

Conference Report

Understanding Microstructure

"Understanding Microstructure: The Key to Advances in Materials" is the theme for the 1996 International Metallographic Society (IMS) Convention, to be held 21-24 July in Pittsburgh. "An Olympic" effort by the Organizing Committee has resulted in excellent programming for the 29th Annual IMS Conference," said General Program Chair Dr. M.G. (Grace) Burke, Westinghouse Electric Corporation—Bettis Atomic Power Laboratory. The Conference will include two special symposia, hands-on workshops, a commercial exhibition, and a two-day meeting.

Two special symposia will be presented during the Conference. "Advances in Specimen Preparation Techniques for Materials Analysis" will be held on Sunday, 21 July. This symposium will cover techniques for the preparation of metallographic specimens, ultramicrotomy, and other techniques for the preparation of complex multiphase materials for analytical electron microscopy. Co-chairs are Wes Hughes, Westinghouse Science & Technology Center, and Steve Glancy, Struers.

The second symposium, "Microstructural Development, Phase Equilibria and Properties," will be held on Monday, 22 July, and will deal with the experimental determination of phase diagrams, phase stability, and equilibria, microstructural development, and phase transformations. Co-chairs are Dr. Mike Notis, Lehigh University, and George Vander Voort, Carpenter Technology Corporation.

The IMS Technical Meeting, chaired by Dr. Elliot Clark, Westinghouse Savannah River Laboratory, and co-chaired by Dr. Eric Palmiere, University of Pittsburgh, will comprise seven sessions highlighted by keynote speakers from the United States, Canada, Brazil, and Great Britain. The Technical Meeting will be held 23-24 July, and will include sessions on Image Analysis and Modeling, Failure Analysis and Microstructural Aspects of Environmental Degradation of Materials, Microstructural Characterization of Novel Materials, Theory and Microstructure of Phase Transformations, and Analysis and Behavior of Surfaces.

Also new to this year's Technical Meeting is a session on "The Virtual Darkroom: Microscopy without Film," a forum for those involved in materials characterization to learn about the latest developments moving away from conventional film-based microscopy, and toward digital imaging, archiving, and processing. The International Metallographic Contest and the IMS Graduate Student Poster Competition will also be featured during the convention.

Contact the ASM Member Services Center, Materials Park, OH 44073-0002; tel: 216/338-5151, ext. 300; fax: 216/338-4634; e-mail: mem-serv@po.asm-intl.org.

Welding and Joining Science and Technology

The First Announcement and Call For Papers/Posters has been made for the First ASM European Welding Science and Technology Conference, being organized by the European Council of ASM International. The conference, taking place in Madrid, Spain, on 10-12 March 1997, is in cooperation with the Centro Nacional de Investigaciones Metalurgicas (CENIM).

The Madrid Conference will cover a wide variety of welding-related topics, both basic and applied. The focus of the conference will be on sharing the information in the field of materials joining and will include topics on welding, soldering, solid-phase welding, and new kinds of joints made using various heat sources.

The Conference tasks will include organization of an extensive discussion of the possibilities for fabrication of new kinds of structures in conventional and advanced materials. The program for the Conference will cover a wide discussion on the problems and solutions in the field of treatment and joining of materials. Topics include modeling of welding processes, process development, weldability, welding metallurgy, and properties of weldments. In addition, papers are solicited on welding and joining issues related to the control of defects, sensing, control and automation, quality, productivity, design and life extensions of welds in automotive, aerospace, shipbuilding, and energy systems.

The three-day Conference will consist of oral presentations and poster sessions, with all contributions to be printed in a volume of proceedings. Participants who wish to present a paper or display a poster should submit a typed, single-page (A4) abstract in English, (not exceeding 300 words) to arrive in the ASM European office before 15 June 1996.

Please address all correspondence and general inquiries, including submission of Abstracts, to the Conference Secretariat: ASM European Office; Boulevard St. Michel, 15; B-1040 Brussels, Belgium; tel: +32.2.743.1546; fax: +32.2.743.1550; e-mail: 100332.670@Compuserve.com.

