leadership roles.
- How businesses and academia can work together.

The speakers and topics were very well received. Many students took the opportunity to ask questions during the discussion period after each talk.

The student demonstration session covered a number of different materials demonstrations. Five different universities were represented, with two presentations by faculty and three by students. Over the course of the session, attendees moved about to get good views of the demonstrations being presented,



Students enjoyed the MS&T'10-sponsored NASA Johnson Space Center tour in Houston, Texas.

T'10 student activities recap

and they freely discussed and shared ideas on different demonstrations and outreach methods in general.

In addition, PCSA delegates Eric Patterson and Chris Dosch delivered a presentation on trends in ceramic and materials education as seen by current undergraduate and graduate students. Using the survey results from more than 100 students at 20 universities, their talk discussed student opinions on issues such as how prepared students felt for working in a technical job and where students wanted to work after graduation (i.e., in industry, in academia or at a national lab). The presentation definitely engaged the attendees, as the 20-minute break scheduled to follow the talk was replaced by a discussion of the talk's information.

Middle-school and high-school students from the Houston area were able to join in the materials engineering excitement through hands-on demonstrations at the ASM materials minicamp. Students visited a variety of demonstration booths, where they learned about many different materi-



Students at the PCSA Demo Symposium showed how a sheet of tempered glass breaks compared to unstrengthened sheet glass.

als, such as structural materials, high-temperature steels, shape memory alloys and glasses. In keeping with the rocket scientist theme, the ACerS booth gave students a first-hand experience of the insulating power of space shuttle tile. Students learned how glass fibers are made, how color is created in glass and

how normally elastic materials, such as racquetballs and marshmallows, become brittle and shatter when cooled with liquid nitrogen. The students in attendance said they had a blast seeing the demonstrations and learning about interesting materials.

A full recap of MS&T'10 student activities will be presented in the January/February issue of the *Bulletin*. ■

Bill Hammetter, Keramos officer, drops mugs until they shatter. The winning height (not shown) was 150 centimeters.



Mug Drop winners: Twyla Sampaco (left), University of Washington, won with a drop height of 150 centimeters. Albert Tien (right), University of Washington, won for most aesthetic mug.

Jaime George, PCSA programming chair and graduate student at Missouri University of Science and Technology, and Claire Weiss, PCSA delegate and graduate student at University of Connecticut, presented ceramics-related demonstrations to middle-school and high-school students during the ASM minicamp.



Electronic Materials and Applications 2011

Royal Plaza in the Walt Disney World Resort
Orlando, Fla., USA • Jan. 19–21, 2011

register

before Dec. 21, 2010,
to save \$125

Save 25 percent when you register for both
EMA 2011 and ICACC'11

PREVIEW

Program overview

Electronic Materials and Applications 2011 will focus on electronic ceramics for energy generation, conversion and storage applications, and it will bring together leaders and experts in the field to address the related material challenges. Jointly programmed by the Electronics Division and Basic Science Division of ACerS, EMA 2011 will be held Jan. 19–21, 2011, at the Royal Plaza in the Walt Disney World Resort, Orlando, Fla. The meeting is designed for materials scientists, engineers, students, researchers and manufacturers with an interest in renewable energy, innovative hybrid and all-electric transportation development, electrical ceramics and advanced microelectronics.

Hotel information

Royal Plaza in the Walt Disney World Resort

1905 Hotel Plaza Boulevard
Lake Buena Vista, FL 32830
Phone: 407-828-2828 / 800-248-7890
Fax: 407-827-6338

Room rate

\$149 single/double

Cutoff date

Secure your room at ceramics.org/ema2011 before
Dec. 20, 2010, to ensure the discounted rate.

Plenary speakers



Akira Ando

General Manager, Murata Mfg. Co.

Topic: **Structure-Derived Novel Function of Electronic Ceramics**



Patricia M. Dehmer

Deputy Director for Science Programs, Department of Energy

Topic: **Facing Our Energy Challenges in a New Era of Science**



Roop L. Mahajan

Virginia Tech

Topic: **Interdisciplinary Research and Innovation for a Sustainable Energy Future**



Lynnette Madsen

Program Director for Ceramics, National Science Foundation

Topic: **A Decade of Ceramics**

Technical program

Advances in Ceramic Processing, Forming and Shaping

This symposium will focus on the advancement of understanding ceramic processing science, forming and shaping.

Advanced Dielectric, Piezoelectric and Ferroic Materials, and Emerging Fields in Electronics

This symposium will bring together researchers from academia and industry to present the latest advances in synthesis, modeling and characterization of dielectric, piezoelectric, ferroelectric and multiferroic materials.

Nano Phenomena and Interfacial/Surface Effects in Electronic Ceramics

This symposium will provide a forum for academic, industrial and national laboratory researchers to present and discuss the latest advances and fundamental research in the area of interfacial effects on the structural and physical properties of electronic ceramics.

Energy Harvesting and Sensors for Structural Health Monitoring

This symposium will review past developments, current challenges and future goals in the field of energy harvesting and its application to structural health monitoring.

Functional Ceramics for Energy Storage & Conversion

This symposium will provide a forum for academic, industrial and national laboratory researchers to present and discuss the latest advances and fundamental research in the area of functional ceramic materials for energy storage and conversion systems.

Ceramic Materials in Power Electronics (wide-bandgap-integration, high-power capacitors)

This symposium will provide a forum for academic, industrial and national laboratory researchers to present and discuss the latest advances and fundamental research in the area of bulk, thick-film, thin-film and nanoparticle electronic ceramics for power electronic applications.

Metamaterials and Microwave Ceramics

This symposium is a forum for emerging electromagnetic phenomena, engineered materials design, structure–property relationships and system performance in these highly engineered artificial electromagnetic structures.

Highlights of Student Research in Basic Science and Electronic Ceramics

This symposium will showcase primarily undergraduate as well as graduate research to encourage innovation and involvement of students throughout the ceramics community.

EMA 2011 Schedule

Wednesday, Jan. 19, 2011

Registration	7:30 a.m. – 7:00 p.m.
Welcome and Opening Remarks	8:45 – 9:00 a.m.
Plenary Session I	9:00 – 10:00 a.m.
Concurrent Technical Sessions	10:30 a.m. to Noon
Plenary Session II	1:15 – 2:15 p.m.
Concurrent Technical Sessions	2:45 – 5:30 p.m.
Poster Session & Welcome Reception	6:00 – 8:00 p.m.

Thursday, Jan. 20, 2011

Registration	7:00 a.m. – 6:00 p.m.
Plenary Session III	8:00 – 9:00 a.m.
Concurrent Technical Sessions	9:30 a.m. – Noon
Plenary Session IV	1:15 – 2:15 p.m.
Concurrent Technical Sessions	2:45 – 5:30 p.m.
Conference Dinner	7:00 – 9:00 p.m.

Friday, Jan. 21, 2011

Registration	7:00 a.m. – 4:30 p.m.
Plenary Session V	8:00 – 9:00 a.m.
Concurrent Technical Sessions	9:30 a.m. – Noon
Concurrent Technical Sessions	1:30 – 5:00 p.m.

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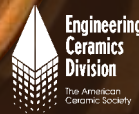
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35TH INTERNATIONAL CONFERENCE AND EXPOSITION ON ADVANCED CERAMICS AND COMPOSITES

Hilton Daytona Beach Resort & Ocean Center ♦ Daytona Beach, Fla., USA ♦ Jan. 23–28, 2011

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Save 25 percent when you register for both ICACC'11 and EMA 2011



Organized by The American Ceramic Society and The American Ceramic Society's Engineering Ceramics Division

PREVIEW

Program overview

The 35th International Conference and Exposition on **Advanced Ceramics and Composites** will include advanced structural and functional ceramics, composites and other emerging ceramic materials and technologies. ICACC'11 offers 14 symposia plus two focused sessions that will provide an open forum for scientists, researchers and engineers from around the world to present and exchange recent advances on various aspects related to ceramic science and technology.

Schedule of events

Sunday – January 23

Welcome Reception 5 p.m. – 7 p.m.

Monday – January 24

Opening Awards Ceremony and Plenary Session 8:30 a.m. – Noon
Concurrent Technical Sessions 1:20 p.m. – 6 p.m.

Tuesday – January 25

Concurrent Technical Sessions 8 a.m. – 6 p.m.
Exposition and Reception 5 p.m. – 8 p.m.
Poster Session "A" 5 p.m. – 8 p.m.

Wednesday – January 26

Concurrent Technical Sessions 8 a.m. – 6 p.m.
Exposition and Reception 5 p.m. – 7:30 p.m.
Poster Session "B" 5 p.m. – 7:30 p.m.

Thursday – January 27

Concurrent Technical Sessions 8 a.m. – 6 p.m.

Friday – January 28

Concurrent Technical Sessions 8 a.m. – Noon

Plenary and awards information



2011 James I. Mueller Award

Sylvia M. Johnson

NASA-Ames Research Center

Topic: **"Thermal Protection Materials: From Retrospect to Foresight"**



2011 Bridge Building Award

Lalit Mohan Manocha

Sardar Patel University, India

Topic: **"Carbon/Carbon Composites to Ceramic-Matrix Composites: High-End Applications through Controlled Microstructure"**



Plenary speaker

William Edward Lee

Imperial College London, U.K.

Topic: **"Opportunities for Advanced Ceramics and Composites in the Nuclear Sector"**



Plenary speaker

Zhong-Lin Wang

Georgia Institute of Technology

Topic: **"Nanogenerators and Nanopiezotronics"**

<p>Mechanical Behavior and Performance of Ceramics & Composites</p>	<p>Porous Ceramics: Novel Developments and Applications</p>
<p>Diverse aspects of mechanical behavior of ceramics and composites, and their correlations to processing, component performance and reliability.</p>	<p>Brings together engineers, technologists and scientists in the area of ceramic (and glass-ceramics) materials containing high volume fractions of porosity, with porosity ranging from nanometers to nanometers.</p>
<p>Advanced Ceramic Coatings for Structural, Environmental and Functional Applications</p>	<p>Thermal Management Materials and Technologies</p>
<p>Advances in coating sciences and technologies, processing, micro-structure and property characterization and life prediction.</p>	<p>New materials and the associated technologies related to thermal management.</p>
<p>8th International Symposium on Solid Oxide Fuel Cells: Materials, Science and Technology</p>	<p>Advanced Sensor Technology: Developments and Applications</p>
<p>International forum for scientists and engineers to present recent technical progress, and to exchange ideas and technical information.</p>	<p>Advanced sensor technology based on ceramic materials.</p>
<p>Armor Ceramics</p>	<p>Materials for Extreme Environments: Ultrahigh-Temperature Ceramics and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)</p>
<p>Address areas critical to the development of armor ceramics that meet the necessary performance requirements.</p>	<p>Design, processing, structure–property relationships, thermal and mechanical properties, oxidation resistance, machining and joining, and stability of UHTCs and MAX phases.</p>
<p>Next-Generation Bioceramics</p>	<p>Advanced Ceramics and Composites for Nuclear and Fusion Applications</p>
<p>Discussion among groups involved in the development and use of bioceramics, including ceramic researchers, medical device manufacturers and clinicians.</p>	<p>Opportunities and needs of advanced ceramics and composites in energy systems and current state of the art for science and technology.</p>
<p>International Symposium on Ceramics for Electric Energy Generation, Storage and Distribution</p>	<p>Advanced Materials and Technologies for Rechargeable Batteries</p>
<p>Advanced engineering ceramics and technologies that could help the global community.</p>	<p>Improvements in materials design, electrodes architecture and cell chemistry are required to extend the life, enhance the safety and lower the cost of rechargeable Li-ion batteries.</p>
<p>5th International Symposium on Nanostructured Materials and Nanotechnology: Development and Applications</p>	<p>Geopolymers and Other Inorganic Polymers</p>
<p>Science and technology of nanostructured materials, with a strong focus on the elaboration of the practical side of nanotechnology.</p>	<p>Geopolymers and other inorganic polymer analogues exhibiting similar behaviors.</p>
<p>5th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials and Systems, in honor of Professor Katsutoshi Komeya</p>	<p>Computational Design, Modeling and Simulation of Ceramics and Composites</p>
<p>Discuss global advances in the research and development of advanced processing and manufacturing technologies for a wide variety of non-oxide and oxide-based structural ceramics.</p>	<p>Design, modeling, simulation and characterization of ceramics and composites.</p>
<p></p>	<p>Pacific Rim Engineering Ceramics Summit</p>
<p></p>	<p>Discussion of latest emerging ceramic technologies and facilitation of open dialogue with leading experts.</p>

Hotel information

Hilton Daytona Beach Resort/Ocean Walk Village

100 North Atlantic Avenue, Daytona Beach, FL 32118
Tel: 386-254-8200 | Fax: 386-253-8841

Room rates

Conference rate: \$169.00 | Student rate: \$139.00
Government rate: \$ 84.00

Cut-off date

Secure your room at ceramics.org/daytona2011 before **Dec. 22, 2010**, to ensure the discounted rate.

ICACC'11 Exposition

Tuesday, January 25

5 p.m. – 8 p.m.

Wednesday, January 26

5 p.m. – 7:30 p.m.

To reserve space, contact **Pat Janeway** at 614-794-5826 or pjaneway@ceramics.org.

Calendar of events

January 2011

19–21 Electronic Materials and Applications 2011 – Royal Plaza in the Walt Disney World Resort, Orlando, Fla.; www.ceramics.org/ema2011

23–28 35th Int'l Conference and Exposition on Advanced Ceramics and Composites – Daytona Beach, Fla.; www.ceramics.org/icacc-11

March 2011

16–18 The Ceramic Society of Japan Annual Meeting 2011 – Shizuoka University, Shizuoka, Japan; www.cersj.org

21–25 Flow and Fracture in Advanced Glasses – Saint-Malo, France; www.larmaur.univ-rennes1.fr/english/news

23–24 ACerS St. Louis Section and the Refractory Ceramics Division 46th Annual Symposium – Hilton St. Louis Airport Hotel, St. Louis, Mo.; www.ceramics.org/sections/st-louis-section

April 2011

5–7 CICMT 2011: IMAPS/ACerS 7th Int'l Conference and Exhibition on Ceramic Interconnect and Ceramic Microsystems Technologies – Westgate Hotel, San Diego, Calif.; www.imaps.org/ceramics

26–29 9th European Conference on Industrial Furnaces and Boilers – Hotel Palácio, Estoril, Portugal; www.cenertec.pt/infub/

May 2011

2–4 ➔ INTERTECH 2011 – Hyatt Regency O'Hare, Chicago, Ill.; www.intertechconference.com

2–5 ➔ Int'l Symposium on Olfaction and Electronic Nose 2011 – Rockefeller University, New York City, N.Y.; www.engconf.org/11as.html

5–8 GOMD 2011: Glass & Optical Materials Division Spring Meeting – Hilton Hotel, Savannah, Ga.; www.ceramics.org/gomd2011

12–15 Advances in Applied Physics and Materials Science 2011 Congress – Mirada Del Mar Hotel, Antalya, Turkey; www.apmas2011.org

June 2011

5–8 ➔ Fractography of Glasses and Ceramics VI – Jacksonville, Fla.; www.fractographyvi.com/index.html

27–July 1 Semiconductor Technology for Ultra Large Scale Integrated Circuits and Thin Film Transistors – Hong Kong, China; www.engconf.org/11ax.html

July 2011

10–14 ➔ PACRIM9: The 9th Int'l Meeting of Pacific Rim Ceramic Societies – Cairns, Australia; www.austceram.com/pacrim9.asp

10–14 ➔ 9th Int'l Conference on Advances in the Fusion and Processing of Glass (held in conjunction with PACRIM9) – Cairns, Australia; www.austceram.com/pacrim9.asp

24–26 Cements Division/Center for Advanced Cement-Based Materials Annual Meeting – Vanderbilt University, Nashville, Tenn.; www.ceramics.org/divisions/cements-division

August 2011

1–3 Ceramic Leadership Summit 2011 – Hyatt Regency, Baltimore, Md.; www.ceramics.org/cls2011

7–11 ➔ Int'l Workshop on Piezoelectric Materials and Applications 2011 for Clean Energy Systems – Hotel Roanoke, Roanoke, Va.; www.cpe.vt.edu/ehw

28–Sept. 1 ➔ Sintering 2011 – Jeju Island, Korea; www.sintering2011.org

October 2011

2–7 ➔ EDP2011: The 4th Int'l Conference on Electrophoretic Deposition: Fundamentals and Applications – Casa Magna Marriott Hotel, Puerto Vallarta, Mexico; www.engconfintl.org/11ab.html

9–14 Nano & Micromechanical Testing in Materials R&D – Gran Melia Salinas Hotel, Lanzarote, Canary Islands, Spain; www.engconf.org/11avenue.html

12–22 Carbon-Based Nanomaterials & Devices – Suzhou, China; www.engconf.org/11an.html

16–20 MS&T'11: Materials Science & Technology 2011 Conference and Exhibition – Greater Columbus Convention Center, Columbus, Ohio; www.matscitech.org

30–Nov. 2 ➔ 3rd Int'l Symposium on Advanced Ceramics and Technology for Sustainable Energy Applications – Pingtung, Taiwan; www.mse.ntu.edu.tw/~actsea2011

November 2011

11–14 ➔ UNITECR 2011: Unified Int'l Conference on Refractories – Kyoto International Conference Center, Japan; www.unitecr2011.org

15–18 ➔ The 11th Int'l Conference on Ferrites – Nara, Japan

27–Dec 1 ➔ Fray Int'l Symposium on Metals and Materials Processing in a Clean Environment – Hilton Cancun Golf & Spa Resort, Cancun, Mexico; www.flogen.com/FraySymposium

May 2012

20–23 10th Int'l Symposium on Ceramic Materials and Components for Energy and Environmental Applications – Int'l Congress Center, Dresden, Germany; www.cmcee12.de

22–25 ➔ Ceramitec 2012 – New Munich Trade Fair Centre, Germany; www.ceramitec.de

Dates in **RED** denote new entry in this issue.

Entries in **BLUE** denote ACerS events.

➔ denotes meetings that ACerS cosponsors, endorses or otherwise cooperates in organizing.

Career Opportunities

**Senior Process Engineer
Casting Cell**

M Cubed Technologies, Inc. is seeking Senior Process Engineer – Casting Cell for its Precision Division in Monroe, CT. Implements processes and operating systems for the manufacture of ceramic products. Works toward continuous improvement and Lean concepts. Candidates should have Masters degree in materials engineering/science and three years ceramic/metal processing experience. EOE

Send resume/letter of interest to Attn:

J. Jones
M Cubed Technologies, Inc.
1 Tralee Industrial Park
Newark, DE; 19711
fax 302-454-6506; or
j_jones@mmmt.com

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FACULTY POSITIONS

Department of Materials Science and Engineering, University of North Texas

The University of North Texas seeks applicants to fill one open rank (Assistant/Associate/Full Professor) and two Associate and/or Full Professor in the Department of Materials Science and Engineering (MTSE). Tenured appointments are possible. The positions will cover a broad area of structural materials (metals, ceramics, polymers and composites/hybrids) and candidates will develop synergies to further strengthen the existing core emphases in: 1) Structural aerospace, automotive and multifunctional composite materials; 2) Structural biomaterials; and 3) Structural energy-related materials.

The MTSE department at UNT has grown significantly adding eight members in the past five years to its present size of thirteen faculty members. The proposed faculty positions are a part of the recently approved strategic plan of the MTSE department for expansion and future growth and to create excellence and prominence in the area of structural materials. UNT has excellent materials processing, testing, and characterization facilities that are part of the Center for Advanced Research and Technology (CART) housed within MTSE department at UNT, an interdisciplinary center (physics, chemistry, and biology). UNT also has developed a strong research effort in computational materials across multiple size and time scales. The new faculty members will also lead new research endeavors and work closely with UNT faculty with both experimental and computational research programs to forge national/international collaborative research proposals. Additional information on the MTSE department can be found at www.mtse.unt.edu.

The positions require an earned doctorate in Materials Science and Engineering, or a related field. Applicants should have demonstrated a strong commitment to teaching and research, and must exhibit potential to develop and sustain a cutting-edge research program with funding from sources external to the university. Prior teaching and/or research experience is preferred. Salaries, benefits, and teaching loads typical for an emerging research university.

Applicants must submit an online application to <http://facultyjobs.unt.edu>. Screening of applications will begin on November 1, 2010 and will continue until the search is closed. For additional information and questions, please can contact co-chairs of the search committee Narendra Dahotre (940-565-2031, Narendra.Dahotre@unt.edu) or Thomas Scharf (940-891-6837, Thomas.Scharf@unt.edu). The University of North Texas is an AA/ADA/EOE committed to diversity in its educational programs.

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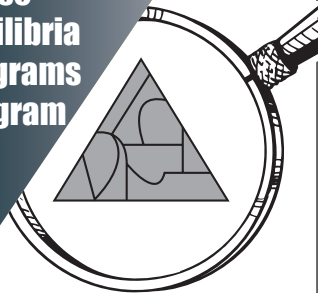
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bulletin
December 2010

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Statement of Ownership

Ownership, Management and Circulation Statement per 39 U.S. Code 3685 for *American Ceramic Society Bulletin* as filed Oct. 1, 2008, with the U.S. Postal Service.

American Ceramic Society Bulletin is published monthly by The American Ceramic Society, 600 N. Cleveland Ave., Suite 210, Westerville, OH 43082-6921. Publisher is Charles Spahr, and Editor is Peter Wray.

	Avg. each issue during previous 12 months	Actual no. of single issue nearest filing date
A. Total number of copies (net press run)	9,912	11,589
B. Paid and/or requested circulation		
1. Paid/requested outside-county mail subscriptions	7,217	8,717
2. Paid in-county subscriptions	none	none
3. Sales through dealers and carriers, street vendors, counter sales and other non-USPS paid distribution	2,054	2,592
4. Other classes mailed through the USPS	none	none
C. Total paid and/or requested circulation	9,271	11,309
D. Free distribution by mail (samples, complimentary and other free)		
1. Outside-county	2,534	2,494
2. In-county	none	none
3. Other classes mailed through the USPS	none	none
E. Free distribution outside the mail (carriers or other means)	350	31
F. Total free distribution	2,884	2,525
G. Total distribution	12,155	13834
H. Copies not distributed	257	216
I. Total	12,412	14,050
J. Percent paid and/or requested circulation	81.75%	76.27%

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Lighting	96, 99	Moisture testing	84	Polysilazane	50	Residual stress analysis	91
Lime & limestone	39	Molding	56	Porcelain	96	Resins, molding	46
Lithium and compounds	45	Molds, case	56	Porcelain enamel	99	Resistors, thick-film	97
Lithium minerals	39	Molds, ceramic forming	56	Porcelain enamels	46, 58	Resonators	97
Litigation	85	Molds, models	56	Pore size analyzers	82	RF components	97
Lubricants	49	Molybdenum and compounds	45	Pore structure analysis	91	Rheological additives	50
Lusters	58	Monolithic	73	Porosimeters	84	Rheometers	84
Machining	88	Montmorillonite	39	Pottery	96	Rings	94
Machining equipment	56	Mortars	73	Powdered metals	46	Rods	74, 94
Magnesia, fused	45	Mugs	96	Powders samplers	84	Roll compaction	57
Magnesia-alumina, sintered	45	Mullite	39, 73	Praseodymium oxide	46	Roller mills	54
Magnesite	39, 73	Multilayer ceramics, AlN	97	Precast shapes	74	Rollers	74
Magnesium and compounds	45	Multilayer ceramics, custom	97	Precious metals	46, 58	Roofing tile machinery	57
Magnesium phosphates	45	Nanomaterials	45	Presses, compacting	56	Rutile	40
Magnetic separation instruments	83	Neodymium oxide	46	Presses, dry	56	Safety equipment	54
Magnetic stirrers	83	Nepheline syenite	39	Presses, extrusion	56	Saggers	74
Magnetics	88	Neutron activation analysis instruments	82	Presses, hot	56	Samarium oxide	46
Magnets, hard	97	Nickel and compounds	46	Presses, hot isostatic	57	Sample handling automation	91
Magnets, soft	97	Niobium and compounds	46	Presses, hydraulic	57	Sample preparation equipment	84
Maintenance & repairs, after sales	85	Niobium oxide	46	Presses, isostatic	57	Sand, foundry	46
Management	85	Nitride products	94	Presses, other	57	Sand, glass	46
Mandrels, diamond	56	Nondestructive evaluation instruments	82	Presses, pressure casting	57	Sand, high-purity silica	46
Manganese and compounds	45	Nozzles	53, 73	Presses, refractory shapes	57	Sapphire	40
Manganese dioxide	45	Nozzles, air spray	53	Presses, rotary	57	Saws, diamond	57
Manufacturing	86	Nozzles, liquid spray	53	Presses, tile (ceramic)	57	Scale systems	54
Markets	86	Nuclear materials	86, 89	Pressure casting systems, dinnerware	57	Scandium and compounds	46
Materials analysis	90	Nuclear waste containers	94	Pressure casting systems, sanitaryware	57	Scanning electron microscopy	91
Materials handling equipment	52	Olivine	39	Pressure sensors	82	Screen printing	89
Materials preparation, handling, & packaging	50	Optical and optoelectronic ceramics	99	Printers, ceramic decal	58	Screen printing equipment	58
Materials testing & characterization	86	Optical comparitors	84	Process control equipment	53	Screening, custom	89
Mechanical properties	91	Optical emission spectroscopy instruments	82	Process/quality control systems	67	Screens/screening equipment	54
Mechanical property measurement instruments	83	Optical fiber production	92			Seals	89
Membranes, ceramic	94	Optical properties	91			Secondary ion mass spectroscopy instruments	82
Metal oxides, mixed	58					Selenium and compounds	46
Metallic salts	45					Semiconducting	46
						Semiconductor processing	92

Semiconductors	97	Substrates, alumina	98	Titanium carbide	47	Yttrium and compounds	48
Semiconductors (consultants)	86	Substrates, aluminum nitride	98	Titanium diboride	47	Zeta potential analyzers	83
Sensors	97	Substrates, glass	98	Titanium dioxide	47	Zinc and compounds	48
Sensors, temperature	67	Substrates, other	98	Titanium nitride	47	Zinc borate	48
Separators	54	Substrates, silicon carbide	98	Toll blending, processing	89	Zinc oxide	48
Services & resources	84	Superabrasives	47, 57	Toll firing, contract	89	Zircon	40, 75
Setters	74	Superconducting	47	Tools, modelling	57	Zirconia	48, 75
Setting equipment	57	Superconductors	86, 89	Transducers	98	Zirconia products	95
Setting pins	74	Superconductors, wires	98	Transducers, ultrasonic	82	Zirconia, engineering grade	48
Shredders	54	Surface analysis instruments	82	Transfer cars	67	Zirconia, high-purity	48
Sialon powder	46	Surface area analysis	91	Transformers	98	Zirconia, refractory grade	48
Sieving equipment	54	Surface modification systems	57	Transmission electron microscopy	91	Zirconium and compounds	48
Silica	40, 46, 74	Suspending agents	50	Tribological studies	91	Zirconium carbide	48
Silicates	46	Tableware	99	Tubes	75, 94	Zirconium carbonate	48
Silicide products	94	Talc	40	Tubing & rod	99	Zirconium dioxide	48
Silicon	46	Tantalum metal powder	47	Tungsten carbide	47	Zirconium oxide	48
Silicon carbide	46, 75	Tantalum oxide	47	Tungsten oxide	48		
Silicon carbide products	94	Tap hole clays	75	Turning machines, insulator	57		
Silicon nitride	46	Tape casting additives	50	Ultrasonic ceramics	98		
Silicon nitride products	94	Tape casting equipment	57	Ultrasonic inspection/flaw detection, refractories	89		
Silicon nitride rollers	94	Tapes	98	Ultrasonic instruments	82		
Silicon powder	47	Technical glass	99	Ultrasonic machining equipment	57		
Silver pastes, conducting	58	Technical writing	86	Ultrasonic transducers	82		
Single wafer pack	54	Technology transfer	86	Uranium and compounds	48		
Sintering aids	50	Tensile testers	82	Used equipment	54, 57		
Size reduction equipment	54	Terbium oxide	47	Vacuum cleaning systems	54		
Slab rollers	57	Testing/evaluation instruments & equipment	79	Vanadium and compounds	48		
Soda ash	40	Textile	75	Varistors	98		
Sodium and compounds	47	Thermal analysis	91	Ventilating equipment	54		
Sodium nitrate	47	Thermal diffusivity/conductivity analysis instruments	82	Vermiculite	40		
Software	86	Thermal imaging	82	Vibrators	54		
Solar	99	Thermal spray equipment	57	Vibrators, bin	54		
Solvent recovery equipment	54	Thermistors	98	Vibratory finishing equipment	57		
Sonic testing	82	Thermocouple wire	67	Viscometers, high-temperature	84		
Spark plugs	98	Thermocouples & accessories	67	Viscosity measurement instruments	84		
Specialty	75	Thermogravimetric analysis instruments	82	Viscosity stabilizers	50		
Specialty glass	99	Thermomechanical analysis instruments	82	Visual and optical testers	82		
Spectroscopy	91	Thermometers	84	Visual inspection instruments	84		
Spectroscopy instruments	82	Thick film materials	47	Ware trucks	54		
Spheres, ceramic	47	Thickening agents	50	Water sorption measurement	82		
Spheres, glass	47	Thin brick	96	Wear-resistant parts	95		
Spinels	40	Thin film materials	47	Weighing equipment	54		
Spodumene	40	Thread guides	94	Weighing/scales	84		
Sponges	57	Tile	99	Wetting agents	50		
Spray booths	57, 58	Tile inspection, automatic	54	Wheels, cutoff and grinding	57		
Spray dryers	54	Tile production	92	Wheels, diamond	57		
Spray drying	89	Tile selection equipment	54	Whiskers	48		
Spray guns, automatic	54	Tile, floor	96	Whiteware production	92		
Spray guns, manual	54	Tile, pavers	96	Whitewares	89		
Sputtering equipment	57	Tile, quarry	96	Wire cloth	54		
Stained glass	99	Tile, sorting equipment	54	Wire saws, diamond	57		
Stains	58	Tile, wall	96	Wollastonite	40		
Steatite	40	Tilemaking equipment	57	X-ray computed tomography instruments	82		
Stoneware	96	Tin and compounds	47	X-ray diffraction	91		
Stoneware & porcelain	94	Titania	47	X-ray diffraction instruments	82		
Storage equipment	54	Titanium and compounds	47	X-ray instruments	83		
Strontium and compounds	47			X-ray spectroscopy instruments	83		
Structural ceramics	86			Ytria	48		
Structural ceramics production	92						
Substrate wafer trays	54						

CLAYS & NATURAL MINERALS

Andalusite

C-E Minerals, PA (M.K. Pierce)

Aplite

US Silica Co, WV (M. Lyman)

Bauxite

C-E Minerals, PA (M.K. Pierce)

Hindalco Industries Ltd, Belgaum R&D Centre, Karnataka (Anil Bhatnagar)

Lock 3 Co, PA

US Electrofused Minerals Inc, PA

See ad page 37

Bentonite

Laviosa Chimica Mineraria SpA, Italy (Angelo Brodetto)

Stephan Schmidt KG, Germany

RT Vanderbilt Co Inc, CT (Randall L. Johnson)

Borax

Amalgamet Canada, Div of Premetalco Inc, Canada (Naujoks Manfred)

Rio Tinto Minerals, CO

Chromite

Comptoir de Mineraux et Matieres Premieres, France

Laviosa Chimica Mineraria SpA, Italy

US Electrofused Minerals Inc, PA

See ad page 37

Clays, ball

Hammill & Gillespie Inc, NJ (Dorna L. Isaacs)

Imerys, GA

Old Hickory Clay Co, KY (Ken Bougher)

Sheffield Pottery, MA

Sibelco Benelux, Belgium

Stephan Schmidt KG, Germany

Unimin Corp, CT

See ad page 34

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Clays, china

Fusion Ceramics Inc, Reimbold & Strick, OH (D. F. Schneider)

Hammill & Gillespie Inc, NJ (Dorna L. Isaacs)

Imerys, GA

Old Hickory Clay Co, KY

Sheffield Pottery, MA

Sibelco Benelux, Belgium

RT Vanderbilt Co Inc, CT (Randall L. Johnson)

Clays, enamel

Old Hickory Clay Co, KY

Sibelco Benelux, Belgium

Stephan Schmidt KG, Germany

Clays, engobe

Imerys, GA

Old Hickory Clay Co, KY

Sheffield Pottery, MA

Sibelco Benelux, Belgium

Stephan Schmidt KG, Germany

Clays, fire or refractory

C-E Minerals, PA (M.K. Pierce)

Furnace Products & Services Inc, PA

Lock 3 Co, PA

Old Hickory Clay Co, KY

Sheffield Pottery, MA

Sibelco Benelux, Belgium

Stephan Schmidt KG, Germany

Clays, glaze

Imerys, GA

Old Hickory Clay Co, KY

Sheffield Pottery, MA

Sibelco Benelux, Belgium

Stephan Schmidt KG, Germany

Clays, stoneware

Old Hickory Clay Co, KY

Sheffield Pottery, MA

Sibelco Benelux, Belgium

Stephan Schmidt KG, Germany

Cordierite

Associated Ceramics & Technology Inc, PA

Du-Co Ceramics Co, PA (Tom Arbanas)

Maryland Ceramic & Steatite Co Inc, MD

Dolomite

Hammill & Gillespie Inc, NJ (Dorna L. Isaacs)

Natl Lime & Stone Co, OH (Jim Wells)

Sibelco Benelux, Belgium

Unimin Corp, CT

See ad page 34

Feldspar

Avalon Rare Metals Inc, Ontario

Hammill & Gillespie Inc, NJ (Dorna L. Isaacs)

Imerys, GA

Sheffield Pottery, MA

Sibelco Benelux, Belgium

Stephan Schmidt KG, Germany

Unimin Corp, CT

See ad page 34

Fireclay

ACCCO Inc., OH

Aalsey Refractories Co, MO (Fireclay)

C-E Minerals, PA (M.K. Pierce)

Hammill & Gillespie Inc, NJ (Dorna L. Isaacs)

Lock 3 Co, PA

Riverside Refractories Inc, AL (Bob Kuhn)

Sheffield Pottery, MA

The Maryland Refractorie Co, OH

Flint

Sheffield Pottery, MA

Short Mountain Silica, TN

Stephan Schmidt KG, Germany

Unimin Corp, CT

See ad page 34

Fluorspar

Seaforth Mineral & Ore Co Inc, OH

Forsterite

Du-Co Ceramics Co, PA (Tom Arbanas)

Hectorite

RT Vanderbilt Co Inc, CT (Randall L. Johnson)

Kaolin

C-E Minerals, PA (M.K. Pierce)

Hammill & Gillespie Inc, NJ (Dorna L. Isaacs)

Imerys, GA

M&M Clays Inc, GA

Old Hickory Clay Co, KY

RE Carroll Inc, NJ (Robert E. Carroll III)

Sheffield Pottery, MA

Stephan Schmidt KG, Germany

Unimin Corp, CT

See ad page 34

US Silica Co, WV (M. Lyman)

RT Vanderbilt Co Inc, CT (Randall L. Johnson)

Kyanite

Lock 3 Co, PA

Pryor Giggey Co, AL (Allen R. Davis)

Lime & limestone

Hammill & Gillespie Inc, NJ (Dorna L. Isaacs)

Natl Lime & Stone Co, OH (Jim Wells)

RE Carroll Inc, NJ (Robert E. Carroll III)

Lithium minerals

Amalgamet Canada, Div of Premetalco Inc, Canada (C.A. Merivale)

Avalon Rare Metals Inc, Ontario

Magnesite

C-E Minerals, PA (M.K. Pierce)

Lock 3 Co, PA

Pred Materials International Inc, NY

Mica

Amalgamet Canada, Div of Premetalco Inc, Canada (C.A. Merivale)

Comptoir de Mineraux et Matieres Premieres, France

Imerys, GA

Montmorillonite

Stephan Schmidt KG, Germany

Mullite

Atlantic Equipment Engineers, Micron Metals Inc, NJ

C-E Minerals, PA (M.K. Pierce)

International Ceramic Engineering, MA

Nabaltec GmbH, Germany

Pred Materials International Inc, NY

Sasol North America Inc, Ceralox Div, AZ

US Electrofused Minerals Inc, PA

See ad page 47

Var Lac Old Chemical Co, NJ

Washington Mills Electro Minerals Co, NY

See ad page 43

WASHINGTON MILLS
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Nepheline syenite

Hammill & Gillespie Inc, NJ (Dorna L. Isaacs)

Sheffield Pottery, MA

Sibelco Benelux, Belgium

Unimin Corp, CT

See ad page 34

Olivine

Lock 3 Co, PA

Sibelco Benelux, Belgium

Unimin Corp, CT

See ad page 34

Petalite

Avalon Rare Metals Inc, Ontario

Hammill & Gillespie Inc, NJ (Dorna L. Isaacs)

Pyrite

Washington Mills Electro Minerals Co, NY

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Pyrophyllite

Maryland Ceramic & Steatite Co Inc, MD

RT Vanderbilt Co Inc, CT (Randall L. Johnson)

Quartz

Amalgamet Canada, Div of Premetalco Inc, Canada (Naujoks Manfred)

Imerys, GA

International Ceramic Engineering, MA

Quartz Scientific Inc, OH

Short Mountain Silica, TN

Sibelco Benelux, Belgium

Unimin Corp, CT

See ad page 34

Sapphire

International Ceramic Engineering, MA
 Sasol North America Inc, Ceralox Div, AZ

Silica

C-E Minerals, PA (M.K. Pierce)
 Hammill & Gillespie Inc, NJ (Dorna L. Isaacs)
 Imerys, GA
 Lock 3 Co, PA
 Short Mountain Silica, TN
 Sibelco Benelux, Belgium
 The Maryland Refractorie Co, OH

Unimin Corp, CT

See ad page 34

US Silica Co, WV (M. Lyman)

Soda ash

RE Carroll Inc, NJ (Robert E. Carroll III)

Spinel

Almatis Inc, PA See ad inside front cover

C-E Minerals, PA (M.K. Pierce)
 Pred Materials International Inc, NY
 Sasol North America Inc, Ceralox Div, AZ

US Electrofused Minerals Inc, PA

See ad page 47

**Washington Mills Electro Minerals Co,
NY**

See ad page 43

**Spodumene**

Amalgamet Canada, Div of Premetalco Inc, Canada (C.A. Merivale)
 Avalon Rare Metals Inc, Ontario

Steatite

Associated Ceramics & Technology Inc, PA
 Du-Co Ceramics Co, PA (Tom Arbanas)
 International Ceramic Engineering, MA
 Maryland Ceramic & Steatite Co Inc, MD

Talc

Rio Tinto Minerals, CO
 RT Vanderbilt Co Inc, CT (Randall L. Johnson)

Vermiculite

Comptoir de Mineraux et Matieres Premieres, France

Wollastonite

Associated Ceramics & Technology Inc, PA
 Eppler Assocs, CT (Richard A. Eppler)
 NYCO Minerals Inc, NY
 Seaforth Mineral & Ore Co Inc, OH
 RT Vanderbilt Co Inc, CT (Randall L. Johnson)

Zircon

Comptoir de Mineraux et Matieres Premieres, France
 Lock 3 Co, PA

US Electrofused Minerals Inc, PA

See ad page 47

**CERAMIC & METALLIC POWDERS/
MATERIALS**

Abrasive grains

C-E Minerals, PA (M.K. Pierce)
Ceradyne Inc, CA

Electro Abrasives, NY See ad page 47

Guyson Intl Ltd, United Kingdom
KC Abrasive Co LLC, KS (Ronald Barncord)
Rio Tinto Alcan Specialty Aluminas, OH
Treibacher Schleifmittel North America Inc, NY

US Electrofused Minerals Inc, PA
See ad page 47

Washington Mills Electro Minerals Co, NY
See ad page 43

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Adsorbants & catalysts

fuelcellmaterials.com, NexTech Materials Limited, OH
Saint-Gobain NorPro Corp, OH

Alloys

Bayville Chemical Supply Co, NY

Alumina, activated

Rio Tinto Alcan Specialty Aluminas, OH

Alumina, calcined

Almatis Inc, PA See ad inside front cover

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Electro Abrasives, NY See ad page 47

Hindalco Industries Ltd, Belgaum R&D Centre, Karnataka (Anil Bhatnagar)

KC Abrasive Co LLC, KS (Ronald Barncord)

