

Conference Report

NTSC'96 Conference

Showcasing the advantages of thermal spray technology for design engineers and other specifiers, the 1996 National Thermal Spray Conference & Exposition (NTSC'96) will be held concurrently with Materials Week '96 at the Cincinnati Convention Center, 7-10 Oct. NTSC'96 is sponsored by the ASM Thermal Spray Society (ASM-TSS), an Affiliate Society of ASM International. "In addition to providing a forum for those who already work with thermal spray, we look forward to bringing our processes and applications before the more than 3000 materials engineers and specifiers who visit Materials Week," said Dr. Robert C. Tucker, ASM-TSS vice-president and conference general chairman (corporate fellow and Associate Director of Praxair Surface Technologies, Inc.).

The conference will comprise more than 200 technical presentations on the latest in thermal spray research and practical applications. Sessions will cover materials, processes, and characterization; land transportation applications; aerospace; marine applications; infrastructure maintenance; power generation; petroleum/petrochemical industries; and commercial developments. In addition, the NTSC'96 Exposition will feature the latest developments in thermal spray equipment, coatings, metallographic equipment and services, instrumentation and applications.

Materials Week, the major concurrent event held in Cincinnati with NTSC '96, is sponsored by ASM International and TMS (The Minerals, Metals, and Materials Society) and features more than 200 technical sessions on a wide variety of topics, as well as a Materials Testing Exposition with more than 100 exhibiting companies. "By holding NTSC concurrently with Materials Week, we give attendees of both events more value for their conference dollar," said Robert C. Uhl, ASM-TSS Executive Director. "In addition, materials engineers and specifiers have an opportunity to become better acquainted with thermal spray technology and its many applications for heat, wear, and corrosion prevention. And in return, members of the ASM Thermal Spray Society have an opportunity to learn more about advances throughout the materials field."

For complete information about NTSC'96, the NTSC Exposition, and Materials Week, contact the ASM Member Services Center: tel: 800/336-5152, ext. 703 (U.S. only) or 216/338-5151, ext. 703; fax: 216/338-4634; e-mail: mem-serv@po.asm-intl.org. Or, visit the ASM International website at <http://www.asm-intl.org>.

NTSC'96 Exposition

The latest advances in thermal spray technology—an aerospace-proven alternative for resistance to heat, wear, and corrosion—will be showcased at NTSC'96. With exhibits from more than 50 companies and organizations, the National Thermal Spray Exposition will feature new developments in thermal spray equipment, coatings, metallographic equipment and services, instrumentation, and applications. As a first step toward understanding these applications and technologies, thermal spray product briefing sessions will be held. These popular forums are practical and not highly technical, and are designed to familiarize attendees with the latest services, consumables, and equipment developed by various exhibitors.

More than 1200 visitors are expected to attend, with an additional 3300 expected to attend the adjacent Materials Exposition, sponsored by ASM International and TMS (The Minerals, Metals, & Materials Society) as part of their annual "Materials Week" event. "We expect our National Thermal Spray Expo to draw a high number of thermal spray practitioners, specifiers, and R&D personnel, but we're also looking to introduce thermal spray to the many design engineers, purchasing agents, and quality assurance personnel who come to Materials Week," said Doug Dickerson of Praxair Surface Technologies, chairman of the thermal spray exposition's sales and marketing committee.

Admittance to the NTSC Exposition is free with all conference registrations (multiple or single day). Free Expo-only passes are available from ASM. Visitors to the exposition may also attend the adjacent ASM-TMS Materials Exposition at no cost.

Materials Week

The world's leading annual event for materials researchers, engineers and specifiers, Materials Week '96, 7-10 Oct in Cincinnati, OH, will feature more than 900 presentations on new developments in materials testing, surface engineering, and ad-

vanced materials research. "In today's market-driven workplace, getting maximum performance from materials depends strongly on the quality of interaction between the research and industrial communities," said Alexander R. Scott, TMS executive director. "Materials Week is the one place where the leaders of these communities can come together to share information and to network at an international and interdisciplinary level."

