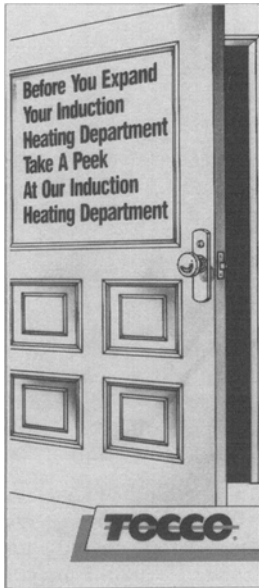


pass through slots on the ledges to create high-velocity, turbulent flows, thus increasing convective heat transfer to the retort and then to the workload. As a result, the mantle quickly achieves an operating temperature of up to 2500 °F.

Circle (70) on reader service card

Tocco, Inc., Madison Hts, MI, has expanded its customer support services by



Tocco Inc.

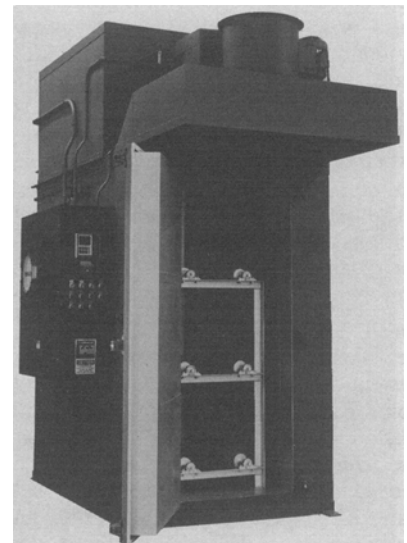
establishing a Commercial Induction Heat Treating Department to handle *out-of-the-ordinary induction heat treating tasks* for commercial heat treaters, as well as original equipment manufacturers.

A new, free brochure describes Tocco's ability to handle prototype development, pre-production, new product launches, and low- to mid-volume production. Operations at both its Michigan Technology and its Boaz, AL headquarters are covered.

Circle (71) on reader service card

The **Grieve Corp.** No. 696 is a special *electrically heated walk-in oven* used for curing Teflon tubes by continuously rotating the parts during processing. The Round Lake, IL, manufacturer reports the oven is equipped with three levels of motorized rollers that are supported by high-temperature metallized graphite bearings within the workspace. Other features include a removable top-mounted heat chamber, an indicating/programming/3-mode current proportioning temperature controller, a temperature recorder, and an SCR power controller.

Special safety features include a manual reset temperature controller, a fused disconnect switch, separate heating element control contactors for the excess temperature controller and recirculating blower air flow safety switch.



Grieve Corp.

Circle (72) on reader service card

A *natural gas-fired, ion-nitriding vacuum furnace* is offered by **Abar Ipsen Industries**, Bensalem, PA. Compared to electrically heated furnaces, it reduces energy consumption by 75% while providing superior temperature uniformity, shortened cycle times, and better heat-treating qualities.

Circle No. (73) on reader service card.

Calendar of Events

May 1-2

Pacific Northwest Society for Coatings Technology Annual Symposium, Portland, OR, USA; Contact: John Westendorf, Lipscomb Chemical Co., 2627 NW Nicolai St., Portland, OR 97210, USA; 503/241-3520.

May 3-7

ANTEC: Society of Plastics Engineers 50th Anniversary Annual Technical Conference, Detroit, MI, USA; Contact: SPE, P.O. Box 403, 14 Fairfield Dr., Brookfield Ctr., CT 06805, USA; 203/775-0471.

May 3-7

Society of Tribologists and Lubrication Engineers Annual Conference & Exhibition, Philadelphia, PA, USA; Contact:

STLE, 840 Busse Hwy., Park Ridge, IL 60068, USA; 708/825-5536.

May 4-5

2nd Symposium on Advances in Fatigue Lifetime Predictive Techniques, Pittsburgh, PA, USA; Contact: Dorothy Savini, Symposia Operations, ASTM, 1916 Race St., Philadelphia, PA 19103, USA; 215/299-5400.