International Mechanical Engineering Congress & Exposition

The Material Processing Committee of the Materials Division of ASME is sponsoring a symposium on the "Intelligent Manufacturing and Material Processing" for the 1996 International Mechanical Engineering Congress & Exposition and ASME Winter Annual Meeting, Atlanta, Georgia, 7-22 November 1996.

The purpose of the symposium is to provide an appropriate forum for individuals working on different aspects of intelligent material processing and its application in industry. Authors are encouraged to submit papers across a broad spectrum of issues related to intelligent manufacturing methodologies, materials systems, and current applications. Topics of interest include, but are not limited to:

- Process design and optimization
- Fabrication of intelligent material-based systems
- Sensor development and technology
- Process modeling
- Process control
- Novel processing methodologies

Contact: Prof. John Coulter, Intelligent Materials and Manufacturing Lab., Department of Mechanical Engineering and Mechanics, 19 Memorial Drive West, Lehigh University, Lehigh University Bethlehem, PA 18015; tel: 610/758-4503; fax: 610/758-6224; e-mail: jcoi@lehigh.edu or Prof. M. Cengiz Altan, School of Aerospace and Mechanical Eng. University of Oklahoma, Norman, OK 73019; tel: 405/325-1737; fax: 405/325-1088; e-mail: altan@mailhost.ecn.uoknor.edu.

Strength of Materials

The International Conference on the Strength of Materials, ICSMA-11, will focus on the fundamental aspects of deformation, fracture, and strength of crystalline materials of all types. This includes metallic materials, ceramics, intermetallics, ionic crystals, composites, nano- and microcrystals, advanced materials, shape memory alloys, thin films, etc. Presentations of papers of fundamental aspects to applied problems are welcome. ICSMA-11 merges with the Seventh International Symposium on Plasticity of Metals and Alloys (ISPMA-7).

Topics include:

- Fundamental properties of dislocations and other defects (characterization/defect interactions/modeling/simulation)
- Plastic deformation (yielding/strain hardening and softening/microstructure evolution/large strains/plastic instabilities/superplasticity)
- Strengthening mechanisms (solid solution strengthening/precipitation and dispersion strengthening/substructure strengthening) fracture and toughness (mechanisms of fracture/quantitative characterization/effect of temperature)
- Cyclic deformation and fatigue (cyclic hardening and softening/nucleation of microcracks/mechanisms of crack propagation)
- High-temperature creep and fracture (specific creep mechanisms/creep damage/creep crack growth)
- Interface-related strength and environmental effects (grain boundaries/internal and external oxidation/internal interfaces/coating)

Contact: Dr. L. Kunz, Academy of Sciences of the Czech Republic, Institute of Physics of Materials, CZ-616 62 Brno, Zizkova 22, Czech Republic; tel: +42-5-746327; fax: +42-5-41212301; e-mail: kunz@ipm.cz.

Meetings on Powder Metallurgy and Advanced Particulate Materials

The Metal Powder Industries Federation (MPIF), a trade association for the international metal powder and producing and consuming industries, will sponsor the following technical meetings in 1996:

- 17-19 July, Basic P/M Short Course, Penn State Scanticon, State College, Pennsylvania
- 13-14 August, P/M Machinability Seminar, Baltimore, Maryland
- 26-28 August, 1996 Powder Injection Molding Symposium, Penn State Scanticon, State College, Pennsylvania
- 10-11 September, P/M Preventive Maintenance Seminar, Pittsburgh, Pennsylvania

- 1-2 October, Advanced P/M Short Course, Nashville, Tennessee
- 22-23 October, Sintering Seminar, Chicago, Illinois
- 24-25 October, Post-Sintering Operations Seminar, Chicago, Illinois

Contact: Peter K. Johnson, Metal Powder Industries Federation, 105 College Road East, Princeton, NJ 08540-6692; tel: 609/452-7700; fax: 609/987-8523.

Thermal Spray Technical Papers Presented at Corrosion/96

The following papers were presented at the International Annual Conference and Corrosion Show, Denver, Colorado, 24-29 March 1996.