Sponsored by ASM International and The Minerals, Metals, & Materials Society (TMS), the Materials Week technical program is engineered around the theme "Improving Materials Performance in Today's Marketplace." This year's program comprises more than 120 sessions, with presentations ranging from fundamental science to proven production technologies. The materials testing focus area features multisession symposia and technical programs on:

- Cast Metal Matrix Composites: Processing, Properties, Applications
- Creep and Stress Relaxation in Miniature Structures and Components
- Deformation and Fracture of Ordered Intermetallic Materials
- Failure Analysis
- Fundamentals of Deformation and Fracture
- Materials Issues in Machining
- Metallurgy, Processing and Applications of Metal Wires: State-of-the-Art Technology and Challenges for the Future
- Nondestructive Evaluation and Materials Properties
- Retained Austenite and Mechanical Behavior
- Surface Performance of Titanium Alloys
- Tribology of Materials

The 2nd Annual Surface Engineering Symposium comprises a second area of focused technical programming. Twenty sessions, featuring 315 papers from 14 countries, will cover applications ranging from corrosion and wear resistance to biomedical, electronic, and optical applications. The symposium will also cover coating methods including CVD, PVD, thermal spray, laser, ion-beam processes (including plasma nitriding), carburizing, electroplating, and painting.

A third focus area on advanced materials research and applications will feature a number of symposia and multisession programs, including:

- Alloy Design and Soldering Technologies for Lead-Free and Lead-Bearing Solders
- Automotive Materials Technology
- Diffusion and Reaction in Thermal, Electrical Field, and Stress Gradients
- Hard and Soft Magnetic Materials
- High Temperature Materials
- Impact of Information Technology on the Global Materials Industry
- Industrial Applications of Materials Synthesis: Rapid Tooling
- International Symposium on Nickel and Iron Aluminides: Processing, Properties, and Applications
- The Invar Effect: A Centennial Symposium (marking the 100th anniversary of its discovery)
- Kinetically Determined Particle Shapes and the Dynamics of Solid: Solid Interfaces
- "Making It Green," the Symposium on Environmentally Conscious Manufacturing
- Metal Ceramic Interfaces
- Modeling Forming Processes of Materials in the Semi-Solid State
- Multi-Media Based Instruction in the Classroom
- Processing and Fabrication of Advanced Materials
- Smart Materials and Properties
- Solidification and Powder Processing of Rare Earth Based Materials

"The purpose of Materials Week is to be an essential event for members of both societies, as well as for anyone interested in the performance of metals and engineering materials," said Edward L. Langer, ASM managing director. "We believe that

bringing together many technical presentations maximizes a delegate's learning and networking opportunities, while minimizing their travel expenses and time spent away from work."

Full-conference registrants to Materials Week will pay a single fee for complete access to all technical sessions sponsored by ASM and TMS. Other events during Materials Week include the ASM-TMS Materials Exposition, three distinguished lectures, and the ASM Awards Dinner. In addition, Materials Week '96 will be held in conjunction with the National Thermal Spray Conference & Exposition (NTSC'96), sponsored by the ASM Thermal Spray Society, an Affiliate Society of ASM International. This technical program features more than 200 presentations covering the latest research and practical applications regarding thermal spray, an aerospace-proven technology for high-performance heat, wear, and corrosion resistance.

For complete details on Materials Week '96, visit the Materials Week '96 Website at <http://www.asm-intl.org/matlswk/>, or contact ASM Member Services Center: tel: 800/336-5152, ext. 703; 216/338-5151, ext. 703; fax: 216/338-4634; e-mail: matlswk@mailback.com or TMS Customer Service: 412/776-9000, ext. 270; tel: 800/759-4867; fax: 412/776-3770; e-mail: csc@tms.org.

Heat Treating Society '96 Conference Is a Success

The 1996 ASM Heat Treating Society Conference & Exposition, "The One for Heat Treaters," lived up to its name with timely and practical conference sessions, a record-sized exposition, and a number of new services designed to provide real-world solutions to heat treat problems. "We're very pleased with the results of this year's event," said Jerry Hoeft of Caterpillar Inc., ASM-HTS President. "A record number of exhibitors made this our biggest event yet, and the attendance of a growing number of conference delegates tells us that we're meeting the technical programming needs of more of our members."

Highlights of the conference and exposition included a technical program more than twice the size of previous ASM-HTS events; a 246-exhibitor expo featuring the latest in heat treating furnaces, equipment, and services; and an "Ask the Experts" area that provided practical answers at the ASM-HTS exhibit.