May 4-5

Seminar: Biomaterials for the '90's: Polyurethanes and Ion Beam Modification Techniques, Boston, MA, USA; Contact: Technomic Publishing Co., Inc., 851 N. Holland Ave., Box 3535, Lancaster, PA 17604, USA; 800/233-9936.

May 4-5

11th ASTM Symposium on Composite Materials, Pittsburgh, PA, USA; Contact: Dorothy Savini, Symposia Operations, ASTM, 1916 Race St., Philadelphia, PA 19103, USA; 215/299-5400.

May 4-5

Workshop: Neutron and Synchrotron Radiation Studies of Materials, Upton, NY, USA; Contact: R. Greenberg, Dept. of Physics, Brookhaven National Lab., Upton, NY 11973, USA; 516/282-5564.

May 4-6

Advances in Hard Materials Production, Bonn, GERMANY; Contact: Conference Organizer, HMP 92, MPR Publishing Services, Ltd., Old Bank Bldg., Bellstone, Shrewsbury SY1 1HU, UK; 743/364-675.

May 4-6

Course: Evaluation of Materials and Structures by Quantitative Ultrasonic Nondestructive Evaluation, Evanston, IL, USA; Contact: Northwestern University, Evanston, IL, USA; 708/491-3365.

May 4-6

Polymer Conference, New Orleans, LA, USA; Contact: Institute of Materials Science, State University of New York, New Paltz, NY 12561, USA; 914/257-3800.

May 4-7

Offshore Technology Conference, Houston, TX, USA; Contact: ASME, Conference Dept., 345 E. 47th St., New York, NY 10017, USA; 212/705-7722.

May 4-7

Annual Meeting of the Society of Tribologists and Lubrication Engineers, Philadelphia, PA, USA; Contact: STLE, 840 Busse Hwy., Park Ridge, IL 60068-2376, USA; 708/825-5536.

May 4-8

Course: Optical Engineering: Design, Integration, and Performance, Los Angeles, CA, USA; Contact: Engineering Technology Institute, P.O. Box 8859, Waco, TX 76714-8859, USA; 800/367-4238.

May 4-8

10th Annual School for Natural and Accelerated Weathering of Materials, Miami, FL, USA; Contact: Atlas Electric Devices Co., 4114 N. Ravenswood Ave., Chicago, IL 60613, USA; 312/327-4520.

May 5-7

Seminar: Sheet Metal Forming Technology, Materials Park, OH, USA; Contact: Lucy Lucarelli, MEI, ASM International, Materials Park, OH 44073, USA; 216/338-5151.

May 5-9

Eurotech '92 Multi-Disciplinary Exhibition, including **Europlastica**, Brussels, BELGIUM; Contact: Brussels International Trade Fair, Place de Belgique, B-1020, Brussels, BELGIUM.

May 5-9

META V Exhibition of Manufacturing Technology and Automation, Frankfurt, GERMANY; Contact: Verein Deutscher, Werkzeugmaschinenfabriken eV, Comeliusstr. 4, D-6000 Frankfurt am Main, GERMANY; 069/756081-0.

May 6

2nd Symposium on Fractography of Modern Engineering Materials II, Pittsburgh, PA, USA; Contact: Leslie N. Gilbertson, Zimmer, Inc., P.O. Box 708, Warsaw, IN 46580, USA; 219/372-4676.

May 6-8

5th International ACMLC Conference: Opportunities and Applications for Cost-Effective Composite Materials and Processes, Orlando, FL, USA; Contact: ACMLC, 425 California Ave., Stuart, FL 34994, USA; 407/288-9996.

May 11-13

13th International Conference of SAMPE European Chapter, Hamburg, GERMANY; Contact: SAMPE '92, P.O. Box 302480, D-2000 Hamburg 36, GERMANY; 40/3569-2243.

May 11-13

10th Annual Meeting of the Powder Coating Institute, Palm Beach, FL, USA; Contact: Powder Coating Institute, 1800 Diagonal Rd., Suite 370, Alexandria, VA 22314, USA; 703/684-4409.

