

Conference Report

Conference Information

Exhibitor Prospectus for ITSC'98

26-28 May 1998, Nice, France. Cosponsored by the German Welding Society and by the High Temperature Society of Japan with the patronage of the International Institute of Welding (IIW) and the scientific assistance of the Select Committee "Surfacing and Thermal Spraying" of the IIW.

ITSC is the largest International Conference and Exhibition in the field of Thermal Spraying. The last ITSC was held in Kobe, Japan, in 1995. The next ITSC (the last one of this century) will be held in Nice, France, in 1998. This major event will be a superb opportunity to everyone associated with this technology. The exhibition will be held concurrently with the conference and applies to all kind of equipment, materials, or service suppliers dealing with thermal spraying.

Processes and Equipment

Thermal spray equipment, air filtration equipment, automation equipment for thermal spray, characterization equipment, materials handling equipment, materials processors, safety equipment, surface preparation and finishing equipment, thermal diagnostic imaging sensors, blasting media, water jet cleaning, pressure and vacuum blasting, flow controllers, wet collectors, air compressors, exhaust systems.

Materials

Wires for arc and flame; ceramic rods; masking compounds and tapes; metallic, intermetallic, and ceramic powders; self-fluxing powders; sealants; abrasable materials.

Services

Commercial thermal sprayers, characterization and evaluation services, thermal spraying applications, industrial gases suppliers, pressure and vacuum blasting, on-site coating services, shop coating services, volume production, reclamation.

Others

Scientific associations; editors; research centers; universities; laboratories; market research; robotics; metallographic equipment; contract research; education; data acquisition, testing services.

Exhibit days are from Tuesday, 26 May 1998 to Thursday, 28 May 1998 (10 am to 5 pm).

Exhibition Committee

E. Pesme (Air Liquide, France); Chairman; R. Cooper (X-Form, USA); G. Gueldry (SNEMCA, France); C. Howes (Miller Thermal, USA); F. Tourenne (Bioland, France); R. Lucchese, A. Lefort (CEA, France); A. Saida (European Gas Turbines, France); B. Hansz (IPSE, France); D. Cornu (SEP, France); J-P. Duhamel (Sulzer Metco, France); A. Proner (SNMI, France).

Registration Fee

Pre-equipped booth package (module: 9 square meters): 23,000 FF (~ \$U.S. 4,300)

Includes: Walled enclosure of profiled anodized, aluminum columns with white melamine profile panels lettered header board within the structure; flooring of woven blue carpet; sign; electrical outlets; lighting; daily cleaning; and exhibitor badges.

Free space (minimum of 2 modules) 18 square meters: 32,000 FF (~ \$U.S. 6,000) with additional modules at 13,000 FF (~ \$US 2,500).

Also included are administration costs, 1-page feature in the exhibition catalogue, 50 invitations cards to the exhibition and forum, 1 invitation to the opening cocktail reception, 1 invitation to the gala evening, Colloquium proceedings and 1 parking card per booth. For more details contact:

EUROPE, AFRICA, SOUTH AMERICA: Congrès Scientifiques Services (France), 2 rue des Villarmains, BP 124, F-92210 Saint Cloud, France; phone: +33 (0)1.47.71.90.04; fax: +33 (0)1.47.71.90.05; e-mail: montmayeul@chartreuse.cea.fr; NORTH AMERICA and NTSC EXHIBITORS: Jan DiRosa, ASM (USA), Materials Park, OH 44073-0002; phone: 1/216/338-1733; fax: 1/216/338-4634;

e-mail: jdirosa@po.asm-intl.org; ASIA and PACIFIC COUNTRIES: Dr. Akira Kobayashi, Welding Research Institute Osaka University, 11-1 Mihoo Ibaraki, Osaka 567, Japan; phone: 06-879 8651 or 06-879 8684; fax: 06-879 8689; e-mail: kobayasi@jwri.osaka-u.ac.jp.

Thermal Spray Processing of Nanoscale Materials

2-8 August 1997, Davos, Switzerland. Significant interest has been generated recently in the field of nanoscale (nanocrystalline, nano-phase) materials. This interest stems not only from the outstanding properties that can be obtained in such materials, but also from the realization that early skepticism about the ability to produce high-quality, unagglomerated nanoscale powder was unfounded. Accordingly, the focus is shifting from synthesis to processing, that is, how to make useful coatings and structures from these powders. The potential applications span the whole spectrum of technology, from thermal barrier coatings for turbine blades to wear-resistant rotating parts.

Significant progress has been made in various aspects of processing on nanoscale materials. Most of this work is focused on the fabrication of bulk structures. However, the process most likely to have the soonest (and perhaps the greatest) major technological impact is deposition of coatings by thermally activated processes. This includes so-called "thermal spray" such as HVOF and plasma spray, but also includes innovations such as chemical vapor condensation (CVC) and a number of exciting new combustion processes.