Nabaltec GmbH, Germany

Refractory Minerals, PA

Rio Tinto Alcan Specialty Aluminas, OH

Sasol North America Inc, Ceralox Div, AZ

The Maryland Refractorie Co, OH

US Electrofused Minerals Inc, PA
See ad page 47

Alumina, fused

C-E Minerals, PA (M.K. Pierce)

Electro Abrasives, NY See ad page 47

Guyson Intl Ltd, United Kingdom

KC Abrasive Co LLC, KS (Ronald Barncord)

McDanel Advanced Ceramic Technologies, PA

Rio Tinto Alcan Specialty Aluminas, OH

Treibacher Schleifmittel North America Inc, NY

US Electrofused Minerals Inc, PA
See ad page 47

USEM
U.S. ELECTROFUSED MINERALS, INC.
600 Steel Street Aliquippa, PA 15001
Phone: (724) 857-9880 Fax: (724) 857-9916
www.usminerals.com

Washington Mills Electro Minerals Co, NY
See ad page 43

WASHINGTON MILLS
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Alumina, high-purity

Cerac Inc, Subsidiary of Williams Advanced Materials, WI
Ceramare SA, Switzerland

International Ceramic Engineering, MA

Ipsen Ceramics, IL

KC Abrasive Co LLC, KS (Ronald Barncord)

Pred Materials International Inc, NY
Sasol North America Inc, Ceralox Div, AZ
Valley Design Corp, CA

Alumina, hydrated

Almatis Inc, PA See ad inside front cover

Hindalco Industries Ltd, Belgaum R&D Centre, Karnataka (Anil Bhatnagar)

KC Abrasive Co LLC, KS (Ronald Barncord)

Nabaltec GmbH, Germany

Noah Technologies Corp, Chemical Div, TX

RE Carroll Inc, NJ (Robert E. Carroll III)

Rio Tinto Alcan Specialty Aluminas, OH

Alumina, other grades

Almatis Inc, PA See ad inside front cover
C-E Minerals, PA (M.K. Pierce)

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Nabaltec GmbH, Germany
Rio Tinto Alcan Specialty Aluminas, OH
Sasol North America Inc, Ceralox Div, AZ
Wesbond Corp, DE (Wes Jones)

Alumina, reactive

Almatis Inc, PA See ad inside front cover



Hindalco Industries Ltd, Belgaum R&D Centre, Karnataka
(Anil Bhatnagar)
Nabaltec GmbH, Germany
Rio Tinto Alcan Specialty Aluminas, OH

Alumina, single crystal

Superconix Inc, MN
Treibacher Schleifmittel North America Inc, NY

Alumina, tabular

Almatis Inc, PA See ad inside front cover



C-E Minerals, PA (M.K. Pierce)
Rio Tinto Alcan Specialty Aluminas, OH

Alumina, zirconia toughened

CerCo LLC, OH
International Ceramic Engineering, MA
Sasol North America Inc, Ceralox Div, AZ
Smaht Ceramics Inc, UT
Treibacher Schleifmittel North America Inc, NY

Washington Mills Electro Minerals Co, NY See ad page 43

Zircoa Inc, OH

Aluminum

Atlantic Equipment Engineers, Micron Metals Inc, NJ
Hindalco Industries Ltd, Belgaum R&D Centre, Karnataka
(Anil Bhatnagar)
Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Dietmar Scherer)
Leico Industries Inc, NY
Var Lac Oid Chemical Co, NJ

Aluminum nitride

Atlantic Equipment Engineers, Micron Metals Inc, NJ

Bullen, OH

Ceradyne Inc, CA (J. Mangels)
HC Starck GmbH, Germany
HC Starck Inc, MA
Hains Technology Assocs, Canada
International Ceramic Engineering, MA
Pred Materials International Inc, NY
Rio Tinto Alcan Specialty Aluminas, OH
Var Lac Oid Chemical Co, NJ

Aluminum oxide, abrasive grade

Rio Tinto Alcan Specialty Aluminas, OH

Aluminum oxide, fused brown

BassTech Intl, NJ

C-E Minerals, PA (M.K. Pierce)
Electro Abrasives, NY See ad page 47

Guyson Intl Ltd, United Kingdom
KC Abrasive Co LLC, KS (Ronald Barncord)
Rio Tinto Alcan Specialty Aluminas, OH
Treibacher Schleifmittel North America Inc, NY
Washington Mills Electro Minerals Co, NY See ad page 43

Aluminum oxide, fused white

Abresist Corp, IN
C-E Minerals, PA (M.K. Pierce)
Electro Abrasives, NY See ad page 47

Guyson Intl Ltd, United Kingdom
KC Abrasive Co LLC, KS (Ronald Barncord)
Rio Tinto Alcan Specialty Aluminas, OH
Treibacher Schleifmittel North America Inc, NY
Washington Mills Electro Minerals Co, NY See ad page 43

Aluminum phosphates

BassTech Intl, NJ
Refractory Minerals, PA

Aluminum titanate

Sasol North America Inc, Ceralox Div, AZ

Antimony and compounds

Alfa Aesar Johnson Matthey, MA
Atlantic Equipment Engineers, Micron Metals Inc, NJ
GFI Advanced Technologies Inc, NJ
Var Lac Oid Chemical Co, NJ

Arsenic oxide

Alfa Aesar Johnson Matthey, MA
Amalgamet Canada, Div of Premetalco Inc, Canada
(Naujoks Manfred)

Barium and compounds

Alfa Aesar Johnson Matthey, MA
BassTech Intl, NJ
Cerac Inc, Subsidiary of Williams Advanced Materials, WI
Noah Technologies Corp, Chemical Div, TX
Seaforth Mineral & Ore Co Inc, OH

Barium carbonate

BassTech Intl, NJ

Barium titanate

SCI Engineered Materials Inc, OH
Superconix Inc, MN

Bauxite, sintered

Rio Tinto Alcan Specialty Aluminas, OH

Beryllia

Leico Industries Inc, NY

Beryllium and compounds

Noah Technologies Corp, Chemical Div, TX

Bismuth and compounds

Atlantic Equipment Engineers, Micron Metals Inc, NJ
Bayville Chemical Supply Co, NY
SCI Engineered Materials Inc, OH
Var Lac Oid Chemical Co, NJ

Boric acid

Amalgamet Canada, Div of Premetalco Inc, Canada
(Naujoks Manfred)
Natl BoraXX Corp, OH

Boron and compounds

Amalgamet Canada, Div of Premetalco Inc, Canada
(Naujoks Manfred)
Atlantic Equipment Engineers, Micron Metals Inc, NJ
Bayville Chemical Supply Co, NY
Electro Abrasives, NY See ad page 47
HC Starck GmbH, Germany
HC Starck Inc, MA

Matrix Enterprises, OH
Natl BoraXX Corp, OH
Noah Technologies Corp, Chemical Div, TX
Rio Tinto Minerals, CO
Var Lac Old Chemical Co, NJ

Boron carbide

Atlantic Equipment Engineers, Micron Metals Inc, NJ
Ceradyne Inc, CA (J. Mangels)

Electro Abrasives, NY See ad page 47

HC Starck GmbH, Germany
HC Starck Inc, MA
KC Abrasive Co LLC, KS (Ronald Barncord)
Matrix Enterprises, OH

US Electrofused Minerals Inc, PA

See ad page 47

Var Lac Old Chemical Co, NJ

**Washington Mills Electro Minerals Co,
NY**

See ad page 43

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Boron nitride

Atlantic Equipment Engineers, Micron Metals Inc, NJ
Basic Resources, TN (Robert Sitterson)
Bayville Chemical Supply Co, NY
Ceradyne Inc, CA
HC Starck GmbH, Germany
HC Starck Inc, MA
International Ceramic Engineering, MA
Momentive Performance Materials, OH
Pred Materials International Inc, NY
Var Lac Old Chemical Co, NJ

Cadmium and compounds

Amalgamet Canada, Div of Premetalco Inc, Canada
(Naujoks Manfred)
Bayville Chemical Supply Co, NY
Cerac Inc, Subsidiary of Williams Advanced Materials, WI
Noah Technologies Corp, Chemical Div, TX

Calcium aluminates

Almatis Inc, PA See ad inside front cover

Calcium and compounds

Bayville Chemical Supply Co, NY
Noah Technologies Corp, Chemical Div, TX

Calcium carbonate

Basic Resources, TN (Robert Sitterson)
RE Carroll Inc, NJ (Robert E. Carroll III)

Calcium hexaboride

Ceradyne Inc, CA

Calcium silicate

Promat GmbH, Germany (H.-J. Feulner)

Carbons, carbon black

RT Vanderbilt Co Inc, CT (Randall L. Johnson)

Carbons, diamond

Advanced Superabrasives, NV

Carbons, graphite

Pred Materials International Inc, NY

Superior Graphite Co, IL See ad page 42

Cements

Calucem Inc, PA
Cotronics Corp, NY
Kerneos Inc, VA (Nancy E. Bunt)

Cements, high temperature

Abresist Corp, IN

Manufacturing fused
minerals and abrasives to
meet your most demanding
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Refractory Specialties Inc, OH
Sauereisen Inc, PA

Cements, refractory

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Cotronics Corp, NY
Kerneos Inc, VA (Nancy E. Bunt)
Pryor Giggey Co, AL (Allen R. Davis)
Saint-Gobain Ceramic Materials, MA (Mike Schnelzer)
Unifrax Corp, NY See ad page 70
US Electrofused Minerals Inc, PA
See ad page 47

Ceramic powders (general)

Cerac Inc, Subsidiary of Williams Advanced Materials, WI
HC Starck Ceramics GmbH & Co KG, Germany
HC Starck GmbH, Germany
HC Starck Inc, MA
Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Andreas Killinger)
KC Abrasive Co LLC, KS (Ronald Barncord)
Momentive Performance Materials, OH
Noah Technologies Corp, Chemical Div, TX
Phoenix Coating Resources Inc, FL
Rio Tinto Alcan Specialty Aluminas, OH
Sasol North America Inc, Ceralox Div, AZ
The Maryland Refractorie Co, OH
Trans-Tech Inc, MD See ad page 45

Trans-Tech
Ceramics and Advanced Materials
PH: 301.874.6464
Email: transtech@skyworksinc.com
www.trans-techinc.com

Washington Mills Electro Minerals Co, NY See ad page 43

Ceramic and compounds

Alfa Aesar Johnson Matthey, MA
fuelcellmaterials.com, NexTech Materials Limited, OH
Zircar Zirconia Inc, NY

Cermets

Cerac Inc, Subsidiary of Williams Advanced Materials, WI
ESL Electroscience, PA (Richard S. Webb)

Chamotte

C-E Minerals, PA (M.K. Pierce)

Chrome and compounds

Atlantic Equipment Engineers, Micron Metals Inc, NJ
SCI Engineered Materials Inc, OH
US Electrofused Minerals Inc, PA
See ad page 47

Var Lac Old Chemical Co, NJ

Clay bodies, formulated

American Art Clay Co Inc, IN
Ceramics Consulting Services, MA
Imerys, GA
Sheffield Pottery, MA
Zero Refractories Inc, MI

Cobalt and compounds

Atlantic Equipment Engineers, Micron Metals Inc, NJ
Bayville Chemical Supply Co, NY
Ceramic Color, PA
HC Starck GmbH, Germany
HC Starck Inc, MA
SCI Engineered Materials Inc, OH
Var Lac Old Chemical Co, NJ

Colloidal silica

BassTech Intl, NJ
Minco Inc, TN

Colorants, inorganic

American Chemet Corp, IL
See ad page 41
C-E Minerals, PA (Chris Lang)

Fusion Ceramics Inc, Reimbold & Strick, OH (D. F. Schneider)

Reusche & Co. of TWS Inc, CO

Copper and compounds

American Chemet Corp, IL
See ad page 41

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740 WAUKEGAN RD.
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FAX (847) 948-0811

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Noah Technologies Corp, Chemical Div, TX
Pred Materials International Inc, NY
Shoei Chemical Inc, Japan (Y. Akimoto)
Var Lac Old Chemical Co, NJ

Crystals, single

Bayville Chemical Supply Co, NY
GFI Advanced Technologies Inc, NJ
Superconix Inc, MN

Dielectric powders

Phoenix Coating Resources Inc, FL
Trans-Tech Inc, MD See ad page 45

Dysprosium oxide

Alfa Aesar Johnson Matthey, MA
Bayville Chemical Supply Co, NY
Leico Industries Inc, NY

Electrically conducting powders

Advanced Cerametrics Inc, NJ (Bud Cass)
BassTech Intl, NJ
Fraunhofer Inst for Silicate Research, Germany
fuelcellmaterials.com, NexTech Materials Limited, OH

Erbium oxide

Alfa Aesar Johnson Matthey, MA
Bayville Chemical Supply Co, NY
Leico Industries Inc, NY

Europium oxide

Bayville Chemical Supply Co, NY
Leico Industries Inc, NY

Ferrites/ferromagnetic

Powder Processing & Technology LLC, IN

Fibers, ceramic

Advanced Cerametrics Inc, NJ (Bud Cass)
Fraunhofer Inst for Silicate Research, Germany (H. Spaniol)
Hyper-Therm HTC, CA
Refractory Specialties Inc, OH
Thermal Products Co Inc, GA
Unifrax Corp, NY See ad page 70

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E-mail: info@unifrax.com

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Fibers, glass

BassTech Intl, NJ
Mo-Sci Corp, MO (M Velez)
Saint-Gobain Quartz Ltd, UK
Unifrax Corp, NY See ad page 70

Fillers, fused silica

C-E Minerals, PA (M.K. Pierce)

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901 East Eight Avenue
King of Prussia, PA 19406
Phone: 610-768-8800
Fax: 610-337-8122
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Fillers, spherical silica

C-E Minerals, PA (M.K. Pierce)

C-E Minerals
901 East Eight Avenue
King of Prussia, PA 19406
Phone: 610-768-8800
Fax: 610-337-8122
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Fluorides

BassTech Intl, NJ
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GFI Advanced Technologies Inc, NJ
Noah Technologies Corp, Chemical Div, TX

Frit

Bartley Crucible & Refractories Inc, NJ (D. Mischel)
Ceramic Color, PA
Fusion Ceramics Inc, Reimbold & Strick, OH (D. F. Schneider)
Matrix Enterprises, OH

Sem-Com Co Inc, OH (Neil Hofziger)

See ad page 96

Specialty Glass Inc, FL

See ad page 97

VIOX Corp, WA

See ad page 98

Fused silica

Basic Resources, TN (Robert Sitterson)
BassTech Intl, NJ
Cargille Labs, NJ
Cerac Inc, Subsidiary of Williams Advanced Materials, WI
Industrial Ceramic Products Inc, OH (R.C. Oberst)
Ipsen Ceramics, IL
Minco Inc, TN
Momentive Performance Materials, OH
Saint-Gobain Quartz Ltd, United Kingdom
Valley Design Corp, CA

Gadolinium oxide

Alfa Aesar Johnson Matthey, MA
Bayville Chemical Supply Co, NY
GFI Advanced Technologies Inc, NJ

Gallium and compounds

Alfa Aesar Johnson Matthey, MA
Bayville Chemical Supply Co, NY
Cerac Inc, Subsidiary of Williams Advanced Materials, WI
GFI Advanced Technologies Inc, NJ
Superconix Inc, MN

Germanium dioxide

Alfa Aesar Johnson Matthey, MA
BassTech Intl, NJ
Gelest Inc, PA (Joel Zazyczny)
GFI Advanced Technologies Inc, NJ

Germanium oxide

BassTech Intl, NJ
Bayville Chemical Supply Co, NY
GFI Advanced Technologies Inc, NJ

Grain, refractory

C-E Minerals, PA (M.K. Pierce)

Graphite

Bartley Crucible & Refractories Inc, NJ (D. Mischel)
Mersen USA St Marys-PA Corp, Graphite Materials Div, PA

Superior Graphite Co, IL See ad page 42

Graphite, pyrolytic

Momentive Performance Materials, OH

Indium and compounds

Bayville Chemical Supply Co, NY
Cerac Inc, Subsidiary of Williams Advanced Materials, WI
GFI Advanced Technologies Inc, NJ
Superconix Inc, MN

Iron and compounds

Bayville Chemical Supply Co, NY
Leico Industries Inc, NY
SCI Engineered Materials Inc, OH

Iron oxide

Comptoir de Mineraux et Matieres Premieres, France
Hammill & Gillespie Inc, NJ (Dorna L. Isaacs)
Powder Processing & Technology LLC, IN

Lanthanides

Alfa Aesar Johnson Matthey, MA
Bayville Chemical Supply Co, NY
Gelest Inc, PA (Joel Zazyczny)
Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Rainer Gadow)

Lanthanum and compounds

Alfa Aesar Johnson Matthey, MA
Cerac Inc, Subsidiary of Williams Advanced Materials, WI
fuelcellmaterials.com, NexTech Materials Limited, OH
HC Starck GmbH, Germany
HC Starck Inc, MA

Lead and compounds

Noah Technologies Corp, Chemical Div, TX

Lithium and compounds

BassTech Intl, NJ
Ceramic Color, PA

Pred Materials International Inc, NY

Magnesia, fused

Advanced Composite Materials Corp, SC
Du-Co Ceramics Co, PA (Tom Arbanas)

**Washington Mills Electro Minerals Co,
NY** See ad page 43

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Magnesium and compounds

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HC Starck GmbH, Germany
HC Starck Inc, MA
Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Dietmar Scherer)
Noah Technologies Corp, Chemical Div, TX
Pred Materials International Inc, NY
RE Carroll Inc, NJ (Robert E. Carroll III)
Var Lac Old Chemical Co, NJ

Magnesium phosphates

BassTech Intl, NJ
Refractory Minerals, PA

Manganese dioxide

BassTech Intl, NJ

Manganese and compounds

Atlantic Equipment Engineers, Micron Metals Inc, NJ
Bayville Chemical Supply Co, NY
Var Lac Old Chemical Co, NJ

Metallic salts

Alfa Aesar Johnson Matthey, MA
Noah Technologies Corp, Chemical Div, TX

Metallizing compounds

Alfa Aesar Johnson Matthey, MA

Microspheres, hollow

**Washington Mills Electro Minerals Co,
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Molybdenum and compounds

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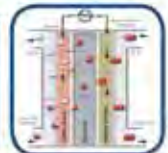
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Neodymium oxide

Alfa Aesar Johnson Matthey, MA
Leico Industries Inc, NY
Spontaneous Materials, IN

Nickel and compounds

American Chemet Corp, IL

See ad page 41



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Bayville Chemical Supply Co, NY
Cerac Inc, Subsidiary of Williams Advanced Materials, WI
Ceramic Color, PA
HC Starck GmbH, Germany
HC Starck Inc, MA
SCI Engineered Materials Inc, OH
Shoei Chemical Inc, Japan (Y. Akimoto)
Var Lac Old Chemical Co, NJ

Niobium and compounds

Bayville Chemical Supply Co, NY
GFI Advanced Technologies Inc, NJ
HC Starck Inc, MA
Leico Industries Inc, NY
Noah Technologies Corp, Chemical Div, TX
SCI Engineered Materials Inc, OH

Niobium oxide

Cerac Inc, Subsidiary of Williams Advanced Materials, WI
HC Starck GmbH, Germany
HC Starck Inc, MA

Organic precursors

Fraunhofer Inst for Silicate Research, Germany (W. Glaubitt)
Starfire Systems Inc, NY

Pastes, conductor

Shoei Chemical Inc, Japan (Y. Akimoto)

Phosphates

BassTech Intl, NJ
ICL Performance Products LP, MO
Refractory Minerals, PA

Piezoelectric compositions

APC Intl Ltd, PA
Fraunhofer Inst for Silicate Research, Germany (B. Brunner)
Saint-Gobain Quartz Ltd, United Kingdom
Sparkler Ceramics Pvt Ltd, India
Superconix Inc, MN

Pigments

Ceramic Color, PA
Eppler Assocs, CT (Richard A. Eppler)
Phoenix Coating Resources Inc, FL

Plaster, gypsum

Sheffield Pottery, MA

Plaster, industrial

Sheffield Pottery, MA

Porcelain enamels

Reusche & Co. of TWS Inc, CO

Potassium and compounds

Bayville Chemical Supply Co, NY

Powdered metals

Alfa Aesar Johnson Matthey, MA
Bayville Chemical Supply Co, NY
Pred Materials International Inc, NY
SCI Engineered Materials Inc, OH

Praseodymium oxide

Alfa Aesar Johnson Matthey, MA
Cerac Inc, Subsidiary of Williams Advanced Materials, WI
Leico Industries Inc, NY

Precious metals

Alfa Aesar Johnson Matthey, MA
Cerac Inc, Subsidiary of Williams Advanced Materials, WI
Leico Industries Inc, NY
Shoei Chemical Inc, Japan (Y. Akimoto)

Rare earths

Alfa Aesar Johnson Matthey, MA
Cerac Inc, Subsidiary of Williams Advanced Materials, WI
Noah Technologies Corp, Chemical Div, TX
Pred Materials International Inc, NY
Spontaneous Materials, IN
Superconix Inc, MN

Zircar Zirconia Inc, NY

Refractory oxides

Cerac Inc, Subsidiary of Williams Advanced Materials, WI

Resins, molding

Starfire Systems Inc, NY

Samarium oxide

Alfa Aesar Johnson Matthey, MA
Leico Industries Inc, NY

Sand, foundry

Minco Inc, TN
Pryor Giggey Co, AL (Allen R. Davis)

Unimin Corp, CT

US Silica Co, WV (M. Lyman)

See ad page 34

Sand, glass

Minco Inc, TN
Short Mountain Silica, TN
Unimin Corp, CT
US Silica Co, WV (M. Lyman)

See ad page 34

Sand, high-purity silica

BassTech Intl, NJ
Minco Inc, TN
Short Mountain Silica, TN
The Maryland Refractorie Co, OH
Unimin Corp, CT
US Silica Co, WV (M. Lyman)

See ad page 34

Scandium and compounds

Alfa Aesar Johnson Matthey, MA
GFI Advanced Technologies Inc, NJ
Leico Industries Inc, NY

Selenium and compounds

Alfa Aesar Johnson Matthey, MA
Amalgamet Canada, Div of Premetalco Inc, Canada (Naujoks Manfred)
Noah Technologies Corp, Chemical Div, TX

Semiconducting

GFI Advanced Technologies Inc, NJ
Superconix Inc, MN

Sialon powder

McDanel Advanced Ceramic Technologies, PA
Pred Materials International Inc, NY

Silica

Fraunhofer Inst for Silicate Research, Germany (W. Glaubitt)
Ipsen Ceramics, IL
Minco Inc, TN
Short Mountain Silica, TN
Sibelco Benelux, Belgium
The Maryland Refractorie Co, OH

Unimin Corp, CT

US Silica Co, WV (M. Lyman)

See ad page 34

Silicates

BassTech Intl, NJ

Pred Materials International Inc, NY

Silicon

Atlantic Equipment Engineers, Micron Metals Inc, NJ
Dow Corning Corp, MI
Elkem Metals Inc, PA
GFI Advanced Technologies Inc, NJ
Logomatic GmbH, Germany
Noah Technologies Corp, Chemical Div, TX
Pred Materials International Inc, NY
Sonic-Mill, NM
Superconix Inc, MN
Var Lac Old Chemical Co, NJ

Silicon carbide

Advanced Composite Materials Corp, SC
Atlantic Equipment Engineers, Micron Metals Inc, NJ
BassTech Intl, NJ
Bullen, OH
C-E Minerals, PA (M.K. Pierce)
Ceradyne Inc, CA (J. Mangels)
CerCo LLC, OH (Paul Stipanovich)
Dow Corning Corp, MI

Electro Abrasives, NY

See ad page 47



Fraunhofer Inst for Silicate Research, Germany (J. Clade)
HC Starck GmbH, Germany
HC Starck Inc, MA
KC Abrasive Co LLC, KS (Ronald Barncord)
Logomatic GmbH, Germany
Pred Materials International Inc, NY
Sonic-Mill, NM
Starfire Systems Inc, NY
Superconix Inc, MN

Superior Graphite Co, IL

See ad page 42



Tenmat Ltd, United Kingdom (Peter Sharp)
Treibacher Schleifmittel North America Inc, NY

US Electrofused Minerals Inc, PA

See ad page 47

Var Lac Old Chemical Co, NJ

Washington Mills Electro Minerals Co, NY

See ad page 43



Silicon nitride

Atlantic Equipment Engineers, Micron Metals Inc, NJ
Bullen, OH
Ceradyne Inc, CA (J. Mangels)
CerCo LLC, OH
HC Starck GmbH, Germany

HC Starck Inc, MA
International Ceramic Engineering, MA
McDanel Advanced Ceramic Technologies, PA
Pred Materials International Inc, NY
Rio Tinto Alcan Specialty Aluminas, OH
Tenmat Ltd, United Kingdom (Peter Sharp)
Var Lac Old Chemical Co, NJ

Silicon powder

Elkem Metals Inc, PA

Sodium and compounds

Noah Technologies Corp, Chemical Div, TX

Spheres, ceramic

Fraunhofer Inst for Silicate Research, Germany (F. Hutter)
Refratarios Paulista Industria e Comercio Ltda, Brazil
(Romano G. Capasso)
Saint-Gobain NorPro Corp, OH
Zircar Zirconia Inc, NY

Spheres, glass

C-E Minerals, PA (M.K. Pierce)
Guyson Intl Ltd, United Kingdom
KC Abrasive Co LLC, KS (Ronald Barncord)
Mo-Sci Corp, MO (CW Kim)

Strontium and compounds

Alfa Aesar Johnson Matthey, MA
BassTech Intl, NJ
Cerac Inc, Subsidiary of Williams Advanced Materials, WI
GFI Advanced Technologies Inc, NJ
Noah Technologies Corp, Chemical Div, TX
Seaforth Mineral & Ore Co Inc, OH

Superabrasives

Accurate Diamond Tool Corp, NJ
Diamond Industrial Tools Inc, IL
Pryor Giggey Co, AL (Allen R. Davis)
Rio Tinto Alcan Specialty Aluminas, OH

Superconducting

Alfa Aesar Johnson Matthey, MA

Tantalum metal powder

GFI Advanced Technologies Inc, NJ
HC Starck GmbH, Germany
HC Starck Inc, MA
Leico Industries Inc, NY

Tantalum oxide

HC Starck GmbH, Germany
HC Starck Inc, MA

Terbium oxide

Alfa Aesar Johnson Matthey, MA
GFI Advanced Technologies Inc, NJ
Leico Industries Inc, NY

Thick film materials

ESL Electroscience, PA (Richard S. Webb)
fuelcellmaterials.com, NexTech Materials Limited, OH
Shoei Chemical Inc, Japan (Y. Akimoto)

Thin film materials

Cerac Inc, Subsidiary of Williams Advanced Materials, WI
Gelest Inc, PA (Joel Zazyczny)
Valley Design Corp, CA

Tin and compounds

Amalgamet Canada, Div of Premetalco Inc, Canada
(Naujoks Manfred)
Atlantic Equipment Engineers, Micron Metals Inc, NJ
Gelest Inc, PA (Joel Zazyczny)
Var Lac Old Chemical Co, NJ

Titania

Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Michael Buchmann)
Pred Materials International Inc, NY

Titanium and compounds

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HC Starck GmbH, Germany
HC Starck Inc, MA
Leico Industries Inc, NY
Noah Technologies Corp, Chemical Div, TX
Var Lac Old Chemical Co, NJ

Titanium carbide

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HC Starck GmbH, Germany
HC Starck Inc, MA
Var Lac Old Chemical Co, NJ

Titanium diboride

Ceradyne Inc, CA (J. Mangels)
HC Starck GmbH, Germany
HC Starck Inc, MA
Momentive Performance Materials, OH
Pred Materials International Inc, NY

Titanium dioxide

BassTech Intl, NJ
Fraunhofer Inst for Silicate Research, Germany (P.
Lobmann)
Superconix Inc, MN

Titanium nitride

Atlantic Equipment Engineers, Micron Metals Inc, NJ
HC Starck GmbH, Germany
HC Starck Inc, MA
Pred Materials International Inc, NY
Var Lac Old Chemical Co, NJ

Tungsten carbide

Abresist Corp, IN
Atlantic Equipment Engineers, Micron Metals Inc, NJ
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HC Starck Inc, MA
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- Mullite-Zirconia
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- Wollastonite



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Var Lac Old Chemical Co, NJ

Tungsten oxide

HC Starck GmbH, Germany
HC Starck Inc, MA

Uranium and compounds

Noah Technologies Corp, Chemical Div, TX

Vanadium and compounds

Atlantic Equipment Engineers, Micron Metals Inc, NJ
Noah Technologies Corp, Chemical Div, TX
Stratcor Inc, PA
Var Lac Old Chemical Co, NJ

Whiskers

Advanced Composite Materials Corp, SC

Yttria

Bullen, OH

ESL Electroscience, PA (Richard S. Webb)
HC Starck GmbH, Germany
HC Starck Inc, MA
Pred Materials International Inc, NY

Washington Mills Electro Minerals Co, NY
See ad page 43

Zircar Zirconia Inc, NY

Yttrium and compounds

Alfa Aesar Johnson Matthey, MA
Cerac Inc, Subsidiary of Williams Advanced Materials, WI

Zinc and compounds

Cerac Inc, Subsidiary of Williams Advanced Materials, WI
Leico Industries Inc, NY
Noah Technologies Corp, Chemical Div, TX
Perl Pigments LLC, NJ
RE Carroll Inc, NJ (Robert E. Carroll III)
SCI Engineered Materials Inc, OH

Zinc borate

Natl BoraXX Corp, OH

Zinc oxide

American Chemet Corp, IL

See ad page 41

Perl Pigments LLC, NJ
SCI Engineered Materials Inc, OH
Superconix Inc, MN
ZincOx Resources Plc, United Kingdom
Zochem, Canada (Dwayne Dietrich)

Zirconia

fuelcellmaterials.com, NexTech Materials Limited, OH
International Ceramic Engineering, MA
Leico Industries Inc, NY
Pangea Intl Ltd, China
Phoenix Coating Resources Inc, FL
PremaTech Advanced Ceramics, MA
Refractron Technologies Corp, NY

Trans-Tech Inc, MD See ad page 45

Washington Mills Electro Minerals Co, NY
See ad page 43

Zircar Zirconia Inc, NY

Zircoa Inc, OH

Zirconia, engineering grade

Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Andreas Killinger)
Leico Industries Inc, NY
McDanel Advanced Ceramic Technologies, PA
Pangea Intl Ltd, China
Zircoa Inc, OH

Zirconia, high-purity

International Ceramic Engineering, MA
Pangea Intl Ltd, China
Phoenix Coating Resources Inc, FL
Refractron Technologies Corp, NY

Zirconia, refractory grade

McDanel Advanced Ceramic Technologies, PA
Pangea Intl Ltd, China
Phoenix Coating Resources Inc, FL

US Electrofused Minerals Inc, PA

See ad page 47

Washington Mills Electro Minerals Co, NY
See ad page 43

Zircoa Inc, OH

Zirconium and compounds

Atlantic Equipment Engineers, Micron Metals Inc, NJ
Cerac Inc, Subsidiary of Williams Advanced Materials, WI
Ceradyne Inc, CA
HC Starck GmbH, Germany
HC Starck Inc, MA
Noah Technologies Corp, Chemical Div, TX
Var Lac Old Chemical Co, NJ

Zirconium carbide

HC Starck GmbH, Germany
HC Starck Inc, MA

Zirconium carbonate

BassTech Intl, NJ

Zirconium diboride

Ceradyne Inc, CA
HC Starck GmbH, Germany
HC Starck Inc, MA
Pred Materials International Inc, NY

Zirconium oxide

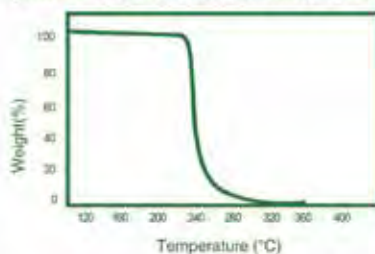
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Phoenix Coating Resources Inc, FL
Refractron Technologies Corp, NY
Superconix Inc, MN
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Cotronics Corp, NY
Dow Corning Corp, MI
Master Bond Inc, NJ
Starfire Systems Inc, NY

Adhesives, organic

Cotronics Corp, NY

Empower Materials Inc, DE

See ad page 48

Master Bond Inc, NJ

Binders

Active Minerals Intl LLC, MD

See ad page 49

BassTech Intl, NJ

Empower Materials Inc, DE

See ad page 48



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Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Ralf Fischer)

Refractory Minerals, PA

Richard E Mistler Inc, PA (Richard E. Mistler)

Tapcasting Warehouse Div, Richard E Mistler Inc, PA

RT Vanderbilt Co Inc, CT (Randall L. Johnson)

Wesbond Corp, DE (Wes Jones)
Zschimmer & Schwarz, U.S. Div, GA

Conditioners

Sweco, KY
RT Vanderbilt Co Inc, CT (Randall L. Johnson)

Deflocculants

Richard E Mistler Inc, PA (Richard E. Mistler)
Tapecasting Warehouse Div, Richard E Mistler Inc, PA
RT Vanderbilt Co Inc, CT (Randall L. Johnson)
Zschimmer & Schwarz, U.S. Div, GA

Defoaming agents

Dow Corning Corp, MI
Zschimmer & Schwarz, U.S. Div, GA

Fillers

C-E Minerals, PA (Chris Lang)
Momentive Performance Materials, OH
Nat'l Lime & Stone Co, OH (Jim Wells)
NYCO Minerals Inc, NY
RE Carroll Inc, NJ (Robert E. Carroll III)
The Maryland Refractorie Co, OH

Unimin Corp, CT See ad page 34



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Flocculants

Wesbond Corp, DE (Wes Jones)
Zschimmer & Schwarz, U.S. Div, GA

Fluxes

Unimin Corp, CT See ad page 34



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Foaming agents

Dow Corning Corp, MI
Zschimmer & Schwarz, U.S. Div, GA

Fungicides

RT Vanderbilt Co Inc, CT (Randall L. Johnson)

Gelling agents

Active Minerals Intl LLC, MD
See ad page 49

Sasol North America Inc, Ceralox Div, AZ

Glaze additives

Zschimmer & Schwarz, U.S. Div, GA

Lubricants

Ceradyne Inc, CA
Dow Corning Corp, MI
Kaeser Compressors Inc, VA
Momentive Performance Materials, OH
RE Carroll Inc, NJ (Robert E. Carroll III)
Renite Co, OH (Rodger P. Kampf)

Superior Graphite Co, IL See ad page 42

Tapecasting Warehouse Div, Richard E Mistler Inc, PA
Zschimmer & Schwarz, U.S. Div, GA

Mill additions

Sweco, KY

Organometallic precursors

Gelest Inc, PA (Joel Zazyczny)

Plasticizers

Richard E Mistler Inc, PA (Richard E. Mistler)

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- By using *Acti-Gel® 208* to reduce Cellulose Ethers and eliminate Phosphate Dispersants, the negative effects of Sodium are greatly reduced, allowing for increased adhesion strengths and reduced surface defects.
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Tapecasting Warehouse Div, Richard E Mistler Inc, PA
Zschimmer & Schwarz, U.S. Div, GA

Polycarbosilane

Gelest Inc, PA (Joel Zazyczny)
Starfire Systems Inc, NY

Polysilazane

Dow Corning Corp, MI
Gelest Inc, PA (Joel Zazyczny)
Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Dietmar Scherer)

Refractory additives

BassTech Intl, NJ
Ceradyn Inc, CA
Matrix Enterprises, OH
QuantumSphere Inc, CA
Refractory Minerals, PA
Zschimmer & Schwarz, U.S. Div, GA

Release agents

Dow Corning Corp, MI
Momentive Performance Materials, OH
Renite Co, OH (Rodger P. Kampf)
Zschimmer & Schwarz, U.S. Div, GA

Rheological additives

Zschimmer & Schwarz, U.S. Div, GA

Tape casting additives

Empower Materials Inc, DE

See ad page 48

Tapecasting Warehouse Div, Richard E Mistler Inc, PA
Zschimmer & Schwarz, U.S. Div, GA

Sintering aids

Amalgamet Canada, Div of Premetalco Inc, Canada
(Naujoks Manfred)

Empower Materials Inc, DE

See ad page 48

Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Marcus Speicher)

Starfire Systems Inc, NY

Suspending agents

Active Minerals Intl LLC, MD

See ad page 49



Dow Corning Corp, MI
RT Vanderbilt Co Inc, CT (Randall L. Johnson)
Zschimmer & Schwarz, U.S. Div, GA
ZYP Coatings Inc, TN (C.E. Holcombe)

Thickening agents

Active Minerals Intl LLC, MD

See ad page 49

Sasol North America Inc, Ceralox Div, AZ
RT Vanderbilt Co Inc, CT (Randall L. Johnson)

Viscosity stabilizers

Active Minerals Intl LLC, MD

See ad page 49

RT Vanderbilt Co Inc, CT (Randall L. Johnson)

Wetting agents

Dow Corning Corp, MI
Zschimmer & Schwarz, U.S. Div, GA

MATERIALS PREPARATION, HANDLING & PACKAGING

Agglomerators

Eirich Machines Inc, IL
Heinen Drying GmbH, Heinen Trocknungstechnologie
GmbH, Germany
Lancaster Products Div, Kercher Industries Inc, PA
Littleford Day Inc, KY
Processall Inc, OH
Sahut Conreur SA, France
Sturtevant Inc, MA

Bag emptiers

Cyclonaire Corp, NE
Dover Conveyor Inc, OH
Dynamic Air Inc, MN
Nol-Tec Systems Inc, MN

Bagging equipment

Cyclonaire Corp, NE
Dynamic Air Inc, MN
Haver & Boecker, Germany
Rosco Engineering Process Equipment, CO

Bags

Bulk Pack Inc, LA (Pete Anderson)

Barcode labels

Quality Stamp Co, OH
Strico AG, Switzerland

Batching equipment

Cyclonaire Corp, NE
Dover Conveyor Inc, OH
Eirich Machines Inc, IL
General Glass Equipment Co, NJ
Lancaster Products Div, Kercher Industries Inc, PA
Lanly Co, OH
Littleford Day Inc, KY
Manufacturers Equipment Co, OH (F.B. Carraher)
Nol-Tec Systems Inc, MN
Processall Inc, OH
Rosco Engineering Process Equipment, CO (Robert St.
Clair)
Sama Maschinenbau GmbH, Germany
Sweco, KY
Young Industries Inc, PA

Batching plants and systems

Cyclonaire Corp, NE
Nol-Tec Systems Inc, MN

Belts, elevator

Dover Conveyor Inc, OH

Bin activators

Carman Industries Inc, IN

Bin dischargers

Carman Industries Inc, IN
Cyclonaire Corp, NE
Dover Conveyor Inc, OH
Dynamic Air Inc, MN
Nol-Tec Systems Inc, MN

Bins, storage

Bulk Pack Inc, LA (Pete Anderson)
Dover Conveyor Inc, OH
Heinen Drying GmbH, Heinen Trocknungstechnologie
GmbH, Germany
Jenike & Johanson Inc, MA
Nol-Tec Systems Inc, MN

Tempo Plastic, CA

See ad page 50

Blenders

Advanced Machinery Inc, MI (T. A. Crosson)
Cyclonaire Corp, NE

Detroit Process Machinery Inc., MI

See ad page 55

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Gasbarre Products Inc, PA (Steve Volansky)

Glen Mills Inc, NJ (L. Zigman-Horn)

See ad page 51

Heinen Drying GmbH, Heinen Trocknungstechnologie GmbH, Germany

Hosokawa Micron Powder Systems, NJ

Lancaster Products Div, Kercher Industries Inc, PA

Littleford Day Inc, KY

Mohr Corp, MI

See ad page 87

Netzsch Premier Technologies LLC, PA

Nol-Tec Systems Inc, MN

Norstone Inc, PA

Processall Inc, OH

Rosco Engineering Process Equipment, CO

Sturtevant Inc, MA

Sweco, KY

Young Industries Inc, PA

Blungers

Eirich Machines Inc, IL

Sama Maschinenbau GmbH, Germany

Briquetting & tableting equipment

Advanced Machinery Inc, MI (T. A. Crosson)

Hosokawa Micron Powder Systems, NJ

Sahut Conreur SA, France

Buckets, elevator

Dover Conveyor Inc, OH

Maxi-Lift Inc, TX (Chris Tarver)