May 11-14

PLAST-EX '92, Mississauga, Ontario, CANADA; Contact: Society of the Plastics Industry of Canada, 1262 Don Mills Rd., Suite 104, Don Mills, Ontario M3B 2W7 CANADA; 416/449-3444.

May 11-14

Powder and Bulk Solids Conference and Exhibition, Rosemont, IL, USA; Contact: G. Cavalier, Conference Dept., Cahners Exposition Group Powder and Bulk Solids '92, 1350 E. Touhy Ave., P.O. Box 5060, Des Plaines, IL 60017-5060, USA.

May 11-15

Course: Mechanics of Composite Materials, Lawrence, KS, USA; Contact: Aerospace Short Course, University of Kansas, Div. of Continuing Education, 6330 College Blvd., Overland Park, KS 66211-1506, USA; 913/491-0221.

May 11-15

Course: Composite Airframe Structures, Los Angeles, CA, USA; Contact: UCLA Extension, Short Course Program, 10995 Le Conte Ave., Suite 542, Los Angeles, CA 90024-2883, USA; 310/825-1047.

May 11-15

11th International Conference on Vacuum Metallurgy, Antibes, FRANCE; Contact: Societe Francaise de Metallurgie et de Materiaux (SF2M), 1, rue Paul Cezanne, 75008 Paris, FRANCE; 1/49-59-71-00.

May 11-15

3rd International Conference on Advances in Coatings and Surface Engineering for Corrosion and Wear Resistance, Newcastle-upon-Tyne, ENGLAND; Contact: Dr. J.S. Gray, Surface Engineering Research Group, Ellison Bldg., The Polytechnic, Newcastle-upon-Tyne NE1 8ST, ENGLAND.

May 11-15

Course: Practical Considerations in Structural Fatigue and Damage Tolerant Design of New and Aging Aircraft, Salt Lake City, UT, USA; Contact: Dr. David Hoepfner, FASIDE International, Inc., P.O. Box 58-1197, Salt Lake City, UT 84158-1197, USA.

May 12-13

Course: Fundamentals of Corrosion and Its Control, Wrightsville Beach, NC, USA; Contact: Sherree Darden, Program Coordinator, LaQue Center for Corrosion Technology, P.O. Box 656, Wrightsville Beach, NC 28480, USA; 919/256-2271.

May 12-14

Advanced Productivity Exposition, Detroit, MI, USA; Contact: Customer Service Center, SME, One SME Dr., P.O. Box 930, Dearborn, MI 48121-0930, USA; 313/271-2861.

May 12-15

49th World Magnesium Conference, Chicago, IL, USA; Contact: Byron Clow/Felicia Garber, International Magnesium Assoc., 1303 Vincent Pl., Suite One, McLean, VA 22101, USA; 703/442-8888.

May 13-20

Trade Fair: Porochnikovaja Metallurgia (powder metalurgy/ceramics), Kiev, RUSSIA; Contact: NOWEA International GmbH, Postfach (BP), 32 02 03, D-4000 Dusseldorf 30, GERMANY; 211/4560-02.

May 17-20

Spring Week: Federation of Societies for Coatings Technology, Boston, MA, USA; Contact: FSCT, 492 Norristown Rd., Blue Bell, PA 19422, USA; 215/940-0777.

May 17-20

44th International Industrial Engineering Conference, Chicago, IL, USA; Contact: Jill Obereiner, Institute of Industrial Engineers, 25 Technology Park, Atlanta, Norcross, GA 30092, USA; 404/449-0460.

May 17-20

Electrochemical Characterization of Thin Solid Films Symposium; High T_c Superconductor Technologies Symposium; Stability of Refractory Materials Symposium, St. Louis, MO, USA; Contact: Electrochemical Society, 10 S. Main St., Pennington, NJ 08534, USA; 609/737-1902.

May 17-21

Australasian Institute of Mining and Metallurgy Conference, Broken Hill, New South Wales, AUSTRALIA; Contact: Australasian Institute of Mining and Metallurgy, Conference Dept., P.O. Box 122, Parkville, Victoria 3052, AUSTRALIA; 03/347-3166.