- "Advancements in Application of Thermoplastic Powder Coatings for Railcar Linings," by D. Horton and J. Loustaunau. Order No. 96647
- "Bond Strength of Electrochemically-Aged Arc-Sprayed Zinc Coatings on Concrete," by B.S. Covino, S. Bullard, G.R. Holcomb, S.D. Cramer, G. McGill, and C. Cryer. Order No. 96308
- "Corrosion Control of Subsea Piping Systems Using Thermal Sprayed Aluminum Coatings," by S.L. Wolfson. Order No. 96560
- "Effect of Thermal Sprayed Coatings on In-Bed Tube Erosion and Corrosion in the Fluidized Bed Combusters," by S.W. Lee and B.Q. Wang. Order No. 96147
- "Erosion-Corrosion of Cooled Thermal Sprayed Coatings Impacted by Mixtures of Quartz and Chemically Active Compounds," by B.Q. Wang and K.R. Luer. Order No. 96170

Order from NACE International, P.O. Box 218340, Houston, TX 77218-8340; tel: 713/492-0535.

Thermal Spray Poster Presented at Corrosion/96

"Combustion Spray Processing of Polymers for Corrosion Protection" by Jeffrey Brogan, State University of New York at Stony Brook, Department of Materials Science and Engineering, Stony Brook, NY 11794-2275.

Thermal spraying of virgin polymers is an effective method to produce protective barrier coatings. Thermoplastic spraying provides an environmentally sensitive alternative to paint and other organic formulations since it is a 100% solids process with minimal volatile organic compounds (VOCs). Materials costs can be substantially reduced if recycled and post-consumer commingled polymer (PCCP) is used as the feedstock powder. Since PCCP contains numerous polymer groups including polyethylene, polypropylene, polystyrene, and polyethylene terephthalate, extruded parts may fail from insufficient cohesion. Currently, the effectiveness of PCCP coatings used for protective barrier coatings is under review.

In this study, ethylene methacrylic acid copolymer (EMAA) as well as PCCP coatings were thermal sprayed onto steel substrates. The adhesion of EMAA and various blends of EMAA with PCCP to steel was assessed using ASTM D 3167 peel tests and a modified ASTM C 633 tensile adhesion test. In addition, accelerated weathering tests were conducted according to ASTM G 63; cycling ultraviolet light (UV-B lamps) at 60 °C with condensation at 50 °C, every 4 h for a total of 1250 h. Coating microstructures will be presented along with results from adhesion and weathering experiments. The interfacial fracture toughness was calculated from viscoelastic models. Results indicate that blending PCCP with EMAA increases coating adhesion to steel, decreases the crack density, and decreases the average crack length.

Ethylene methacrylic acid copolymer and a PCCP/EMAA blend was combustion sprayed onto various segments of the Triborough Bridge (Randalls Island, NY) in August and September of 1995. Results from the demonstrations will also be presented to show the feasibility of applying polymer coatings in the field.

High Temperature Materials Laboratory Workshop

In conjunction with the DOE Automotive Technology Development Contractors' Coordination Meeting, a workshop was held 24 October 1995 to describe the High Temperature Materials Laboratory (HTML) Fellowship Program at Oak Ridge National Laboratory (ORNL). The meeting at the Ritz Carlton Hotel in Dearborn, Michigan, was held to inform employees of the automotive and heavy-duty engine companies and their component suppliers of potential research opportunities that exist at HTML. Procedures to access these programs, which are sponsored by the DOE Office of Transportation Technologies, were described to attendees.

Attendees included representatives from such companies as General Motors, Ford Motor Company, Allied Signal, Detroit Diesel, FEV Engine Technology Company, HI-Z Technology Inc., Volkswagen AG, Kyocera, and Allison Engine Company.

Debbie Haught, DOE Program Manager, convened the meeting by welcoming and thanking attendees for their participation. Arvid Pasto, HTML Director gave an overview of HTML capabilities, and Billie Russell, HTML Fellowship Program Coordinator, presented the current status of the program. Other DOE program managers participating were Ted Vojnovich, Mike Michaelis, and Pandit Patil.