Classifiers

Haver & Boecker, Germany

Hosokawa Micron Powder Systems, NJ

Netzsch Premier Technologies LLC, PA

Norstone Inc, PA

Rosco Engineering Process Equipment, CO

Sturtevant Inc, MA

Sweco, KY

Young Industries Inc, PA

Compressors, air

Kaeser Compressors Inc, VA

Conveyors

Basic Machinery Co Inc, NC

CS Bell Co, OH

Cambridge Wire Cloth Co, MD

Casso-Solar Tech LLC, NY

DeMarco Vacuum Corp, IL

Dover Conveyor Inc, OH

Dynamic Air Inc, MN

General Glass Equipment Co, NJ

Kornylak Corp, OH

Lancaster Products Div, Kercher Industries Inc, PA

Manufacturers Equipment Co, OH (F.B. Carraher)

Maryland Wire Belts Inc, MD

Maxi-Lift Inc, TX (Chris Tarver)

Nol-Tec Systems Inc, MN

Rosco Engineering Process Equipment, CO (Robert St. Clair)

Velco GmbH, Germany

WCS Inc, CA

Young Industries Inc, PA

Conveyors, belt

Cambridge Wire Cloth Co, MD

Casso-Solar Tech LLC, NY

Dover Conveyor Inc, OH

Lanly Co, OH

Maryland Wire Belts Inc, MD

Conveyors, bucket

Dover Conveyor Inc, OH

Maxi-Lift Inc, TX (Chris Tarver)

Conveyors, pneumatic

Cyclonaire Corp, NE

Dynamic Air Inc, MN

Nol-Tec Systems Inc, MN

Velco GmbH, Germany

Conveyors, screw

Cyclonaire Corp, NE

Dover Conveyor Inc, OH

Dynamic Air Inc, MN

Conveyors, vibrating

Carman Industries Inc, IN

Dynamic Air Inc, MN

Crushers

Advanced Machinery Inc, MI (T. A. Crosson)

Basic Machinery Co Inc, NC

CS Bell Co, OH

Detroit Process Machinery Inc., MI

See ad page 55

Fritsch GmbH, Milling and Sizing, Germany

Glen Mills Inc, NJ (L. Zigman-Horn)

See ad page 51

Gundlach Equipment Corp, IL

Hosokawa Micron Powder Systems, NJ

Lancaster Products Div, Kercher Industries Inc, PA

Manufacturers Equipment Co, OH (F.B. Carraher)

Mohr Corp, MI

See ad page 87

Retsch Inc, PA

Rosco Engineering Process Equipment, CO (Robert St. Clair)

Sahut Conreur SA, France

Schutte-Buffer Buffalo Hammermill LLC, NY (Thomas E. Warne)

Stedman Machine Co Inc, Div of Eagle Crusher Co, IN

Sturtevant Inc, MA

Williams Patent Crusher & Pulverizer Co Inc, MO

Wyssmont Co Inc, NJ (J. Bevacqua)

Crushers, hammermill

CS Bell Co, OH

Glen Mills Inc, NJ (E. Szwerc)

See ad page 51

Hosokawa Micron Powder Systems, NJ

Schutte-Buffer Buffalo Hammermill LLC, NY (Thomas E. Warne)

Stedman Machine Co Inc, Div of Eagle Crusher Co, IN

Sturtevant Inc, MA

Williams Patent Crusher & Pulverizer Co Inc, MO

Crushers, impact

Glen Mills Inc, NJ (E. Szwerc)

See ad page 51

Gundlach Equipment Corp, IL

Schutte-Buffer Buffalo Hammermill LLC, NY (Thomas E. Warne)

Stedman Machine Co Inc, Div of Eagle Crusher Co, IN

Sturtevant Inc, MA

Williams Patent Crusher & Pulverizer Co Inc, MO

Wyssmont Co Inc, NJ (J. Bevacqua)

Crushers, jaw

Fritsch GmbH, Milling and Sizing, Germany

Glen Mills Inc, NJ (E. Szwerc)

See ad page 51

Schutte-Buffer Buffalo Hammermill LLC, NY (Thomas E. Warne)

Sturtevant Inc, MA

Crushers, primary

Gundlach Equipment Corp, IL

Schutte-Buffer Buffalo Hammermill LLC, NY (Thomas E. Warne)

Stedman Machine Co Inc, Div of Eagle Crusher Co, IN

Sturtevant Inc, MA

Williams Patent Crusher & Pulverizer Co Inc, MO

Crushers, roll

Gundlach Equipment Corp, IL

Manufacturers Equipment Co, OH (F.B. Carraher)

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Dynamic Air Inc, MN
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Lancaster Products Div, Kercher Industries Inc, PA
Rosco Engineering Process Equipment, CO

Drum tumblers

Glen Mills Inc, NJ (D. Ahrens)

See ad page 51

Laval Labs Inc, Quebec

Dryers, fluid bed

Carman Industries Inc, IN
Dynamic Air Inc, MN
Heinen Drying GmbH, Heinen Trocknungstechnologie GmbH, Germany
Williams Patent Crusher & Pulverizer Co Inc, MO

Dryers, rotating tray

Wyssmont Co Inc, NJ (J. Bevacqua)

Dust collectors

Chisholm Boyd & White Co, IL
Cyclonaire Corp, NE
Dynamic Air Inc, MN
Guyson Intl Ltd, United Kingdom
Nol-Tec Systems Inc, MN
Spencer Turbine Co, CT (C. Beaulieu)

Dust control equipment

Chisholm Boyd & White Co, IL
Dynamic Air Inc, MN
Rosco Engineering Process Equipment, CO (Robert St. Clair)
Spencer Turbine Co, CT (C. Beaulieu)
Young Industries Inc, PA

Edge Protectors

Tempo Plastic, CA

See ad page 50

Electric screen heating

Midwestern Industries Inc, OH (Bill Crone)

Environmental/waste treatment equipment

Cober Muegge LLC, CT
Fritsch GmbH, Milling and Sizing, Germany
Kaeser Compressors Inc, VA
Rosco Engineering Process Equipment, CO
Spencer Turbine Co, CT (P. Burdick)

Fans

Chisholm Boyd & White Co, IL
Rosco Engineering Process Equipment, CO
Spencer Turbine Co, CT (P. Johnson)

Feeders

Basic Machinery Co Inc, NC
Carman Industries Inc, IN
Dover Conveyor Inc, OH
Dynamic Air Inc, MN
Fritsch GmbH, Milling and Sizing, Germany
General Glass Equipment Co, NJ
Jenike & Johanson Inc, MA
Lancaster Products Div, Kercher Industries Inc, PA
Manufacturers Equipment Co, OH (F.B. Carraher)
Nol-Tec Systems Inc, MN
Rosco Engineering Process Equipment, CO (Robert St. Clair)
Wyssmont Co Inc, NJ (J. Bevacqua)
Young Industries Inc, PA

Feeders, batch

Carman Industries Inc, IN
Dover Conveyor Inc, OH
Merkle International Inc, IL

Nol-Tec Systems Inc, MN

Feeders, glass, hot

Carman Industries Inc, IN

Feeders, gravimetric

Dynamic Air Inc, MN

Feeders, pneumatic

Cyclonaire Corp, NE
Dynamic Air Inc, MN
Nol-Tec Systems Inc, MN

Filters

Cambridge Wire Cloth Co, MD
Croll-Reynolds Engineering Co, CT (Louis D. Ancillai)
Haver & Boecker, Germany
Kaeser Compressors Inc, VA
Norstone Inc, PA
Russell Finex Inc, NC
Sweco, KY
Tapecasting Warehouse Div, Richard E Mistler Inc, PA

Filters, cloth/felt

Haver & Boecker, Germany
Norstone Inc, PA
Tapecasting Warehouse Div, Richard E Mistler Inc, PA

Granulators

Aadvanced Machinery Inc, MI (T. A. Crosson)
CW Brabender Instruments Inc, NJ
Fritsch GmbH, Milling and Sizing, Germany
Heinen Drying GmbH, Heinen Trocknungstechnologie GmbH, Germany
Hosokawa Micron Powder Systems, NJ
Lancaster Products Div, Kercher Industries Inc, PA
Littleford Day Inc, KY
Mohr Corp, MI See ad page 87
Netzsch Premier Technologies LLC, PA
Sahut Conreur SA, France
Wyssmont Co Inc, NJ (J. Bevacqua)

Grinders

Buehler Ltd, IL
CS Bell Co, OH
Diamond Industrial Tools Inc, IL
Fritsch GmbH, Milling and Sizing, Germany
Glen Mills Inc, NJ (D. Ahrens)

See ad page 51

Hosokawa Micron Powder Systems, NJ
Logomatic GmbH, Germany
Netzsch Premier Technologies LLC, PA
Norstone Inc, PA
Stedman Machine Co Inc, Div of Eagle Crusher Co, IN
Sturtevant Inc, MA
Sweco, KY
WCS Inc, CA
Wyssmont Co Inc, NJ (J. Bevacqua)

Grinding media

CerCo LLC, OH (Susan English)
ER Advanced Ceramics Inc, OH
Fritsch GmbH, Milling and Sizing, Germany
Glen Mills Inc, NJ (S. Goldberg)

See ad page 51

KC Abrasive Co LLC, KS (Ronald Barncord)
Netzsch Premier Technologies LLC, PA
Norstone Inc, PA
Pangea Intl Ltd, China
Premier Mill An SPX Brand, WI
Sweco, KY
Tapecasting Warehouse Div, Richard E Mistler Inc, PA
Union Process Inc, OH
Zircoa Inc, OH

Grinding mills, vibratory

Fritsch GmbH, Milling and Sizing, Germany
Sturtevant Inc, MA

Sweco, KY

Gunning equipment, refractory

Reed Gunite & Shotcrete Equipment, CA (Paul Sulman)
Velco GmbH, Germany

Hoppers

Basic Machinery Co Inc, NC
Dover Conveyor Inc, OH
Jenike & Johanson Inc, MA
Manufacturers Equipment Co, OH (F.B. Carraher)
Reed Gunite & Shotcrete Equipment, CA (Paul Sulman)
Rosco Engineering Process Equipment, CO

Hydraulic systems

Basic Machinery Co Inc, NC
BMI Automation Inc, AL (Henry Burns III)

Impeller, mixing

Norstone Inc, PA
Premier Mill An SPX Brand, WI

Materials handling equipment

Abresist Corp, IN
Basic Machinery Co Inc, NC
BMI Automation Inc, AL (Henry Burns III)
CS Bell Co, OH
Cyclonaire Corp, NE
DeMarco Vacuum Corp, IL
Dover Conveyor Inc, OH
Dynamic Air Inc, MN
Eirich Machines Inc, IL
Gasbarre Products Inc, PA (Steve Volansky)
Heinen Drying GmbH, Heinen Trocknungstechnologie GmbH, Germany
Keyria Inc, CO
Kornylak Corp, OH
Lancaster Products Div, Kercher Industries Inc, PA
Manufacturers Equipment Co, OH (F.B. Carraher)
Maxi-Lift Inc, TX (Chris Tarver)
Nol-Tec Systems Inc, MN
North Star Equipment Inc, WA
Reed Gunite & Shotcrete Equipment, CA (Paul Sulman)
Rosco Engineering Process Equipment, CO (Robert St. Clair)
Sellick Equipment Ltd, Canada
Spencer Turbine Co, CT (P. Johnson/ C. Beaulieu)
Sweco, KY
Tempo Plastic, CA See ad page 50
WCS Inc, CA
Young Industries Inc, PA

Mill linings

Abresist Corp, IN
CerCo LLC, OH (Susan English)
ER Advanced Ceramics Inc, OH
Norstone Inc, PA
Sweco, KY

Mills

CW Brabender Instruments Inc, NJ
CS Bell Co, OH
Eirich Machines Inc, IL
ER Advanced Ceramics Inc, OH
EXAKITechnologies Inc, OK
Glen Mills Inc, NJ (D. Ahrens)

See ad page 51

Gundlach Equipment Corp, IL
Netzsch Premier Technologies LLC, PA
Noble Technologies Group, NH (Charles W. Miller)
Norstone Inc, PA
Premier Mill An SPX Brand, WI
Retsch Inc, PA
Schutte-Buffalo Hammermill LLC, NY (Thomas E. Warne)
Sonic-Mill, NM

Stedman Machine Co Inc, Div of Eagle Crusher Co, IN
Sturtevant Inc, MA
Sweco, KY
Tapecasting Warehouse Div, Richard E Mistler Inc, PA
Union Process Inc, OH

Mills, attritor

Aadvanced Machinery Inc, MI (T. A. Crosson)
Detroit Process Machinery Inc., MI
See ad page 55
Glen Mills Inc, NJ (S. Goldberg)
See ad page 51

Netzsch Premier Technologies LLC, PA
Norstone Inc, PA
Sturtevant Inc, MA
Union Process Inc, OH
Wyssmont Co Inc, NJ (J. Bevacqua)

Mills, ball & pebble

Aadvanced Machinery Inc, MI (T. A. Crosson)
Detroit Process Machinery Inc., MI
See ad page 55
ER Advanced Ceramics Inc, OH
Fritsch GmbH, Milling and Sizing, Germany
Glen Mills Inc, NJ (S. Goldberg)
See ad page 51

Hosokawa Micron Powder Systems, NJ
Netzsch Premier Technologies LLC, PA
Norstone Inc, PA
Sweco, KY
Union Process Inc, OH

Mills, centrifugal

Fritsch GmbH, Milling and Sizing, Germany
Glen Mills Inc, NJ (E. Szwerc)
See ad page 51

Mills, hammer

CS Bell Co, OH
Glen Mills Inc, NJ (E. Szwerc)
See ad page 51
Hosokawa Micron Powder Systems, NJ
Schutte-Buffalo Hammermill LLC, NY (Thomas E. Warne)
Stedman Machine Co Inc, Div of Eagle Crusher Co, IN
Sturtevant Inc, MA
Williams Patent Crusher & Pulverizer Co Inc, MO

Mills, jar

Detroit Process Machinery Inc., MI
See ad page 55
Fritsch GmbH, Milling and Sizing, Germany
Norstone Inc, PA
Tapecasting Warehouse Div, Richard E Mistler Inc, PA

Mills, jet

Hosokawa Micron Powder Systems, NJ
Netzsch Premier Technologies LLC, PA
Norstone Inc, PA
Rosco Engineering Process Equipment, CO
Sturtevant Inc, MA

Mills, planetary

Fritsch GmbH, Milling and Sizing, Germany
Retsch Inc, PA

Mills, roll

EXAKT Technologies Inc, OK
Gundlach Equipment Corp, IL
Norstone Inc, PA
Williams Patent Crusher & Pulverizer Co Inc, MO

Mills, rod

Wyssmont Co Inc, NJ (J. Bevacqua)

Mills, vibratory

Fritsch GmbH, Milling and Sizing, Germany
Sweco, KY

Mining & beneficiation equipment

Dover Conveyor Inc, OH

Netzsch Premier Technologies LLC, PA
Reed Gunite & Shotcrete Equipment, CA (Paul Sulman)
Rosco Engineering Process Equipment, CO

Mixers, batch

Dynamic Air Inc, MN
Eirich Machines Inc, IL
Glen Mills Inc, NJ (E. Szwerc)
See ad page 51



Goceram AB, Sweden
Heinen Drying GmbH, Heinen Trocknungstechnologie GmbH, Germany
Laval Labs Inc, Quebec
Netzsch Premier Technologies LLC, PA
Nol-Tec Systems Inc, MN
Norstone Inc, PA
Premier Mill An SPX Brand, WI
Processall Inc, OH

Mixers, drum

Glen Mills Inc, NJ (E. Szwerc)
See ad page 51
Laval Labs Inc, Quebec
Norstone Inc, PA

Mixers, pneumatic

Dynamic Air Inc, MN
Nol-Tec Systems Inc, MN

Mixers, portable

Dynamic Air Inc, MN
Premier Mill An SPX Brand, WI

Mixers, refractory

Eirich Machines Inc, IL
Littleford Day Inc, KY
Netzsch Premier Technologies LLC, PA
Reed Gunite & Shotcrete Equipment, CA (Paul Sulman)

Mixers, vacuum

Eirich Machines Inc, IL
Netzsch Premier Technologies LLC, PA
Norstone Inc, PA
Processall Inc, OH

Mixing equipment

Aadvanced Machinery Inc, MI (T. A. Crosson)
Detroit Process Machinery Inc., MI
See ad page 55

Dynamic Air Inc, MN
Eirich Machines Inc, IL
ER Advanced Ceramics Inc, OH
General Glass Equipment Co, NJ

Glen Mills Inc, NJ (L. Zigman-Horn)
See ad page 51

Goceram AB, Sweden
Gundlach Equipment Corp, IL
Hosokawa Micron Powder Systems, NJ
Lancaster Products Div, Kercher Industries Inc, PA
Littleford Day Inc, KY
Netzsch Premier Technologies LLC, PA
Noble Technologies Group, NH (Charles W. Miller)
Norstone Inc, PA
Peltsman Corp, MN
Premier Mill An SPX Brand, WI
Processall Inc, OH
Rosco Engineering Process Equipment, CO
Sweco, KY

Young Industries Inc, PA

Nozzles

HC Starck Ceramics GmbH & Co KG, Germany
Maryland Ceramic & Steatite Co Inc, MD
Renite Co, OH (L. Harding)

Nozzles, air spray

Renite Co, OH (L. Harding)

Nozzles, liquid spray

CerCo LLC, OH
Graco Inc, MN
Renite Co, OH (L. Harding)

Packaging equipment

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BMI Automation Inc, AL (Henry Burns III)
Haver & Boecker, Germany
Hosokawa Micron Powder Systems, NJ
Lachenmeier AS, Denmark
PTX-Pentronix Inc, Subsidiary of Gasbarre Products Inc, MI (Jim Kastl)
Rosco Engineering Process Equipment, CO
Tempo Plastic, CA See ad page 50

Palletizing equipment

BMI Automation Inc, AL (Henry Burns III)
PTX-Pentronix Inc, Subsidiary of Gasbarre Products Inc, MI (Jim Kastl)
Rosco Engineering Process Equipment, CO

Pans, dry and wet

Manufacturers Equipment Co, OH (F.B. Carraher)

Pneumatic systems

Abresist Corp, IN
BMI Automation Inc, AL (Henry Burns III)
Cyclonaire Corp, NE
Lanly Co, OH
Nol-Tec Systems Inc, MN
Reed Gunite & Shotcrete Equipment, CA (Paul Sulman)
Rosco Engineering Process Equipment, CO (Robert St. Clair)
Velco GmbH, Germany
Young Industries Inc, PA

Pollution control equipment

Chisholm Boyd & White Co, IL
Control Instruments Corp, NJ
DeMarco Vacuum Corp, IL
Rosco Engineering Process Equipment, CO
Spencer Turbine Co, CT (C. Beaulieu)
Young Industries Inc, PA

Process control equipment

Casso-Solar Tech LLC, NY
Control Instruments Corp, NJ
Datapaq Inc, MA
Eirich Machines Inc, IL
General Glass Equipment Co, NJ
Keyria Inc, CO
Lancaster Products Div, Kercher Industries Inc, PA
Malvern Instruments, MA
Nol-Tec Systems Inc, MN
Rosco Engineering Process Equipment, CO
Strainoptics Inc, PA

Protective packaging

Tempo Plastic, CA See ad page 50

Protective packaging, foam

Tempo Plastic, CA See ad page 50

Protective packaging, trays

Tempo Plastic, CA See ad page 50

Pulverizers

Aadvanced Machinery Inc, MI (T. A. Crosson)
Basic Machinery Co Inc, NC
CS Bell Co, OH
Fritsch GmbH, Milling and Sizing, Germany

Glen Mills Inc, NJ (D. Ahrens)

See ad page 51

Gundlach Equipment Corp, IL
 Hosokawa Micron Powder Systems, NJ
 Rosco Engineering Process Equipment, CO
 Schutte-Buffalo Hammermill LLC, NY (Thomas E. Warne)
 Stedman Machine Co Inc, Div of Eagle Crusher Co, IN
 Sturtevant Inc, MA
 Williams Patent Crusher & Pulverizer Co Inc, MO
 Wyssmont Co Inc, NJ (J. Bevacqua)

Pumps

ER Advanced Ceramics Inc, OH
 Fluid Metering Inc, NY
 Goulds Pumps ITT, NY
 Graco Inc, MN
 Reed Gunite & Shotcrete Equipment, CA (Paul Sulman)
 Sama Maschinenbau GmbH, Germany
 Warren Rupp Inc, OH

Pumps, concrete

Reed Gunite & Shotcrete Equipment, CA (Paul Sulman)

Pumps, drum

Graco Inc, MN

Pumps, vacuum

Kaeser Compressors Inc, VA

Roller mills

EXAKTTechnologies Inc, OK
 Tapecasting Warehouse Div, Richard E Mistler Inc, PA
 Williams Patent Crusher & Pulverizer Co Inc, MO

Safety equipment

Kiln Doctor Inc, VA

Scale systems

CSC Force Measurement Inc, MA
 Mettler-Toledo Inc, OH
 Nol-Tec Systems Inc, MN

Screens/screening equipment

Advanced Machinery Inc, MI (T. A. Crosson)
 Basic Machinery Co Inc, NC
 Cambridge Wire Cloth Co, MD
 Croll-Reynolds Engineering Co, CT (Louis D. Ancillai)
Detroit Process Machinery Inc., MI

See ad page 55

Dynamic Air Inc, MN
 Haver & Boecker, Germany
 Manufacturers Equipment Co, OH (F.B. Carraher)
 Midwestern Industries Inc, OH (Bill Crone)
 Norstone Inc, PA
 Rosco Engineering Process Equipment, CO (Robert St. Clair)
 Russell Finex Inc, NC
 Sama Maschinenbau GmbH, Germany
 Sweco, KY

Separators

Fritsch GmbH, Milling and Sizing, Germany
 Gundlach Equipment Corp, IL
 Hosokawa Micron Powder Systems, NJ
 Kaeser Compressors Inc, VA
 Midwestern Industries Inc, OH (Bill Crone)
 Rosco Engineering Process Equipment, CO
 Russell Finex Inc, NC
 Spencer Turbine Co, CT (C. Beaulieu)
 Sturtevant Inc, MA
 Sweco, KY
 Williams Patent Crusher & Pulverizer Co Inc, MO

Shredders

Basic Machinery Co Inc, NC
 Fritsch GmbH, Milling and Sizing, Germany
Glen Mills Inc, NJ (L. Zigman-Horn)
 See ad page 51
 Gundlach Equipment Corp, IL

Hosokawa Micron Powder Systems, NJ
 Stedman Machine Co Inc, Div of Eagle Crusher Co, IN
 Williams Patent Crusher & Pulverizer Co Inc, MO

Sieving equipment

Fritsch GmbH, Milling and Sizing, Germany
Glen Mills Inc, NJ (L. Zigman-Horn)
 See ad page 51
 Haver & Boecker, Germany
 Hosokawa Micron Powder Systems, NJ
Mohr Corp, MI
 See ad page 87

Norstone Inc, PA

Retsch Inc, PA
 Russell Finex Inc, NC
 Sweco, KY
 WCS Inc, CA

Single wafer pack

Tempo Plastic, CA See ad page 50

**Size reduction equipment**

Basic Machinery Co Inc, NC
 CS Bell Co, OH
 Dynamic Air Inc, MN
 Eirich Machines Inc, IL
 ER Advanced Ceramics Inc, OH
 Fritsch GmbH, Milling and Sizing, Germany
Glen Mills Inc, NJ (D. Ahrens)
 See ad page 51

Gundlach Equipment Corp, IL
 Hosokawa Micron Powder Systems, NJ
 Manufacturers Equipment Co, OH (F.B. Carraher)
 Netzsch Premier Technologies LLC, PA
 Noble Technologies Group, NH (Charles W. Miller)
 Norstone Inc, PA
 Retsch Inc, PA
 Rosco Engineering Process Equipment, CO
 Schutte-Buffalo Hammermill LLC, NY (Thomas E. Warne)
 Stedman Machine Co Inc, Div of Eagle Crusher Co, IN
 Sturtevant Inc, MA
 Sweco, KY
 Union Process Inc, OH
 Williams Patent Crusher & Pulverizer Co Inc, MO
 Wyssmont Co Inc, NJ (J. Bevacqua)

Spray dryers

Advanced Machinery Inc, MI (T. A. Crosson)
Detroit Process Machinery Inc., MI
 See ad page 55

Dorst America Inc, PA (Greg Wallis)
 Heinen Drying GmbH, Heinen Trocknungstechnologie GmbH, Germany

Sama Maschinenbau GmbH, Germany
 Spray Drying Systems Inc, MD

Spray guns, automatic

Graco Inc, MN

Spray guns, manual

Amstat Industries Inc, IL
 Graco Inc, MN

Storage equipment

Basic Machinery Co Inc, NC
 Cyclonaire Corp, NE
 Kornylak Corp, OH
 Manufacturers Equipment Co, OH (F.B. Carraher)

Substrate wafer trays

Tempo Plastic, CA See ad page 50

**Used equipment**

Advanced Machinery Inc, MI (T. A. Crosson)
 American Isostatic Presses, OH (Reggie Persaud)
 Dorst America Inc, PA (Greg Wallis)
 Gundlach Equipment Corp, IL

Mohr Corp, MI See ad page 87



Norstone Inc, PA
 Reed Gunite & Shotcrete Equipment, CA (Paul Sulman)
 Sweco, KY

Vacuum cleaning systems

Spencer Turbine Co, CT (C. Beaulieu)

Ventilating equipment

American Art Clay Co Inc, IN
 Evenheat Kiln Inc, MI

Vibrators

Carman Industries Inc, IN

Vibrators, bin

Carman Industries Inc, IN
 Cyclonaire Corp, NE

Ware Trucks

North Star Equipment Inc, WA

Weighing equipment

CSC Force Measurement Inc, MA
 Cyclonaire Corp, NE
 Dynamic Air Inc, MN
 Eirich Machines Inc, IL
 Emery Winslow Scale Co, CT
 Hosokawa Micron Powder Systems, NJ
 Manufacturers Equipment Co, OH (F.B. Carraher)
 Mettler-Toledo Inc, OH
 Nol-Tec Systems Inc, MN
 Sama Maschinenbau GmbH, Germany

Wire cloth

Cambridge Wire Cloth Co, MD
 Haver & Boecker, Germany
 Midwestern Industries Inc, OH (Tim Carey)
 Russell Finex Inc, NC

FABRICATING & FINISHING**Abrasives**

Accurate Diamond Tool Corp, NJ
 Advanced Superabrasives, NV
 Diamond Industrial Tools Inc, IL
Electro Abrasives, NY See ad page 47
 Engis Corp, IL
 Greenlee Diamond Tool Co, IL
 Guyson Intl Ltd, United Kingdom
 Hygan Products Ltd, United Kingdom
 Industrial Tools Inc, CA
 KC Abrasive Co LLC, KS (Ronald Barncord)

Keir Mfg Inc, NC

Pryor Giggey Co, AL (Allen R. Davis)

Sanamar Inc, NJ

Washington Mills Electro Minerals Co, NY See ad page 43

Abrasives, belts and wheels

Advanced Superabrasives, NV
Diamond Industrial Tools Inc, IL
Engis Corp, IL
Greenlee Diamond Tool Co, IL
Industrial Tools Inc, CA

Abrasives, diamond

Accurate Diamond Tool Corp, NJ
Advanced Superabrasives, NV
Diacut Inc, CO
Diamond Industrial Tools Inc, IL
Engis Corp, IL
Greenlee Diamond Tool Co, IL
Industrial Tools Inc, CA
Regal Diamond Products, OH

Annealing lehrs

Casso-Solar Tech LLC, NY

Harrop Industries Inc, OH See ad page 60

Brickmaking equipment

Basic Machinery Co Inc, NC
BMI Automation Inc, AL (Henry Burns III)
Chisholm Boyd & White Co, IL

Harrop Industries Inc, OH See ad page 60

Keyria Inc, CO

Lancaster Products Div, Kercher Industries Inc, PA
Manufacturers Equipment Co, OH (F.B. Carraher)

Mohr Corp, MI See ad page 87

Stedman Machine Co Inc, Div of Eagle Crusher Co, IN
WCS Inc, CA

CVD equipment

Capovani Brothers Inc, NY

Centorr/Vacuum Industries Inc, NH (Scott Robinson) See ad page 61

Thermal Technology Inc, CA

Casting equipment, pressure

American Isostatic Presses, OH (Reggie Persaud)
Dorst America Inc, PA (Greg Wallis)

Mohr Corp, MI See ad page 87

Sama Maschinenbau GmbH, Germany

Casting equipment, slip

Hygan Products Ltd, United Kingdom

Mohr Corp, MI See ad page 87

Peltsman Corp, MN

Sama Maschinenbau GmbH, Germany

Casting equipment, tape

Carsten Systems & Machine Ltd, BC

Harrop Industries Inc, OH See ad page 60
Maryland Ceramic & Steatite Co Inc, MD

Mohr Corp, MI See ad page 87

Richard E Mistler Inc, PA (Richard E. Mistler)

Tapecasting Warehouse Div, Richard E Mistler Inc, PA

Coating equipment

Beamalloy Technologies LLC, OH

Capovani Brothers Inc, NY

Carsten Systems & Machine Ltd, BC

Industrial Hard Carbon LLC, NC

Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Thomas Schirmer)

Manufacturers Equipment Co, OH (F.B. Carraher)

Mohr Corp, MI See ad page 87

Coating supplies

Phoenix Coating Resources Inc, FL
Reusche & Co. of TWS Inc, CO

Cold end coatings, glass

Renite Co, OH (Rodger P. Kampf)

Controllers

Dorst America Inc, PA (Greg Wallis)

General Glass Equipment Co, NJ

Kaeser Compressors Inc, VA

Cutting equipment

Basic Machinery Co Inc, NC
Diamond Industrial Tools Inc, IL
General Glass Equipment Co, NJ
Well Diamond Wire Saws Inc, GA

Cutting tools

Accurate Diamond Tool Corp, NJ
Advanced Superabrasives, NV
Diacut Inc, CO
Engis Corp, IL
Industrial Ceramic Technology, MI (John J. Schuldies)
Industrial Tools Inc, CA

Cutting wires, brick

Manufacturers Equipment Co, OH (D.F. Meyer)

Cutting wires, refractory

Logomatic GmbH, Germany
Manufacturers Equipment Co, OH (D.F. Meyer)
Well Diamond Wire Saws Inc, GA

Deburring equipment

Engis Corp, IL
Guyson Intl Ltd, United Kingdom
Hygan Products Ltd, United Kingdom
Sweco, KY

Diamond drills

Accurate Diamond Tool Corp, NJ
Advanced Superabrasives, NV
Diamond Industrial Tools Inc, IL

Diamond hones

Accurate Diamond Tool Corp, NJ
Advanced Superabrasives, NV
Diamond Industrial Tools Inc, IL
Engis Corp, IL
Greenlee Diamond Tool Co, IL
Industrial Tools Inc, CA

Diamond saw blades

Accurate Diamond Tool Corp, NJ
Advanced Superabrasives, NV
Diacut Inc, CO
Diamond Industrial Tools Inc, IL
Engis Corp, IL
Greenlee Diamond Tool Co, IL
Industrial Tools Inc, CA
Leco Corp, MI
US Foam Corp, OH
Well Diamond Wire Saws Inc, GA

Diamond tools

Accurate Diamond Tool Corp, NJ
Advanced Superabrasives, NV
Diamond Industrial Tools Inc, IL
Die Quip Corp, PA
Engis Corp, IL
Greenlee Diamond Tool Co, IL
Industrial Tools Inc, CA
Leco Corp, MI
Regal Diamond Products, OH

Dicing equipment

Capovani Brothers Inc, NY
Diacut Inc, CO
Diamond Industrial Tools Inc, IL

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- Piston Extruders
- Mixers & Blenders
- Jar Mills
- Pebble Mills
- Lab Equipment
- Crushers & Pulverizers
- Attritors
- Spray Dryers
- Screeners
- Media Mills
- Kilns & Furnaces
- Stokes Press Parts

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Industrial Tools Inc, CA
Logomatic GmbH, Germany
Well Diamond Wire Saws Inc, GA

Dies

Gasbarre Products Inc, PA (Steve Volansky)
Industrial Ceramic Technology, MI (John J. Schuldies)
North Star Equipment Inc, WA
Peltsman Corp, MN

Dressing wheels, diamond

Accurate Diamond Tool Corp, NJ
Advanced Superabrasives, NV
Diacut Inc, CO
Diamond Industrial Tools Inc, IL
Engis Corp, IL
Greenlee Diamond Tool Co, IL

Extruders

Aadvanced Machinery Inc, MI (T. A. Crosson)
American Art Clay Co Inc, IN
Basic Machinery Co Inc, NC
CW Brabender Instruments Inc, NJ

Detroit Process Machinery Inc., MI

See ad page 55

Dorst America Inc, PA (Greg Wallis)
Ipsen Ceramics, IL
Kiln Doctor Inc, VA
Manufacturers Equipment Co, OH (F.B. Carraher)

Mohr Corp, MI

See ad page 87

North Star Equipment Inc, WA
WCS Inc, CA

Feeders

Dover Conveyor Inc, OH
Isoform Ltd, United Kingdom
Manufacturers Equipment Co, OH (F.B. Carraher)
Wyssmont Co Inc, NJ (J. Bevacqua)

Forming equipment

ACCCO Inc., OH
American Isostatic Presses, OH (Reggie Persaud)
Arburg GmbH + Co KG, Germany
Avure Technologies Inc, OH (Dave Peltier)
Dorst America Inc, PA (Greg Wallis)
Engineered Pressure Systems Inc, MA (Ken Morse)
Ipsen Ceramics, IL
Isoform Ltd, United Kingdom
Manufacturers Equipment Co, OH (F.B. Carraher)

Mohr Corp, MI

See ad page 87

Peltsman Corp, MN
Sama Maschinenbau GmbH, Germany

Glass finishing equipment

Casso-Solar Tech LLC, NY
General Glass Equipment Co, NJ
Guyson Intl Ltd, United Kingdom
Well Diamond Wire Saws Inc, GA

Glass forming equipment

Casso-Solar Tech LLC, NY
General Glass Equipment Co, NJ
Glass Technical Inst, CA (R.A. Drake)
Renite Co, OH (L.Harding)

Glass shear spray

Renite Co, OH (Rodger P. Kampf)

Glass supplies

Ipsen Ceramics, IL
Renite Co, OH (Rodger P. Kampf)

Grinders, centerless

Diamond Industrial Tools Inc, IL
Logomatic GmbH, Germany

Grinders, cylindrical

Diamond Industrial Tools Inc, IL
Logomatic GmbH, Germany

Grinders, finished product

DCM Tech, MN
Ipsen Ceramics, IL
Logomatic GmbH, Germany
Sama Maschinenbau GmbH, Germany

Grinding wheels

Accurate Diamond Tool Corp, NJ
Action Superabrasives, OH
Advanced Superabrasives, NV
Diacut Inc, CO
Diamond Industrial Tools Inc, IL
Die Quip Corp, PA
Engis Corp, IL
Greenlee Diamond Tool Co, IL
Industrial Tools Inc, CA
Sanamar Inc, NJ

Hydraulic systems

BMI Automation Inc, AL (Henry Burns III)
Isoform Ltd, United Kingdom

Injection molding equipment

Acelent Technologies Pte Ltd, Singapore
Arburg GmbH + Co KG, Germany
BMI Automation Inc, AL (Henry Burns III)

Centorr/Vacuum Industries Inc, NH (Scott Robinson)

See ad page 61

Goceram AB, Sweden
Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Ralf Fischer)
Peltsman Corp, MN

Jiggering equipment

Sama Maschinenbau GmbH, Germany

Lapping equipment

Capovani Brothers Inc, NY
Diamond Industrial Tools Inc, IL
Die Quip Corp, PA
Engis Corp, IL
Industrial Tools Inc, CA

Lapping supplies

Accurate Diamond Tool Corp, NJ
Advanced Superabrasives, NV
Ceradyne Inc, CA
Diamond Industrial Tools Inc, IL
Die Quip Corp, PA
Engis Corp, IL
KC Abrasive Co LLC, KS (Ronald Barncord)

Laser scribes

Cerlase, France (Jose Daems)
Laserage Technology Corp, IL
Strico AG, Switzerland

Machining equipment

Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
Ikonics Imaging-Industrial Solutions, MN
International Ceramic Engineering, MA
PremaTech Advanced Ceramics, MA

Mandrels, diamond

Accurate Diamond Tool Corp, NJ
Advanced Superabrasives, NV
Diacut Inc, CO
Diamond Industrial Tools Inc, IL
Engis Corp, IL
Greenlee Diamond Tool Co, IL
Logomatic GmbH, Germany

Molding

Petro Mold Co, PA (Robert Petro/Justin Poole)

Molds, case

JACPA Ceramic, MI
Petro Mold Co, PA (Robert Petro/Justin Poole)

Molds, ceramic forming

Ceramaret SA, Switzerland

Goceram AB, Sweden
Ipsen Ceramics, IL
Isoform Ltd, United Kingdom
JACPA Ceramic, MI
Peltsman Corp, MN
Petro Mold Co, PA (Robert Petro/Justin Poole)
Sama Maschinenbau GmbH, Germany

Molds, models

JACPA Ceramic, MI
Petro Mold Co, PA (Robert Petro/Justin Poole)

Plasma etching systems

Capovani Brothers Inc, NY
Logomatic GmbH, Germany

PVD equipment

Beamalloy Technologies LLC, OH
Capovani Brothers Inc, NY
Teeter Marketing Services LLC, NY

Pneumatic systems

BMI Automation Inc, AL (Henry Burns III)
Cyclonaire Corp, NE
Peltsman Corp, MN
Young Industries Inc, PA

Polishing equipment

Capovani Brothers Inc, NY
Diamond Industrial Tools Inc, IL
Engis Corp, IL
Industrial Tools Inc, CA
Leco Corp, MI

Polishing powder and supplies

Advanced Superabrasives, NV
Engis Corp, IL
KC Abrasive Co LLC, KS (Ronald Barncord)
Matrix Enterprises, OH
Sasol North America Inc, Ceralox Div, AZ

Presses, compacting

Avure Technologies Inc, OH
Chisholm Boyd & White Co, IL

Detroit Process Machinery Inc., MI

See ad page 55

Dorst America Inc, PA (Greg Wallis)
Engineered Pressure Systems Inc, MA (Ken Morse)
Gasbarre Products Inc, PA (Steve Volansky)
Mackey Bowley Intl Ltd, United Kingdom (G.Fenton/S.
Winn)

Mohr Corp, MI

See ad page 87

PTX-Pentronix Inc, Subsidiary of Gasbarre Products Inc,
MI (Jim Kastl)
Sahut Conreur SA, France

Presses, dry

Advanced Machinery Inc, MI (T. A. Crosson)
ACCCO Inc., OH
Chisholm Boyd & White Co, IL
Dorst America Inc, PA (Greg Wallis)
Gasbarre Products Inc, PA (Steve Volansky)
Mackey Bowley Intl Ltd, United Kingdom (G.Fenton/S.
Winn)

Maryland Ceramic & Steatite Co Inc, MD

Mohr Corp, MI

See ad page 87

Presses, extrusion

Dorst America Inc, PA (Greg Wallis)
Maryland Ceramic & Steatite Co Inc, MD

Mohr Corp, MI

See ad page 87

Presses, hot

American Isostatic Presses, OH (Reggie Persaud)

Centorr/Vacuum Industries Inc, NH (Paul Lennon)

See ad page 61

Mackey Bowley Intl Ltd, United Kingdom (G.Fenton/S.
Winn)

Mohr Corp, MI

See ad page 87

Oxy-Gon Industries Inc, NH

See ad page 65

Thermal Technology Inc, CA

Presses, hot isostatic

American Isostatic Presses, OH (Reggie Persaud)

Avure Technologies Inc, OH (Dave Peltier)

Engineered Pressure Systems Inc, MA (Ken Morse)

Mohr Corp, MI See ad page 87**Presses, hydraulic**

Aadvanced Machinery Inc, MI (T. A. Crosson)

Arburg GmbH + Co KG, Germany

Dorst America Inc, PA (Greg Wallis)

Gasbarre Products Inc, PA (Steve Volansky)

Mackey Bowley Intl Ltd, United Kingdom (G.Fenton/S. Winn)

Mohr Corp, MI See ad page 87**Presses, isostatic**

Aadvanced Machinery Inc, MI (T. A. Crosson)

American Isostatic Presses, OH (Reggie Persaud)

Avure Technologies Inc, OH (Dave Peltier)

Detroit Process Machinery Inc., MI

See ad page 55

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Dorst America Inc, PA (Greg Wallis)

Engineered Pressure Systems Inc, MA (Ken Morse)