The following sessions will be covered by the conference program: Process Modeling, Physical and Mechanical Properties, Recent Innovations in Processing, Applications, Thermal Stability—Modeling and Experimentation, Interfaces, Functionally Graded Materials, Microstructure Control during Processing, and Post Deposition Processing.

The Engineering Foundation has announced a Conferences Fellowship Program. Applicants are limited to those currently active in engineering or related professions with a direct interest in the conference topic. They must be within ten years of their B.S. degree at the time their application is submitted. The stipend is sufficient to cover the conference registration fee and on-site room and board. Transportation expenses are not included. Application information may be obtained by fax from the Engineering Foundation or on the World Wide Web.

Davos, the highest town in Europe, is a well-known ski resort and summer hiking and climbing center in the easternmost Swiss province of Graubunden. It is not far from the Austrian border, southeast of Zurich, and north of St. Moritz. The conference sessions will be held at the Congress Hall (Kongresszentrum). Conference participants will be housed at two hotels close to each other and the Congress Hall. Lunches and most dinners will be eaten at the Cresta Sun Hotel.

The conference fee is all inclusive. It includes registration, accommodations, meals, taxes, and gratuities from dinner on Sunday through lunch on Friday. The fees are tentatively set at: participant (single room), \$1110; participant (sharing room with another participant or guest), \$1070; graduate student, \$780; and guest, \$500.

The conference organization consists of the following: Conference Chair: Enrique J. Lavernia, Department of Chemical Engineering and Materials Science, University of California at Irvine; phone: 1/714/824-8714; fax: 1/714/824-2262. Conference Co-Chairs: Dr. Lawrence Kabacoff, Office of Naval Research, Materials Division; phone: 1/703/696-0283; fax: 1/703/696-0934; Dr. Manfred Ruhle, Max Planck Institut für Metallforschung, Institut für Werkstoffwissenschaften; phone 49-711-209-5319; fax: 49-711-209-52950; and Professor Koichi Niihara, The Institute of Scientific and Industrial Research, Osaka University; phone: 81-6-879-8440; fax: 81-6-879-8444. Contact: Engineering Foundation, 345 East 47th Street, New York, NY 10017; tel: 212/705-7836; fax: 212/705-7441; e-mail: engfnd@aol.com.

Fine Powder Processing '97

15-17 September 1997, the Penn State Conference Center Hotel University Park, Pennsylvania.

An International Conference on Fine Grinding, Classification, and Agglomeration Science and Technologies
Organized by: The Particulate Materials Center at Penn State and Hosokawa Micron Powder Systems

The objective of the conference is to explore new developments and applications in the processing of micron and submicron powders. Much of the progress in the science and technology of particle systems has occurred in the context of specific industries; applications or academic disciplines and developments in one area are often not recognized in others. The conference is intended as a forum for bringing together different aspects of the science and technology of fine powder processing, with emphasis on fine grinding technologies, classification, and agglomeration. The purpose is to explore new developments and novel processing alternatives and share technologies across industry/discipline boundaries.

Co-Chairpersons: Professor Richard Hogg, The Particulate Materials Center of The Pennsylvania State University and Dr. C.C. Huang, Hosokawa Micron Powder Systems.

Papers and poster presentations are invited in the following topic areas: fundamentals of grinding and classification; novel grinding and classification devices and technologies; modeling and simulation of grinding and classification systems; grinding for mineral liberation; wear and contamination control; particle shape control; scaling of capacity and energy; ball, media, and jet mills; agglomeration/deagglomeration processes; flow behavior; powder production for non-brittle materials; production of fine powders with narrow size distributions; grinding aids and mechanochemical interactions; optimized grinding and classifying circuits; grindability and grinding limits of materials; dry and wet classification systems; particle size and morphological analysis; real-time, in-process particle size

analysis; instrumentation and control systems; explosion hazards; compaction/tabletting; plant practice on fine grinding and classification processes; and powder production for heat/energy sensitive materials.

Contact: Robert G. Cornwall, Associate Director, The Particulate Materials Center, The Pennsylvania State University, 147 Research Building West, University Park, PA 16802-6809, USA; phone: 814/863-6156; fax: 814/863-9704; e-mail: rgc5@psu.edu.

Bioceramics 10

5-9 October 1997. Many researchers from different parts of the world will have the opportunity to exchange new ideas and recent experimental and clinical data. Clinicians and fundamental researchers will be welcomed. This tenth symposium will cover the whole area of ceramics for biomedical applications: fabrication process, structure, physical and biological properties, and clinical applications. Dense or porous ceramics, bioglasses, sintered oxide and nonoxide ceramics, carbon, single crystals, cements, ceramics composite with polymers, metals or organic polymers, bioactive ceramics will be accepted if applied to biological field. Biological subjects will deal with hybrid systems, cell cultures, cell behavior on different ceramic materials, *in vivo* studies, *ex vivo* analysis, and clinical applications. Clinical application includes different fields like orthopedic surgery, dentistry, maxillofacial surgery, plastic surgery, cardiovascular surgery, ENT, neurosurgery.