May 18-19

Course: Polymer Blends, Lowell, MA, USA; University of MA at Lowell, Special Programs, Continuing Education, 1 University Ave., Lowell, MA 01854, USA.

May 18-19

Symposium: Slow Strain Rate Testing for the Evaluation of Environmentally-Induced Cracking: Research and Engineering Applications, Pittsburgh, PA, USA; Contact: ASTM, 1916 Race St., Philadelphia, PA 19103, USA; 215/299-5400.

May 18-21

AEROMAT '92: Advanced Aerospace Materials/Processes Conference and Exposition, Anaheim, CA, USA; Contact: MCSC, ASM International, Materials Park, OH 44073, USA; 216/338-5151.

May 18-21

5th International Conference on Creep of Materials, Orlando, FL, USA; Contact: MCSC, ASM International, Materials Park, OH 44073, USA; 216/338-5151.

May 18-22

Course: Laser Fundamentals and Systems Los Angeles, CA, USA; Contact: Engineering Technology Institute, P.O. Box 8859, Waco, TX 76714-8859, USA; 800/367-4238.

May 19-21

37th AUCSC: Appalachian Underground Corrosion Short Course, Morgantown, WV, USA; Contact: Angela Durham, AUCSC, P.O. Box 6070, Morgantown, WV 26506-6070, USA.

May 19-21

EASTEC '92, W. Springfield, MA, USA; Contact: Robert Kian, SME, One SME Dr., P.O. Box 930, Dearborn, MI, 48121-0930, USA; 313/271-1500.

May 19-21

Conference: Lasers in Fabricating: Achieving Maximum Productivity, Schaumburg, IL, USA; Contact: Lynn Anderson, Fabricators and Manufacturers Assoc. Int'l., 5411 E. State St., Rockford, IL 61108-2378, USA; 815/399-8700.

May 19-22

High-Tech Materials Exhibition '92, Makuhari, JAPAN; Contact: High-Tech Materials Exhibition 1992, Nihon Keizai Shim-bun, Inc., General Projects Dept., 1-9-5 Otemachi, Chiyoda-ku, Tokyo 100-66, JAPAN; 03/3243-9082.

May 19-24

ILA International Aerospace Technologies Exhibition, Hanover, GERMANY; Contact: Deutsche Messe AG, Messengelände, D-3000 Hanover 82, GERMANY; 0511-890.

May 20

Seminar: Magnetic Properties for CAD Analysis, London, ENGLAND; Contact: Margaret Swadling, The UK Magnetics Club, Wantage Business Park, Wantage, Oxfordshire OX12 9BJ, ENGLAND; 02357/70652.

May 20-21

International Conference: The Global Outlook for Polymer-Bonded Magnets, Chicago, IL, USA; Contact: Kathy Briggs, Intertech Conferences, 170 U.S. Rt. One, Portland, ME 04105, USA; 207/781-9800.

May 20-22

20th North American Manufacturing Research Conference, Pullman, WA, USA; Contact: Mark Stratton, SME Education Dept., One SME Dr., P.O. Box 930, Dearborn, MI 48121-0930, USA; 313/271-2861.

May 21-22

Course: Engineering Polymers, Lowell, MA, USA; Contact: University of MA at Lowell, Special Programs, Continuing Education, 1 University Ave., Lowell, MA 01854, USA.

May 25-29

International Conference on High T_c Superconductivity - BHTSC '92, Beijing, PR/CHINA; Contact: Prof. S.S. Zie, Institute of Physics, CAS, PR/CHINA; 281866.

May 25-29

3rd International Symposium on High Temperature Corrosion and Protection of Materials, Les Embiez, FRANCE; Contact: Symposium Secretary, Universite de Provence, Case 26, 13331 Marseille Cedex 3, FRANCE; 33/91847007.

May 26-29

4th International Conference on Composite Interfaces, Cleveland, OH, USA; Contact: Prof. Hatsuo Ishida, Dept. of Macromolecular Science, Case Western Reserve University, Cleveland, OH 44106, USA; 216/368-4285.