Gasbarre Products Inc, PA

Isoform Ltd, United Kingdom

Mohr Corp, MI See ad page 87

PTX-Pentronix Inc, Subsidiary of Gasbarre Products Inc, MI (Jim Kastl)

Sama Maschinenbau GmbH, Germany

Presses, other

ACCCO Inc., OH

American Isostatic Presses, OH (Reggie Persaud)

Arburg GmbH + Co KG, Germany

Chisholm Boyd & White Co, IL

Dorst America Inc, PA (Greg Wallis)

Elizabeth Carbide Die Co Inc, PA

Engineered Pressure Systems Inc, MA (Ken Morse)

Isoform Ltd, United Kingdom

Lancaster Products Div, Kercher Industries Inc, PA

Mackey Bowley Intl Ltd, United Kingdom (G.Fenton/S. Winn)

Mohr Corp, MI See ad page 87

North Star Equipment Inc, WA

Presses, pressure casting

Dorst America Inc, PA (Greg Wallis)

Inst for Mfg Tech for Ceramic Components & Composi, University of Stuttgart, Germany (Marcus Speicher)

Mackey Bowley Intl Ltd, United Kingdom (G.Fenton/S. Winn)

Presses, refractory shapes

Engineered Pressure Systems Inc, MA (Ken Morse)

Mackey Bowley Intl Ltd, United Kingdom (G.Fenton/S. Winn)

Presses, rotary

Aadvanced Machinery Inc, MI (T. A. Crosson)

Presses, tile (ceramic)

North Star Equipment Inc, WA

Pressure casting systems, dinnerware

Dorst America Inc, PA (Greg Wallis)

Sama Maschinenbau GmbH, Germany

Pressure casting systems, sanitaryware

Dorst America Inc, PA (Greg Wallis)

Pug mills

Advanced Machinery Inc, MI (T. A. Crosson)

Basic Machinery Co Inc, NC

Dorst America Inc, PA (Greg Wallis)

Kiln Doctor Inc, VA

Lancaster Products Div, Kercher Industries Inc, PA

Mohr Corp, MI See ad page 87

Sama Maschinenbau GmbH, Germany

Sheffield Pottery, MA

Young Industries Inc, PA

Roll compaction

Sahut Conreur SA, France

Roofing tile machinery**Mohr Corp, MI**

See ad page 87

Saws, diamond

Accurate Diamond Tool Corp, NJ

Advanced Superabrasives, NV

Diacut Inc, CO

Engis Corp, IL

Greenlee Diamond Tool Co, IL

Industrial Tools Inc, CA

Logomatic GmbH, Germany

Well Diamond Wire Saws Inc, GA

Setting equipment

Basic Machinery Co Inc, NC

BMI Automation Inc, AL (Henry Burns III)

Harrop Industries Inc, OH See ad page 60**Slab rollers**

Kiln Doctor Inc, VA

North Star Equipment Inc, WA

Sponges

Hygan Products Ltd, United Kingdom

US Foam Corp, OH

Spray booths

Kiln Doctor Inc, VA

Mohr Corp, MI See ad page 87

Sama Maschinenbau GmbH, Germany

Sputtering equipment

Capovani Brothers Inc, NY

Superabrasives

Accurate Diamond Tool Corp, NJ

Action Superabrasives, OH

Advanced Superabrasives, NV

Diamond Industrial Tools Inc, IL

Engis Corp, IL

Greenlee Diamond Tool Co, IL

Industrial Tools Inc, CA

Sanamar Inc, NJ

Teeter Marketing Services LLC, NY

Surface modification systems

Beamalloy Technologies LLC, OH

Ikonics Imaging-Industrial Solutions, MN

Teeter Marketing Services LLC, NY

Tape casting equipment

Carsten Systems & Machine Ltd, BC

Harrop Industries Inc, OH See ad page 60

Richard E Mistler Inc, PA (Richard E. Mistler)

TCW
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Tapecasting Warehouse Div, Richard E Mistler Inc, PA

Thermal spray equipment

Inst for Mfg Tech for Ceramic Components & Composi, University of Stuttgart, Germany (Andreas Killinger)

Tilemaking equipment

Basic Machinery Co Inc, NC

BMI Automation Inc, AL (Henry Burns III)

Manufacturers Equipment Co, OH (F.B. Carraher)

Mohr Corp, MI

See ad page 87

North Star Equipment Inc, WA

Tools, modelling

Hygan Products Ltd, United Kingdom

Sheffield Pottery, MA

Turning machines, insulator

Sama Maschinenbau GmbH, Germany

Ultrasonic machining equipment**Bullen, OH**

International Ceramic Engineering, MA

Sonic-Mill, NM

Used equipment

Advanced Machinery Inc, MI (T. A. Crosson)

Basic Machinery Co Inc, NC

Capovani Brothers Inc, NY

Diamond Industrial Tools Inc, IL

Dorst America Inc, PA (Greg Wallis)

Intelligent Micro Patterning LLC, FL

Kiln Doctor Inc, VA

Mohr Corp, MI

See ad page 87

Vibratory finishing equipment**Mohr Corp, MI**

See ad page 87

Sweco, KY

Wheels, cutoff and grinding

Accurate Diamond Tool Corp, NJ

Advanced Superabrasives, NV

Diacut Inc, CO

Diamond Industrial Tools Inc, IL

Engis Corp, IL

Greenlee Diamond Tool Co, IL

Industrial Tools Inc, CA

Leco Corp, MI

Logomatic GmbH, Germany

Wheels, diamond

Accurate Diamond Tool Corp, NJ

Advanced Superabrasives, NV

Diacut Inc, CO

Diamond Industrial Tools Inc, IL

Engis Corp, IL

Greenlee Diamond Tool Co, IL

Industrial Tools Inc, CA

Leco Corp, MI

Wire saws, diamond

Advanced Superabrasives, NV

Logomatic GmbH, Germany

Well Diamond Wire Saws Inc, GA

DECORATING**Coating equipment**

Casso-Solar Tech LLC, NY

Colors

Ceramic Color, PA

Cerlase, France (Jose Daems)

Fusion Ceramics Inc, Reimbold & Strick, OH

Reusche & Co. of TWS Inc, CO

Thompson Enamel Inc, KY (Guido Maehren)

Decal equipment

Hygan Products Ltd, United Kingdom

Decals

Heinrich Ceramic Decal Inc, MA
Innovative Ceramic Corp, OH
Quality Stamp Co, OH
Strico AG, Switzerland

Decorating equipment

Amstat Industries Inc, IL
Casso-Solar Tech LLC, NY
Guyson Intl Ltd, United Kingdom
Intelligent Micro Patterning LLC, FL
Jettable Ltd, Israel
Sama Maschinenbau GmbH, Germany
Videojet Technologies Inc, IL

Decorating supplies

Ceramic Color, PA
Hygan Products Ltd, United Kingdom
Innovative Ceramic Corp, OH
Quality Stamp Co, OH
Reusche & Co. of TWS Inc, CO
Seppic Inc, NJ
Videojet Technologies Inc, IL

Enamels

Ceramic Color, PA
Cerlase, France (Jose Daems)
Fusion Ceramics Inc, Reibold & Strick, OH (Ray Stanton)
Reusche & Co. of TWS Inc, CO
Thompson Enamel Inc, KY (Guido Maehren)

Engobes

American Art Clay Co Inc, IN
Ceramic Color, PA
Fusion Ceramics Inc, Reibold & Strick, OH (D. F. Schneider)

Frits

Bartley Crucible & Refractories Inc, NJ (D. Mischel)
Ceramic Color, PA
Eppler Assocs, CT (Richard A. Eppler)
Fusion Ceramics Inc, Reibold & Strick, OH

Sem-Com Co Inc, OH (Neil Hofziger)

See ad page 96

Thompson Enamel Inc, KY (Guido Maehren)

VIOX Corp, WA

See ad page 98

Glazes

American Art Clay Co Inc, IN
Ceramic Color, PA
Cerlase, France (Jose Daems)
Eppler Assocs, CT (Richard A. Eppler)
Fusion Ceramics Inc, Reibold & Strick, OH (Nath Viswanath)

Sem-Com Co Inc, OH (Neil Hofziger)

See ad page 96

Sheffield Pottery, MA

Glazing equipment

Du-Co Ceramics Co, PA (Tom Arbanas)
Sama Maschinenbau GmbH, Germany

Ink stamps

Innovative Ceramic Corp, OH
Quality Stamp Co, OH

Inks

American Art Clay Co Inc, IN
Ceramic Color, PA
Fusion Ceramics Inc, Reibold & Strick, OH
Innovative Ceramic Corp, OH
Jettable Ltd, Israel
Quality Stamp Co, OH
Reusche & Co. of TWS Inc, CO
Videojet Technologies Inc, IL

Inks, organic printing

Innovative Ceramic Corp, OH
Quality Stamp Co, OH

Inks, UV screenprinting

Intelligent Micro Patterning LLC, FL

Lehrs

CFF Kilns & Furnaces, CA

Harrop Industries Inc, OH See ad page 60

Nabertherm Inc, DE

Recco Furnaces, CA

Lusters

Reusche & Co. of TWS Inc, CO

Metal oxides, mixed

Ceramic Color, PA

Pad printing dies

Innovative Ceramic Corp, OH
Quality Stamp Co, OH

Pigments

Ceramic Color, PA
Eppler Assocs, CT (Richard A. Eppler)
Fusion Ceramics Inc, Reibold & Strick, OH (Dave Stanton)
Reusche & Co. of TWS Inc, CO

Porcelain enamels

Cerlase, France (Jose Daems)
Fusion Ceramics Inc, Reibold & Strick, OH
Reusche & Co. of TWS Inc, CO
Thompson Enamel Inc, KY (Guido Maehren)

Precious metals

Reusche & Co. of TWS Inc, CO

Printers, ceramic decal

Heinrich Ceramic Decal Inc, MA
Innovative Ceramic Corp, OH
Quality Stamp Co, OH

Screen printing equipment

Amstat Industries Inc, IL
Casso-Solar Tech LLC, NY
Haver & Boecker, Germany

Silver pastes, conducting

Master Bond Inc, NJ
Reusche & Co. of TWS Inc, CO

Spray booths

American Art Clay Co Inc, IN
Sama Maschinenbau GmbH, Germany

Stains

Ceramic Color, PA
Fusion Ceramics Inc, Reibold & Strick, OH
Sheffield Pottery, MA

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 Furnace Products & Services Inc, PA

Harrop Industries Inc, OH See ad page 60

Keyria Inc, CO
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Burners, oxyfuel

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Calciners

Applied Test Systems Inc, PA
 CFF Kilns & Furnaces, CA
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Harrop Industries Inc, OH See ad page 60
Keith Co, CA See ad page 65

Nabertherm Inc, DE
 Recco Furnaces, CA
 Wyssmont Co Inc, NJ (J. Bevacqua)

Cars, dryer

Keyria Inc, CO

Cars, kiln

Burton GmbH & Co KG, Germany
 CFF Kilns & Furnaces, CA

Harrop Industries Inc, OH See ad page 60

Keith Co, CA See ad page 65

Keyria Inc, CO
 Recco Furnaces, CA

Controllers

Applied Test Systems Inc, PA

Carbolite Inc, WI See ad page 62

General Glass Equipment Co, NJ
 Orton Ceramic Foundation, OH (Jim Baldwin)
 Paragon Industries L P, TX

Controllers, combustion

Air Products & Chemicals Inc, PA
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 Maxon Corp, IN

Controllers, furnace

Carbolite Inc, WI See ad page 62

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 Lanly Co, OH
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Controllers, temperature

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Harrop Industries Inc, OH See ad page 60

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See ad page 66

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 Avure Technologies Inc, OH (Dave Peltier)

Carbolite Inc, WI See ad page 62

Casso-Solar Tech LLC, NY

Centorr/Vacuum Industries Inc, NH (Paul Lennon) See ad page 61

CM Furnaces Inc, NJ See ad page 66



Cober Muegge LLC, CT

Deltech Inc, CO See ad page 63

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Harrop Industries Inc, OH See ad page 60
Keith Co, CA See ad page 65
Recco Furnaces, CA
Spheric Technologies Inc, AZ

Furnaces, electric

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American Isostatic Presses, OH (Reggie Persaud)
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Carbolite Inc, WI See ad page 62
Carsten Systems & Machine Ltd, BC
Casso-Solar Tech LLC, NY
Centorr/Vacuum Industries Inc, NH
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See ad page 64

Lanly Co, OH
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Nabertherm Inc, DE
Oxy-Gon Industries Inc, NH
See ad page 65

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CFF Kilns & Furnaces, CA

Fives North American Combustion Inc, OH
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Harrop Industries Inc, OH See ad page 60
Keith Co, CA See ad page 65
L&L Kiln Mfg Inc, NJ
L&L Special Furnace Co Inc, PA
See ad page 64

Lanly Co, OH
Lucifer Furnaces Inc, PA
Nabertherm Inc, DE
Recco Furnaces, CA
Wyssmont Co Inc, NJ (J. Bevacqua)
Furnaces, glass melting

Applied Test Systems Inc, PA
Carbolite Inc, WI See ad page 62
Casso-Solar Tech LLC, NY
CM Furnaces Inc, NJ See ad page 66
Deltech Inc, CO See ad page 63
Furnace Products & Services Inc, PA
General Glass Equipment Co, NJ
Linn High Therm GmbH, Germany
Nabertherm Inc, DE
Paragon Industries L P, TX
VIOX Corp, WA See ad page 98
Zircar Zirconia Inc, NY

Furnaces, high-temperature

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Avure Technologies Inc, OH (Dave Peltier)
Capovani Brothers Inc, NY
Carbolite Inc, WI See ad page 62
Carsten Systems & Machine Ltd, BC
Centorr/Vacuum Industries Inc, NH
(Paul Lennon) See ad page 61
CM Furnaces Inc, NJ See ad page 66
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Dalmia Inst of Scientific & Industrial Research, India
Deltech Inc, CO See ad page 63
Detroit Process Machinery Inc., MI
See ad page 55

Furnace Products & Services Inc, PA
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Harrop Industries Inc, OH See ad page 60
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Kilns, bell

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Harrop Industries Inc, OH See ad page 60

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L&L Special Furnace Co Inc, PA

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Kilns, box

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Kilns, elevator

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Kilns, pusher plate

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Kilns, rotary

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Keith Co, CA See ad page 65

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Alumina

Able Supply Co, Able Refractory Products, TX
 Advanced Ceramic Technology, CA
 Allied Mineral Products Inc, OH (J. R. Tabor)
 Applied Ceramics Inc, GA
 B&B Refractories Inc, CA
 Bartley Crucible & Refractories Inc, NJ (D. Mischel)
 Ceramco Inc, NH
 CerCo LLC, OH (Greg Little)
 Dalmia Inst of Scientific & Industrial Research, India (B.K. Panda/P. Sahu)
 Du-Co Ceramics Co, PA (Tom Arbanas)
 ER Advanced Ceramics Inc, OH
 ETEC Gesellschaft fuer Technische Keramik GmbH, Germany
 Fosbel Inc, OH
 Ipsen Ceramics, IL
 Magneco Metrel Inc, IL (Michael Anderson)
 Pell Industries, PA (Gary W. Pell)
 Pryor Giggey Co, AL (Allen R. Davis)
 Refractory Minerals, PA
 Refractory Specialties Inc, OH
 RHI Monofrax Ltd, NY
 Riverside Refractories Inc, AL (Bob Kuhn)
 Saint-Gobain Ceramic Materials, MA (Stephan Arbini)
 Selee Corp, NC (Watt Jackson)
 Shinagawa Advanced Materials Americas Inc, OH
 Smaht Ceramics Inc, UT
 Sunrock Ceramics Co, IL
 The Maryland Refractorie Co, OH
 Togni SA Materiais Refratarios, Brazil
 Zircar Refractory Composites Inc, NY
Zircar Zirconia Inc, NY

**Anchors**

Togni SA Materiais Refratarios, Brazil

Arches, suspended

Fosbel Inc, OH
 Ipsen Ceramics, IL
 Merkle International Inc, IL
 Refractory Specialties Inc, OH
 Togni SA Materiais Refratarios, Brazil

Backwalls

Fosbel Inc, OH
 Merkle International Inc, IL

Basic

Allied Mineral Products Inc, OH (J. R. Tabor)

Dalmia Magnesite Corp, Dalmia Cement (Bharat) Ltd, India (S. Veeraraghavan)
 Furnace Products & Services Inc, PA
 RHI Monofrax Ltd, NY
 Togni SA Materiais Refratarios, Brazil

Blankets

Basic Resources, TN (Robert Sitterson)
 Cetek Ltd, OH
 Promat GmbH, Germany (H.-J. Feulner)
 Refractory Specialties Inc, OH
 RHI Monofrax Ltd, NY
 Thermal Products Co Inc, GA
Unifrax Corp, NY See ad page 70
 Zircar Refractory Composites Inc, NY
Zircar Zirconia Inc, NY

Boards

Basic Resources, TN (Robert Sitterson)
 Promat GmbH, Germany (H.-J. Feulner)
 Refractory Specialties Inc, OH
 RHI Monofrax Ltd, NY
 Tenmat Ltd, United Kingdom (Peter Sharp)
 Thermal Products Co Inc, GA
Unifrax Corp, NY See ad page 70
 Zircar Refractory Composites Inc, NY
Zircar Zirconia Inc, NY

Brick

Able Supply Co, Able Refractory Products, TX
 CerCo LLC, OH (Susan English)
 Dalmia Magnesite Corp, Dalmia Cement (Bharat) Ltd, India (S. Veeraraghavan)
 Insulating Firebrick Inc, PA
 RHI Monofrax Ltd, NY
 Saint-Gobain Ceramic Materials, MA (Stephan Arbini)
 Shinagawa Advanced Materials Americas Inc, OH
 Sunrock Ceramics Co, IL
 Togni SA Materiais Refratarios, Brazil

Brick, acid resisting

Koch Knight LLC, OH (Mark Martin)
 Togni SA Materiais Refratarios, Brazil

Brick, fireclay

Able Supply Co, Able Refractory Products, TX
 Allied Mineral Products Inc, OH (J. R. Tabor)
 Aalsey Refractories Co, MO (Brick, fireclay)
 B&B Refractories Inc, CA
 Burton GmbH & Co KG, Germany
 Cetek Ltd, OH
 Lock 3 Co, PA
 Pryor Giggey Co, AL (Allen R. Davis)
 RHI Monofrax Ltd, NY
 Togni SA Materiais Refratarios, Brazil

Carbon

Applied Ceramics Inc, GA
 Dalmia Magnesite Corp, Dalmia Cement (Bharat) Ltd, India (S. Veeraraghavan)
 Koch Knight LLC, OH (Mark Martin)
 Shinagawa Advanced Materials Americas Inc, OH

Castable

Able Supply Co, Able Refractory Products, TX
 Allied Mineral Products Inc, OH (J. R. Tabor)
 Aalsey Refractories Co, MO (Castable)
 Ceramic Oxide Fabricators Pty Ltd, Australia
 Cetek Ltd, OH
 Dalmia Inst of Scientific & Industrial Research, India (B.K. Panda)
 Dalmia Magnesite Corp, Dalmia Cement (Bharat) Ltd, India (S. Veeraraghavan)
 Furnace Products & Services Inc, PA
 Industrial Ceramic Products Inc, OH (R.C. Oberst)
 Magneco Metrel Inc, IL (Michael Anderson)
 Phoenix Coating Resources Inc, FL

Plibrico Japan Co Ltd, Japan
 Promat GmbH, Germany (H.-J. Feulner)
 Pryor Giggey Co, AL (Allen R. Davis)
 RHI Monofrax Ltd, NY
 Riverside Refractories Inc, AL (Bob Kuhn)
 Saint-Gobain Ceramic Materials, MA (Mike Schnelzer)
 Selee Corp, NC (Watt Jackson)
 Togni SA Materiais Refratarios, Brazil
 Zero Refractories Inc, MI
 Zircar Refractory Composites Inc, NY

Cements

Able Supply Co, Able Refractory Products, TX
 Allied Mineral Products Inc, OH (J. R. Tabor)
 Calucem Inc, PA
 Cotronics Corp, NY
 Dalmia Inst of Scientific & Industrial Research, India (U.N. Sahoo)
 Furnace Products & Services Inc, PA
 Kerneos Inc, VA (Nancy E. Bunt)
 Kiln Doctor Inc, VA
 Refractory Specialties Inc, OH
 Saint-Gobain Ceramic Materials, MA (Mike Schnelzer)
Unifrax Corp, NY See ad page 70

Clay flux

Furnace Products & Services Inc, PA
 RHI Monofrax Ltd, NY

Coatings

Allied Mineral Products Inc, OH (J. R. Tabor)
 Applied Ceramics Inc, GA
 Basic Resources, TN (Robert Sitterson)
 Cetek Ltd, OH
 Cotronics Corp, NY
 Furnace Products & Services Inc, PA
 Momentive Performance Materials, OH
 Phoenix Coating Resources Inc, FL
 Plibrico Japan Co Ltd, Japan
 Promat GmbH, Germany (H.-J. Feulner)
 Refractory Specialties Inc, OH
 Riverside Refractories Inc, AL (Bob Kuhn)
 Starfire Systems Inc, NY
 Thermal Products Co Inc, GA
Unifrax Corp, NY See ad page 70
 Zero Refractories Inc, MI
 Zircar Refractory Composites Inc, NY
 ZYP Coatings Inc, TN (C.E. Holcombe)

Cordierite

Advanced Ceramic Technology, CA
 Applied Ceramics Inc, GA
 Associated Ceramics & Technology Inc, PA
 B&B Refractories Inc, CA
 Burton GmbH & Co KG, Germany
 CerCo LLC, OH (Greg Little)
 Du-Co Ceramics Co, PA (Tom Arbanas)
 ER Advanced Ceramics Inc, OH
 Industrial Ceramic Products Inc, OH (R.C. Oberst)
 Smaht Ceramics Inc, UT
 The Maryland Refractorie Co, OH

Crucibles

AdValue Technology LLC, AZ See ad page 74

Allied Mineral Products Inc, OH
 APC Intl Ltd, PA
 Applied Ceramics Inc, GA
 B&B Refractories Inc, CA
 Bartley Crucible & Refractories Inc, NJ (D. Mischel)
 Blasch Precision Ceramics Inc, NY (Ted Collins)
 Ceramco Inc, NH
 CerCo LLC, OH (Greg Little)
 ETEC Gesellschaft fuer Technische Keramik GmbH, Germany

Furnace Products & Services Inc, PA
 HC Starck Ceramics GmbH & Co KG, Germany
 Industrial Ceramic Products Inc, OH (R.C. Oberst)
 Ipsen Ceramics, IL
 Leco Corp, MI
 Magneco Metrel Inc, IL (James Colander)
 McDanel Advanced Ceramic Technologies, PA
 Momenive Performance Materials, OH
 Pell Industries, PA (Gary W. Pell)
 Pryor Giggey Co, AL (Allen R. Davis)
 Saint-Gobain Quartz Ltd, United Kingdom
 Selee Corp, NC (Watt Jackson)
 Silicon Carbide Products Inc, NY
 Tenmat Ltd, United Kingdom (Peter Sharp)
 Thermal Products Co Inc, GA
 Zircoa Inc, OH

Dead-burned

Dalmia Magnesite Corp, Dalmia Cement (Bharat) Ltd, India (S. Veeraraghavan)
 Togni SA Materiais Refratarios, Brazil

Fiber products

Allied Mineral Products Inc, OH
 Cetek Ltd, OH
 Cotronics Corp, NY
 Furnace Products & Services Inc, PA
 Inst for Mfg Tech for Ceramic Components & Composi, University of Stuttgart, Germany (Natasa Doslik)
 Leco Corp, MI
 Promat GmbH, Germany (H.-J. Feulner)
 Pryor Giggey Co, AL (Allen R. Davis)
 Pyromeral Systems Inc, TX
 Pyromeral Systems Sarl, France
 Tenmat Ltd, United Kingdom (Mark Jellicoe)
 Thermal Products Co Inc, GA

Unifrax Corp, NY

See ad page 70



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 Telefax: 716-278-3900
 Web Address: www.unifrax.com
 E-mail: info@unifrax.com

Zircar Zirconia Inc, NY

Filters, molten metal

Industrial Ceramic Products Inc, OH (R.C. Oberst)
 Selee Corp, NC (Watt Jackson)

Foundry

Allied Mineral Products Inc, OH (J. R. Tabor)
 B&B Refractories Inc, CA
 Bartley Crucible & Refractories Inc, NJ (D. Mischel)
 Basic Resources, TN (Robert Sitterson)
 Blasch Precision Ceramics Inc, NY (Ted Collins)
 Fosbel Inc, OH
 HC Starck Ceramics GmbH & Co KG, Germany
 Industrial Ceramic Products Inc, OH (R.C. Oberst)
 Ipsen Ceramics, IL
 Leco Corp, MI
 Magneco Metrel Inc, IL (James Colander)
 Pryor Giggey Co, AL (Allen R. Davis)
 Riverside Refractories Inc, AL (Bob Kuhn)
 Saint-Gobain Ceramic Materials, MA (Mike Schnelzer)
 Selee Corp, NC (Watt Jackson)
 Silicon Carbide Products Inc, NY
 Zircar Refractory Composites Inc, NY

Fused cast

Fosbel Inc, OH
 Furnace Products & Services Inc, PA
 Phoenix Coating Resources Inc, FL
 RHI Monofrax Ltd, NY

Fused spinel refractories

Dalmia Inst of Scientific & Industrial Research, India (B. Mishra)
 Shinagawa Advanced Materials Americas Inc, OH
 Togni SA Materiais Refratarios, Brazil

Glass furnace

Fosbel Inc, OH
 Furnace Products & Services Inc, PA
 Ipsen Ceramics, IL
 Magneco Metrel Inc, IL (Ali Farhadi)
 RHI Monofrax Ltd, NY
 Togni SA Materiais Refratarios, Brazil

Graphite

Bartley Crucible & Refractories Inc, NJ (D. Mischel)
 Furnace Products & Services Inc, PA
 Renite Co, OH (Rodger P. Kampf)
 Shinagawa Advanced Materials Americas Inc, OH
 Zero Refractories Inc, MI

Grog

Alsey Refractories Co, MO (Grog)
 The Maryland Refractorie Co, OH
 Togni SA Materiais Refratarios, Brazil

Gunning

Able Supply Co, Able Refractory Products, TX
 Allied Mineral Products Inc, OH (J. R. Tabor)
 Cetek Ltd, OH
 Dalmia Magnesite Corp, Dalmia Cement (Bharat) Ltd, India (S. Veeraraghavan)
 Fosbel Inc, OH
 Magneco Metrel Inc, IL
 Plibrico Japan Co Ltd, Japan
 Pryor Giggey Co, AL (Allen R. Davis)
 Riverside Refractories Inc, AL (Bob Kuhn)
 Saint-Gobain Ceramic Materials, MA (Patrick Stephan)
 Togni SA Materiais Refratarios, Brazil
Unifrax Corp, NY See ad page 70
 Velco GmbH, Germany

High-alumina

Advanced Cerametics Inc, NJ (Bud Cass)
 Advanced Ceramic Technology, CA
 Allied Mineral Products Inc, OH (J. R. Tabor)
 Associated Ceramics & Technology Inc, PA
 B&B Refractories Inc, CA
 Blasch Precision Ceramics Inc, NY (Ted Collins)
 Ceramco Inc, NH
 CerCo LLC, OH
 Dalmia Inst of Scientific & Industrial Research, India (B.K. Panda/P. Sahu)
 ER Advanced Ceramics Inc, OH
 ETEC Gesellschaft fuer Technische Keramik GmbH, Germany
 Fosbel Inc, OH
 Ipsen Ceramics, IL
 Leco Corp, MI
 Lock 3 Co, PA
 Magneco Metrel Inc, IL (Michael Anderson)
 Plibrico Japan Co Ltd, Japan
 RHI Monofrax Ltd, NY
 Riverside Refractories Inc, AL (Bob Kuhn)
 Saint-Gobain Ceramic Materials, MA (Arbini/Stephan)
 Selee Corp, NC (Watt Jackson)
 Shinagawa Advanced Materials Americas Inc, OH
 Sunrock Ceramics Co, IL
 The Maryland Refractorie Co, OH
 Togni SA Materiais Refratarios, Brazil
 Zircar Refractory Composites Inc, NY
 Zircoa Inc, OH

Insulating brick

Burton GmbH & Co KG, Germany
 Cetek Ltd, OH

Dalmia Inst of Scientific & Industrial Research, India (B.K. Panda/P. Sahu)
 Dalmia Magnesite Corp, Dalmia Cement (Bharat) Ltd, India (S. Veeraraghavan)
 Furnace Products & Services Inc, PA
 Insulating Firebrick Inc, PA
 Promat GmbH, Germany (H.-J. Feulner)
 RHI Monofrax Ltd, NY
 Togni SA Materiais Refratarios, Brazil
 Zircoa Inc, OH

Insulation

Dalmia Magnesite Corp, Dalmia Cement (Bharat) Ltd, India (S. Veeraraghavan)
 Du-Co Ceramics Co, PA (Tom Arbanas)
 Furnace Products & Services Inc, PA
 Plibrico Japan Co Ltd, Japan
 Promat GmbH, Germany (H.-J. Feulner)
 Pryor Giggey Co, AL (Allen R. Davis)
 RHI Monofrax Ltd, NY
 Smaht Ceramics Inc, UT
 Tenmat Ltd, United Kingdom (Mark Jellicoe)
 Thermal Products Co Inc, GA

Unifrax Corp, NY

See ad page 70



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Insulation board

Basic Resources, TN (Robert Sitterson)
 Promat GmbH, Germany (H.-J. Feulner)
 Refractory Specialties Inc, OH
 Thermal Products Co Inc, GA

Unifrax Corp, NY

See ad page 70

Zircar Refractory Composites Inc, NY

Zircar Zirconia Inc, NY

Insulation, microporous

Furnace Products & Services Inc, PA
 Promat GmbH, Germany (H.-J. Feulner)
 Refractory Specialties Inc, OH
 Thermal Products Co Inc, GA

Unifrax Corp, NY

See ad page 70

Insulation slabs, calcium silicate

Furnace Products & Services Inc, PA
 Promat GmbH, Germany (H.-J. Feulner)
 Refractory Specialties Inc, OH
 Zircar Refractory Composites Inc, NY

Insulation slabs, vermiculite

Insulating Firebrick Inc, PA
 Promat GmbH, Germany (H.-J. Feulner)
 Refractory Specialties Inc, OH
 Thermal Products Co Inc, GA

Kiln car insulation

Burton GmbH & Co KG, Germany
 Promat GmbH, Germany (H.-J. Feulner)

Refractory Specialties Inc, OH
Thermal Products Co Inc, GA

Kiln furniture

Advanced Ceramic Technology, CA
American Art Clay Co Inc, IN
Applied Ceramics Inc, GA
B&B Refractories Inc, CA
Blasch Precision Ceramics Inc, NY (Ted Collins)
Burton GmbH & Co KG, Germany
CerCo LLC, OH (Greg Little)
Evenheat Kiln Inc, MI
Harper Intl Corp, NY
Industrial Ceramic Products Inc, OH (R.C. Oberst)
Ipsen Ceramics, IL
Kiln Doctor Inc, VA
L&L Kiln Mfg Inc, NJ
Magneco Metrel Inc, IL (James Colander)
Manufacturers Equipment Co, OH (F.B. Carraher)
Paragon Industries L P, TX
Pell Industries, PA (Gary W. Pell)
Pryor Giggey Co, AL (Allen R. Davis)
Refratarios Paulista Industria e Comercio Ltda, Brazil
(Romano G. Capasso)
RHI Monofrax Ltd, NY
Saint-Gobain Ceramic Materials, MA (Mike Arbini)

Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73

Selee Corp, NC (Watt Jackson)
Silicon Carbide Products Inc, NY
Sunrock Ceramics Co, IL
Zircar Refractory Composites Inc, NY
Zirconia Inc, OH

Magnesite

Allied Mineral Products Inc, OH (J. R. Tabor)

Dalmia Inst of Scientific & Industrial Research, India (B. Mishra)

Dalmia Magnesite Corp, Dalmia Cement (Bharat) Ltd, India (S. Veerarahavan)

Furnace Products & Services Inc, PA

Lock 3 Co, PA

RHI Monofrax Ltd, NY

Togni SA Materiais Refratarios, Brazil

Monolithic

Able Supply Co, Able Refractory Products, TX
Allied Mineral Products Inc, OH (J. R. Tabor)
Blasch Precision Ceramics Inc, NY (Ted Collins)
Ceramco Inc, NH
Dalmia Magnesite Corp, Dalmia Cement (Bharat) Ltd, India (S. Veerarahavan)
Furnace Products & Services Inc, PA
Magneco Metrel Inc, IL
Plibrico Japan Co Ltd, Japan
Pryor Giggey Co, AL (Allen R. Davis)
RHI Monofrax Ltd, NY
Riverside Refractories Inc, AL (Bob Kuhn)
Saint-Gobain Ceramic Materials, MA (Mike Schnelzer)
Selee Corp, NC (Watt Jackson)
Smaht Ceramics Inc, UT
Togni SA Materiais Refratarios, Brazil

Mortars

Able Supply Co, Able Refractory Products, TX
Allied Mineral Products Inc, OH (J. R. Tabor)
Aley Refractories Co, MO (Mortars)
Burton GmbH & Co KG, Germany
Lock 3 Co, PA
Plibrico Japan Co Ltd, Japan
Pryor Giggey Co, AL (Allen R. Davis)
RHI Monofrax Ltd, NY
Riverside Refractories Inc, AL (Bob Kuhn)

Togni SA Materiais Refratarios, Brazil
Zero Refractories Inc, MI

Mullite

Able Supply Co, Able Refractory Products, TX
Advanced Ceramic Technology, CA
Allied Mineral Products Inc, OH (J. R. Tabor)
Applied Ceramics Inc, GA
B&B Refractories Inc, CA
Bartley Crucible & Refractories Inc, NJ (D. Mischel)
Ceramco Inc, NH
Dalmia Inst of Scientific & Industrial Research, India (B.K. Panda/P. Sahu)
ER Advanced Ceramics Inc, OH
ETEC Gesellschaft fuer Technische Keramik GmbH, Germany
Fosbel Inc, OH
Industrial Ceramic Products Inc, OH (R.C. Oberst)
Magneco Metrel Inc, IL (Michael Anderson)
McDaniel Advanced Ceramic Technologies, PA
Norstone Inc, PA
Pell Industries, PA (Gary W. Pell)
Pryor Giggey Co, AL (Allen R. Davis)
RHI Monofrax Ltd, NY
Saint-Gobain Ceramic Materials, MA (Mike Arbini)
Togni SA Materiais Refratarios, Brazil

Unifrax Corp, NY

See ad page 70

Nozzles

Advanced Ceramic Technology, CA
B&B Refractories Inc, CA
Bartley Crucible & Refractories Inc, NJ (D. Mischel)
Blasch Precision Ceramics Inc, NY (Ted Collins)
CerCo LLC, OH
ETEC Gesellschaft fuer Technische Keramik GmbH, Germany
Industrial Ceramic Products Inc, OH (R.C. Oberst)

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Leco Corp, MI
 Magneco Metrel Inc, IL (James Colander)
 Reed Gunite & Shotcrete Equipment, CA (Paul Sulman)
Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73
 Shinagawa Advanced Materials Americas Inc, OH
 Silicon Carbide Products Inc, NY
 Zircoa Inc, OH

Paper

Promat GmbH, Germany (H.-J. Feulner)
 Refractory Specialties Inc, OH
 Tenmat Ltd, United Kingdom (Mark Jellicoe)
 Thermal Products Co Inc, GA
Unifrax Corp, NY See ad page 70

Plastic

Able Supply Co, Able Refractory Products, TX
 Allied Mineral Products Inc, OH (J. R. Tabor)
 Maryland Ceramic & Steatite Co Inc, MD
 Plibrico Japan Co Ltd, Japan
 Pryor Giggey Co, AL (Allen R. Davis)
 RHI Monofrax Ltd, NY
 Riverside Refractories Inc, AL (Bob Kuhn)
 Togni SA Materiais Refratarios, Brazil

Precast shapes

Allied Mineral Products Inc, OH (A.S. Disaia)
 Blasch Precision Ceramics Inc, NY (Ted Collins)
 Ceramco Inc, NH
 ETEC Gesellschaft fuer Technische Keramik GmbH, Germany
 Fosbel Inc, OH
 Industrial Ceramic Products Inc, OH (R.C. Oberst)
 Magneco Metrel Inc, IL
 Plibrico Japan Co Ltd, Japan
 Refractory Specialties Inc, OH

RHI Monofrax Ltd, NY
 Riverside Refractories Inc, AL (Bob Kuhn)
 Selee Corp, NC (Watt Jackson)
 Sil-Base Co Inc, PA
 Silicon Carbide Products Inc, NY
 Togni SA Materiais Refratarios, Brazil
 Zircar Refractory Composites Inc, NY

Pyrometric devices

Taylor Tunncliff Ltd, United Kingdom (David Thomason)

Ramming mixes

Able Supply Co, Able Refractory Products, TX
 Allied Mineral Products Inc, OH (J. R. Tabor)
 Alsey Refractories Co, MO (Ramming mixes)
 Dalmia Magnesite Corp, Dalmia Cement (Bharat) Ltd, India (S. Veeraraghavan)
 Plibrico Japan Co Ltd, Japan
 Pryor Giggey Co, AL (Allen R. Davis)
 RHI Monofrax Ltd, NY
 Riverside Refractories Inc, AL (Bob Kuhn)
 Saint-Gobain Ceramic Materials, MA (Mike Schnelzer)
 Selee Corp, NC (Watt Jackson)
 Togni SA Materiais Refratarios, Brazil

Rods

AdValue Technology LLC, AZ See ad page 74
 Blasch Precision Ceramics Inc, NY (Ted Collins)
 CerCo LLC, OH (Susan English)
 Du-Co Ceramics Co, PA (Tom Arbanas)
 Industrial Ceramic Products Inc, OH (R.C. Oberst)
 Leco Corp, MI
 Magneco Metrel Inc, IL
 McDanel Advanced Ceramic Technologies, PA
Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73

Saint-Gobain Quartz Ltd, United Kingdom
 Silicon Carbide Products Inc, NY

Rollers

CFF Kilns & Furnaces, CA
Keith Co, CA See ad page 65
 Recco Furnaces, CA
 Saint-Gobain Ceramic Materials, MA (Mike Arbini)
Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73
 Saint-Gobain Quartz Ltd, United Kingdom

Saggers

AdValue Technology LLC, AZ See ad page 74
 Applied Ceramics Inc, GA
 B&B Refractories Inc, CA
 Bartley Crucible & Refractories Inc, NJ (D. Mischel)
 Blasch Precision Ceramics Inc, NY (Ted Collins)
 Burton GmbH & Co KG, Germany
 Ceramco Inc, NH
 CerCo LLC, OH (Greg Little)
 Ipsen Ceramics, IL
 Leco Corp, MI
 Pell Industries, PA (Gary W. Pell)
 Refractory Specialties Inc, OH
 Refratarios Paulista Industria e Comercio Ltda, Brazil (Romano G. Capasso)
 Saint-Gobain Ceramic Materials, MA (Mike Arbini)
 Selee Corp, NC (Watt Jackson)
 Sunrock Ceramics Co, IL

Setters

AdValue Technology LLC, AZ See ad page 74
 Applied Ceramics Inc, GA
 B&B Refractories Inc, CA
 Blasch Precision Ceramics Inc, NY (Ted Collins)
 Burton GmbH & Co KG, Germany
 Ceramco Inc, NH
 CerCo LLC, OH (Greg Little)
 Industrial Ceramic Products Inc, OH (R.C. Oberst)
 Ipsen Ceramics, IL
 Leco Corp, MI
 Maryland Ceramic & Steatite Co Inc, MD
 Pell Industries, PA (Gary W. Pell)
 Refractory Specialties Inc, OH
 Saint-Gobain Ceramic Materials, MA (Mike Arbini)
Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73
 Selee Corp, NC (Watt Jackson)
 Sunrock Ceramics Co, IL

Setting pins

Industrial Ceramic Products Inc, OH (R.C. Oberst)

Silica

Allied Mineral Products Inc, OH (J. R. Tabor)
 Bartley Crucible & Refractories Inc, NJ (D. Mischel)
 Blasch Precision Ceramics Inc, NY (Ted Collins)
 CerCo LLC, OH (Greg Little)
 CerCo LLC, OH (Susan English)
 Dalmia Inst of Scientific & Industrial Research, India (B.K. Panda/P. Sahu)
 Fosbel Inc, OH
 Ipsen Ceramics, IL
 Magneco Metrel Inc, IL
 Minco Inc, TN
 Refractory Specialties Inc, OH
 RHI Monofrax Ltd, NY
 Saint-Gobain Quartz Ltd, United Kingdom