For the first time, the results of ASM-HTS Immediate Needs Surveys in 1990 and 1995 influenced the content of the conference program. "Once our research had helped us to determine what information heat treaters and their customers needed most, it fell to our committee to provide it," said Jon Dossett of Midland Metal Treating Inc., conference co-chair. "That's why the conference was bigger than ever before—there was a lot of ground to cover."

According to Bob Luetje of Kolene Corporation, who co-chaired the conference with Dossett, the most frequent inquiries from ASM-HTS members and other heat treaters were on subjects such as increasing the heating efficiency of furnaces, modeling and control of distortion, and reduced cycle times and process controls. "That's what provided guidance for the development of this year's program," Luetje said. "And thanks to the efforts of the members of the Programming and Events Committee, and the involvement of a record number of presenters, I think we were able to meet our objectives."

Total conference registration of 837 delegates "far exceeded our expectations," Hoeft added, and a total event attendance of 4345 "will provide excellent momentum for our next big heat treat event." The 1997 ASM-HTS Conference & Exposition, 16-18 Sept 1997 in Indianapolis, will be held in conjunction with Materials Week '97.

Conference on Quenching and the Control of Distortion

Quenching and distortion problems produce some of the biggest and most expensive headaches in heat treating. To help heat treaters cut costs and improve the quality of their products, this billion-dollar problem will be the subject of the 2nd International Conference on Quenching and the Control of Distortion, to be held 4-7 Nov 1996, in Cleveland, OH.

This conference is sponsored by the Programming & Events Committee of the ASM Heat Treating Society, and is cosponsored by ATTT, AWT, Heat Treating Network, Heat Treatment Institution of Chinese Mechanical Engineering Society (CMES), INFAC IIT Research Institute (IITRI), Japan Heat Treating Society, Metal Treating Institute, Russian Metallurgists Association, and Wolfson Heat Treatment Center.

Understanding quenching and distortion control is of vital importance for the continued technical growth and economic development of the heat treating industry," said conference co-chairman George Totten, Union Carbide Corp., Tarrytown, NY. "At our first international conference in 1993, we felt that quenching was one of the least understood of the heat treating technologies. Since then, there has been an explosion of research programs, particularly in quench process development, distortion modeling, and in identifying and understanding root causes and methods of control of distortion, both ferrous and nonferrous."

"Bringing researchers and heat treaters together is the most important function of any conference, and one of the primary objectives in organizing this event," said conference co-chairman Maurice Howes, IIT Research Institute, Chicago, IL. "Our

goal is to provide a current, global assessment of quenching technology while providing a forum for possible future collaboration."

To provide additional learning opportunities, ASM-HTS will present two full-day seminars on Sunday, 3 Nov, immediately preceding the conference. More information about "Computer Simulation of Distortion Control During Heat Treating Processes" and "Fundamentals of Quenching Technology," including registration fees and course details, are available from ASM-HTS.

On Monday, 4 Nov, the Prof. Imao Tamura Memorial Symposium will be held in conjunction with the conference. Prof. Tamura spent his entire professional life conducting quenching and quenching-related research, and many of the researchers who have continued in his footsteps will speak on various aspects of fundamental quenching technology. From Tuesday through Thursday, 5-7 Nov, an additional 25 technical sessions will feature more than 125 presentations on cooling curve analysis, hardenability prediction, gas quenching, fluidized bed technology, press quenching, laser hardening and distortion, modeling microstructure (heat transfer, residual stress and distortion), distortion, spray quenching, and measurement.

Conference co-chairman Soren Sjoström, ABB Stal AB, Finspang, Sweden, said that this conference represents the most exciting overall program on global quenching technology ever assembled. "The number of papers submitted by overseas authors is outstanding, and this is an ideal opportunity to discuss research that is ongoing in all parts of the world," he said.

For complete information, contact the ASM-HTS Member Services Center, Materials Park, OH, 44073-0002; tel: 800/336-5152, ext. 703 (U.S. only) or 216/338-5151, ext. 703; fax: 216/338-4634; e-mail: mem-serv@po.asm-intl.org. <http://www.asm-intl.org>.

The International Conference on Advances in Welding Technology

The International Conference on Advances in Welding Technology, will be held on 6-8 Nov 1996, at the Hyatt on Capitol Square, Columbus, OH. It is sponsored by the Edison Welding Institute, The American Welding Society, The Welding Institute, and the Navy Joining Center. Contact Renee Dickinson: tel: 614/487-5819.