May 27

16th Annual Spring Seminar: The Institute for Bridge Integrity and Safety, New York, NY, USA; Contact: IBIS, 8700 25th Ave., Brooklyn, NY 11214, USA; 718/996-1785.

May 28-29

Intensive Short Course: Polycrystalline-Silicon Technology and Applications, Millbrae, CA, USA; Contact: Alice Boatwright, Continuing Education in Engineering, University Extension, University of California, 2223 Fulton St., Berkeley, CA 94720, USA; 415/642-3112.

May 28 - June 5

International Thermal Spray Conference and Exposition, Orlando, FL, USA; Contact: MCSC, ASM International, Materials Park, OH 44073 USA; 216/338-5151.

May 31 - June 4

12th Scandinavian Corrosion Congress & EUROCORR '92, Espoo, FINLAND; Contact: P.J. Tunturi, Finncorr, P.O. Box 383, SF-02151 Espoo, FINLAND; 358/0-4354-3715.

May 31- June 5

International Conference on Pressure Vessel Technology, Dusseldorf, GERMANY; Contact: Vereinigung der Technischen, Uberwachungs-Vereine, Kurfurstenstrasse 56, 4300 Essen 1, GERMANY.

May 31 - June 5

3rd AIM Conference on Advanced Topics in Polymer Science, Gargnano, ITALY; Contact: G. Marrucci & L. Nicolais, Engineering Faculty, University of Naples, Piazzale Tecchio, 80125 Napoli, ITALY; 768/2273.

June 1-4

5th International Symposium on Polymer Analysis and Characterization, Aichi, JAPAN; Contact: Dr. Sadao Mori, Dept. of Industrial Chemistry, Faculty of Engineering, Mie University, Tsu Mie 514, JAPAN; 592/32-1211, Ext. 3843.

June 1-4

37th International Gas Turbine and Aeroengine Congress and Exposition, Cologne, GERMANY; Contact: International Gas Turbine Institute, 6085 Barfield Rd., Suite 207, Atlanta, GA 30328, USA; 404/847-0072.

June 1-4

Course/Workshop: Advanced Composite Materials Technology, Lowell, MA, USA; Contact: University of Massachusetts at Lowell, Special Programs, Continuing Education, 1 University Ave., Lowell, MA 01854, USA.

June 1-5

Course: Laser Safety, Chicago, IL, USA; Contact: Engineering Technology Institute, P.O. Box 8859, Waco, TX 76714-8859, USA; 800/367-4238.

June 1-5

25th ISATA Silver Jubilee Conference: New and Alternative Materials for the Automotive Industries, Florence, ITALY; Contact: Dr. J.I. Soliman, ISATA, 42 Lloyd Park Ave., Croydon CR0 5SB, ENGLAND; 081/681-3069.

June 2-5

Electronic Materials, Strasbourg, FRANCE; Contact: E-MRS Spring Mtg., Attn.: Prof. P. Siffert, Centre de Recherche Nucleaires, Lab Phase, 67037, Strasbourg Cedex, FRANCE.

June 4

Composite Materials and Design, Neu Ulm, GERMANY; Contact: Cerein Deutscher Ingenieure, Postfach 11, 39, Graf-Recke-Strasse 84, D-4000 Dusseldorf 1, GERMANY; 0211/6214-302.

June 3-4

Advances in Polymer Blends and Alloys, San Diego, CA, USA; Contact: Program Div., Technomic Publishing Co., Inc. 851 New Holland Ave., Box 3535, Lancaster, PA 17604, USA; 800/233-9936.

June 3-5

Airframe Structural Design, Dayton, OH, USA; Contact: University Consortium for Continuing Education, 16161 Ventura Blvd., M/C C-752, Encino, CA 91436, USA; 818/995-6335.

June 4-6

IMAT '92: Exhibition and Conference on Innovative Materials, Faenza, ITALY; Contact: IMAT '92 Conference Secretariat, Techna-P.O. Box 174, 48018 Faenza, ITALY; 22461.