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Selee Corp, NC (Watt Jackson)
Short Mountain Silica, TN
Sibelco Benelux, Belgium
The Maryland Refractorie Co, OH

Unimin Corp, CT See ad page 34

Silicon carbide

Allied Mineral Products Inc, OH (J. R. Tabor)
Bartley Crucible & Refractories Inc, NJ (D. Mischel)
Blasch Precision Ceramics Inc, NY (Ted Collins)
Burton GmbH & Co KG, Germany
CerCo LLC, OH (Greg Little)

Electro Abrasives, NY See ad page 47

Fosbel Inc, OH
Lock 3 Co, PA
Magneco Metrel Inc, IL (Michael Anderson)
Plibrico Japan Co Ltd, Japan
Pryor Giggey Co, AL (Allen R. Davis)

Saint-Gobain Ceramic Materials, MA (Arbini/Stephan/
Schnelzer)

**Saint-Gobain Ceramics, Structural
Ceramics Group, NY** See ad page 73

Selee Corp, NC (Watt Jackson)
Silicon Carbide Products Inc, NY
Togni SA Materiais Refratarios, Brazil

Specialty

Able Supply Co, Able Refractory Products, TX
Allied Mineral Products Inc, OH (J. R. Tabor)
Aalsey Refractories Co, MO (Specialty)
B&B Refractories Inc, CA
Bartley Crucible & Refractories Inc, NJ (D. Mischel)
Blasch Precision Ceramics Inc, NY (Ted Collins)
Ceramco Inc, NH
CerCo LLC, OH (Paul Stipanovich)
ETEC Gesellschaft fuer Technische Keramik GmbH,
Germany
Goceram AB, Sweden
Industrial Ceramic Products Inc, OH (R.C. Oberst)
Magneco Metrel Inc, IL (Thomas Colander)

McDaniel Advanced Ceramic Technologies, PA
Refractory Specialties Inc, OH
Riverside Refractories Inc, AL (Bob Kuhn)
Saint-Gobain Ceramic Materials, MA (Arbini/Stephan/
Schnelzer)
Togni SA Materiais Refratarios, Brazil
Zero Refractories Inc, MI

Tap hole clays

Riverside Refractories Inc, AL (Bob Kuhn)

Textile

Ceramco Inc, NH
Cotronics Corp, NY
Saint-Gobain Quartz Ltd, United Kingdom
Thermal Products Co Inc, GA

Tubes

AdValue Technology LLC, AZ
See ad page 74

Applied Ceramics Inc, GA
B&B Refractories Inc, CA
Ceramco Inc, NH
Ceramic Oxide Fabricators Pty Ltd, Australia
CerCo LLC, OH (Greg Little)
ETEC Gesellschaft fuer Technische Keramik GmbH,
Germany
Industrial Ceramic Products Inc, OH (R.C. Oberst)
Leco Corp, MI
Magneco Metrel Inc, IL
Saint-Gobain Ceramic Materials, MA (Mike Arbini)
**Saint-Gobain Ceramics, Structural
Ceramics Group, NY** See ad page 73
Silicon Carbide Products Inc, NY
Thermal Products Co Inc, GA
Zircar Refractory Composites Inc, NY
Zircoa Inc, OH

Zircon

Applied Ceramics Inc, GA
Bartley Crucible & Refractories Inc, NJ (D. Mischel)
Dalmia Inst of Scientific & Industrial Research, India (B.
Mishra)
Fosbel Inc, OH
Lock 3 Co, PA
RHI Monofrax Ltd, NY
Togni SA Materiais Refratarios, Brazil
Zircoa Inc, OH

Zirconia

Advanced Cerametrics Inc, NJ (Bud Cass)
Applied Ceramics Inc, GA
Bartley Crucible & Refractories Inc, NJ (D. Mischel)
Ceramco Inc, NH
CerCo LLC, OH (Greg Little)
Dalmia Inst of Scientific & Industrial Research, India
Dalmia Magnesite Corp, Dalmia Cement (Bharat) Ltd,
India (S. Veeraraghavan)
ETEC Gesellschaft fuer Technische Keramik GmbH,
Germany
Fosbel Inc, OH
Pangea Intl Ltd, China
Phoenix Coating Resources Inc, FL
Pryor Giggey Co, AL (Allen R. Davis)
RHI Monofrax Ltd, NY
Saint-Gobain Ceramic Materials, MA (Mike Arbini)
Selee Corp, NC (Watt Jackson)
Zircar Zirconia Inc, NY



Zircoa Inc, OH

U. S. Index

Arizona

AdValue Technology LLC
Refrac Systems
Sasol North America Inc, Ceralox Div
Spheric Technologies Inc

California

Advanced Ceramic Technology
B&B Refractories Inc
Ceradyne Inc
CFF Kilns & Furnaces
C-Shore Intl Inc
Gerling Applied Engineering Inc
Glass Technical Inst
Horiba Instruments Inc
Hyper-Therm HTC
Industrial Tools Inc
Keith Co
Kyocera Intl Inc
Laguna Clay Co
Morgan Technical Ceramics
Peter Pugger Mfg Inc
Recco Furnaces
Reed Gunite & Shotcrete Equipment
SAMPE
SRI Intl
T Q Abrasive Machining
Thermal Technology Inc
Tile Heritage Foundation
UKAM Industrial Superhard Tools
Valley Design Corp
WCS Inc

Colorado

CoorsTek Analytical Laboratories
CoorsTek Laboratories
Deltech Inc
Keyria Inc
Reusche & Co. of TWS Inc
Rio Tinto Minerals
Rosco Engineering Process Equipment

Connecticut

Croll-Reynolds Engineering Co
EBL Products Inc
Emery Winslow Scale Co
Eppler Assocs
Innovative Research & Products Inc
M-Tech Instruments
RT Vanderbilt Co Inc
Saint-Gobain Advanced Ceramics
Spencer Turbine Co
Technisonic Research Inc
Unimin Corp
Vision Engineering Inc
Vitta Corp

Delaware

DuPont Co
Empower Materials Inc
Micron Inc
Nabertherm Inc
Wesbond Corp

Florida

Friatec
Haiku Tech Inc
Intelligent Micro Patterning LLC
Ocean Optics Inc
Phoenix Coating Resources Inc
Quantachrome Instruments
Specialty Glass Inc

Georgia

Applied Ceramics Inc
Imerys
M&M Clays Inc
Micromeritics Instrument Corp
Thermal Products Co Inc
Well Diamond Wire Saws Inc
Zschimmer & Schwarz, U.S. Div

Idaho

Quality Thermistor Inc

Illinois

American Chemet Corp
Amstat Industries Inc
Binks/Devilbiss
Buehler Ltd
Chisholm Boyd & White Co
DeMarco Vacuum Corp
Diamond Industrial Tools Inc
Eirich Machines Inc
Engis Corp
Greenlee Diamond Tool Co
Gundlach Equipment Corp
Haeger Industries Inc
Intl Decal Corp
Ipsen Ceramics
James Instruments
Kraft Chemical Co
Magneco Metrel Inc
Merkle International Inc
Particle Technology Labs
Portland Cement Assn
Superior Graphite Co
UV Process Supply Inc
Videojet Technologies Inc

Indiana

Abresist Corp
American Art Clay Co Inc
Brannon & Associates PC
Carman Industries Inc
Enceratec Corp
Maxon Corp
Piezo Technologies
Powder Processing & Technology LLC
Spontaneous Materials
Stedman Machine Co Inc, Div of Eagle
Crusher Co

Kansas

KC Abrasive Co LLC

Kentucky

Littleford Day Inc
Machined Ceramics Inc
Old Hickory Clay Co
Saint-Gobain Ceramics & Plastics Inc
Schott North America Inc
Sweco
Thompson Enamel Inc

Louisiana

Bulk Pack Inc

Maryland

Active Minerals Intl LLC
Cambridge Intl
Cambridge Wire Cloth Co
Maryland Ceramic & Steatite Co Inc
Maryland Wire Belts Inc
Refractory Composites Inc
Shimadzu Scientific Instruments
Spray Drying Systems Inc
Trans-Tech Inc

Massachusetts

Alfa Aesar Johnson Matthey
Amptek Inc
AVS Inc
Bomas Machine Specialties Inc
Ceramics Consulting Services
CeraNova Corp
Communications & Power Industry Inc
CSC Force Measurement Inc
CSM Instruments Inc
Datapaq Inc
Engineered Pressure Systems Inc
Ferro Ceramic Grinding Inc
Geller Microanalytical Laboratory Inc
HC Starck Inc
International Ceramic Engineering
Malvern Instruments
Massachusetts Inst of Technology
Microplasmic Corp
Modern Times Legal
Netzsch Instruments Inc
Osram Sylvania Inc, R & D Library
PANalytical
RD Webb Company Inc
Saint-Gobain Abrasives
Saint-Gobain Grains & Powders
Saint-Gobain High-Performance
Materials
Sheffield Pottery

Michigan

Advanced Machinery Inc
Dow Chemical Co
Dow Corning Corp
Evenheat Kiln Inc
Impact Analytical
Industrial Ceramic Technology
JACPA Ceramic
Leco Corp
Mohr Corp
PTX-Pentronix Inc, Subsidiary of
Gasbarre Products Inc
Zero Refractories Inc

Minnesota

DCM Tech
Dynamic Air Inc
Graco Inc
Ikonics Imaging-Industrial Solutions
Nol-Tec Systems Inc
North Star Imaging Inc
Peltsman Corp
Superconix Inc

Missouri

Chemir Analytical Services
ICL Performance Products LP
Industrial Testing Laboratories Inc

Missouri University of Science and
Technology
Mo-Sci Corp
Williams Patent Crusher & Pulverizer
Co Inc

Nebraska

Cyclonaire Corp

Nevada

Advanced Superabrasives

New Hampshire

Centorr/Vacuum Industries Inc
Ceramco Inc
Materials Research Furnaces Inc
Noble Technologies Group
Oxy-Gon Industries Inc
Z-Tech LLC

New Jersey

Accurate Diamond Tool Corp
Accuratus Ceramic Corp
Advanced Cerametrics Inc
Atlantic Equipment Engineers, Micron
Metals Inc
ATS Rheosystems
Bartley Crucible & Refractories Inc
BassTech Intl
Cargille Labs
CM Furnaces Inc
Color-Tec
Control Instruments Corp
CW Brabender Instruments Inc
Degussa Corp
General Glass Equipment Co
GFI Advanced Technologies Inc
Glen Mills Inc
Hammill & Gillespie Inc
HED Intl Inc, Unique/Pereny Div
Hosokawa Micron Powder Systems
Instar Enterprises Intl Inc
L&L Kiln Mfg Inc
Linseis Inc
Lunzer Inc
Master Bond Inc
Perl Pigments LLC
RE Carroll Inc
Sanamar Inc
Sensor Products
Seppic Inc
Shamrock Technologies Inc
Unique/Pereny Furnaces & Kilns, Div
HED Inc
Var Lac Old Chemical Co
Wyssmont Co Inc

New Mexico

Sandia Natl Labs
Sonic-Mill

New York

Alfred University
Angstrom Precision Optics Inc.
Bayville Chemical Supply Co
Blasch Precision Ceramics Inc
Brinkmann Instruments Inc
Brookhaven Instruments Corp
Capovani Brothers Inc

Carl Zeiss Microimaging Inc
 Casso-Solar Corp
 Corning Inc
 Cotronics Corp
 DeFelsko Corp
 Electro Abrasives Corp
 Evans Analytical Group
 Ferronics Inc
 FilTROS Ltd
 Fluid Metering Inc
 Glass Factory Directory
 Goulds Pumps ITT
 Harper Intl Corp
 Heany Industries Inc, Industrial Ceramic Div
 I Squared R Element Co Inc
 Kanthal Heating Systems
 Leico Industries Inc
 NanoDynamics Inc
 NYCO Minerals Inc
 Oneida Research Services Inc
 P-Ker Engineering
 Pred Materials International Inc
 Refractron Technologies Corp
 Rensselaer Polytechnic Inst
 RHI Monofrax Ltd
 Saint-Gobain Ceramics, Structural Ceramics Group
 Schutte-Buffalo Hammermill LLC
 Silicon Carbide Products Inc
 Spectronics Corp
 Starfire Systems Inc
 Taber Industries
 Teeter Marketing Services LLC
 Thermex-Thermatron Inc
 Treibacher Schleifmittel North America Inc
 Unifrax Corp
 Vent-A-Kiln Corp
 Washington Mills Electro Minerals Co
 Zircar Refractory Composites Inc
 Zircar Zirconia Inc

North Carolina

Basic Machinery Co Inc
 DuPont Electronic Technologies, Microcircuit Materials
 Keir Mfg Inc
 Russell Finex Inc
 Selee Corp
 Thermcraft Inc

Ohio

ACCCO Inc
 Action Superabrasives
 Akron Porcelain & Plastics Co
 Allied Mineral Products Inc
 American Ceramic Society Bulletin
 American Isostatic Presses
 Assn of American Ceramic Component Manufacturers
 Astro Met Inc
 Avure Technologies Inc
 Beamalloy Technologies LLC
 Bullen Ultrasonics Inc
 Carter Diamond Tool Corp
 Ceramic Educational Council
 Ceramics Monthly
 ceramicSOURCE
 CerCo LLC
 Cetek Ltd

Chemical Abstracts Service
 CS Bell Co
 Dover Conveyor Inc
 ER Advanced Ceramics Inc
 EZ Grout Corp
 Federal Mogul
 Fives North American Combustion Inc
 Fosbel Inc
 fuelcellmaterials.com, NexTech Materials Limited
 Fusjon Ceramics Inc, Reimbold & Strick
 Glass Mfg Industry Council
 Harrop Industries Inc
 Industrial Ceramic Products Inc
 Ingredient Masters
 Innovative Ceramic Corp
 Intl Journal of Applied Ceramic Technology, American Ceramic Society
 Journal of the American Ceramic Society
 Kepcor Inc, SSI Tiles
 Koch Knight LLC
 Kornylak Corp
 Koyo Corp of USA
 Krumor Inc
 Lankard Materials Lab Inc
 Lanly Co
 London Tile Co
 Manufacturers Equipment Co
 Mason Color Works Inc
 Matrix Enterprises
 Mettler Toledo
 Micropyretics Heaters Intl Inc
 Midwestern Industries Inc
 Momentive Performance Materials
 Natl BoraXX Corp
 Natl Inst of Ceramic Engineers
 Natl Lime & Stone Co
 NSL Analytical Services Inc
 Orton Ceramic Foundation
 Owens-Illinois Inc
 Performance Ceramics Co
 Pottery Making Illustrated
 Processall Inc
 PSC Inc, Div of C A Litzler
 Quality Stamp Co
 Quartz Scientific Inc
 Refractory Specialties Inc
 Regal Diamond Products
 Renite Co
 Rio Tinto Alcan Specialty Aluminas
 Saint-Gobain NorPro Corp
 SCI Engineered Materials Inc
 Seaforth Mineral & Ore Co Inc
 Sem-Com Co Inc
 SGCD-Society of Glass & Ceramic Decorators
 Shinagawa Advanced Materials Americas Inc
 Steel Valley Firebrick LLC, dba Maryland Refractories Co
 The American Ceramic Society
 Tosoh USA Inc
 Union Process Inc
 US Foam Corp
 Whitacre Greer Co
 Yxlon Intl Inc
 Zircoa Inc

Oklahoma

EXAKTTechnologies Inc

Oregon

Precision Measurements & Instruments Corp

Pennsylvania

Advanced Materials Technologies
 AGR Intl Inc
 Air Products & Chemicals Inc
 Almatis Inc
 American Piezo Ceramics Inc
 American Stress Technologies Inc
 Anter Corp
 Applied Test Systems Inc
 Associated Ceramics & Technology Inc
 Calucem Inc
 Carbone of America, Graphite Materials Div
 C-E Minerals
 Ceramic Color & Chemical Mfg Co
 Ceramic Services Inc
 Die Quip Corp
 Dorst America Inc
 Du-Co Ceramics Co
 Elizabeth Carbide Die Co Inc
 Elkem Metals Inc
 ESL Electroscience
 Fluid Energy Processing & Equipment Co
 Furnace Products & Services Inc
 Gasbarre Products Inc
 Gelest Inc
 Goodfellow Corp
 Hauck Mfg Co
 Insulating Firebrick Inc
 Kion Specialty Polymers
 Lancaster Products Div, Kercher Industries Inc
 Lock 3 Co
 Lucifer Furnaces Inc
 McDanel Advanced Ceramic Technologies
 Natl Magnetics Group Inc
 Netzsch Fine Particle Technology LLC
 Nilfisk-Advance America Inc
 Norstone Inc
 Pell Industries
 Petro Mold Co
 Reference Metals Co Inc
 Refractory Machining Services
 Refractory Minerals
 Retsch Inc
 Richard E Mistler Inc
 Saint-Gobain Grains & Powders, ABC/Warren/Amplex Superabrasives
 Sauereisen Inc
 Sil-Base Co Inc
 Strainoptic Inc
 Stratcor Inc
 Tapecasting Warehouse Div, Richard E Mistler Inc
 Trent Inc
 Universal Technical Equipment Inc
 US Electrofused Minerals Inc
 Young Industries Inc

South Carolina

Advanced Composite Materials Corp
 Ceramic Recruiters Inc
 CeramTec North America
 Marion Ceramics Inc

MicroCeram Co
 Morgan AM&T

Tennessee

AdTech Ceramics
 General Shale Brick Inc
 HC Spinks Clay Co Inc
 Minco Inc
 SE Intl Inc
 Short Mountain Silica

Texas

Able Supply Co, Able Refractory Products
 Baikowski Malakoff Inc
 Birney W West PE
 Huber Construction Inc
 Huper Optix Distributors
 Maxi-Lift Inc
 MEG Systems Corp
 Noah Technologies Corp, Chemical Div
 Paragon Industries LP
 Pyromeral Systems Inc
 Saint-Gobain Ceramics

Utah

Ceramatec Inc
 EDO Corp
 Smaht Ceramics Inc

Vermont

Superior Technical Ceramics Corp

Virginia

Brick Industry Assoc
 CP Films Inc, Precision Coated Films Div
 HunterLab
 Kaeser Compressors Inc
 Kerneos Incorporated
 Kiln Doctor Inc

Washington

North Star Equipment Inc
 VIOX Corp

West Virginia

Fenton Art Glass Co
 US Silica Co

Wisconsin

BuzzMac Intl LLC
 Cerac Inc, Subsidiary of Williams Advanced Materials
 Cilas Particle Size
 Dings Co, Magnetic Group
 GE Healthcare
 Lignotech USA
 Premier Mill An SPX Brand
 Vector Technologies Inc

International Index

This is a listing of organizations located outside the United States.

Australia

Ceramic Oxide Fabricators Pty Ltd

Austria

Plansee Metal GmbH

Belgium

NV Bekaert SA

Sibelco

Vito-Flemish Inst for
Technological Research

Brazil

Refratarios Paulista Industria e
Comercio Ltda

Togni SA Materiais Refratarios

Canada

Activation Laboratories Ltd

Amalgamet Canada, Div of
Premetalco Inc

Avalon Rare Metals Inc

Carsten Systems & Machine Ltd

Hains Technology Assocs

Laval Labs Inc

Neoptix

Proscience Inc, Glass Shop Div

Sellick Equipment Ltd

SGS Minerals Services

Zochem

China

Pangea Intl Ltd

Terio Corp

Tianjin Innova Tech Co Ltd

Denmark

Haldor Topsoe A/S

Finland

Outotec Research Oy

France

Cerlase

Comptoir de Mineraux et Matieres
Premieres

Pyromeral Systems Sarl

Sahut Conreur SA

Thales TRT

Germany

Anceram GmbH & Co KG

Arburg GmbH + Co KG

Burton GmbH & Co KG

Eglasstrek Patent Promotion &
Awarding GmbH

ETEC Gesellschaft fuer Technische
Keramik GmbH

FCT Hartbearbeitungs GmbH

FCT Ingenieurkeramik GmbH

FCT Systeme GmbH

Fraunhofer Inst for Silicate
Research

Friatec AG

Fritsch GmbH, Milling and Sizing

Haver & Boecker

HC Starck Ceramics GmbH &
Co KG

HC Starck GmbH

Heinen Drying GmbH, Heinen
Trocknungstechnologie GmbH

Inst for Mfg Tech for Ceramic
Components & Composi,
University of Stuttgart

Linn High Therm GmbH

Logomatic GmbH

Nabaltec AG

Promat GmbH

Sama Maschinenbau GmbH

Stephan Schmidt KG

Vallen-Systeme GmbH

Velco GmbH

India

Abref Private Ltd

Ace Refractories Ltd

Bharat Heavy Electricals Ltd,
Ceramic Bus Unit/Electro
Porcelains Div

Central Glass & Ceramic Research
Inst, Library

Dalmia Inst of Scientific &
Industrial Research

Dalmia Magnesite Corp, Dalmia
Cement (Bharat) Ltd

Hindalco Industries Ltd, Belgaum
R&D Centre

Indian Ceramic Society, Central
Glass & Ceramic Research Inst

Prism Monolithics Pvt Ltd

Sparkler Ceramics Pvt Ltd

Vesuvius India Ltd

Israel

Israel Ceramic & Silicate Inst

Italy

Ceramic Instruments Srl

Expert System Solutions Srl

Japan

Inax Corp, Space D&T Lab

Kyocera Corp

Murata Manufacturing Co Ltd

New Glass Forum

Plibrico Japan Co Ltd

Shoei Chemical Inc

Toyota Central R&D Labs Inc

Luxembourg

Laeis GmbH

Netherlands

Hyflux CEPAration

Innalox BV

PANalytical

Norway

NorECs AS, Norwegian Electro
Ceramics

Singapore

Acelent Technologies Pte Ltd

South Africa

ISCOSA

Sri Lanka

CENTEC, Sri Lanka Ceramics
Council

Sweden

Goceram AB

Vesta Ceramics AB

Switzerland

Ceramaret SA

Strico AG

Turkey

Anadolu Cam Sanayii AS

United Kingdom

Advanced NDT Limited

Areva T&D Technology Centre

Brookhaven Instruments Ltd

Ceram Research Ltd

Guyson Intl Ltd

Gwent Electronic Materials Ltd

Hygan Products Ltd

Isoform Ltd

Lloyd Instruments Ltd

Mackey Bowley Intl Ltd

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Surface Inspection Ltd

Taylor Tunnicliff Ltd

Tenmat Ltd

ZincOx Resources Plc

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TESTING/EVALUATION INSTRUMENTS & EQUIPMENT

Taber Industries, NY (Alan Jaenecke)

Acoustic instruments

BuzzMac Int'l LLC, WI
Matrix Enterprises, OH
Vallen-Systeme GmbH, Germany

Atomic absorption spectrometers

Shimadzu Scientific Instruments, MD (Bob Clifford)

Chemical analysis instruments

Malvern Instruments, MA
Ocean Optics Inc, FL (R. Randelman)
PANalytical, Netherlands
Shimadzu Scientific Instruments, MD

Color measurement equipment

Ceram /M & P Laboratory, United Kingdom
Color-Tec, NJ
HunterLab, VA
Ocean Optics Inc, FL (R. Randelman)
Shimadzu Scientific Instruments, MD (Gilbert Vial)

Compression testing equipment

Applied Test Systems Inc, PA
Capovani Brothers Inc, NY
CSC Force Measurement Inc, MA
Dalmia Inst of Scientific & Industrial Research, India (U.N. Sahoo)
Lloyd Instruments Ltd, United Kingdom (Toby Rogers)
Shimadzu Scientific Instruments, MD (Gilbert Vial)

Computer software

Applied Test Systems Inc, PA
Color-Tec, NJ
CSC Force Measurement Inc, MA
Datapaq Inc, MA

Expert System Solutions Srl, Italy
General Glass Equipment Co, NJ
Lloyd Instruments Ltd, United Kingdom (Toby Rogers)
PANalytical, Netherlands
Sensor Products, NJ (Vadim Shalyt)

Couplants, ultrasonic instruments

Universal Technical Equipment Inc, PA

Density analyzers

AGR Intl Inc, PA

Micromeritics Instrument Corp, GA
See ad page 79

Particle Technology Labs, IL
Quantachrome Instruments, FL
Shimadzu Scientific Instruments, MD (Gilbert Vial)

Differential scanning calorimetry instruments

Linseis Inc, NJ
Particle Technology Labs, IL
Shimadzu Scientific Instruments, MD (Gilbert Vial)

Differential thermal analysis instruments

Dalmia Inst of Scientific & Industrial Research, India (C.R. Panda)
Datapaq Inc, MA
Expert System Solutions Srl, Italy
Linseis Inc, NJ
Orton Ceramic Foundation, OH (Jim Baldwin)
Shimadzu Scientific Instruments, MD (Gilbert Vial)

Dilatometers

Anter Corp, PA
Edward Orton Jr Ceramic Foundation, OH (Jim Baldwin)
Expert System Solutions Srl, Italy (Mariano Paganelli)
Linseis Inc, NJ
Orton Ceramic Foundation, OH (Jim Baldwin)
Precision Measurements & Instruments Corp, OR

Dye penetrant equipment and supplies

Advanced NDT Limited, United Kingdom (Keith McLaughlin)
Spectronics Corp, NY (Betty Cheng)
Universal Technical Equipment Inc, PA

Eddy current testing instruments

Advanced NDT Limited, United Kingdom (Keith McLaughlin)
DeFelsko Corp, NY
M-Tech Instruments, CT (Michael Maulucci)
Universal Technical Equipment Inc, PA

Electrochemical analysis instruments

fuelcellmaterials.com, NexTech Materials Limited, OH
NorECs AS, Norwegian Electro Ceramics, Norway
Ocean Optics Inc, FL (M. Shahriari)

Electromechanical analysis instruments

Advanced Materials Technologies, PA (Joseph P. Dougherty)
CSC Force Measurement Inc, MA
Lloyd Instruments Ltd, United Kingdom (Toby Rogers)

Electronic analysis instruments

Advanced Materials Technologies, PA (Joseph P. Dougherty)
fuelcellmaterials.com, NexTech Materials Limited, OH

Flexural analysis instruments

Expert System Solutions Srl, Italy
Lloyd Instruments Ltd, United Kingdom (Toby Rogers)
Taber Industries, NY

Gas analysis instruments

Ceramic Oxide Fabricators Pty Ltd, Australia
Control Instruments Corp, NJ
Dalmia Inst of Scientific & Industrial Research, India
Horiba Instruments Inc, CA (D. Horstman)
Ocean Optics Inc, FL (R. Randelman)

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Expert System Solutions Srl, Italy (Daniele Rebecchi)
Haver & Boecker, Germany
Horiba Instruments Inc, CA
Leco Corp, MI
Malvern Instruments, MA

Micromeritics Instrument Corp, GA

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Particle Technology Labs, IL
Sensor Products, NJ (Vadim Shalyt)

Infrared spectroscopy instruments

Ocean Optics Inc, FL (R. Randelman)
Shimadzu Scientific Instruments, MD

Interferometers

Precision Measurements & Instruments Corp, OR

Leak detectors

AGR Intl Inc, PA
Capovani Brothers Inc, NY
Kaeser Compressors Inc, VA
Spectronics Corp, NY
Universal Technical Equipment Inc, PA
Vallen-Systeme GmbH, Germany

Microfocus X-ray imaging instruments

Horiba Instruments Inc, CA

Moisture analyzers

CW Brabender Instruments Inc, NJ
Leco Corp, MI
Mettler-Toledo Inc, OH
Ocean Optics Inc, FL (M. Shahriari)

Neutron activation analysis instruments

Amptek Inc, MA

Nondestructive evaluation instruments

Advanced NDT Limited, United Kingdom (Keith McLaughlin)
AGR Intl Inc, PA
American Stress Technologies Inc, PA
Amptek Inc, MA
BuzzMac Intl LLC, WI
CSM Instruments Inc, MA
Dalmia Inst of Scientific & Industrial Research, India
Datapaq Inc, MA
DeFelsko Corp, NY
Matrix Enterprises, OH
M-Tech Instruments, CT (Michael Maulucci)
Orton Ceramic Foundation, OH (Jim Baldwin)
Precision Measurements & Instruments Corp, OR
Sensor Products, NJ (Vadim Shalyt)
Spectronics Corp, NY (Betty Cheng)
Strainoptics Inc, PA
Universal Technical Equipment Inc, PA
Vallen-Systeme GmbH, Germany

Optical emission spectroscopy instruments

Horiba Instruments Inc, CA
Leco Corp, MI
Ocean Optics Inc, FL
PANalytical, Netherlands

Oxygen analyzers

Noble Technologies Group, NH (Charles W. Miller)
Ocean Optics Inc, FL (M. Shahriari)

Particle size analysis instruments

Amptek Inc, MA
Dalmia Inst of Scientific & Industrial Research, India (B.B. Sahu)
Fritsch GmbH, Milling and Sizing, Germany
Geller Microanalytical Laboratory Inc, MA

Haver & Boecker, Germany
Horiba Instruments Inc, CA
Hosokawa Micron Powder Systems, NJ
Laval Labs Inc, Quebec
Malvern Instruments, MA

Micromeritics Instrument Corp, GA

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PANalytical, Netherlands
Particle Technology Labs, IL
Shimadzu Scientific Instruments, MD (Gilbert Vial)

Pore size analyzers

Dalmia Inst of Scientific & Industrial Research, India (P. Mohapatra)

Micromeritics Instrument Corp, GA

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Particle Technology Labs, IL
Quantachrome Instruments, FL

Pressure sensors

Sensor Products, NJ (Vadim Shalyt)

Raman spectroscopy instruments

Horiba Instruments Inc, CA (I. Nir)
Malvern Instruments, MA
Ocean Optics Inc, FL (R. Randelman)

Secondary ion mass spectroscopy instruments

Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Dietmar Scherer)

Sonic testing

Matrix Enterprises, OH
Vallen-Systeme GmbH, Germany

Spectroscopy instruments

Amptek Inc, MA
Ocean Optics Inc, FL (R. Randelman)
PANalytical, MA
Shimadzu Scientific Instruments, MD

Surface analysis instruments

Capovani Brothers Inc, NY
CSM Instruments Inc, MA
Dalmia Inst of Scientific & Industrial Research, India (P. Mohapatra)
Horiba Instruments Inc, CA (B. Sears)
PANalytical, MA
Particle Technology Labs, IL
Quantachrome Instruments, FL
Sensor Products, NJ (Vadim Shalyt)
Taber Industries, NY (Alan Jaenecke)

Tensile testers

Applied Test Systems Inc, PA
Capovani Brothers Inc, NY
CSC Force Measurement Inc, MA
Lloyd Instruments Ltd, United Kingdom (Toby Rogers)
Shimadzu Scientific Instruments, MD (Gilbert Vial)

Thermal diffusivity/conductivity analysis instruments

Anter Corp, PA
Dalmia Inst of Scientific & Industrial Research, India (B.K. Naik)
Linseis Inc, NJ

Netzsch Instruments Inc, MA

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Precision Measurements & Instruments Corp, OR
Sensor Products, NJ (Vadim Shalyt)

Thermal imaging

Birney W West PE, TX (Birney W. West)

Thermogravimetric analysis instruments

Leco Corp, MI
Linseis Inc, NJ
Mettler-Toledo Inc, OH

Netzsch Instruments Inc, MA

See ad page 81



Shimadzu Scientific Instruments, MD (Gilbert Vial)

Thermomechanical analysis instruments

ATS Rheosystems, NJ
BuzzMac Intl LLC, WI
Expert System Solutions Srl, Italy (Mariano Paganelli)
Linseis Inc, NJ
Orton Ceramic Foundation, OH (Jim Baldwin)
Shimadzu Scientific Instruments, MD (Gilbert Vial)

Transducers, ultrasonic

APC Intl Ltd, PA
Technisonic Research Inc, CT
Universal Technical Equipment Inc, PA

Ultrasonic instruments

Advanced NDT Limited, United Kingdom (Keith McLaughlin)
APC Intl Ltd, PA
DeFelsko Corp, NY
Guyson Intl Ltd, United Kingdom
M-Tech Instruments, CT (Michael Maulucci)
Sonic-Mill, NM
Universal Technical Equipment Inc, PA

Ultrasonic transducers

Advanced NDT Limited, United Kingdom (Keith McLaughlin)
APC Intl Ltd, PA
Guyson Intl Ltd, United Kingdom
M-Tech Instruments, CT (Michael Maulucci)
Technisonic Research Inc, CT
Universal Technical Equipment Inc, PA

Visual and optical testers

AGR Intl Inc, PA
Taber Industries, NY (Alan Jaenecke)

Water sorption measurement

Micromeritics Instrument Corp, GA

See ad page 79

Quantachrome Instruments, FL

X-ray diffraction instruments

American Stress Technologies Inc, PA

Dalmia Inst of Scientific & Industrial Research, India
(S.K. Panda)

PANalytical, Netherlands

PANalytical, MA

Shimadzu Scientific Instruments, MD

X-ray instruments

American Stress Technologies Inc, PA

Amptek Inc, MA

Horiba Instruments Inc, CA (D. Malone)

PANalytical, MA

SE Intl Inc, TN (Beth Cramer)

Universal Technical Equipment Inc, PA

X-ray spectroscopy instruments

Amptek Inc, MA

PANalytical, Netherlands

PANalytical, MA

Shimadzu Scientific Instruments, MD

Zeta potential analyzers

Fritsch GmbH, Milling and Sizing, Germany

Horiba Instruments Inc, CA

Laval Labs Inc, Quebec

Malvern Instruments, MA

Particle Technology Labs, IL

LABORATORY EQUIPMENT & SUPPLIES

Laboratory equipment & supplies

Taber Industries, NY (Alan Jaenecke)

Chemicals

Clemson University, School of Matls Sci & Engrg, SC
Tapecasting Warehouse Div, Richard E Mistler Inc, PA

Colorimeters

Cargille Labs, NJ

Color-Tec, NJ

HunterLab, VA

Laval Labs Inc, Quebec

Computers

Expert System Solutions Srl, Italy

Density measurement instruments

AGR Intl Inc, PA

Cargille Labs, NJ

Micromeritics Instrument Corp, GA

See ad page 79

Particle Technology Labs, IL

Quantachrome Instruments, FL

Universal Technical Equipment Inc, PA

Detectors

Amptek Inc, MA

Control Instruments Corp, NJ

SE Intl Inc, TN (Beth Cramer)

Vallen-Systeme GmbH, Germany

Dimension measurement instruments

AGR Intl Inc, PA

CSC Force Measurement Inc, MA

Die Quip Corp, PA

Precision Measurements & Instruments Corp, OR

Dryers

Applied Test Systems Inc, PA

Ceramic Services Inc, PA

CFF Kilns & Furnaces, CA

Cober Muegge LLC, CT

Detroit Process Machinery Inc., MI

See ad page 55

Goceram AB, Sweden

Heinen Drying GmbH, Heinen Trocknungstechnologie
GmbH, Germany

Kaeser Compressors Inc, VA

Lanly Co, OH

Linn High Therm GmbH, Germany

Littleford Day Inc, KY

PSC Inc, Div of C A Litzler, OH

Recco Furnaces, CA

Retsch Inc, PA

Wyssmont Co Inc, NJ (J. Bevacqua)

Fiberoptic illuminators

Die Quip Corp, PA

Fixtures, bend test

Applied Test Systems Inc, PA

Lloyd Instruments Ltd, United Kingdom (Toby Rogers)

Glass testing instruments

AGR Intl Inc, PA

Anter Corp, PA

Expert System Solutions Srl, Italy (Mariano Paganelli)

Lloyd Instruments Ltd, United Kingdom (Toby Rogers)

Mo-Sci Corp, MO (CW Kim)

Orton Ceramic Foundation, OH (Jim Baldwin)

Strainoptics Inc, PA

Taber Industries, NY (Alan Jaenecke)

Glassware

AdValue Technology LLC, AZ

See ad page 74

Quartz Scientific Inc, OH

Saint-Gobain Quartz Ltd, United Kingdom

Glossimeters

Horiba Instruments Inc, CA (P. Millett)

Taber Industries, NY (Alan Jaenecke)

Hardness measurement instruments

Accurate Diamond Tool Corp, NJ

Buehler Ltd, IL

Capovani Brothers Inc, NY

CSM Instruments Inc, MA

Leco Corp, MI

M-Tech Instruments, CT (Michael Maulucci)

Shimadzu Scientific Instruments, MD

Taber Industries, NY

Hot plates

Capovani Brothers Inc, NY

Lab crucibles

AdValue Technology LLC, AZ

See ad page 74



Ceramic Oxide Fabricators Pty Ltd, Australia

Laval Labs Inc, Quebec

McDanel Advanced Ceramic Technologies, PA

Saint-Gobain Quartz Ltd, United Kingdom

Thermal Products Co Inc, GA

Lab furnaces

Aadvanced Machinery Inc, MI (T. A. Crosson)

American Isostatic Presses, OH (Reggie Persaud)

Applied Test Systems Inc, PA

Capovani Brothers Inc, NY

Carbolite Inc, WI See ad page 62

Centorr/Vacuum Industries Inc, NH
(Paul Lennon) See ad page 61

Ceramic Services Inc, PA

CM Furnaces Inc, NJ See ad page 66

CSC Force Measurement Inc, MA

Detroit Process Machinery Inc., MI

See ad page 55

Expert System Solutions Srl, Italy (Daniele Rebecchi)

L&L Special Furnace Co Inc, PA

See ad page 64

Linn High Therm GmbH, Germany

Lucifer Furnaces Inc, PA

Nabertherm Inc, DE

Oxy-Gon Industries Inc, NH

See ad page 65

Paragon Industries L P, TX

Shinagawa Advanced Materials Americas Inc, OH

Thermal Technology Inc, CA

Trent Inc, PA (C.L. Hierdahl)

RD Webb Company Inc, MA

Zircar Zirconia Inc, NY

Lab furnace tubes

AdValue Technology LLC, AZ

See ad page 74

Carbolite Inc, WI

See ad page 62

Ceramic Oxide Fabricators Pty Ltd, Australia

McDanel Advanced Ceramic Technologies, PA

Nabertherm Inc, DE

Quartz Scientific Inc, OH

Light sources

Spectronics Corp, NY

Mechanical property measurement instruments

ATS Rheosystems, NJ

Buehler Ltd, IL

BuzzMac Intl LLC, WI

CSC Force Measurement Inc, MA

CSM Instruments Inc, MA

EXAKTTechnologies Inc, OK

Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Karl Berreth)

Lloyd Instruments Ltd, United Kingdom (Toby Rogers)

Matrix Enterprises, OH

Shimadzu Scientific Instruments, MD

Taber Industries, NY

Microscopes, hot stages

Dalmia Inst of Scientific & Industrial Research, India
(B.B. Sahu)

Expert System Solutions Srl, Italy (Daniele Rebecchi)

Microscopes, interference

Buehler Ltd, IL

Microscopes, other

AdValue Technology LLC, AZ

See ad page 74

Capovani Brothers Inc, NY

Geller Microanalytical Laboratory Inc, MA

Leco Corp, MI

Microscopes, polarizing

Buehler Ltd, IL

Leco Corp, MI

Strainoptics Inc, PA

Microscopes, reflected light

Buehler Ltd, IL

Capovani Brothers Inc, NY

Leco Corp, MI

Microscopes, scanning electron

Capovani Brothers Inc, NY

Geller Microanalytical Laboratory Inc, MA

Microscopes, transmission electron

Horiba Instruments Inc, CA

Mills, laboratory

CW Brabender Instrumens Inc, NJ

Capovani Brothers Inc, NY

Detroit Process Machinery Inc., MI

See ad page 55

EXAKTTechnologies Inc, OK

Fritsch GmbH, Milling and Sizing, Germany

Laval Labs Inc, Quebec
PANalytical, Netherlands
Retsch Inc, PA
Stedman Machine Co Inc, Div of Eagle Crusher Co, IN
Sturtevant Inc, MA
Sweco, KY
Tapecasting Warehouse Div, Richard E Mistler Inc, PA
Union Process Inc, OH

Mixers, laboratory

CW Brabender Instruments Inc, NJ
Capovani Brothers Inc, NY

Detroit Process Machinery Inc., MI

See ad page 55

Dynamic Air Inc, MN
Fritsch GmbH, Milling and Sizing, Germany
Lancaster Products Div, Kercher Industries Inc, PA
Laval Labs Inc, Quebec
Littleford Day Inc, KY
Peltsman Corp, MN
Processall Inc, OH