Guest speakers were: Thomas Gross (DOE Deputy Assistant Secretary, Office of Transportation Technologies), Maxine Savitz (Director, Allied Signal Ceramic Components), Santosh Limaye (President of LoTec, Inc.), and Barrett Jackson (Former Industrial Fellow, Kyocera). Also attending was Mary Rawlins, Manager, Programs Branch, DOE-Oak Ridge Operations.

Contact: Billie J. Russell, ORNL, P.O. Box 2008, Oak Ridge, TN 37831-6062; tel: 423/574-1926; e-mail: russelbj@ornl.gov, URL: <http://www.hsrn.ornl.gov/mc/fellowfm.html>.

Thermal Spray Papers Presented at the AWS Exposition and Annual Convention

The following papers were presented at International Welding and Fabrication Exposition and Annual Convention of the American Welding Society held in Chicago, Illinois, 21-25 April 1996:

- “ISO/TC 107/SC 5, Thermal Spraying, Work Program,” by R.A. Sulit, Sulit Engineering
- “The Use of Thermal Sprayed Zinc and Zinc Alloys for Infrastructure and Civil Works Rehabilitation: Case Histories,” by K. Duplissie, Platt Brothers & Co.
- “Galvarium Thermal Spray System (55Al/45Zn Arc-Spray Pseudo Alloy over SABNOR Bond Coat on Power Tool Cleaned Steel Surface),” by M. Hamamura, Arc Techno Co., Ltd. (Japan) and R.A. Sulit, Sulit Engineering
- “Thermal Spray Coatings for the Preservation of Infrastructure and Civil Works: BIRL Program,” by T. Bernecki, Basic Industrial Research Laboratory, Northwestern University
- “Applications in the Natural Gas Transmission and Related Industries,” by K. Kempton, Exline Inc.
- “New Wear Resistance/Corrosion Spray Materials for Pump Repairs,” by L.K. Grimenstein, Nation Coatings Systems, Inc.
- “Machining Arc Spray Coatings,” by T.A. Robinson and E.R. Sampson, TAFA Inc.
- “High Output Electric Arc Spraying: A Progress Report on the Introduction of a New Light-Weight, High-Output, Arc Spray System,” by E. Sampson, L. Nieder, J. Dunkerly, and J. Alexander, TAFA Inc.
- “Fused Coatings in Petro-Chemical Industries,” by G.L. Fillion, Wall Colmonoy Corp.
- “HVOF Coatings in Military,” by R.W. Rigney, Integrated Systems Analyst
- “Specifications/Applications Infrastructure,” by R.A. Sulit, Sulit Engineering
- “Aircraft and Corrosion Applications,” by E.R. Sampson, TAFA Inc.
- “Sugar and Glass Industries and Corrosion,” by W.F. Ridgway, Eutectic + Castolin Institute

Contact: The American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126; tel: 800/443-9353.

Thermal Spray Papers Presented at the Adhesion Society Meeting

The following papers were presented at the 19th Annual Meeting of The Adhesion Society held 18-21 February 1996 at Kingston Plantation, Myrtle Beach, South Carolina:

- “The Durability of Adhesively Bonded Titanium: Performance of Plasma Sprayed Polymeric Coating Pretreatments,” by F. Jackson, J. Dillard, D. Dillard, B. Holmes, H. Parvatareddy, and R. Zatorski, Hampton University
- “Use of Plasma Sprayed Coatings as Surface Treatments for Aluminum Adherends,” by Guy D. Davis, P.L. Whisnant, G.B. Groff, and J.D. Venables, DACCO SCI., Inc.
- “The Notched Coating Adhesion Specimen: A Quantitative Test for Coating Adhesion,” by Tsunou Chang, Yeh-Hung Lai, and David A. Dillard, Virginia Tech.

Contact: Kim Mills, The Adhesion Society, 2 Davidson Hall, Blacksburg, VA 24061-0201; tel: 540/231-7257.