June 9-12

Alloy Steels and Specialty Alloys in 1992, Dusseldorf, GERMANY; Contact: International Tungsten Industry Assoc., 280 Earls Crt. Rd., London SW5 9AS, ENGLAND; 071/373-7413

June 14-19

Conference on Composite Construction II, Potosi, MO, USA; Contact: Engineering Foundation Conferences, 345 E. 47th St., New York, NY 10017, USA; 212/705-7835.

June 15-16

Seminar/Workshop: Injection Mold Design, Lowell, MA, USA; Contact: University of Massachusetts at Lowell, Special Programs, Continuing Education, 1 University Ave., Lowell, MA 01854, USA.

June 15-19

Gordon Research Conference: Fundamentals of Diamond and Cubic Boron Nitride Film, NH, USA; Contact: Dr. A.M. Cruickshank, Director, Gordon Research Conferences, University of Rhode Island, Kingston, RI 02881-0801, USA; 401/783-4011.

June 16

Symposium: Polymer-Modified Hydraulic-Cement Mixtures, Louisville, KY, USA; Contact: ASTM, 1916 Race St., Philadelphia, PA, 19103, USA; 215/299-5400.

June 17-19

Course: Extrusion Coating Technology: Equipment, Materials, and Processing, Lowell, MA, USA; Contact: University of

Massachusetts at Lowell, Special Programs, Continuing Education, 1 University Ave., Lowell, MA 01854, USA.

June 18-25

Aluminum: Exhibition on the Production and Applications, and Semi-Products, Moscow, RUSSIA; Contact: NOWEA International GmbH, Postfach (BP) 32 02 03, D-4000 Dusseldorf 30 GERMANY; 211/4560-02.

June 21-25

Pressure Vessels and Piping Conference, New Orleans, LA, USA; Contact: ASME, Conference Dept. 345 E. 47th St., New York, NY 10017, USA; 212/705-7722.

June 21-26

P/M '92: Powder Metallurgy World Congress, San Francisco, CA, USA; Contact: MPIF, 105 College Rd., E., Princeton, NJ 08540, USA; 609/452-7700.

June 22-25

Suf/Fin '92 Conference and Exhibition, Atlanta, GA, USA; Contact: American Electroplaters and Surface Finishers Society, Central Florida Research Parkway, Orlando, FL 32826, USA; 407/281-6441.

June 22-25

6th U.S./JAPAN Conference on Composite Materials, Orlando, FL, USA; Contact: K.L. Reifsnider/M.W. Hyer, Dept. of Engineering Science & Mechanics, Virginia Polytechnic Institute & State University, Blacksburg, VA 24061-0219, USA; 703/231-5077.

June 23-25

6th International Sampe Electronic Materials and Processes Conference and Exposition, Baltimore, MD, USA; Contact: D. White, SAMPE, P.O. Box 2459, Covina, CA 91722, USA; 818/331-0616.

June 23-27

1st Pacific RIM International Conference on Advanced Materials and Processing, Hangzhou, PR/CHINA; Contact: PRICM-1 Secretariat, The Chinese Society of Metals, 46 Dongsixi Dajie, Beijing 100711, PR/CHINA; 557031, Ext. 1390.

June 24-26

Electronic Materials Conference, Cambridge, MA, USA; Contact: TMS, Conference Dept., 420 Commonwealth Dr., Warrendale, PA 15086, USA; 412/776-9050.

June 28 - July 2

7th World Conference and Exhibition on Titanium, San Diego, CA, USA; Contact: TMS, Conference Dept., 420 Commonwealth Dr., Warrendale, PA 15086, USA; 412/776-9050.

June 29 - July 3

6th International Conference on Solid Films and Surfaces, Paris, FRANCE; Contact: J. LeCante, LURE-Bat 209 D, Université Paris-Sud, 91405 Orsay, FRANCE; 33/1-6446-8003.

June 30 - July 2

Structural Adhesives in Engineering, Bristol, ENGLAND; Contact: Plastics and Rubber Institute, Conference Office, 11 Hobart Pl., London SW1W 0HL, ENGLAND; 071/245-9555.