Moisture testing

CW Brabender Instruments Inc, NJ
Laval Labs Inc, Quebec
Leco Corp, MI

Optical comparitors

Die Quip Corp, PA

Optical properties measurement instruments

AGR Intl Inc, PA
Angstrom Precision Optics Inc, NY
Cargille Labs, NJ
Fritsch GmbH, Milling and Sizing, Germany
Precision Measurements & Instruments Corp, OR

pH meters

Horiba Instruments Inc, CA (P. Millett)
Laval Labs Inc, Quebec
Mettler-Toledo Inc, OH
Ocean Optics Inc, FL (M. Shahriari)

Polarimeters

Strainoptics Inc, PA

Porosimeters

Micromeritics Instrument Corp, GA

See ad page 79



Particle Technology Labs, IL
Quantachrome Instruments, FL

Powders samplers

Quantachrome Instruments, FL
Retsch Inc, PA

Pyrometers

Kiln Doctor Inc, VA

Recorders

CSC Force Measurement Inc, MA
Datapaq Inc, MA
Linseis Inc, NJ

Rheometers

ATS Rheosystems, NJ
CW Brabender Instruments Inc, NJ
Malvern Instruments, MA
Particle Technology Labs, IL

Sample preparation equipment

Buehler Ltd, IL
Capovani Brothers Inc, NY
EXAKT Technologies Inc, OK
Expert System Solutions Srl, Italy
Fluid Metering Inc, NY
Fritsch GmbH, Milling and Sizing, Germany
Laval Labs Inc, Quebec
Linn High Therm GmbH, Germany

Micromeritics Instrument Corp, GA

See ad page 79

PANalytical, Netherlands
Retsch Inc, PA
Well Diamond Wire Saws Inc, GA

Viscometers, high-temperature

ATS Rheosystems, NJ
Shimadzu Scientific Instruments, MD

Viscosity measurement instruments

ATS Rheosystems, NJ
CW Brabender Instruments Inc, NJ
Capovani Brothers Inc, NY
Cargille Labs, NJ
Malvern Instruments, MA
Orton Ceramic Foundation, OH (Jim Baldwin)

Visual inspection instruments

AGR Intl Inc, PA
Buehler Ltd, IL
Die Quip Corp, PA
Strainoptics Inc, PA
Taber Industries, NY (Alan Jaenecke)

Weighing/scales

CSC Force Measurement Inc, MA
Emery Winslow Scale Co, CT
Laval Labs Inc, Quebec
Mettler-Toledo Inc, OH
Shimadzu Scientific Instruments, MD
Taber Industries, NY (Alan Jaenecke)

CONSULTANTS/SERVICES

Advanced coatings

Activation Laboratories Ltd, Canada
Beamalloy Technologies LLC, OH
Bharat Heavy Electricals Ltd, Ceramic Bus Unit/Electro Porcelains Div, India (Ravichandran S.)
Cetek Ltd, OH
Chemir Analytical Services, MO (Ila Sharma)
Eppler Assocs, CT (Richard A. Eppler)
Fraunhofer Inst for Silicate Research, Germany (G. Schottner)
Gateway Materials Technology Inc, IL
Hains Technology Assocs, Canada (Don Hains)
Hyper-Therm HTC, CA
Industrial Testing Laboratories Inc, MO
Innovative Research & Products Inc, CT
Microplasmic Corp, MA (Jerry L. Patel)
Smaht Ceramics Inc, UT
Teeter Marketing Services LLC, NY

Trans-Tech Inc, MD

See ad page 45

Analytical services

Activation Laboratories Ltd, Canada
Alfred University, NY
ATS Rheosystems, NJ
CERAM, Staffordshire
Chemir Analytical Services, MO (Ila Sharma)
Dow Corning Corp, MI
Fraunhofer Inst for Silicate Research, Germany (R. Flegler)
Gateway Materials Technology Inc, IL

Geller Microanalytical Laboratory Inc, MA

**GELLER MICROANALYTICAL
LABORATORY, INC.**
426 Boston St. Topsfield, MA 01983
Tel: 978-887-7000 Fax: 978-887-6671
Email: sales@gellermicro.com

www.gellermicro.com

H&M Analytical Services Inc, NJ
Hindalco Industries Ltd, Belgaum R&D Centre, Karnataka (Anil Bhatnagar)

Industrial Testing Laboratories Inc, MO
Israel Ceramic & Silicate Inst, Israel

Micromeritics Instrument Corp, GA

See ad page 79

Micron Inc, DE
Oneida Research Services Inc, NY (D. Delluomo)
Orton Ceramic Foundation, OH (Joseph Homney)
Particle Technology Labs, IL
Quantachrome Instruments, FL
Ruth Engel Refractory Consulting Service, OH
SGS Minerals Services, Canada
Stephan Schmidt KG, Germany

Brick & structural clay processing

BMI Automation Inc, AL (Henry Burns III)
Ceram /M & P Laboratory, United Kingdom
Eppler Assocs, CT (Richard A. Eppler)
Innovative Processing Solutions LLC, IN
Lancaster Products Div, Kercher Industries Inc, PA

Ceramic materials

Abresist Corp, IN
Activation Laboratories Ltd, Canada
Advanced Materials Technologies, PA (Joseph P. Dougherty)
Alfred University, NY
Areva T&D Technology Centre, United Kingdom
Bharat Heavy Electricals Ltd, Ceramic Bus Unit/Electro Porcelains Div, India (All)
Ceram /M & P Laboratory, United Kingdom
Ceramics Consulting Services, MA
Chemir Analytical Services, MO (Ila Sharma)
Eppler Assocs, CT (Richard A. Eppler)
FCT Hartbearbeitungs GmbH, Germany
fuelcellmaterials.com, NexTech Materials Limited, OH
Gateway Materials Technology Inc, IL
Hains Technology Assocs, Canada (Don Hains)
Hyper-Therm HTC, CA
Imerys, GA
Industrial Ceramic Technology, MI (John J. Schuldies)
Industrial Testing Laboratories Inc, MO
Innovative Research & Products Inc, CT
International Ceramic Engineering, MA
Orton Ceramic Foundation, OH (Tom McInerney)
Pangea Intl Ltd, China
P-Ker Engineering, NY
Powder Processing & Technology LLC, IN
Richard E Mistler Inc, PA (Richard E. Mistler)
Silicon Carbide Products Inc, NY
Smaht Ceramics Inc, UT
Tapecasting Warehouse Div, Richard E Mistler Inc, PA
Teeter Marketing Services LLC, NY

Chemistry

Activation Laboratories Ltd, Canada
Chemical Abstracts Service, OH
Chemir Analytical Services, MO (Ila Sharma)
Eppler Assocs, CT (Richard A. Eppler)
fuelcellmaterials.com, NexTech Materials Limited, OH
H&M Analytical Services Inc, NJ
Industrial Testing Laboratories Inc, MO
SGS Minerals Services, Canada

Combustion systems

Air Products & Chemicals Inc, PA
Ceramic Services Inc, PA
Fives North American Combustion Inc, OH

Harrop Industries Inc, OH See ad page 60
Ruark Engineering Inc, MO

Compositions

Activation Laboratories Ltd, Canada
Areva T&D Technology Centre, United Kingdom
Chemir Analytical Services, MO (Ila Sharma)
Eppler Assocs, CT (Richard A. Eppler)
fuelcellmaterials.com, NexTech Materials Limited, OH
Industrial Testing Laboratories Inc, MO
Innovative Research & Products Inc, CT
Richard E Mistler Inc, PA (Richard E. Mistler)

Sem-Com Co Inc, OH (Neil Hofziger) See ad page 96
Specialty Glass Inc, FL See ad page 97
Trans-Tech Inc, MD See ad page 45

Decorating processes & materials

Ceram /M & P Laboratory, United Kingdom
Cerlase, France (Jose Daems)
Eppler Assocs, CT (Richard A. Eppler)
Industrial Testing Laboratories Inc, MO
JACPA Ceramic, MI

Design

Areva T&D Technology Centre, United Kingdom
BMI Automation Inc, AL (Henry Burns III)
Eglasstrek Patent Promotion & Awarding GmbH, Germany
General Glass Equipment Co, NJ
Hyper-Therm HTC, CA

I Squared R Element Co Inc, NY See ad page 66

JACPA Ceramic, MI
Jenike & Johanson Inc, MA
Lancaster Products Div, Kercher Industries Inc, PA
Magneco Metrel Inc, IL (Thomas Colander)

Electronics & electrical materials

Advanced Materials Technologies, PA (Joseph P. Dougherty)
APC Intl Ltd, PA
Areva T&D Technology Centre, United Kingdom
Eppler Assocs, CT (Richard A. Eppler)
fuelcellmaterials.com, NexTech Materials Limited, OH
Hains Technology Assocs, Canada (Don Hains)
Industrial Testing Laboratories Inc, MO
Innovative Research & Products Inc, CT
Pangea Intl Ltd, China
Powder Processing & Technology LLC, IN
Superconix Inc, MN

Trans-Tech Inc, MD See ad page 45

Energy

Ceram /M & P Laboratory, United Kingdom
Gateway Materials Technology Inc, IL
Innovative Research & Products Inc, CT

Engineering

Areva T&D Technology Centre, United Kingdom
Cyclonaire Corp, NE
Eglasstrek Patent Promotion & Awarding GmbH, Germany
General Glass Equipment Co, NJ
Glass Technical Inst, CA (R.A. Drake)
Hyper-Therm HTC, CA
Innovative Processing Solutions LLC, IN
International Ceramic Engineering, MA
Jenike & Johanson Inc, MA
Microplasmic Corp, MA
Nol-Tec Systems Inc, MN
Powder Processing & Technology LLC, IN

Specialty Glass Inc, FL See ad page 97
Teeter Marketing Services LLC, NY

Environmental

Activation Laboratories Ltd, Canada
Ceram /M & P Laboratory, United Kingdom
Eppler Assocs, CT (Richard A. Eppler)
Glass Technical Inst, CA (R.A. Drake)
Industrial Testing Laboratories Inc, MO

Environmental compliance

Areva T&D Technology Centre, United Kingdom
Ceram /M & P Laboratory, United Kingdom
Eppler Assocs, CT (Richard A. Eppler)

Expert witness

Birney W West PE, TX (Birney W. West)
CERAM, Staffordshire
Ceram /M & P Laboratory, United Kingdom
Ceramics Consulting Services, MA
Chemir Analytical Services, MO (Ila Sharma)
Eppler Assocs, CT (Richard A. Eppler)
Gateway Materials Technology Inc, IL
H&M Analytical Services Inc, NJ
Industrial Testing Laboratories Inc, MO
Innovative Research & Products Inc, CT
Particle Technology Labs, IL
Ruth Engel Refractory Consulting Service, OH

Fabrication

Able Supply Co, Able Refractory Products, TX
Accuratus Ceramic Corp, NJ
Angstrom Precision Optics Inc, NY
BMI Automation Inc, AL (Henry Burns III)
Bomas Machine Specialties Inc, MA
Bullen, OH
Gateway Materials Technology Inc, IL
Huber Construction Inc, TX
Hyper-Therm HTC, CA
Lancaster Products Div, Kercher Industries Inc, PA
PremaTech Advanced Ceramics, MA
Richard E Mistler Inc, PA (Richard E. Mistler)
Thermal Products Co Inc, GA

Financial

Hains Technology Assocs, Canada (Don Hains)
Richard E Mistler Inc, PA (Richard E. Mistler)

Furnaces

Able Supply Co, Able Refractory Products, TX
American Isostatic Presses, OH (Reggie Persaud)
Birney W West PE, TX (Birney W. West)
Casso-Solar Tech LLC, NY

Centorr/Vacuum Industries Inc, NH (Paul Lennon) See ad page 61

Fosbel Inc, OH
General Glass Equipment Co, NJ

Harrop Industries Inc, OH See ad page 60

Huber Construction Inc, TX
Magneco Metrel Inc, IL (Thomas Colander)
Trent Inc, PA (C.L. Hierdahl)

Glass processes & materials

Alfred University, NY
Angstrom Precision Optics Inc, NY
Areva T&D Technology Centre, United Kingdom
Eppler Assocs, CT (Richard A. Eppler)
Glass Technical Inst, CA (R.A. Drake)
Industrial Testing Laboratories Inc, MO
Magneco Metrel Inc, IL
New Glass Forum, Japan

Sem-Com Co Inc, OH (Neil Hofziger) See ad page 96

Sonic-Mill, NM
VIOX Corp, WA See ad page 98

Glazes/colorants

Ceram /M & P Laboratory, United Kingdom
Ceramics Consulting Services, MA
Eppler Assocs, CT (Richard A. Eppler)
Industrial Testing Laboratories Inc, MO

High technology ceramics

APC Intl Ltd, PA
Arburg GmbH + Co KG, Germany
Areva T&D Technology Centre, United Kingdom
Astro Met Inc, OH
Bharat Heavy Electricals Ltd, Ceramic Bus Unit/Electro Porcelains Div, India (Satapathy L.N.)
Ceram /M & P Laboratory, United Kingdom
Chemir Analytical Services, MO (Ila Sharma)
Fraunhofer Inst for Silicate Research, Germany (F. Raether)
fuelcellmaterials.com, NexTech Materials Limited, OH
Gateway Materials Technology Inc, IL
Hains Technology Assocs, Canada (Don Hains)
Hyper-Therm HTC, CA
Industrial Ceramic Technology, MI (John J. Schuldies)
Industrial Testing Laboratories Inc, MO
Innovative Research & Products Inc, CT
Microplasmic Corp, MA (Jerry L. Patel)
P-Ker Engineering, NY
Powder Processing & Technology LLC, IN
Richard E Mistler Inc, PA (Richard E. Mistler)
Silicon Carbide Products Inc, NY
Smaht Ceramics Inc, UT

Trans-Tech Inc, MD See ad page 45
Zirconia Inc, OH

Kilns

Birney W West PE, TX (Birney W. West)
Casso-Solar Tech LLC, NY
Ceram /M & P Laboratory, United Kingdom
Harrop Industries Inc, OH See ad page 60
Kiln Doctor Inc, VA
Nabertherm Inc, DE
Ruark Engineering Inc, MO

Litigation

Brannon & Associates PC, IN
Ceram /M & P Laboratory, United Kingdom
Eppler Assocs, CT (Richard A. Eppler)
H&M Analytical Services Inc, NJ
Particle Technology Labs, IL
Ruth Engel Refractory Consulting Service, OH

Maintenance & repair, after sale

Centorr Vacuum Industries Inc, NH (Paul Lennon) See ad page 61

Management

Gateway Materials Technology Inc, IL

Glass Technical Inst, CA (R.A. Drake)
Hains Technology Assocs, Canada (Don Hains)
Teeter Marketing Services LLC, NY

Manufacturing

Angstrom Precision Optics Inc, NY
Ceram /M & P Laboratory, United Kingdom
CeramTec North America, SC
Cyclonaire Corp, NE
Gateway Materials Technology Inc, IL
Glass Technical Inst, CA (R.A. Drake)
Hains Technology Assocs, Canada (Don Hains)
Ikonics Imaging-Industrial Solutions, MN
Innovative Processing Solutions LLC, IN
JACPA Ceramic, MI
Jenike & Johanson Inc, MA
Lancaster Products Div, Kercher Industries Inc, PA
Lasera Technology Corp, IL
Maryland Ceramic & Steatite Co Inc, MD
P-Ker Engineering, NY
Powder Processing & Technology LLC, IN
Richard E Mistler Inc, PA (Richard E. Mistler)
Smaht Ceramics Inc, UT

Markets

fuelcellmaterials.com, NexTech Materials Limited, OH
Gateway Materials Technology Inc, IL
Hains Technology Assocs, Canada (Don Hains)
Innovative Research & Products Inc, CT
New Glass Forum, Japan
Richard E Mistler Inc, PA (Richard E. Mistler)
Teeter Marketing Services LLC, NY

Materials testing & characterization

Alfred University, NY
Angstrom Precision Optics Inc, NY
Anter Corp, PA
Arburg GmbH + Co KG, Germany
Areva T&D Technology Centre, United Kingdom
ATS Rheosystems, NJ
Bharat Heavy Electricals Ltd, Ceramic Bus Unit/Electro
Porcelains Div, India (Satapathy L.N.)
Birney W West PE, TX (Birney W. West)
BuzzMac Intl LLC, WI
CERAM, Staffordshire
Ceram /M & P Laboratory, United Kingdom
Chemir Analytical Services, MO (Ila Sharma)
CSC Force Measurement Inc, MA
Cyclonaire Corp, NE
Eppler Assocs, CT (Richard A. Eppler)
Expert System Solutions Srl, Italy
Gateway Materials Technology Inc, IL
H&M Analytical Services Inc, NJ

Harrop Industries Inc, OH See ad page 60

TOLL FIRING
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3470 East Fifth Ave. • Columbus, Ohio 43219-1797
Tel: (614) 231-3621 • Fax: (614) 235-3699
E-mail: sales@harropusa.com
www.harropusa.com

Hindalco Industries Ltd, Belgaum R&D Centre, Karnataka
(Anil Bhatnagar)
Hyper-Therm HTC, CA
Industrial Testing Laboratories Inc, MO
Jenike & Johanson Inc, MA

Micromeritics Instrument Corp, GA

See ad page 79

M-Tech Instruments, CT (Michael Maulucci)
Nol-Tec Systems Inc, MN
NorECs AS, Norwegian Electro Ceramics, Norway
Oneida Research Services Inc, NY (D. Delluomo)
Orton Ceramic Foundation, OH (Joseph Homney)

Particle Technology Labs, IL



P-Ker Engineering, NY
Precision Measurements & Instruments Corp, OR
Richard E Mistler Inc, PA (Richard E. Mistler)
Ruth Engel Refractory Consulting Service, OH
SGS Minerals Services, Canada
Smaht Ceramics Inc, UT
Stephan Schmidt KG, Germany
Strainoptics Inc, PA
Taber Industries, NY
Washington Mills Electro Minerals Co,
NY See ad page 43

Modeling

Areva T&D Technology Centre, United Kingdom
CERAM, Staffordshire
Ceram /M & P Laboratory, United Kingdom
Hyper-Therm HTC, CA
JACPA Ceramic, MI

Nuclear materials

Hyper-Therm HTC, CA

Patent searches

Brannon & Associates PC, IN
Eppler Assocs, CT (Richard A. Eppler)
Modern Times Legal, MA
Teeter Marketing Services LLC, NY

Professional engineer

Birney W West PE, TX (Birney W. West)
Ruark Engineering Inc, MO
Spontaneous Materials, IN

Quality management/ISO 9000

Ceram /M & P Laboratory, United Kingdom

Refractories

Able Supply Co, Able Refractory Products, TX
Basic Resources, TN (Robert Sitterson)
Birney W West PE, TX (Birney W. West)
CERAM, Staffordshire
Ceram /M & P Laboratory, United Kingdom
Delkic & Associates, FL
Edward Orton Jr Ceramic Foundation, OH (Joseph
Homeny)
Huber Construction Inc, TX
Industrial Ceramic Products Inc, OH (R.C. Oberst)
Innovative Research & Products Inc, CT
Ipsen Ceramics, IL
Magneco Metrel Inc, IL (Thomas Wank)
Orton Ceramic Foundation, OH (Joseph Homeny)
Pryor Giggy Co, AL (Allen R. Davis)
Ruth Engel Refractory Consulting Service, OH
Silicon Carbide Products Inc, NY
Teeter Marketing Services LLC, NY
The Maryland Refractory Co, OH

Research

Alfred University, NY
Arburg GmbH + Co KG, Germany
Areva T&D Technology Centre, United Kingdom
CERAM, Staffordshire
Ceram /M & P Laboratory, United Kingdom
Cerlase, France (Jose Daems)
Chemir Analytical Services, MO (Ila Sharma)
Eppler Assocs, CT (Richard A. Eppler)
Gateway Materials Technology Inc, IL
Glass Technical Inst, CA (R.A. Drake)

Hyper-Therm HTC, CA
Intelligent Micro Patterning LLC, FL
Microplasmic Corp, MA (Jerry L. Patel)
Mo-Sci Corp, MO (M Velez)
New Glass Forum, Japan
Oneida Research Services Inc, NY (D. Delluomo)
Orton Ceramic Foundation, OH (Joseph Homeny)
Precision Measurements & Instruments Corp, OR
Richard E Mistler Inc, PA (Richard E. Mistler)
Superconix Inc, MN

Semiconductors (consultants)

CERAM, Staffordshire
Innovative Research & Products Inc, CT
Superconix Inc, MN

Software

Chemical Abstracts Service, OH
Expert System Solutions Srl, Italy
General Glass Equipment Co, NJ
New Glass Forum, Japan

Structural ceramics

Astro Met Inc, OH
Bharat Heavy Electricals Ltd, Ceramic Bus Unit/Electro
Porcelains Div, India (Satapathy L.N.)
CERAM, Staffordshire
CeramTec North America, SC
FCT Hartbearbeitungs GmbH, Germany
Gateway Materials Technology Inc, IL
Hains Technology Assocs, Canada (Don Hains)
Hyper-Therm HTC, CA
Industrial Ceramic Technology, MI (John J. Schuldies)
Innovative Research & Products Inc, CT
Silicon Carbide Products Inc, NY
Smaht Ceramics Inc, UT

Superconductors

Areva T&D Technology Centre, United Kingdom
Innovative Research & Products Inc, CT
Superconix Inc, MN

Technical writing

Bharat Heavy Electricals Ltd, Ceramic Bus Unit/Electro
Porcelains Div, India (All)
Eppler Assocs, CT (Richard A. Eppler)
Gateway Materials Technology Inc, IL
Glass Technical Inst, CA (R.A. Drake)
Innovative Research & Products Inc, CT
Spontaneous Materials, IN
Teeter Marketing Services LLC, NY

Technology transfer

Arburg GmbH + Co KG, Germany
Ceram /M & P Laboratory, United Kingdom
Cerlase, France (Jose Daems)
Eglasstrek Patent Promotion & Awarding GmbH,
Germany
Gateway Materials Technology Inc, IL
Hains Technology Assocs, Canada (Don Hains)
Industrial Testing Laboratories Inc, MO
Innovative Research & Products Inc, CT
Particle Technology Labs, IL
Richard E Mistler Inc, PA (Richard E. Mistler)
Teeter Marketing Services LLC, NY

CUSTOM CERAMIC FABRICATION/ ENGINEERING SERVICES

Advanced ceramics, structural

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Accuratus Ceramic Corp, NJ
Advanced Cerametrics Inc, NJ (Bud Cass)
Advanced Ceramic Technology, CA
Associated Ceramics & Technology Inc, PA
Astro Met Inc, OH

Bullen, OH



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Ceramaret SA, Switzerland
Ceramic Oxide Fabricators Pty Ltd, Australia
CeramicTec North America, SC
CerCo LLC, OH
Enceratec Corp, IN (William F. Mandler Jr.)
FCT Hartbearbeitungs GmbH, Germany
Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabidoux)
Hyper-Therm HTC, CA
Ikonics Imaging-Industrial Solutions, MN
Industrial Ceramic Technology, MI (John J. Schuldies)
Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Karl Berreth)
Israel Ceramic & Silicate Inst, Israel
Keir Mfg Inc, NC
Koch Knight LLC, OH (Curt Rothman)
Machined Ceramics Inc, KY
Maryland Ceramic & Steatite Co Inc, MD
McDanel Advanced Ceramic Technologies, PA
Metoxit AG, Switzerland
Morgan Technical Ceramics, CA
P-Ker Engineering, NY

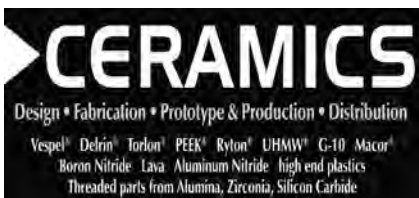
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- Refractron Technologies Corp, NY
Richard E Mistler Inc, PA (Richard E. Mistler)
Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73
Silicon Carbide Products Inc, NY
Smaht Ceramics Inc, UT
Spheric Technologies Inc, AZ
Starfire Systems Inc, NY
Superior Technical Ceramics Corp, VT
Technical Products Inc, WI

See ad page 80



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- Tenmat Ltd, United Kingdom (Peter Sharp)
Vito-Flemish Inst for Technological Research, Belgium
Zircona Inc, OH

Calcining, custom

Powder Processing & Technology LLC, IN



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www.pptechnology.com

Ceramic joining

- Abresist Corp, IN
Advanced Ceramic Technology, CA
CeramicTec North America, SC
Hyper-Therm HTC, CA
P-Ker Engineering, NY
Starfire Systems Inc, NY

Ceramic welding

- Abresist Corp, IN
Cetek Ltd, OH
Fosbel Inc, OH
Fuse Tech/Hot Tech Group, OH

Classification, custom

- Carsten Systems & Machine Ltd, BC
Du-Co Ceramics Co, PA (Tom Arbanas)
KC Abrasive Co LLC, KS (Ronald Barncord)
Powder Processing & Technology LLC, IN

Coatings, corrosion-resistant

- Beamalloy Technologies LLC, OH
Cetek Ltd, OH
Cotronics Corp, NY
CP Films Inc, Precision Coated Films Div, VA
Dow Corning Corp, MI
ESL Electroscience, PA (Richard S. Webb)

- Fraunhofer Inst for Silicate Research, Germany (G. Schottner)
Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabidoux)
HTI Technologies, France
Hyper-Therm HTC, CA
Koch Knight LLC, OH (Mark Martin)
Master Bond Inc, NJ
Microplasmic Corp, MA (Jerry L. Patel)
Refractory Specialties Inc, OH
Renite Co, OH (Rodger P. Kampf)
Smaht Ceramics Inc, UT
Starfire Systems Inc, NY
Trans-Tech Inc, MD See ad page 45

Coatings, thermal-resistant

- Beamalloy Technologies LLC, OH
Cetek Ltd, OH
CP Films Inc, Precision Coated Films Div, VA
Delkic & Associates, FL



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- Dow Corning Corp, MI
ESL Electroscience, PA (Richard S. Webb)
Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabidoux)
HTI Technologies, France
Hyper-Therm HTC, CA
Microplasmic Corp, MA (Jerry L. Patel)
Phoenix Coating Resources Inc, FL
Refractory Specialties Inc, OH



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Starfire Systems Inc, NY
Thermal Products Co Inc, GA
Trans-Tech Inc, MD
Unifrax Corp, NY
Zircoa Inc, OH
ZYP Coatings Inc, TN (C.E. Holcombe)

See ad page 45

See ad page 70

Coatings, wear-resistant

Abresist Corp, IN
Advanced Cerametrics Inc, NJ (Mike Hendricks)
Beamalloy Technologies LLC, OH
CSM Instruments Inc, MA
ESL Electroscience, PA (Richard S. Webb)
ETEC Gesellschaft fuer Technische Keramik GmbH,
Germany
Heany Industries Inc, Industrial Ceramic Div, NY (Clifford
Rabidoux)
HTI Technologies, France
Hyper-Therm HTC, CA
Master Bond Inc, NJ
Microplasmic Corp, MA
Phoenix Coating Resources Inc, FL
Renite Co, OH (Rodger P. Kampf)
Starfire Systems Inc, NY
Teeter Marketing Services LLC, NY
Trans-Tech Inc, MD

See ad page 45

Crushing, custom

Innovative Processing Solutions LLC, IN
Powder Processing & Technology LLC, IN
Stedman Machine Co Inc, Div of Eagle Crusher Co, IN

Dielectrics

Accuratus Ceramic Corp, NJ
Advanced Ceramic Technology, CA
Angstrom Precision Optics Inc, NY
Beamalloy Technologies LLC, OH
Microplasmic Corp, MA
Richard E Mistler Inc, PA (Richard E. Mistler)
Starfire Systems Inc, NY
Trans-Tech Inc, MD

See ad page 45

Drying, custom

Ipsen Ceramics, IL
Powder Processing & Technology LLC, IN

Films, thick

Beamalloy Technologies LLC, OH
Dow Corning Corp, MI
ESL Electroscience, PA (Richard S. Webb)
Intelligent Micro Patterning LLC, FL
P-Ker Engineering, NY
Quality Stamp Co, OH
Vito-Flemish Inst for Technological Research, Belgium

Films, thin

Beamalloy Technologies LLC, OH
CP Films Inc, Precision Coated Films Div, VA
CSM Instruments Inc, MA
Dow Corning Corp, MI
Industrial Hard Carbon LLC, NC
Intelligent Micro Patterning LLC, FL
Teeter Marketing Services LLC, NY
Valley Design Corp, CA

Furnace rebuilds

Fosbel Inc, OH

Grinding, custom

Accuratus Ceramic Corp, NJ
Advanced Ceramic Technology, CA
Angstrom Precision Optics Inc, NY
Astro Met Inc, OH
Bullen, OH

Centerline Technologies, MA
Du-Co Ceramics Co, PA (Tom Arbanas)
FCT Hartbearbeitungs GmbH, Germany

Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
Innovative Processing Solutions LLC, IN
International Ceramic Engineering, MA
Keir Mfg Inc, NC
Krumor Inc, OH
Logomatic GmbH, Germany
Machined Ceramics Inc, KY
McDanel Advanced Ceramic Technologies, PA
Morgan Technical Ceramics, CA
Norstone Inc, PA
Powder Processing & Technology LLC, IN
PremaTech Advanced Ceramics, MA
Refractory Machining Services, PA
Refractory Minerals, PA
Refractron Technologies Corp, NY
Specialty Glass Inc, FL
Stedman Machine Co Inc, Div of Eagle Crusher Co, IN
Union Process Inc, OH
Valley Design Corp, CA
Vito-Flemish Inst for Technological Research, Belgium
**Washington Mills Electro Minerals Co,
NY**

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See ad page 43

Hot repair

Fosbel Inc, OH

Joining

Beamalloy Technologies LLC, OH
Hyper-Therm HTC, CA
P-Ker Engineering, NY

Lapping and polishing

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Angstrom Precision Optics Inc, NY
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Vito-Flemish Inst for Technological Research, Belgium

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Bullen, OH

Centerline Technologies, MA
Cerlase, France (Jose Daems)
Lasera Technology Corp, IL

Machining

ACCCO Inc., OH
Accuratus Ceramic Corp, NJ

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Basic Resources, TN (Robert Sitterson)
Bomas Machine Specialties Inc, MA
Bullen, OH

Centerline Technologies, MA
Ceradyne Inc, CA (J. Mangels)
Ceramaret SA, Switzerland
CerCo LLC, OH
Cotronics Corp, NY
Du-Co Ceramics Co, PA (Tom Arbanas)
FCT Hartbearbeitungs GmbH, Germany
Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
Ikonics Imaging-Industrial Solutions, MN
International Ceramic Engineering, MA
Keir Mfg Inc, NC
Krumor Inc, OH
Lasera Technology Corp, IL
Logomatic GmbH, Germany
Machined Ceramics Inc, KY
Maryland Ceramic & Steatite Co Inc, MD
McDanel Advanced Ceramic Technologies, PA
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Tenmat Ltd, United Kingdom (Peter Sharp)
Valley Design Corp, CA
Zircar Zirconia Inc, NY

Magnetics

Trans-Tech Inc, MD See ad page 45

Milling, custom

Advanced Ceramic Technology, CA
Angstrom Precision Optics Inc, NY
Bullen, OH
Ferro Ceramic Grinding Inc, MA (Costa Sideridis)

Ikonics Imaging-Industrial Solutions, MN
 International Ceramic Engineering, MA
 Morgan Technical Ceramics, CA
 Powder Processing & Technology LLC, IN
 PremaTech Advanced Ceramics, MA
 Refractory Machining Services, PA
Specialty Glass Inc, FL See ad page 97
 Stadman Machine Co Inc, Div of Eagle Crusher Co, IN
 Union Process Inc, OH
Washington Mills Electro Minerals Co, NY See ad page 43

Nuclear materials

Ceradyne Inc, CA
 Hyper-Therm HTC, CA

Piezoelectrics

Advanced Cerametrics Inc, NJ (Bud Cass)
 APC Intl Ltd, PA
 Piezo Technologies, IN
 Sparkler Ceramics Pvt Ltd, India
 Valley Design Corp, CA
 Vito-Flemish Inst for Technological Research, Belgium

Prototypes

Accuratus Ceramic Corp, NJ
 Advanced Ceramic Technology, CA
 Angstrom Precision Optics Inc, NY
 Astro Met Inc, OH

Bullen, OH

Centorr/Vacuum Industries Inc, NH (Paul Lennon) See ad page 61

Ceramaret SA, Switzerland
 CeramTec North America, SC
 CerCo LLC, OH

Du-Co Ceramics Co, PA (Tom Arbanas)
 Enceratec Corp, IN (William F. Mandler Jr.)
 ESL Electroscience, PA (Richard S. Webb)
 FCT Hartbearbeitungs GmbH, Germany
 Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
 Goceram AB, Sweden
 Hyper-Therm HTC, CA


Ikonics Imaging-Industrial Solutions, MN
 Industrial Ceramic Products Inc, OH (R.C. Oberst)
 Intelligent Micro Patterning LLC, FL
 International Ceramic Engineering, MA
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Valley Design Corp, CA
 Vito-Flemish Inst for Technological Research, Belgium

Refractory dryout

Birney W West PE, TX (Birney W. West)
 Riverside Refractories Inc, AL (Bob Kuhn)

Refractory installation

Basic Resources, TN (Robert Sitterson)
 Birney W West PE, TX (Birney W. West)
 Ceradyne Inc, CA
 Fosbel Inc, OH
 Koch Knight LLC, OH (Mark Martin)
 Magneco Metrel Inc, IL
 Promat GmbH, Germany (H.-J. Feulner)
 Riverside Refractories Inc, AL (Bob Kuhn)
 Ruth Engel Refractory Consulting Service, OH

Screen printing

Innovative Ceramic Corp, OH
 Quality Stamp Co, OH
 Vito-Flemish Inst for Technological Research, Belgium

Screening, custom

Haver & Boecker, Germany
 Intelligent Micro Patterning LLC, FL
 Norstone Inc, PA
 Powder Processing & Technology LLC, IN

Seals

Astro Met Inc, OH
 Bharat Heavy Electricals Ltd, Ceramic Bus Unit/Electro Porcelains Div, India (Rathindraath Das)
 CerCo LLC, OH
 Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
 fuelcellmaterials.com, NexTech Materials Limited, OH
 P-Ker Engineering, NY
Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73
 Tenmat Ltd, United Kingdom (Peter Sharp)

Spray drying

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 Powder Processing & Technology LLC, IN



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Trans-Tech Inc, MD See ad page 45
 Vito-Flemish Inst for Technological Research, Belgium

Superconductors

SCI Engineered Materials Inc, OH
 Superconix Inc, MN

Toll blending, processing

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 Powder Processing & Technology LLC, IN
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Toll firing, contract

ACCCO Inc., OH



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 Ipsen Ceramics, IL
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 Quality Stamp Co, OH
 Sunrock Ceramics Co, IL

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Advanced NDT Limited, United Kingdom

Whitewares

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 Powder Processing & Technology LLC, IN

EDUCATION/RESOURCES

Associations & Societies

The American Ceramic Society, OH (Megan Mahan)
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 Brick Industry Assoc, VA
 Ceramic Educational Council, OH
 Glass Mfg Industry Council, OH
 Intl Centre for Diffraction Data, PA
 New Glass Forum, Japan
 Portland Cement Assn, IL
 SAMPE, CA
 SGCD-Society of Glass & Ceramic Decorated Prod, OH
 The American Ceramic Society, ACERS/NICE, OH
 Tile Heritage Foundation, CA

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 Ceramics Consulting Services, MA
 Eppler Assocs, CT (Richard A. Eppler)
 Glass Factory Directory, NY (Liz Scott)
 Kiln Doctor Inc, VA
 Portland Cement Assn, IL
 SAMPE, CA
 Sheffield Pottery, MA
 Tile Heritage Foundation, CA

Continuing education

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 Eppler Assocs, CT (Richard A. Eppler)
 Intl Centre for Diffraction Data, PA
 Jenike & Johanson Inc, MA
 New Glass Forum, Japan
 Portland Cement Assn, IL
 Spontaneous Materials, IN
 Strainoptics Inc, PA

Degree Programs, ABET accredited

Alfred University, NY

Case Western Reserve University, Matls Sci & Engrg, OH
Clemson University, School of Matls Sci & Engrg, SC
Massachusetts Inst of Technology, MA (L.C.
Kimerling, D.K. Roylance)

Missouri University of Science and Technology, MO

Degree Programs, ceramic

Alfred University, NY

Massachusetts Inst of Technology, MA (Y.M. Chiang)

Missouri University of Science and Technology, MO

Degree Programs, glass engrg science

Alfred University, NY

Degree Programs, materials science

Alfred University, NY

Case Western Reserve University, Matls Sci & Engrg, OH

Clemson University, School of Matls Sci & Engrg, SC

Massachusetts Inst of Technology, MA (H.L. Tuller)

Missouri University of Science and Technology, MO

Employment Services

Ceramic Recruiters Inc, SC

SAMPE, CA

Publications - Ceramics

American Ceramic Society Bulletin, OH
(Charles Spahr)

Chemical Abstracts Service, OH

Glass Factory Directory, NY (Liz Scott)

**Intl Journal of Applied Ceramic
Technology, OH**

**Journal of the American Ceramic
Society, OH**

**International Journal of Applied Glass
Science, OH**

SGCD-Society of Glass & Ceramic Decorated Prod, OH

Tile Heritage Foundation, CA

LABORATORY SERVICES

Auger analysis

Evans Analytical Group LLC, CA

Micron Inc, DE

Oneida Research Services Inc, NY (D. Delluomo)

Chemical analysis

Activation Laboratories Ltd, Canada

ATS Rheosystems, NJ

CERAM, Staffordshire

Ceram /M & P Laboratory, United Kingdom

Chemir Analytical Services, MO (Ila Sharma)

CoorsTek Analytical Laboratories, CO

Dalmia Inst of Scientific & Industrial Research, India
(B.K. Naik)

Edward Orton Jr Ceramic Foundation, OH (Joseph
Homeny)

Evans Analytical Group LLC, CA

Fraunhofer Inst for Silicate Research, Germany (R.
Flegler)

H&M Analytical Services Inc, NJ

Hindalco Industries Ltd, Belgaum R&D Centre, Karnataka
(Anil Bhatnagar)

Israel Ceramic & Silicate Inst, Israel

Oneida Research Services Inc, NY (D. Delluomo)

Orton Ceramic Foundation, OH (Joseph Homeny)

SGS Minerals Services, Canada

**Washington Mills Electro Minerals Co,
NY** See ad page 43

Clay testing

Activation Laboratories Ltd, Canada

CERAM, Staffordshire

Ceram /M & P Laboratory, United Kingdom

Edward Orton Jr Ceramic Foundation, OH (Joseph
Homeny)

Expert System Solutions Srl, Italy

Harrop Industries Inc, OH See ad page 60

Imerys, GA

SGS Minerals Services, Canada

Composition development & determination

Activation Laboratories Ltd, Canada

Alfred University, NY

CERAM, Staffordshire

Chemir Analytical Services, MO (Ila Sharma)

Dalmia Inst of Scientific & Industrial Research, India

Edward Orton Jr Ceramic Foundation, OH (Joseph
Homeny)

Industrial Testing Laboratories Inc, MO

P-Ker Engineering, NY

Richard E Mistler Inc, PA (Richard E. Mistler)

Sem-Com Co Inc, OH (Neil Hofziger)
See ad page 96

Corrosion testing

Activation Laboratories Ltd, Canada

Advanced NDT Limited, United Kingdom

CERAM, Staffordshire

Chemir Analytical Services, MO (Ila Sharma)

Dalmia Inst of Scientific & Industrial Research, India
(S.R. Panda)

Edward Orton Jr Ceramic Foundation, OH (Joseph
Homeny)

Fraunhofer Inst for Silicate Research, Germany (R.
Flegler)

Industrial Testing Laboratories Inc, MO

P-Ker Engineering, NY

Density determination

Activation Laboratories Ltd, Canada

AGR Intl Inc, PA

Cargille Labs, NJ

CERAM, Staffordshire

Chemir Analytical Services, MO (Ila Sharma)

Cyclonaire Corp, NE

Edward Orton Jr Ceramic Foundation, OH (Joseph
Homeny)

Hindalco Industries Ltd, Belgaum R&D Centre, Karnataka
(Anil Bhatnagar)