Special Courses

Introduction to Thermal Spray—Processes, Coatings, and Applications

This course (7 Oct 1996, Cincinnati, OH, during NTSC'96) is intended for those new to thermal spray and those who want a basic overview/introduction to thermal spray and its background to better understand the conference presentations. This course includes a brief review of the major advanced thermal spray processes, a description of the more commonly used coatings, and focus on the selection of coating processes and materials for specific applications. The coating processes addressed will include plasma spray, high-velocity oxyfuel, detonation gun deposition, and wire arc. The microstructural characteristics and the related material properties will be discussed as related to wear, corrosion, electromagnetic, and other novel applications. A substantial portion of time will be spent on the selection of processes and coatings to solve specific industrial problems.

The program includes:

- Thermal Spray Processes: Plasma spray, High-velocity oxyfuel spray, detonation gun deposition, advanced wire arc
- Coatings Structures and Properties: Metallic, cermet, ceramic
- Applications: Wear, corrosion, thermal barrier, electromagnetic, others

Instructors: Douglas H. Harris and Robert C. Tucker, Jr. Fee \$99 (ASM and cosponsor members \$79).

Thermal Spray Technology

The course (3-5 Oct 1996, Cincinnati, OH, during NTSC'96) reviews the processing science for each thermal spray coating process, introducing the theory of operation. The theory and practice of the coatings will be presented, including coating application, characterization, and testing. Practical coating systems for electric arc flame and plasma will be reviewed using case

studies, offering students first-hand knowledge of user experience. This course would be of interest to process application, development and design engineers, researchers and quality control personnel. It would also be helpful for anyone involved in specifying materials, material suppliers, sales representatives, and technical management.

Thermal spray coatings are receiving new attention as a method of solving corrosion, wear, and compatibility problems. Thermal spray processes of electric arc, combustion, and plasma spray coatings can apply almost any material to the surface of another. These coating systems must be engineered and applied correctly to operate as an overlay surface. However, education is vital to understanding the coating systems and improving thermal spray coating reliability.

The program includes:

- Surface Science: Coatings, processing, interface/compatibility, alternative processes
- Thermal Spray Process Design: Equipment and theory, selection, electric arc/combustion spray (flame, D-gun, HVOF), plasma
- Processing: Surface preparation, masking and tooling, deposition, post processing (heat treat, HIP, fusion, machining, stripping)
- Coating Systems: Corrosion, compatibility/protection, wear/erosion, thermal barrier, abradable seals, repair, clearance control, abrasive, environmental, electronic/optical
- Materials Systems: Wire, powder, composites, metals, ceramics, cermets
- Applications/Practice/Controls: Industrial, aerospace, automotive, chemical, medical automation, instrumentation, controls
- Testing/Characterization: Bond, mechanical, hardness, metallography, wear/corrosion/erosion, density, structural, standards/specifications
- Designing for Thermal Spray Coatings: Processing, structural, properties
- Processing Systems: Air plasma, flame, vacuum plasma, wire arc, D-gun, HVOF
- Health and Safety

Instructor: Walter Johnson. Fee: \$995 (ASM and cosponsor members \$895).

Workshop on the Metallography of Thermal Spray Coatings

This course (7 Oct 1996 Cincinnati, OH, during NTSC'96) is designed to familiarize students with techniques that will provide a clearer representation of thermal spray coated materials. Microstructural interpretation including density measurement procedures of these materials require proper preparation techniques. Examination of coated materials for microporosity definition will be emphasized along with various metallographic techniques for use by investigators in achieving a better understanding. Much of the course activity will emphasize student preparation techniques using state-of-the-art equipment. Students are encouraged to bring mounted samples with them. This course is intended to benefit investigators through a better understanding of their microstructures using the most advanced techniques.

The program includes:

- Overview of specimen preparation procedures applied to thermal sprayed coatings
- Instructions and hands-on operation using current techniques
- Use of vacuum infiltration procedures, where needed
- Understanding the relation between procedures and the resultant microstructure
- Proper use of automated polishing equipment when determining sample integrity. Manufacturing representatives will perform demonstrations
- Etching and etchants
- Instruction and operation of optical equipment: metallurgical microscopes, metallographs, and photomicrographic cameras

Instructor: Arthur Geary. Fee: \$375 (ASM members \$295).