Israel Ceramic & Silicate Inst, Israel

Micromeritics Instrument Corp, GA
See ad page 79

Orton Ceramic Foundation, OH (Joseph Homeny)

Particle Technology Labs, IL

Quantachrome Instruments, FL

SGS Minerals Services, Canada

Smaht Ceramics Inc, UT

Differential thermal analysis

Activation Laboratories Ltd, Canada

AGR Intl Inc, PA

CERAM, Staffordshire

Chemir Analytical Services, MO (Ila Sharma)

Edward Orton Jr Ceramic Foundation, OH (Joseph
Homeny)

Evans Analytical Group LLC, CA

Fraunhofer Inst for Silicate Research, Germany (J.
Meinhardt)

Harrop Industries Inc, OH See ad page 60
Hindalco Industries Ltd, Belgaum R&D Centre, Karnataka
(Anil Bhatnagar)

Micron Inc, DE

Orton Ceramic Foundation, OH (Joseph Homeny)

Precision Measurements & Instruments Corp, OR

Electron microprobe analysis

Activation Laboratories Ltd, Canada

Fraunhofer Inst for Silicate Research, Germany (F.
Raether)

Industrial Testing Laboratories Inc, MO

Micron Inc, DE

SGS Minerals Services, Canada

Failure analysis

AGR Intl Inc, PA

Areva T&D Technology Centre, United Kingdom

Birney W West PE, TX (Birney W. West)

CERAM, Staffordshire

Chemir Analytical Services, MO (Ila Sharma)

CSM Instruments Inc, MA

Edward Orton Jr Ceramic Foundation, OH (Joseph
Homeny)

H&M Analytical Services Inc, NJ

Micron Inc, DE

Oneida Research Services Inc, NY (D. Delluomo)

Orton Ceramic Foundation, OH (Joseph Homeny)

QuantumSphere Inc, CA

Fracture analysis

AGR Intl Inc, PA

CERAM, Staffordshire

Chemir Analytical Services, MO (Ila Sharma)

CSM Instruments Inc, MA

Micron Inc, DE

Interferometer

Angstrom Precision Optics Inc, NY

Malvern Instruments, MA

Precision Measurements & Instruments Corp, OR

Materials analysis

Activation Laboratories Ltd, Canada

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Alfred University, NY

Anter Corp, PA

Areva T&D Technology Centre, United Kingdom

ATS Rheosystems, NJ

CERAM, Staffordshire

Ceram /M & P Laboratory, United Kingdom

Chemir Analytical Services, MO (Ila Sharma)

CoorsTek Analytical Laboratories, CO

CSC Force Measurement Inc, MA

CSM Instruments Inc, MA

Edward Orton Jr Ceramic Foundation, OH (Joseph
Homeny)

Evans Analytical Group LLC, CA

Materials Characterization Laboratory



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Harrop Industries, OH See ad page 60

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See ad page 79

Micron Inc, DE

Oneida Research Services Inc, NY (D. Delluomo)

Orton Ceramic Foundation, OH (Joseph Homeny)

Particle Technology Labs, IL
 Precision Measurements & Instruments Corp, OR
 SGS Minerals Services, Canada
Washington Mills Electro Minerals Co,
NY See ad page 43



Mechanical properties

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 Areva T&D Technology Centre, United Kingdom
 ATS Rheosystems, NJ
 BuzzMac Intl LLC, WI
 CERAM, Staffordshire
 Chemir Analytical Services, MO (Ila Sharma)
 CoorsTek Analytical Laboratories, CO
 CoorsTek Laboratories, CO
 CSC Force Measurement Inc, MA
 CSM Instruments Inc, MA
 Edward Orton Jr Ceramic Foundation, OH (Joseph Homeny)
 Expert System Solutions Srl, Italy
 Gateway Materials Technology Inc, IL
 Hyper-Therm HTC, CA
 Inst for Mfg Tech for Ceramic Components & Composi,
 University of Stuttgart, Germany (Michael Buchmann)
 Precision Measurements & Instruments Corp, OR
 Smaht Ceramics Inc, UT
 Taber Industries, NY

Optical properties

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 AGR Intl Inc, PA
 Angstrom Precision Optics Inc, NY
 Cargille Labs, NJ
 Precision Measurements & Instruments Corp, OR

Particle size analysis

Activation Laboratories Ltd, Canada
 Areva T&D Technology Centre, United Kingdom
 CERAM, Staffordshire
 Cyclonaire Corp, NE
 H&M Analytical Services Inc, NJ
 Haver & Boecker, Germany
 Israel Ceramic & Silicate Inst, Israel
 Malvern Instruments, MA

Micromeritics Instrument Corp, GA
 See ad page 79

Micron Inc, DE
 Oneida Research Services Inc, NY (D. Delluomo)
 Particle Technology Labs, IL



P-Ker Engineering, NY
 SGS Minerals Services, Canada
 Smaht Ceramics Inc, UT

Washington Mills Electro Minerals Co,
NY See ad page 43

Pore structure analysis

CERAM, Staffordshire
 CSM Instruments Inc, MA

Micromeritics Instrument Corp, GA
 See ad page 79

Particle Technology Labs, IL
 P-Ker Engineering, NY
 Quantachrome Instruments, FL

Residual stress analysis

AGR Intl Inc, PA
 American Stress Technologies Inc, PA
 CSM Instruments Inc, MA
 H&M Analytical Services Inc, NJ
 Hyper-Therm HTC, CA
 Industrial Testing Laboratories Inc, MO
 Inst for Mfg Tech for Ceramic Components & Composi,
 University of Stuttgart, Germany (Michael Buchmann)
 Strainoptics Inc, PA

Sample handling automation

Lancaster Products Div, Kercher Industries Inc, PA

Scanning electron microscopy

Activation Laboratories Ltd, Canada
 AGR Intl Inc, PA
 Alfred University, NY
 Areva T&D Technology Centre, United Kingdom
 CERAM, Staffordshire
 Chemir Analytical Services, MO (Ila Sharma)
 CoorsTek Analytical Laboratories, CO
 Edward Orton Jr Ceramic Foundation, OH (Joseph Homeny)
 Evans Analytical Group LLC, CA
 Fraunhofer Inst for Silicate Research, Germany (J. Meinhardt)
 H&M Analytical Services Inc, NJ
 Hindalco Industries Ltd, Belgaum R&D Centre, Karnataka
 (Anil Bhatnagar)
 Israel Ceramic & Silicate Inst, Israel
 Micron Inc, DE
 Oneida Research Services Inc, NY (D. Delluomo)
 Particle Technology Labs, IL
 SGS Minerals Services, Canada

Washington Mills Electro Minerals Co,
NY See ad page 43

Spectroscopy

Activation Laboratories Ltd, Canada
 CERAM, Staffordshire
 Chemir Analytical Services, MO (Ila Sharma)
 CoorsTek Analytical Laboratories, CO
 Evans Analytical Group LLC, CA
 Micron Inc, DE
 Oneida Research Services Inc, NY (D. Delluomo)
 SGS Minerals Services, Canada

Surface area analysis

AGR Intl Inc, PA
 CERAM, Staffordshire
 CoorsTek Analytical Laboratories, CO
 Hindalco Industries Ltd, Belgaum R&D Centre, Karnataka
 (Anil Bhatnagar)
 Industrial Testing Laboratories Inc, MO

Micromeritics Instrument Corp, GA
 See ad page 79



Oneida Research Services Inc, NY (D. Delluomo)
 Particle Technology Labs, IL
 Quantachrome Instruments, FL

Thermal analysis

Activation Laboratories Ltd, Canada

AGR Intl Inc, PA
 Alfred University, NY
 Anter Corp, PA
 ATS Rheosystems, NJ
 Birney W West PE, TX (Birney W. West)
 CERAM, Staffordshire
 Chemir Analytical Services, MO (Ila Sharma)
 CoorsTek Analytical Laboratories, CO
 Datapaq Inc, MA
 Edward Orton Jr Ceramic Foundation, OH (Joseph Homeny)
 Evans Analytical Group LLC, CA
 Expert System Solutions Srl, Italy (Mariano Paganelli)
 Fraunhofer Inst for Silicate Research, Germany (F. Raether)
Harrop Industries Inc, OH See ad page 60



Industrial Testing Laboratories Inc, MO
 Israel Ceramic & Silicate Inst, Israel
 Mettler-Toledo Inc, OH
 Micron Inc, DE
 Netzsch Instruments Inc, MA
 Orton Ceramic Foundation, OH (Joseph Homeny)
 Particle Technology Labs, IL
 P-Ker Engineering, NY
 Precision Measurements & Instruments Corp, OR
 Smaht Ceramics Inc, UT

Transmission electron microscopy

Evans Analytical Group LLC, CA
 Fraunhofer Inst for Silicate Research, Germany (J. Meinhardt)
 Micron Inc, DE

Tribological studies

CSM Instruments Inc, MA
 Micron Inc, DE
 Taber Industries, NY

X-ray diffraction

Activation Laboratories Ltd, Canada
 Alfred University, NY
 American Stress Technologies Inc, PA
 CERAM, Staffordshire
 Chemir Analytical Services, MO (Ila Sharma)
 CoorsTek Analytical Laboratories, CO
 Edward Orton Jr Ceramic Foundation, OH (Joseph Homeny)
 Evans Analytical Group LLC, CA
 Fraunhofer Inst for Silicate Research, Germany (F. Raether)
 H&M Analytical Services Inc, NJ
 Hindalco Industries Ltd, Belgaum R&D Centre, Karnataka
 (Anil Bhatnagar)
 Israel Ceramic & Silicate Inst, Israel
 Micron Inc, DE
 SGS Minerals Services, Canada
Washington Mills Electro Minerals Co,
NY See ad page 43

PLANT CONSTRUCTION, DESIGN, & ENGINEERING

Brick production

Basic Machinery Co Inc, NC
 BMI Automation Inc, AL (Henry Burns III)
 Dover Conveyor Inc, OH

Harrop Industries Inc, OH See ad page 60

Innovative Processing Solutions LLC, IN
Keyria Inc, CO
Lancaster Products Div, Kercher Industries Inc, PA

Casting plants

CSM Instruments Inc, MA
Dorst America Inc, PA (Greg Wallis)
ER Advanced Ceramics Inc, OH

Ceramic production

BMI Automation Inc, AL (Henry Burns III)
Ceram /M & P Laboratory, United Kingdom
CSM Instruments Inc, MA
HTI Technologies, France
Innovative Processing Solutions LLC, IN
Lancaster Products Div, Kercher Industries Inc, PA
Maryland Ceramic & Steatite Co Inc, MD

Combustion systems

Air Products & Chemicals Inc, PA
Fives North American Combustion Inc, OH
Keyria Inc, CO

Decals & decorating

CSM Instruments Inc, MA
Intl Decal Corp, IL (Jim Roman)

Drying & firing

Basic Machinery Co Inc, NC
Casso-Solar Tech LLC, NY
Ceramic Services Inc, PA

Harrop Industries Inc, OH See ad page 60



Keyria Inc, CO
Sama Maschinenbau GmbH, Germany

Dust collection

Chisholm Boyd & White Co, IL
Cyclonaire Corp, NE
Guyson Intl Ltd, United Kingdom
Nol-Tec Systems Inc, MN
Spencer Turbine Co, CT (C. Beaulieu)

Electronic materials production

Richard E Mistler Inc, PA (Richard E. Mistler)

Environmental control

Saint-Gobain NorPro Corp, OH

Fabrication shops

BMI Automation Inc, AL (Henry Burns III)
Lancaster Products Div, Kercher Industries Inc, PA
Maryland Ceramic & Steatite Co Inc, MD

Glass production

Anadolu Cam Sanayii AS, Turkey
Eglasstrek Patent Promotion & Awarding GmbH, Germany
General Glass Equipment Co, NJ

Inspection systems

Advanced NDT Limited, United Kingdom (Keith McLaughlin)
Cetek Ltd, OH
CSC Force Measurement Inc, MA
Fosbel Inc, OH
Strainoptics Inc, PA

Laboratories

Activation Laboratories Ltd, Canada
Stephan Schmidt KG, Germany

Optical fiber production

Ocean Optics Inc, FL (R. Randelman)

Refractory production

BMI Automation Inc, AL (Henry Burns III)
CerCo LLC, OH (Greg Little)
ER Advanced Ceramics Inc, OH
Lancaster Products Div, Kercher Industries Inc, PA

Semiconductor processing

CSM Instruments Inc, MA

Structural ceramics production

BMI Automation Inc, AL (Henry Burns III)
CerCo LLC, OH
Manufacturers Equipment Co, OH (F.B. Carraher)
Maryland Ceramic & Steatite Co Inc, MD
Takasago Industry Co Ltd, Intl Dept, Japan

Tile production

BMI Automation Inc, AL (Henry Burns III)
Keyria Inc, CO

Whiteware production

Sama Maschinenbau GmbH, Germany

RESEARCH ORGANIZATIONS

Academic

Alfred University, NY
Inst for Mfg Tech for Ceramic Components & Composi,
University of Stuttgart, Germany (Rainer Gadow)
Israel Ceramic & Silicate Inst, Israel
Tile Heritage Foundation, CA

Government Contract/Independent

Ceram /M & P Laboratory, United Kingdom
fuelcellmaterials.com, NexTech Materials Limited, OH
Gateway Materials Technology Inc, IL
Glass Technical Inst, CA (R.A. Drake)
Israel Ceramic & Silicate Inst, Israel



Maryland Ceramic & Steatite Co Inc, MD
New Glass Forum, Japan
SRI Intl, CA

Certification, ISO

Ceram /M & P Laboratory, United Kingdom

ADVANCED STRUCTURAL/ TECHNICAL

Adhesives

Advanced Superabrasives, NV
CerCo LLC, OH
Cotronics Corp, NY
Dow Corning Corp, MI
Starfire Systems Inc, NY

Alumina products

Accuratus Ceramic Corp, NJ

AdValue Technology LLC, AZ

See ad page 74

Advanced Cerametrics Inc, NJ (Bud Cass)
Advanced Ceramic Technology, CA
Advanced Composite Materials Corp, SC
Associated Ceramics & Technology Inc, PA
Astro Met Inc, OH
B&B Refractories Inc, CA
Blasch Precision Ceramics Inc, NY (Ted Collins)


Bullen, OH

Ceramaret SA, Switzerland
Ceramico Inc, NH (T Henriksen)

Ceramic Oxide Fabricators Pty Ltd, Australia
CeramTec North America, SC
CerCo LLC, OH
Du-Co Ceramics Co, PA (Tom Arbanas)
EBL Products Inc, CT
ETEC Gesellschaft fuer Technische Keramik GmbH, Germany
Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
Friatec, FL (Kim Anglin)
Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabidoux)
HTI Technologies, France
International Ceramic Engineering, MA
Ipsen Ceramics, IL
KC Abrasive Co LLC, KS (Ronald Barncord)
Keir Mfg Inc, NC
Kyocera Industrial Ceramics Corp., NC
Leico Industries Inc, NY
Maryland Ceramic & Steatite Co Inc, MD
Master Bond Inc, NJ
McDaniel Advanced Ceramic Technologies, PA
Metoxit AG, Switzerland
P-Ker Engineering, NY
PremaTech Advanced Ceramics, MA
Refractron Technologies Corp, NY
Richard E Mistler Inc, PA (Richard E. Mistler)
Saint-Gobain NorPro Corp, OH
Sasol North America Inc, Ceralox Div, AZ
Smaht Ceramics Inc, UT
Superior Technical Ceramics Corp, VT
Valley Design Corp, CA
Vito-Flemish Inst for Technological Research, Belgium

Armor, ceramic

Associated Ceramics & Technology Inc, PA
CeramTec North America, SC
CerCo LLC, OH
HC Starck Ceramics GmbH & Co KG, Germany
Superior Graphite Co, IL See ad page 42



Bearings

Astro Met Inc, OH
Cera-dyne Inc, CA (J. Mangels)
Enceratec Corp, IN (William F. Mandler Jr.)
Friatec, FL (Kim Anglin)
HC Starck Ceramics GmbH & Co KG, Germany
Koyo Corp of USA, OH
McDaniel Advanced Ceramic Technologies, PA
Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73
Tenmat Ltd, United Kingdom (Peter Sharp)
Vito-Flemish Inst for Technological Research, Belgium

Beryllia products

Centerline Technologies, MA
P-Ker Engineering, NY

Bioceramics, dental

Astro Met Inc, OH
Ceramaret SA, Switzerland
HC Starck Ceramics GmbH & Co KG, Germany
Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabidoux)
HTI Technologies, France
Kyocera Corp, Japan
Metoxit AG, Switzerland
Mo-Sci Corp, MO (S Jung)
Refractron Technologies Corp, NY

Sasol North America Inc, Ceralox Div, AZ

Sem-Com Co Inc, OH (Neil Hofziger)

See ad page 96

Spheric Technologies Inc, AZ

Bioceramics, medical

AdTech Ceramics, TN

Astro Met Inc, OH

Ceramaret SA, Switzerland

CeramTec North America, SC

HTI Technologies, France

Industrial Ceramic Technology, MI (John J. Schuldies)

Kyocera Corp, Japan

Kyocera Industrial Ceramics Corp., NC

Metoxit AG, Switzerland

Mo-Sci Corp, MO (S Jung)

Sasol North America Inc, Ceralox Div, AZ

Trans-Tech Inc, MD

See ad page 45

Vito-Flemish Inst for Technological Research, Belgium

Boride products

Ceradyne Inc, CA

CSM Instruments Inc, MA

ProTech Materials, CA

Saint-Gobain Ceramics, Structural

Ceramics Group, NY See ad page 73

Carbide products

Ceradyne Inc, CA

CSM Instruments Inc, MA

FCT Hartbearbeitungs GmbH, Germany

Ferro Ceramic Grinding Inc, MA (Costa Sideridis)

HC Starck Ceramics GmbH & Co KG, Germany

Kyocera Industrial Ceramics Corp., NC

PremaTech Advanced Ceramics, MA

Silicon Carbide Products Inc, NY

Superior Graphite Co, IL See ad page 42

Tenmat Ltd, United Kingdom (Peter Sharp)

Vito-Flemish Inst for Technological Research, Belgium

Catalysts

Blasch Precision Ceramics Inc, NY (Ted Collins)

fuelcellmaterials.com, NexTech Materials Limited, OH

P-Ker Engineering, NY

Saint-Gobain NorPro Corp, OH

Cermets

CeramTec North America, SC

Kyocera Industrial Ceramics Corp., NC

Coatings

Ceramatec Inc, UT

Cetek Ltd, OH

Cotronics Corp, NY

CSM Instruments Inc, MA

Dow Corning Corp, MI

Gateway Materials Technology Inc, IL

Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabidoux)

HTI Technologies, France

Inst for Mfg Tech for Ceramic Components & Composi, University of Stuttgart, Germany (Andreas Killinger)

Master Bond Inc, NJ

Phoenix Coating Resources Inc, FL

P-Ker Engineering, NY

Teeter Marketing Services LLC, NY

Trans-Tech Inc, MD

See ad page 45

ZYP Coatings Inc, TN (C.E. Holcombe)

Coatings, boron nitride

Ceradyne Inc, CA

Cotronics Corp, NY

Hyper-Therm HTC, CA

Momentive Performance Materials, OH

Composites, carbon-carbon

Precision Measurements & Instruments Corp, OR

Pyromeral Systems Inc, TX

Pyromeral Systems Sarl, France

Starfire Systems Inc, NY

Composites, ceramic-ceramic

Advanced Composite Materials Corp, SC

Areva T&D Technology Centre, United Kingdom

Bullen, OH

Centerline Technologies, MA

CeraNova Corp, MA

Ferro Ceramic Grinding Inc, MA (Costa Sideridis)

Friatec, FL (Kim Angli)

fuelcellmaterials.com, NexTech Materials Limited, OH

Gateway Materials Technology Inc, IL

HTI Technologies, France

Hyper-Therm HTC, CA

Industrial Ceramic Technology, MI (John J. Schuldies)

Metoxit AG, Switzerland

Momentive Performance Materials, OH

Phoenix Coating Resources Inc, FL

PremaTech Advanced Ceramics, MA

Pyromeral Systems Inc, TX

Pyromeral Systems Sarl, France

Silicon Carbide Products Inc, NY

Starfire Systems Inc, NY

Trans-Tech Inc, MD

See ad page 45

Composites, ceramic-metal

AdTech Ceramics, TN

Friatec, FL (Kim Angli)

Pyromeral Systems Inc, TX

Pyromeral Systems Sarl, France

Starfire Systems Inc, NY

Vito-Flemish Inst for Technological Research, Belgium

Composites, ceramic-polymer

Bullen, OH

EBL Products Inc, CT

Hyper-Therm HTC, CA

Starfire Systems Inc, NY

Trans-Tech Inc, MD

See ad page 45

Composites, intermetallic

Momentive Performance Materials, OH

Vito-Flemish Inst for Technological Research, Belgium

Cutters & knives

Accurate Diamond Tool Corp, NJ

Associated Ceramics & Technology Inc, PA

Astro Met Inc, OH

Ferro Ceramic Grinding Inc, MA (Costa Sideridis)

Industrial Ceramic Technology, MI (John J. Schuldies)

Kyocera Corp, Japan

Kyocera Industrial Ceramics Corp., NC

Metoxit AG, Switzerland

PremaTech Advanced Ceramics, MA

Cutting tools

Accurate Diamond Tool Corp, NJ

Advanced Superabrasives, NV

Astro Met Inc, OH

Ceradyne Inc, CA (J. Mangels)

CeramTec North America, SC

CSM Instruments Inc, MA

Friatec, FL (Kim Angli)

Industrial Ceramic Technology, MI (John J. Schuldies)

Kyocera Corp, Japan

Kyocera Industrial Ceramics Corp., NC

Dies

Astro Met Inc, OH

Friatec, FL (Kim Angli)

Industrial Ceramic Technology, MI (John J. Schuldies)

Refractory Specialties Inc, OH

Refractron Technologies Corp, NY

Zircoa Inc, OH

Engine components

Advanced Ceramic Technology, CA

Ceradyne Inc, CA (J. Mangels)

CeramTec North America, SC

Enceratec Corp, IN (William F. Mandler Jr.)

Ferro Ceramic Grinding Inc, MA (Costa Sideridis)

Gateway Materials Technology Inc, IL

HC Starck Ceramics GmbH & Co KG, Germany

Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabidoux)

Industrial Ceramic Technology, MI (John J. Schuldies)

Kyocera Corp, Japan

Kyocera Industrial Ceramics Corp., NC

Metoxit AG, Switzerland

PremaTech Advanced Ceramics, MA

Tenmat Ltd, United Kingdom (Peter Sharp)

Zircoa Inc, OH

Filters

Associated Ceramics & Technology Inc, PA

Bharat Heavy Electricals Ltd, Ceramic Bus Unit/Electro Porcelains Div, India (Madhusoodana C.D./Sukumar Roy)

Blasch Precision Ceramics Inc, NY (Ted Collins)

Kaeser Compressors Inc, VA

Kyocera Corp, Japan

Maryland Ceramic & Steatite Co Inc, MD

Refractron Technologies Corp, NY

Refratarios Paulista Industria e Comercio Ltda, Brazil (Romano G. Capasso)

Starfire Systems Inc, NY

Valley Design Corp, CA

Vito-Flemish Inst for Technological Research, Belgium

Glass-ceramics

Accuratus Ceramic Corp, NJ

Areva T&D Technology Centre, United Kingdom

Astro Met Inc, OH

Ferro Ceramic Grinding Inc, MA (Costa Sideridis)

P-Ker Engineering, NY

Sem-Com Co Inc, OH (Neil Hofziger)

See ad page 96

Starfire Systems Inc, NY

Valley Design Corp, CA

Heat exchangers

Anceram GmbH & Co KG, Germany

Blasch Precision Ceramics Inc, NY (Ted Collins)

fuelcellmaterials.com, NexTech Materials Limited, OH

Kaeser Compressors Inc, VA

Saint-Gobain Ceramics, Structural

Ceramics Group, NY See ad page 73

Honeycombs

Bharat Heavy Electricals Ltd, Ceramic Bus Unit/Electro Porcelains Div, India (Madhusoodana C.D.)

Blasch Precision Ceramics Inc, NY (Ted Collins)

Ceramic Oxide Fabricators Pty Ltd, Australia

Friatec, FL (Kim Angli)

Koch Knight LLC, OH (Curt Rothman)

Smaht Ceramics Inc, UT

Industrial parts

Accuratus Ceramic Corp, NJ

Advanced Cerametrics Inc, NJ (Bud Cass)

Advanced Ceramic Technology, CA

Astro Met Inc, OH

B&B Refractories Inc, CA

Blasch Precision Ceramics Inc, NY (Ted Collins)

Ceradyne Inc, CA (J. Mangels)

Ceramco Inc, NH (T Henriksen)

CeramTec North America, SC

CerCo LLC, OH

Du-Co Ceramics Co, PA (Tom Arbanas)

Enceratec Corp, IN (William F. Mandler Jr.)

ETEC Gesellschaft fuer Technische Keramik GmbH, Germany
 FCT Hartbearbeitungs GmbH, Germany
 Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
 Friatec, FL (Kim Angli)
 Gateway Materials Technology Inc, IL
 HC Starck Ceramics GmbH & Co KG, Germany
 Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabadoux)
 Industrial Ceramic Products Inc, OH (R.C. Oberst)
 Industrial Ceramic Technology, MI (John J. Schuldies)
 Keir Mfg Inc, NC
 Kyocera Corp, Japan
 Kyocera Industrial Ceramics Corp., NC
 McDanel Advanced Ceramic Technologies, PA
 Metoxit AG, Switzerland
 Pell Industries, PA (Gary W. Pell)
 Phoenix Coating Resources Inc, FL
PremaTech Advanced Ceramics, MA
 Silicon Carbide Products Inc, NY
 Smaht Ceramics Inc, UT
 Tenmat Ltd, United Kingdom (Peter Sharp)

Injection molded ceramics

AdTech Ceramics, TN

Ceramco Inc, NH (T Henriksen)
 CerCo LLC, OH
 Friatec, FL (Kim Angli)
 Smaht Ceramics Inc, UT
 Starfire Systems Inc, NY

Membranes, ceramic

Associated Ceramics & Technology Inc, PA
 Bharat Heavy Electricals Ltd, Ceramic Bus Unit/Electro Porcelains Div, India (Madhusoodana C.D./Sukumar Roy)
 Ceramatec Inc, UT
 Friatec, FL (Kim Angli)
 fuelcellmaterials.com, NexTech Materials Limited, OH
 Hyflux CEPAration Tech, Netherlands
 NorECs AS, Norwegian Electro Ceramics, Norway
 Refractron Technologies Corp, NY
 Vito-Flemish Inst for Technological Research, Belgium

Nitride products

AdTech Ceramics, TN

Accuratus Ceramic Corp, NJ
 Advanced Ceramic Technology, CA
 Anceram GmbH & Co KG, Germany
 Blasch Precision Ceramics Inc, NY (Ted Collins)
 Ceradyne Inc, CA
 Enceratec Corp, IN (William F. Mandler Jr.)
 FCT Hartbearbeitungs GmbH, Germany
 Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
 HC Starck Ceramics GmbH & Co KG, Germany
 Kyocera Industrial Ceramics Corp., NC
 ProTech Materials, CA
Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73
 Silicon Carbide Products Inc, NY
 Tenmat Ltd, United Kingdom (Peter Sharp)
 Vito-Flemish Inst for Technological Research, Belgium

Oxide products

Accuratus Ceramic Corp, NJ
 Associated Ceramics & Technology Inc, PA
 Astro Met Inc, OH
 B&B Refractories Inc, CA
 Blasch Precision Ceramics Inc, NY (Ted Collins)
 Ceramco Inc, NH (T Henriksen)
 Ceramic Oxide Fabricators Pty Ltd, Australia
 CeramTec North America, SC
 Du-Co Ceramics Co, PA (Tom Arbanas)
 ETEC Gesellschaft fuer Technische Keramik GmbH, Germany

FCT Hartbearbeitungs GmbH, Germany
 Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
 Friatec, FL (Kim Angli)
 HC Starck Ceramics GmbH & Co KG, Germany
 HTI Technologies, France
 Industrial Ceramic Technology, MI (John J. Schuldies)
 Keir Mfg Inc, NC
 Kyocera Industrial Ceramics Corp., NC
 Metoxit AG, Switzerland
 Osrsm Sylvania Inc, R & D Library, MA
 Phoenix Coating Resources Inc, FL
 P-Ker Engineering, NY
 ProTech Materials, CA
 Refractron Technologies Corp, NY
 Smaht Ceramics Inc, UT
 Superior Technical Ceramics Corp, VT

Reinforcements, fiber

Advanced Composite Materials Corp, SC
 Gateway Materials Technology Inc, IL
 Precision Measurements & Instruments Corp, OR
Saint-Gobain Quartz Ltd, United Kingdom See ad page 73

Reinforcements, whiskers

Advanced Composite Materials Corp, SC

Rings

Anceram GmbH & Co KG, Germany
 Associated Ceramics & Technology Inc, PA
 Astro Met Inc, OH
 Ceramaret SA, Switzerland
 Ceramco Inc, NH (T Henriksen)
 ETEC Gesellschaft fuer Technische Keramik GmbH, Germany
 Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
 Friatec, FL (Kim Angli)
 HC Starck Ceramics GmbH & Co KG, Germany
 Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabadoux)
 Industrial Ceramic Products Inc, OH (R.C. Oberst)
 Ipsen Ceramics, IL
PremaTech Advanced Ceramics, MA
Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73
 Saint-Gobain NorPro Corp, OH
 Silicon Carbide Products Inc, NY
 Superior Technical Ceramics Corp, VT
 Tenmat Ltd, United Kingdom (Peter Sharp)
 Vito-Flemish Inst for Technological Research, Belgium

Rods

Accuratus Ceramic Corp, NJ
 Anceram GmbH & Co KG, Germany
 Associated Ceramics & Technology Inc, PA
 Astro Met Inc, OH
 Ceramaret SA, Switzerland
 Ceramco Inc, NH (T Henriksen)
 Du-Co Ceramics Co, PA (Tom Arbanas)
 ETEC Gesellschaft fuer Technische Keramik GmbH, Germany
 Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
 Friatec, FL (Kim Angli)
 HC Starck Ceramics GmbH & Co KG, Germany
 Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabadoux)
 Industrial Ceramic Products Inc, OH (R.C. Oberst)
 Metoxit AG, Switzerland
PremaTech Advanced Ceramics, MA
Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73
 Silicon Carbide Products Inc, NY
 Smaht Ceramics Inc, UT
 Superior Technical Ceramics Corp, VT
 Tenmat Ltd, United Kingdom (Peter Sharp)

Vito-Flemish Inst for Technological Research, Belgium

Silicon carbide products

Abresist Corp, IN
 Accuratus Ceramic Corp, NJ
 Blasch Precision Ceramics Inc, NY (Ted Collins)
 Ceradyne Inc, CA
 FCT Hartbearbeitungs GmbH, Germany
 Friatec, FL (Kim Angli)
 HC Starck Ceramics GmbH & Co KG, Germany
 Kyocera Industrial Ceramics Corp., NC
PremaTech Advanced Ceramics, MA
 ProTech Materials, CA
Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73



Silicon Carbide Products Inc, NY
 Starfire Systems Inc, NY
 Valley Design Corp, CA

Silicon nitride products

FCT Hartbearbeitungs GmbH, Germany
 HC Starck Ceramics GmbH & Co KG, Germany
Stoneware & porcelain
 Associated Ceramics & Technology Inc, PA
 Ceramco Inc, NH
 Koch Knight LLC, OH (Paul Sims)
 Kyocera Corp, Japan
 P-Ker Engineering, NY

Thread guides

Advanced Cerametrics Inc, NJ (Bud Cass)
 Associated Ceramics & Technology Inc, PA
 Astro Met Inc, OH
 Ceradyne Inc, CA
 Ceramco Inc, NH (T Henriksen)
 Ceramic Oxide Fabricators Pty Ltd, Australia
 CeramTec North America, SC
 Enceratec Corp, IN (William F. Mandler Jr.)
 Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabadoux)
 Industrial Ceramic Products Inc, OH (R.C. Oberst)
 International Ceramic Engineering, MA
 Keir Mfg Inc, NC
 Kyocera Corp, Japan
 Superior Technical Ceramics Corp, VT

Tubes

Accuratus Ceramic Corp, NJ
AdValue Technology LLC, AZ See ad page 74
 Advanced Cerametrics Inc, NJ (Elaine Hartwick)
 Anceram GmbH & Co KG, Germany
 Associated Ceramics & Technology Inc, PA
 Astro Met Inc, OH
 B&B Refractories Inc, CA
 Blasch Precision Ceramics Inc, NY (Ted Collins)
 Ceramaret SA, Switzerland
 Ceramco Inc, NH (T Henriksen)
 Ceramic Oxide Fabricators Pty Ltd, Australia
 CeramTec North America, SC
 CeraNova Corp, MA
 Du-Co Ceramics Co, PA (Tom Arbanas)
 EBL Products Inc, CT
 ETEC Gesellschaft fuer Technische Keramik GmbH, Germany
 Friatec, FL (Kim Angli)

fuelcellmaterials.com, NexTech Materials Limited, OH
 Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabidoux)
 Industrial Ceramic Products Inc, OH (R.C. Oberst)
 International Ceramic Engineering, MA
 Keir Mfg Inc, NC
 Kyocera Corp, Japan
 McDanel Advanced Ceramic Technologies, PA
 Refractron Technologies Corp, NY
Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73
 Silicon Carbide Products Inc, NY
 Superior Technical Ceramics Corp, VT
 Tenmat Ltd, United Kingdom (Peter Sharp)
 Vito-Flemish Inst for Technological Research, Belgium
 Zircoa Inc, OH

Wear-resistant parts

Abresist Corp, IN
Accuratus Ceramic Corp, NJ
AdValue Technology LLC, AZ
 See ad page 74

Advanced Cerametrics Inc, NJ (Elaine Hartwick)
 Advanced Ceramic Technology, CA
 Advanced Composite Materials Corp, SC
 Advanced Superabrasives, NV
 Associated Ceramics & Technology Inc, PA
 Astro Met Inc, OH
 Blasch Precision Ceramics Inc, NY (Ted Collins)
 Ceradyne Inc, CA (J. Mangels)
 Ceramaret SA, Switzerland
 Ceramco Inc, NH (T Henriksen)
 Ceramic Oxide Fabricators Pty Ltd, Australia
 CeramTec North America, SC
 CerCo LLC, OH (Paul Stipanovich)
 Enceratec Corp, IN (William F. Mandler Jr.)
 ETEC Gesellschaft fuer Technische Keramik GmbH, Germany
 FCT Hartbearbeitungs GmbH, Germany
 Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
 Friatec, FL (Kim Angli)
 HC Starck Ceramics GmbH & Co KG, Germany
 Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabidoux)
 HTI Technologies, France
 Industrial Ceramic Technology, MI (John J. Schuldies)
 Ipsen Ceramics, IL
 Keir Mfg Inc, NC
 Kyocera Corp, Japan
 Kyocera Industrial Ceramics Corp., NC
 McDanel Advanced Ceramic Technologies, PA
 Metoxit AG, Switzerland
 P-Ker Engineering, NY
 PremaTech Advanced Ceramics, MA
 Refractron Technologies Corp, NY
Saint-Gobain Ceramics, Structural Ceramics Group, NY See ad page 73
 Silicon Carbide Products Inc, NY
 Starfire Systems Inc, NY
 Superior Technical Ceramics Corp, VT
 Tenmat Ltd, United Kingdom (Peter Sharp)
 Vito-Flemish Inst for Technological Research, Belgium
 Zircoa Inc, OH

Zirconia products

Abresist Corp, IN
Accuratus Ceramic Corp, NJ
AdValue Technology LLC, AZ
 See ad page 74

Advanced Cerametrics Inc, NJ (Bud Cass)
 Advanced Ceramic Technology, CA
 Associated Ceramics & Technology Inc, PA
 Astro Met Inc, OH

Ceramaret SA, Switzerland
 Ceramco Inc, NH (T Henriksen)
 Ceramic Oxide Fabricators Pty Ltd, Australia
 CeramTec North America, SC
 CerCo LLC, OH
 EBL Products Inc, CT
 Enceratec Corp, IN (William F. Mandler Jr.)
 ETEC Gesellschaft fuer Technische Keramik GmbH, Germany
 FCT Hartbearbeitungs GmbH, Germany
 Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
 Friatec, FL (Kim Angli)
 HC Starck Ceramics GmbH & Co KG, Germany
 Heany Industries Inc, Industrial Ceramic Div, NY (Clifford Rabidoux)
 Industrial Ceramic Technology, MI
 International Ceramic Engineering, MA

Kyocera Corp, Japan
 Kyocera Industrial Ceramics Corp., NC
 McDanel Advanced Ceramic Technologies, PA
 Metoxit AG, Switzerland
 Phoenix Coating Resources Inc, FL
 P-Ker Engineering, NY
 ProTech Materials, CA
 Refractron Technologies Corp, NY
 Richard E Mistler Inc, PA (Richard E. Mistler)
 Saint-Gobain NorPro Corp, OH
 Spheric Technologies Inc, AZ
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Trans-Tech Inc, MD See ad page 45
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Kepcor Inc, SSI Tiles, OH

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JACPA Ceramic, MI

Lighting

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Haeger Industries Inc, IL
Intl Decal Corp, IL (Jim Roman)
JACPA Ceramic, MI

Ornamental artware

Fenton Art Glass Co, WV
Haeger Industries Inc, IL
JACPA Ceramic, MI

Pottery

Ceramics Consulting Services, MA
Haeger Industries Inc, IL
Hall China Co, OH
JACPA Ceramic, MI
Sheffield Pottery, MA

CONSTRUCTION

Brick, face

Brick Industry Assoc, VA
General Shale Brick Inc, TN

Brick, glazed

Brick Industry Assoc, VA

Brick, load-bearing

Brick Industry Assoc, VA

Brick, murals

Brick Industry Assoc, VA

Brick, paving

Brick Industry Assoc, VA
General Shale Brick Inc, TN
Koch Knight LLC, OH (Mark Martin)
Marion Ceramics Inc, SC

Flue liners

Abresist Corp, IN
Tenmat Ltd, United Kingdom (Peter Sharp)

Pipe, ceramic-lined

Abresist Corp, IN
CerCo LLC, OH

Thin brick

General Shale Brick Inc, TN
Kepcor Inc, SSI Tiles, OH
Marion Ceramics Inc, SC

Tile, floor

Kepcor Inc, SSI Tiles, OH
London Tile Co, OH
Marion Ceramics Inc, SC

Tile, pavers

London Tile Co, OH
Marion Ceramics Inc, SC

Tile, quarry

London Tile Co, OH

Tile, wall

Kepcor Inc, SSI Tiles, OH
London Tile Co, OH

DINNERWARE

China, fine

Intl Decal Corp, IL (Jim Roman)

China, food service

Hall China Co, OH
Intl Decal Corp, IL (Jim Roman)
JACPA Ceramic, MI

Cookware

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Hall China Co, OH
JACPA Ceramic, MI

Earthenware

JACPA Ceramic, MI
Sheffield Pottery, MA

Ironstone

JACPA Ceramic, MI

Mugs

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Intl Decal Corp, IL (Jim Roman)
JACPA Ceramic, MI

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Hall China Co, OH
Intl Decal Corp, IL (Jim Roman)
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Sheffield Pottery, MA

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Intl Decal Corp, IL (Jim Roman)
JACPA Ceramic, MI
Sheffield Pottery, MA

ELECTRICAL/ELECTRONIC

Capacitors

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Dalmia Magnesite Corp, Dalmia Cement (Bharat) Ltd, India (Dr. T. Settu)
Kyocera Corp, Japan
Murata Manufacturing Co Ltd, Japan

Ceramic brazed assemblies

AdTech Ceramics, TN
Anceram GmbH & Co KG, Germany
CeramTec North America, SC

Conductors

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Advanced Materials Technologies, PA (Joseph P. Dougherty)
ESL Electroscience, PA (Richard S. Webb)
fuelcellmaterials.com, NexTech Materials Limited, OH
Kyocera Corp, Japan
Master Bond Inc, NJ
NorECs AS, Norwegian Electro Ceramics, Norway

Crystals

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GFI Advanced Technologies Inc, NJ
Kyocera Corp, Japan
Superconix Inc, MN

Dielectrics

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Areva T&D Technology Centre, United Kingdom
Dow Corning Corp, MI
ESL Electroscience, PA (Richard S. Webb)
Inst for Mfg Tech for Ceramic Components & Composi, University of Stuttgart, Germany (Andreas Killinger)
Keir Mfg Inc, NC

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Murata Manufacturing Co Ltd, Japan

Trans-Tech Inc, MD See ad page 45

Electrical porcelain insulators

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Maryland Ceramic & Steatite Co Inc, MD

Ferrites & ferromagnetics

Advanced Ceramic Technology, CA

Ferro Ceramic Grinding Inc, MA (Costa Sideridis)

Kyocera Corp, Japan

Powder Processing & Technology LLC, IN

Trans-Tech Inc, MD See ad page 45

Filters, dielectric

Murata Manufacturing Co Ltd, Japan

Trans-Tech Inc, MD See ad page 45

Forsterite ceramics

Du-Co Ceramics Co, PA (Tom Arbanas)

Keir Mfg Inc, NC

Kyocera Corp, Japan

P-Ker Engineering, NY

Fuel cells

Bharat Heavy Electricals Ltd, Ceramic Bus Unit/Electro Porcelains Div, India (Ratindra Nath Das)

Ceramatec Inc, UT

ESL Electroscience, PA (Richard S. Webb)

fuelcellmaterials.com, NexTech Materials Limited, OH

HC Starck Ceramics GmbH & Co KG, Germany

HC Starck Inc, MA

Inst for Mfg Tech for Ceramic Components & Composi, University of Stuttgart, Germany (Thomas Schirmer)

NorECs AS, Norwegian Electro Ceramics, Norway

Trans-Tech Inc, MD See ad page 45

High voltage insulators

Advanced Cerametrics Inc, NJ (Bud Cass)

Anceram GmbH & Co KG, Germany

Bharat Heavy Electricals Ltd, Ceramic Bus Unit/Electro Porcelains Div, India (Ratindra Nath Das)

CeramTec North America, SC

Du-Co Ceramics Co, PA (Tom Arbanas)

Kyocera Corp, Japan

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IC packages

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CerCo LLC, OH

Dow Corning Corp, MI

Du-Co Ceramics Co, PA (Tom Arbanas)

ER Advanced Ceramics Inc, OH

ESL Electroscience, PA (Richard S. Webb)

Ferro Ceramic Grinding Inc, MA (Costa Sideridis)

Maryland Ceramic & Steatite Co Inc, MD

P-Ker Engineering, NY

Saint-Gobain Quartz Ltd, United Kingdom

See ad page 73

Superior Technical Ceramics Corp, VT

Trans-Tech Inc, MD

See ad page 45

Zirconia Inc, OH

Integrated passive components: R,C,L

Murata Manufacturing Co Ltd, Japan

Magnets, soft

Ceramco Inc, NH

Microwave Packages

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Kyocera America Inc, CA

Multilayer ceramics, AIN

Kyocera America Inc, CA

Multilayer ceramics, custom

AdTech Ceramics, TN



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Kyocera America Inc, CA

Murata Manufacturing Co Ltd, Japan

Piezoelectrics

Advanced Cerametrics Inc, NJ (Farhad Mohammadi)

APC Intl Ltd, PA

EBL Products Inc, CT

Kyocera Corp, Japan

Murata Manufacturing Co Ltd, Japan

Piezo Technologies, IN

Saint-Gobain Quartz Ltd, United Kingdom

Sparkler Ceramics Pvt Ltd, India

Superconix Inc, MN

Pyroelectrics

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CeraNova Corp, MA

Resistors, thick-film

Anceram GmbH & Co KG, Germany

ESL Electroscience, PA (Richard S. Webb)

Kyocera Corp, Japan

Resonators

Trans-Tech Inc, MD See ad page 45

RF components

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Advanced Ceramic Technology, CA

Anceram GmbH & Co KG, Germany

Kyocera America Inc, CA

Murata Manufacturing Co Ltd, Japan

Semiconductors

GFI Advanced Technologies Inc, NJ

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SCI Engineered Materials Inc, OH

Superconix Inc, MN

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AdValue Technology LLC, AZ

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Du-Co Ceramics Co, PA (Tom Arbanas)
Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
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Laserage Technology Corp, IL
Richard E Mistler Inc, PA (Richard E. Mistler)
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Sasol North America Inc, Ceralox Div, AZ
Sonic-Mill, NM
Superconix Inc, MN
Valley Design Corp, CA

Substrates, aluminum nitride

Accuratus Ceramic Corp, NJ
Anceram GmbH & Co KG, Germany

Bullen, OH

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Kyocera Industrial Ceramics Corp., NC
Laserage Technology Corp, IL
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Substrates, glass

Bullen, OH

Centerline Technologies, MA
Laserage Technology Corp, IL
Saint-Gobain Quartz Ltd, United Kingdom

Sem-Com Co Inc, OH (Neil Hofziger)

See ad page 96

Sonic-Mill, NM
Valley Design Corp, CA

Substrates, other

Accuratus Ceramic Corp, NJ
Areva T&D Technology Centre, United Kingdom
Associated Ceramics & Technology Inc, PA

Bullen, OH

Centerline Technologies, MA
Du-Co Ceramics Co, PA (Tom Arbanas)
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Saint-Gobain Quartz Ltd, United Kingdom
Smaht Ceramics Inc, UT
Sonic-Mill, NM

Trans-Tech Inc, MD

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Valley Design Corp, CA
Zircoa Inc, OH

Substrates, silicon carbide

Bullen, OH

Centerline Technologies, MA
Ferro Ceramic Grinding Inc, MA (Costa Sideridis)
Kyocera Industrial Ceramics Corp., NC
Richard E Mistler Inc, PA (Richard E. Mistler)
Sonic-Mill, NM
Starfire Systems Inc, NY
Superconix Inc, MN
Tenmat Ltd, United Kingdom (Peter Sharp)

Valley Design Corp, CA

Superconductors, wires

Superconix Inc, MN

Tapes

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ESL Electroscience, PA (Richard S. Webb)
Maryland Ceramic & Steatite Co Inc, MD
Richard E Mistler Inc, PA (Richard E. Mistler)

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CSC Force Measurement Inc, MA
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Piezo Technologies, IN
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Technisonic Research Inc, CT
Vallen-Systeme GmbH, Germany

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Piezo Technologies, IN
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Schott North America Inc, KY

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Zircoa Inc, OH

Borosilicate glass

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Bullen, OH

Sem-Com Co Inc, OH (Neil Hofziger)

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Specialty Glass Inc, FL

See ad page 97

Canes, glass

Saint-Gobain Quartz Ltd, United Kingdom

Sem-Com Co Inc, OH (Neil Hofziger)

See ad page 96

Specialty Glass Inc, FL

See ad page 97

Chemically strengthened glass

Sem-Com Co Inc, OH (Neil Hofziger)

See ad page 96

Container glass

Anadolu Cam Sanayii AS, Turkey

Fibers, continuous

Advanced Cerametrics Inc, NJ (Bud Cass)
Eglasstrek Patent Promotion & Awarding GmbH,
Germany
Saint-Gobain Quartz Ltd, United Kingdom

Fibers, noncontinuous

Saint-Gobain Quartz Ltd, United Kingdom

Fibers, optical

Saint-Gobain Quartz Ltd, United Kingdom
Schott North America Inc, KY
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 Valley Design Corp, CA

Glass-ceramics

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Bullen, OH

Cotronics Corp, NY
 JACPA Ceramic, MI

PremaTech Advanced Ceramics, MA

Schott North America Inc, KY

Sem-Com Co Inc, OH (Neil Hofziger)

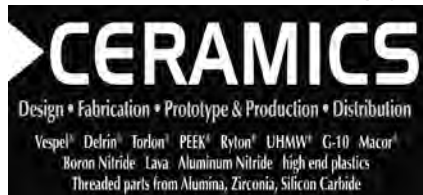
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Specialty Glass Inc, FL

See ad page 97

Technical Products Inc, WI

See ad page 80

**VIOX Corp, WA**

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Glass-to-Metal seals

Areva T&D Technology Centre, United Kingdom
 ESL Electrosience, PA (Richard S. Webb)
 Quartz Scientific Inc, OH

Laboratory & technical glass

Angstrom Precision Optics Inc, NY
 Leco Corp, MI
 Saint-Gobain Quartz Ltd, United Kingdom
 Schott North America Inc, KY

Specialty Glass Inc, FL

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Strainoptics Inc, PA

Laser glasses

Angstrom Precision Optics Inc, NY
 Saint-Gobain Quartz Ltd, United Kingdom
 Schott North America Inc, KY

Lenses

Angstrom Precision Optics Inc, NY
 Kyocera Industrial Ceramics Corp., NC
 Quartz Scientific Inc, OH
 Schott North America Inc, KY

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 Valley Design Corp, CA

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GE Healthcare, WI

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Bullen, OH

Centerline Technologies, MA
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GFI Advanced Technologies Inc, NJ

Saint-Gobain Quartz Ltd, United Kingdom

Schott North America Inc, KY

Valley Design Corp, CA

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 CP Films Inc, Precision Coated Films Div, VA
 CSM Instruments Inc, MA
 Eglasstrek Patent Promotion & Awarding GmbH,
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JACPA Ceramic, MI

Specialty glass

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 Areva T&D Technology Centre, United Kingdom
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 Germany
 Fenton Art Glass Co, WV
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**VIOX Corp, WA**

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**Stained glass**

JACPA Ceramic, MI

Tableware

Fenton Art Glass Co, WV
 JACPA Ceramic, MI

Technical glass

Schott North America Inc, KY

Specialty Glass Inc, FL

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VIOX Corp, WA

See ad page 98

Tile

JACPA Ceramic, MI

Tubing & rod

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 Eglasstrek Patent Promotion & Awarding GmbH,
 Germany
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Exhibit Hall Concessions— Lunch on Show Floor	11 a.m. to 2:30 p.m.
Happy Hour Reception	4 p.m. to 6 p.m.
Poster Session with Authors	4 p.m. to 6 p.m.

Wednesday, October 19

Exhibition	10 a.m. to 3 p.m.
Posters on Display	10 a.m. to 3 p.m.
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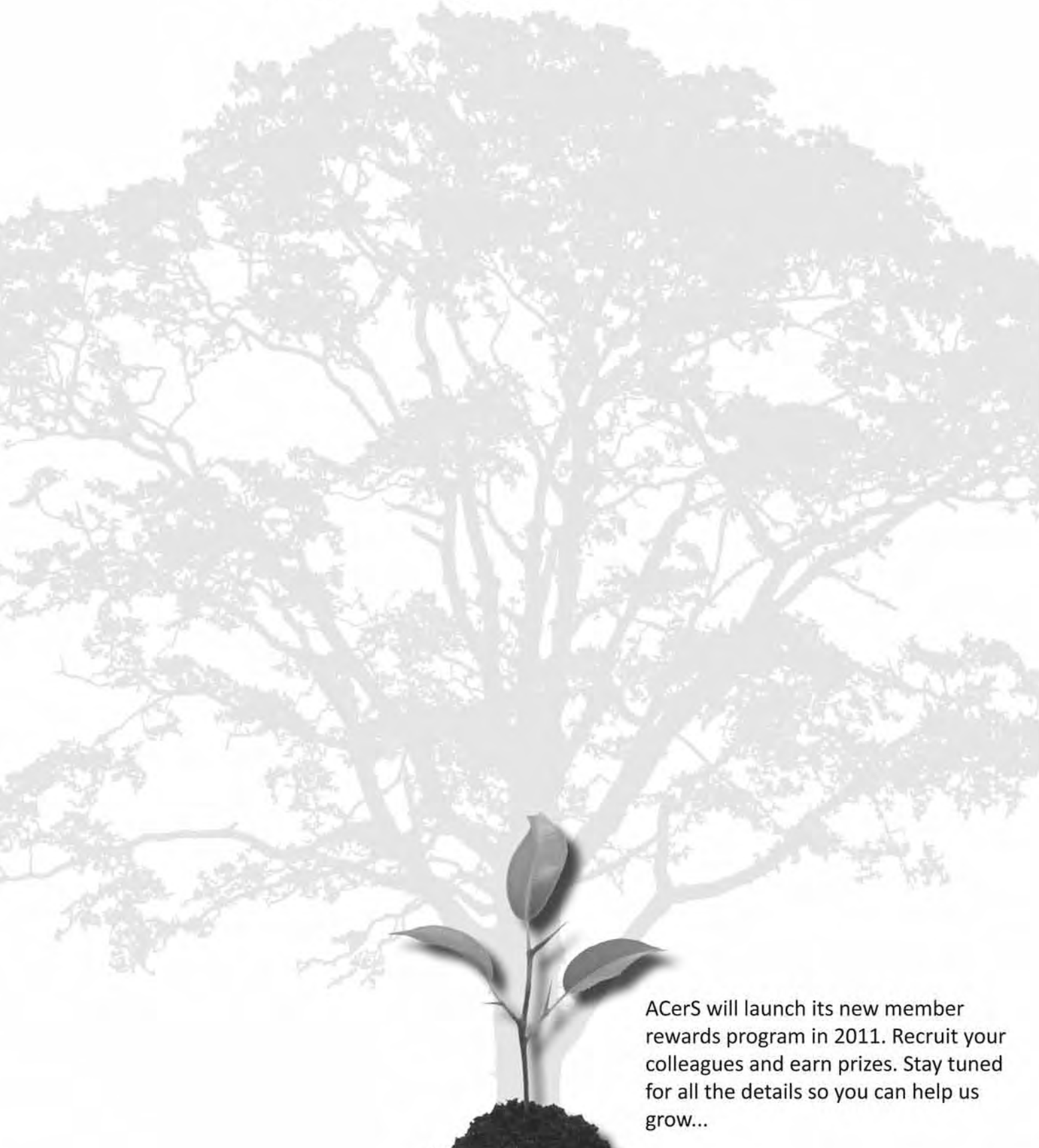
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Adv	Advertising	EM	Engineering Manager	Plt	Plant
AM	Advertising Manager	Equip	Equipment	PE	Plant Engineer
Analysis	Analysis	Exec	Executive	PF	Plant Foreman
Appl	Applications/Applied	EVP	Executive Vice President	PM	Plant Manager
Arch	Architecture/ Architectural	Exp	Export	PS	Plant Superintendent
Asst	Assistant	Fin	Finance/Financial	P	President
AGM	Assistant General Manager	FM	Factory Manager	P-E	President-Elect
AP	Assistant to President	FS	Factory Superintendent	PP	President of Planning
ASM	Assistant Sales	Fdy	Foundry	Proc	Process/Processing
Manager		G	General	Prdn	Production
AVP	Assistant Vice	GD	General Director	Prod	Product/Products
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Assoc	Associate	GPM	General Plant Manager	Pgm	Program/Programs
Atty	Attorney	GPA	General Purchasing Agent	Proj	Project/Projects
Bd	Board	GSM	General Sales Manager	Prom	Promotion
Bkpr	Bookkeeper	GS	General Superintendent	Publ	Publisher/Publish
Br	Branch	Gr	Group	Purch	Purchasing
B	Bureau	Head	Head	PA	Purchasing Agent
Bus	Business	Hon	Honorary	QC	Quality Control
Ctr	Center	HQ	Headquarters	QCE	Quality Control Engineer
Ceram	Ceramic/Ceramist	Hum Res	Human Resources	QCM	Quality Control Manager
CE	Ceramic Engineer	IR	Industrial Relations	Ref	Refractory/Refractories
Chm	Chairman	Ind	Industry/Industrial	Reg	Regional
CB	Chairman of Board	Info	Information	Rep	Representative
CEC	Chairman of Exec. Committee	Instr	Instruments	R	Research
Chem	Chemical/Chemist	Intl	International	R&D	Research & Development
Ch	Chief	Lab	Laboratory	RE	Research Engineer
CC	Chief Chemist	Ldr	Leader	R&E	Research & Engineering
CEO	Chief Executive Officer	Mach	Machine/Machinery	Sales	Sales
CFO	Chief Financial Officer	Mng	Management/Manage Manager	SM	Sales Manager
COO	Chief Operating Officer	MR	Manager of Research	SP	Sales Promotion
Coat	Coatings	MC	Managing Consultant	Sci	Science/Scientific/ Scientist
Coml	Commercial	MD	Managing Director	S	Secretary
Comm	Communications	Mfg	Manufacture/ Manufacturing	S-T	Secretary-Treasurer
Compt	Comptroller	Mkt	Market/Marketing	Sect	Section
Conslt	Consultant	MM	Marketing Manager	Serv	Service
Const	Construction	Matl	Material	Spec	Specialist/Special
Cons	Consumer	Mech	Mechanical	Supt	Superintendent
Cont	Controller	ME	Mechanical Engineer	Supv	Supervisor
Coord	Coordinator	MBD	Member Board of Directors	Sys	Systems
Corp	Corporation	Mbr	Member/Membership	Tech	Technical/Technology
Coun	Counsel/Counselor	Mdse	Merchandise/ Merchandising	TD	Technical Director
Cptrs	Capacitors	Met	Metallurgical/ Metallurgist	TM	Traffic Manager
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Deco	Decorative	Nmbr	Nonmember	VCB	Vice Chairman of Board
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D	Director	OM	Office Manager	VPP	Vice President of Planning
DM	Director of Marketing	Opr	Operations		
DP	Director of Purchasing	O	Owner		
DR	Director of Research	Pdr	Powder/Powders		
DS	Director of Sales	Personel	Personnel		
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Dist	District	Pkg	Packaging		
Div	Division	Ptr	Partner		
Dpty	Deputy				
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Thomas Daubner (P, CE); Chris Pratt (PA); Wayne Pratt (CEO, CB)

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Dan Michael (P)



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Megan Bricker (D Mkt & Mbr); Ted Day (T); Mark Mecklenborg (D Mtg & Tech Pub); Marina Pascucci (P); Laura Vermilya (DO); George Wicks (P-E)

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Published by The American Ceramic Society, the *Bulletin* is the official in-print and online voice of the organization, covering ACerS events, governance news, awards and member achievements. This nine months per year publication has regular news departments covering technical subject matter related to everything glass and ceramic, such as nanotechnology, energy, environment, emerging trends, business news and industry analyses. In addition, the *Bulletin* contains columns that address the special concerns and developments in education, public policy, refractory and primary glass-making industries. The *Bulletin* also serves as a resource for engineers, researchers, technical and corporate managers who recommend, specify and buy materials and equipment used in ceramic and glass production. The December issue contains an in-print version of *ceramicSource*, the industry's most comprehensive and up-to-date directory of suppliers of equipment and materials used to manufacture ceramics and glass.

Peter Wray (Ed); Ann Spence (Asst Ed); Pat Janeway (Adv); Charles Spahr (Publ); Tess Speakman (Prod)



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Rick Alexander (Past P); Ken Anderson (T); Jeff Brundage (P); Thomas Henriksen (Mbr); Julie Tatum (VP)

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Cyndy Conklin (Prdn); Holly Goring (Ed Asst); Sherman Hall (Ed); Steve Hecker (Mktg); Jessica Knapp (Assoc Ed); Erin Pfeifer (Ed Asst); Charles G Spahr (Publ); Mona Thiel (Adv M)

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Design and manufacture hot and cold isostatic pressing systems, including lab, pilot scale and full-production systems. Perform retrofit work on OEM-supplied isostatic equipment. Turnkey installations worldwide. Offices in United States and Europe.

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ENGIS CORP 847-808-9400
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Email: kwerner@engis.com
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600 E Clark St Fax: 330-426-1859
East Palestine, OH 44413

Email: dearily@eracinc.com
Web: http://www.usstoneware.com

Comprised of U.S. Stoneware, U.S. Refractories and U.S. Pumps. U.S. Stoneware is a designer and manufacturer of process equipment for milling, grinding and blending. U.S. Refractories is a manufacturer of industrial ceramic products. U.S. Pumps is a manufacturer of portable, air-operated pumps for virtually any application.

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Email: sales@electroscience.com
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Alvin Feingold (Dev M); Frank J. Goldberg (D Fin); Gerald Lorenz (Dof R&D); Zak Topka (D of Opr.); Richard S. Webb (D Sales & Mkt)

ETEC GESELLSCHAFT FUER 49-2205-9200-189
TECHNISCHE KERAMIK GMBH Fax: 49-2205-9200-164
An der Burg Suelz 17
D-53797 Lohmar, Germany

Email: e.lutz@etec-ceramics.de
Web: http://www.etec-ceramics.com

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Achim Haas (MD); Dr. Hartmut Kruener (GM); Ekkehard H. Lutz (GM)



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Sunnyvale, CA 94086

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Matthew LePage (M Bus Dev NY); Karol Putyera (VP Analy Serv); Xinwei Wang (Sci)

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Email: info@expertsystemsolutions.com
Web: http://www.expertsystemsolutions.com

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Hoenbacher Str 5 Fax: 49-3675-427-05-15
D-96515 Sonneberg, Germany

Email: hartbearbeitung@fct-keramik.de
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Produce ceramic components, from small, highly precise, to large-sized, complex-shaped parts, made of zirconium oxide (Y-TZP), silicon carbide and silicon nitride. Provides an extensive machine park for green and hard machining for toll-services, e.g., small, highly precise parts, testing samples and large-sized ceramic components.

Walter Martin (MD); Gerhard Wotting (M, Appl Eng, R&D)

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Williamstown, WV 26187
Web: <http://www.fentonartglass.com>

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Tom Bobbitt (Eng); George W. Fenton (P); Michael D. Fenton (Purch M); Scott Fenton (Natl Sales M)

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Email: sales@ferroc ceramic.com
Web: <http://www.ferroc ceramic.com>

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Brook Park, OH 44142

Email: fosbel.inc@fosbel.com
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Provide a range of furnace maintenance services, including ceramic-welding technology to repair all types of damaged refractories without furnace shutdown, rebricking services and other innovative hot repairs, inspections and consulting. Customers include the glass, iron and steel, coke, non-ferrous, chemical processing, power generation and petrochemical industries.

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FRAUNHOFER INST FOR SILICATE RESEARCH 49-931-4100-0
Neunerplatz 2 Fax: 49-931-4100-199
D-97082 Wurzburg, Germany

Email: info@isc.fraunhofer.de
Web: <http://www.isc.fraunhofer.de>

Institute for applied research in the field of nonmetallic inorganic materials. Main research divisions are glass, ceramics and inorganic-organic hybrid polymers.

A. Diegeler (Measuring & Process Tech); B. Durschang (Glass); R. Flegler (Ctr of Analytical Serv); K.H. Haas (Inorg/Org Polymers); J. Probst (Life Sci); F. Raether (Sintering Matl); G. Schottner (Surface Tech); D. Sporn (Energy Eng & Adaptronics)

FRIATEC 727-753-0880
11108 Challenger Ave Ste 1 Fax: 727-753-0886
Odessa, FL 33556

Email: kanglin@friatecna.net
Web: <http://www.friatecna.net>

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Kim Anglin (Sales); Dan Barth (Sales); Jeffrey A. Kelly (MD); Gus Landazuri (Sales)

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FUSION CERAMICS INC 330-627-2191
Reimbold & Strick Fax: 330-627-2082
PO Box 127

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David L. Duffy (VP, CFO); Enrique A. Gaete (PE, PM Inter Sales); Victor A. Plumbo (P, CEO); Stephen K. Thomas (PM Dom Sales)

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Email: gerling@2450mhz.com
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Karl Lifschitz (O)

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Email: manager@glassfactorydir.com
Web: <http://www.glassfactorydir.com>

Publish an annual directory of glass factories in North America, including their management, manufacturing capacity, products and contact information. Website with glass industry calendar, glass organization links to organization web pages and educational links to resources on glassmaking and glass history.

Liz Scott (GM)

GLASS MFG INDUSTRY COUNCIL 614-818-9423
600 N Cleveland Ave Ste 210 Fax: 614-818-9485
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Email: mgreenman@gmic.org
Web: <http://www.gmic.org>

A nonprofit trade association, the first organization to represent all sectors of the glass industry (container, flat, specialty and fiberglass). Dedicated to promoting the interests and economic growth, and sustainability of the glass industry through cooperative efforts in the areas of technology, productivity, innovation and environment.

John Brown (Tech D); Michael Greenman (Exec D); Donna Ransom (Exec Asst)

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Robert A. Drake (P)



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S-431 39 Moelndal, Sweden

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J. Brandt (PM); R. Pompe (P, MD)

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Walter Helfrecht (P); William E Mayo (CS)

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Florian Arzberger (SM); Hans-Peter Baldus (Tech Mkt Prod M, F, C); Jurgen Hollering (SM); Monrad Joseph (DS)

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Michael Drost (M, AC); Bettina Essmann (Sales, AC); Thomas Schmidt (M Appl Eng, AC); Muto Yasukazu (SM, Elec & Opt)

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Karsten Beck (Tech Mkt Prod M, AC); Gail Dewey (Reg & Key Acct M); Elisabeth James (Sales, AC)

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Don Hains (Ptr)



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Dorna L. Isaacs (VP); Patricia Isaacs (P)



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K.B. Blanke (Eng M); R.J. Evans (M Tech Serv); J.E. Houseman (CB P T); S.D. Houseman (VP Opr); D.A. O'Brien (VP SM); P.J. Timmel (SM Elec)



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Chesapeake, VA 23324
 Web: <http://www.kerneosinc.com>

Manufacture complete line of high-quality calcium aluminate and fused aggregates for use in refractory monolithics and construction chemistry. Fused products include Ciment Fondu, Secar 41 and Secar 51. Sintered products include Secar 71, Secar 80, Secar Plenium and Secar Xeniom. Also sells a line of organic additives for use in refractory monolithics under the Peramin brand name, Peramin AL 200 and Peramin AL 300.

Charles Alt (M Tech, Ref); Nancy Bunt (NA Refractory Mkt M); Tom Green (P); Josh Pelletier (Tech M); Devdutt Shukla (QCM)

KEYRIA INC 303-277-0404
7815 Shaffer Pkwy Fax: 303-277-0506
Littleton, CO 80127

Email: info@keyria-inc.com
 Web: <http://www.keyria-inc.com>

Offer design and construction capability for complete or part of fully automated plants for the traditional ceramics industry. All related equipment, from the crushing plant to the supervision of production by a central computer, are offered.

Christophe Aubertot (P); Anthony Edwards (VP); Harry E. Shafer Jr. (Concrete Prod M)

KILN DOCTOR INC 540-636-6016
202 E Main St Fax: 540-636-6016
Front Royal, VA 22630

Email: mike@thekilndoctor.com
 Web: <http://www.thekilndoctor.com>

Offer sales, service and repair to the pottery/ceramics industry.

Mike Swauger (P/O)

KOCH KNIGHT LLC 330-488-1651
5385 Orchard View Dr Fax: 330-488-1656
PO Box 30070
East Canton, OH 44370

Email: peter-john.hacker@kochknight.com
 Web: <http://www.kochknight.com>

Design, build and install acid-proof chemical-processing equipment for chlorine, hydrochloric acid and sulfuric acid production equipment as well as other acidic service chemical-processing applications. Acid-proof ceramic brick and mass-transfer media materials manufactured at East Canton, Ohio. Produce RTO media.

Jimmy Breau (Acid Proof Constr M); Diego Copertari (Bus Dev); Ahmed Zamin (VP Sales & Mkt)

KORNYLAK CORP 513-863-1277
400 Heaton St Fax: 513-863-7644
Hamilton, OH 45011

Email: kornylak@kornylak.com
 Web: <http://www.kornylak.com>

Design, engineer and manufacture equipment for materials handling and productivity improvement. Specialty and heavy-duty conveyors, conveying and automated systems, live storage systems and specialty components are included.

Roy Hibbard (Chem Eng); Thomas Kornylak (P); Anne McAdams (MM); Ginger Vizedom (Purch)

KOYO CORP OF USA 440-835-1000
29570 Clemens Rd Fax: 440-835-9347
Westlake, OH 44145

Email: jlox@koyousa.com
 Web: <http://www.koyousa.com>

Manufacture and supply ball and roller bearings, including bearings for extreme special environments.

P. Beargie (Corp Opr M); Rob Hamilton (DS Ind/Aftermkt); Jaime Lox (MM)

KRUMOR INC 216-328-9802
7655 Hub Pkwy Fax: 216-328-9803
Valley View, OH 44125

Email: sales@krumor.com
 Web: <http://www.krumor.com>

Manufacture thermocouples and RTD assemblies for process applications in the ceramics industry for temperatures to 3100°F. Has served domestic and international markets for more than 35 years. Also, replacement components and accessories, machined ceramics and precious-metal parts.

Robert Mikals (GM)



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Dillwyn, VA 23936-0486

Web: <http://www.kyanite.com>



Mine and market raw and calcined kyanite (mullite), domestically and internationally. Available in grain sizes of 35, 48, 100, 200 and 325 mesh. Six plants in Virginia. Provide alumina silicate mineral (with elongated needle-structured bladed particles) and high-alumina benefits.

David Almond (Prod M); Geo V. Conner Jr. (T); Gene Dixon Jr. (P); Terrell Dunnivant (S); Hank Jamerson (D Sales, Mkt, QC)



KYOCERA CORP 81-75-604-3439
6 Takeda Tobadono-cho Fax: 81-75-604-3440
Fushimi-ku
Kyoto 612-8501, Japan

Email: kaz-komori@kyocera.co.jp
 Web: <http://www.kyocera.com>



Engaged in technical, engineering ceramics for industrial applications.

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Kaz Komori (SM Intl)

KYOCERA INDUSTRIAL CERAMICS CORP 828-693-0241
Mountain Home, NC 28758 Fax: 828-692-1340

Email: jack.johnson@kyocera.com

Kyocera Industrial Ceramics Corporation specializes in the manufacture, sales and marketing of engineered ceramic materials and components. It is a wholly owned subsidiary of Kyocera International Inc., the North American headquarters for Kyocera Corporation of Kyoto, Japan.

Brad D'Emilio (PM); Jack Johnson (VP Fine Ceram Prod Gr); Kazuo Kamada (D of Fine Ceram Mfg); David Williams (P)



KYOCERA AMERICA INC 858-614-2592
8611 Balboa Ave Fax: 858-573-0159
San Diego, CA 92123-1580 Telex: 4723069

Email: iris.labadie@kyocera.com
Web: http://www.kyocera.com



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Kenji Aonuma (VP Japan Ceram Prod); David Hester (VP Q); Nick Hortalas (VP of Design and New Bus Dev); Gary Lee (VP Organic Pkg Prod); Chong Park (VP of NAP Prod); Rick Sigliano (VP of Sales); Bob Whisler (P)



L&L KILN MFG INC 856-294-0077
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DK 6400 Sonderborg, Denmark

Email: kl@lachenmeier.com
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Established 1969. Manufacture pallet-packaging machinery, including shrink-wrapping plants, hood-stretch plants, stretch-wrapping plants and sleeve-wrapping plants. Subsidiaries in United Kingdom, Germany, Brazil and United States.

Alice Holm Kristiansen (Mkt); Per Lachenmeier (MD); LD Thomas Petersen (Sales D)

LANCASTER PRODUCTS DIV 717-273-2111
Kercher Industries Inc Fax: 717-273-2967
920 Mechanic St
Lebanon, PA 17046

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Web: http://www.lancasterprd.com

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Timothy Himmelberger (M Prdn); Edwin Kercher (P)

LANLY CO 216-731-1115
26201 Tungsten Rd Fax: 216-731-7900
Cleveland, OH 44132

Email: sales@lanly.com
Web: http://www.lanly.com

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Ed Chapman (Sales); Dave Fowle (Mech Eng); Dennis Hill (P)

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Andrea Biasci (M); Angelo Brodetto (Mkt); Maurizio Cosentini (Sales & Tech Asst); Cinzia Della Porta (Opr M); Giovanni Laviosa (CEO)



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Manufacture and sell lab instruments for the analysis of ceramic and refractory material, sample preparation equipment, microscopes, hardness testers and image analysis equipment.

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Email: leico@leicoind.com

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92275 Eschenfelden, Germany

Email: info@linn.de
Web: http://www.linn.de

Manufacture electrically heated industrial and lab furnaces, hf/ff mf generators, sample preparation systems for

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Horst Linn (P)

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Email: info@linseis.com
Web: http://www.linseis.com

Manufacture thermal analysis instruments (DSC, TMA, DTA, TG, STA, dilatometer), chart recorders, XY recorders and data-acquisition equipment.

Michael Bissell (GM); Claus Linseis (P)

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A privately held specialty refractory manufacturer that supplies products and services for the smallest ceramic shapes to linings for the world's largest blast furnace. Unique product lines include an array of colloidal silica sol-gel-bonded castables, pumpables and shotcretes. Seventeen facilities provide the option for businesses worldwide.

Michael Anderson (VP Director of Research); James Colander (Distr Mfg); Thomas Colander (VP Sales); Charles W. Connors (CEO); Charles W. Connors, Jr. (P, CCO); Albert J. Dzermejko (VP Eng); Ali Farhadi (MM Eng); Curtis A. Rothman (VP Ind Sales); Thomas Wank (VP Mkt)

MALVERN INSTRUMENTS 508-768-6400
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Marisa Fraser (Mkt Comm M)

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Middletown, OH 45044-8924

Email: info@mecoservices.com

Web: http://www.mecoservices.com

Manufacture brick-cutting, coil, autsetting machine and texturing as well as hard chrome-plated die wires. CESH

Div. is the brick industry's distributor for AccuRate feeders, Hanco controls, Burton refractories, De Boer automated soft-mud systems, GSP automated kiln-car systems, Hazemag crushers, Stafier drying trays, Verdes material preparation equipment and VHV conveying systems.

Frank B. Carragher (VP); Jerry J. Chapman (Parts); David F. Meyer (VP); Adam Miller (P)

MARION CERAMICS INC 843-423-1311
PO Box 1134 Fax: 843-423-1515
Marion, SC 29571

Web: http://www.marion_ceramics.com

Established 1885. Manufacture extensive line of unglazed clay products, including bricktile, pool coping, thin brick and brick pavers. Provide products in a wide spectrum of colors. New products include tumbled bricktile and tumbled thin brick.

Daniel Cabeza (P); Jim Keck (PM); Hank Leeke (Cont); Mike Longo (Sales)

MARYLAND CERAMIC & STEATITE CO INC 410-838-4114
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Street, MD 21154

Email: mdlava@erols.com

Web: http://www.marylandceramic.com

Established 1926. Produce industrial and technical ceramics. A large extrusion and dry-pressing business. Product line includes steatite, cordierite, lava, plastics and tape casting.

Ernest Bianchi (CE); Sharon Welsh (Sales)

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1001 Goodwill Ave Fax: 800-884-2723
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Email: mwb@marylandwirebelts.com

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Manufacture industrial combustion equipment, including combustion air blowers, gas and oil burners, and metal-to-metal seated fuel shut-off valves for most high-temperature furnace applications as well as direct-fired air heating for drying, baking and curing.

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Beaver Falls, PA 15010-4700

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Web: http://www.mcdanelceramics.com

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Chris Rogowski (Sales D); Brian Vernon (Reg SM)

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Design and supply custom suspended refractory systems for glassmelting, copper, aluminum, steel pelletizing and reheat furnaces and incinerators. Manufacture blanket batch charger for glassmelting furnaces.

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215 Stackpole St
Saint Marys, PA 15857

Email: gerry.uberti@mersen.com

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Ronald Braund (VP, Sales & Mkt); Harry Burden (MM); Noah Nicholson (GM); Gerard P. Uberti (MM)



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8240 Thayngen, Switzerland

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Shana Wheeler (Media Relations)



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Manufacture low-pressure injection-molding parts (hot pouring) of high-tech materials. These precision ceramic components are used for laser and sensor parts, vacuum and medicine technology, and nozzle and mechanical micro parts. Production site in Meissen, Germany.

Diether v. Frankenberg (Sales M); Mathias Wilde (P)

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The Nemeth Engineering Group Fax: 502-241-5907
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Crestwood, KY 40014

Email: mread@nemeth-engineering.com
Web: <http://www.microdry.com>

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Email: ussales@micromeritics.com
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Manufacture, market and service instruments for characterizing physical properties of materials in production control, quality control and R&D applications. Characteristics determined include surface area, particle size, porosity, pore volume, pore shape, pore size, absolute density, bulk density, envelope density and chemisorption. Material analysis lab available.

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MICRON INC 302-998-1184
3815 Lancaster Pike Fax: 302-998-1836
Wilmington, DE 19805

Email: microanalytical@compuserve.com
Web: <http://www.microanalytical.com>

Established 1966. Independent analytical service lab specializing in materials characterization (morphology, chemistry and structure).

James F. Ficca (P); James M. Ficca (VP); Heiki Heitur (Analyst); Katherine A. Melody (VP); Paul H. Nielsen (Sci)

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Peabody, MA 01960-1704

Email: info@microplasmic.com
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Jerry L. Patel (P, CEO); Nannaji Saka (Ch Sci)

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Email: sales@mincoitc.com
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Manufacture fused silica worldwide for ultra-low-thermal expansion refractory shapes, precision investment-casting ceramics and filler in electronic-grade epoxy encapsulants.

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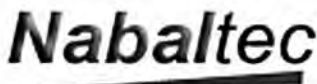
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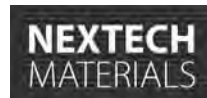
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Helga M. Grill (M); Stephen C. Pred (P)

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160 Goddard Memorial Dr Fax: 508-793-9814
Worcester, MA 01603-1260

Email: info@prematech.com
Web: http://www.prematech.com

Offer machining of advanced materials for a variety of applications in the semiconductor, aerospace, wear component and industrial component market segments.

Ellen Costello (CS); Roger Woods (Sales)

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Email: premiermill@spx.com
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Manufacture high-speed, high-shear mixing, dispersing and milling equipment. Markets include paint, inks and coatings; ceramics; adhesives and sealants; chemical; personal care; and food. Products include single-shaft and multishaft mixers, rotor/stator equipment, media mills (horizontal and basket types), lab dispensators and equipment.

Julie Hoover (MM); Stewart Rissley (Natl. SM); Dave Slovik (Parts & Serv M); John Sneeringer (Tech Sales)

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Web: http://www.processall.com

Manufacture mixers and dryers that utilize a mechanically fluidized bed agitation principle to process solids-to-solids and liquids-to-solids as well as the addition of reinforcing fibers and whiskers. Testing facilities and pilot plants available on a rental basis. Multiprocessing in a single vessel is a specialty.

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Email: sales@protechmaterials.com
Web: http://www.protechmaterials.com

Established 1998. Specialize in technical ceramics, such as boron nitride, titanium diboride, silicon nitride, SiC, aluminum nitride and large quartz parts. Manufacturing processes utilized include hot pressing and sintering.

Larry Liu (Sales M)

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2501 Alexandria Rd Fax: 256-237-3473
Anniston, AL 36201

Email: allen.davis@pryorgiggey.com
Web: http://www.pryorgiggey.com

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T. Austel (QC); Mike Chieppor (P); A.R. Davis (VP Opr); P. Insley (Fin); T. Piserchio (SM); N. Wilkerson (Eng)

PSC INC 216-531-3375
Div of C A Litzler Fax: 216-531-6751
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 Cleveland, OH 44117

Email: info@pscrheat.com
 Web: http://www.pscrheat.com

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Mike London (Eng M); Ben Wilson (SM)



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 Subsidiary of Gasbarre Products Inc Fax: 734-946-5851
 26395 Northline Commerce Dr Ste 604
 Taylor, MI 48180



Email: fran@ptx.com
 Web: http://www.ptx.com
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Jim Kastl (Sales Eng); Fran Koszewski (Adm Sales/Serv); Alan Krauser (Tech Sales/Serv); Dave Mauro (CS M)

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Riaz Ahmad (Lab Serv M); Jeff Dixon (Intl SM); Stephen Hubbard (Domestic SM); David Kiska (Intl SM); Martin Thomas (Bus Dev D); Matthias Thommes (D Appl Sci)



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Daryl Clendenen (SD - Americas); Amul Gupta (Tech, Bus Dev); Alan Lindquist (M Appl Eng); Valerie Weber (CS Coord); Lori Whalen (Bonded Mkt M); Matthew Wheeler (Tech Mkt M)

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Florence Cantelaupe (Ceramic MM); Tim Hillkirk (Sales & MM); Pierre Lecacheux (Sales D); Ron Lonero (Sales & MM); Luc Tremblay (Mkt M); Curtis Vaught (Sales & MM); Arnaud Welto (Ref MM)

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Tina Quartaroli (VP, GM); Ivy Ruark (Adm Asst); Ralph Ruark (P)

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Ronald E. Loehman (Co-D Adv Matl Lab); Harry J. Saxton (D Matl/Proc Sci Ctr)

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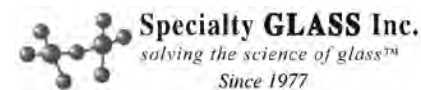
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