Contact: Martine Henry-Amar Laboratoire de Recherches Orthopédiques, Faculté de Médecine Lariboisière, Saint-Louis 10, avenue de Verdun, 75010 Paris, France; tel: 33 1 44 89 77 42; fax: 33 1 44 89 78 22.

CORCON—97

3-6 December 1997, Nehru Centre, Mumbai, India. This will be the first International Exhibition on Corrosion to be held in India under the NACE Banner. NACE International, is the world's largest society of professional engineers dedicated to advancing the knowledge of corrosion resistance and prevention. Every year, India suffers a loss of Rs. 24,000 crores (US\$ 7 billion) due to corrosion. At least 25% of this, that is, Rs. 6,000 crores (US\$ 2 billion), can be avoided through proper corrosion control methods. Corrosion is a universal problem, and NACE, with 15,000 members worldwide, are not only making people aware, but also finding out means and ways to reduce the losses.

The Exhibition theme is "Corrosion Monitoring, Mitigation and Assessment." Plenary talks, by experts on the theme topics will be held everyday in the morning. These will be followed by contributed papers and poster presentations.

Contact: Rajan Bahri, NACE International—India Section, 386, Veer Savarkar Marg, Prabhadevi, Mumbai 400 025, India; tel: 422 8042, 430 7023; fax: 00 91 22-4307365; e-mail: ashok@soochak.ncst.ernet.in.

Third International Particle Technology Forum

6-9 July 1998, Brighton Center, England. Continuing the tradition of the previous biennial International Particle Technology Forums in Denver (1994) and San Diego (1996), the Third IPTF sponsored by AIChE will be held in conjunction with the WCPT-3 in Europe. Approximately 400 papers will be selected for presentation at the Congress. The papers will be fully refereed and published in the Proceedings. A full-day tutorial/workshop on "Emerging Particle Technology: A Vision to the Future" will be held on 6 July 1988. In parallel with the conference, an exhibition will be organized for leading particle technology companies to display their latest developments.

Papers are sought in the following areas: measurement and on-line control; particle interactions and assembly mechanics; agglomeration and growth; comminution and attrition; particle formation; multiphase flow; dispersion, rheology and mixing; particle/fluid separation and drying; powder mechanics, storage and flow; and high-performance particles and new processes.

Organizing Committee of the Third IPTF Chair: Prof. M.C. Roco, National Science Foundation, 4201 Wilson Blvd., Suite 525, Arlington, VA 22230, USA; tel: 703-306-1371, fax: 703-306-0319; mroco@nsf.gov; www.nsf.gov/eng/ptf.

To keep updated on the arrangements contact the Web Site: <http://www.nsf.gov/eng/ptf/> and click on "Meetings." Contact: Miss Jennie Black, Conference Section, IChemE, 165-189 Railway Terrace, Rugby CV21 3HQ, U.K.; tel: 011/44-1788-578214; fax: 011/44-1788-577182; e-mail: jblack@icheme.org.uk.

American National Standards on Thermal Spraying

27-30 April 1998, Detroit, Michigan. The American Welding Society's C2 Committee on Thermal Spraying invites experienced practitioners who can share their experience with people who are still new to thermal spray or who are wondering about the usefulness of this process in their own business, success stories, new uses for thermal spray applications, and solutions to some old problems. Tutorials and educational presentations are also sought from qualified professionals and educators.

Topics of particular interest are (1) automotive applications, (2) infrastructure preservation, (3) chrome plating alternatives, (4) machine element restoration and repair, (5) tool and die repair, (6) thermal spraying of plastics, (7) spray forming, and (8) application development. Papers can be submitted under the following headings.

- *Research-oriented—new science or new research:* This paper presents new, unpublished work in science or engineering in thermal spray processes.
- *Applied Technology—new or unique application:* This paper applies known principles of thermal spray science or engineering in a unique, unpublished application.
- *Education—thermal spray education-related topic:* For, about, or pertaining to thermal spray educators and trainers at all levels, their methods, and their successes.

Please submit your abstract(s) by 31 July 1997, to be screened by the C2E Subcommittee on Conference and Show for the 1998 Symposium. Authors will be notified in December 1997 regarding the acceptance of their papers. Each abstract (summary) should be sufficiently descriptive to give a clear idea of the content of the proposed paper. In any case, it must contain not less than 300, but preferably not more than 500, words. Repeated references to a company and/or the use of advertisements, trade names, or trademarks (or expressions considered as such by the industry) are not permitted. Suitable generic terms must be used, in accordance with those standardized by the American Welding Society, where applicable.

Contact: AWS, 550 N.W. LeJeune Road, Miami, FL 33126. Applications may also be submitted via e-mail (lyons@amweld.org) or by fax (305/443-5951), if followed by a mailed copy of the original application and abstract. To assure your paper's consideration for the 1998 Symposium, your applications must be postmarked no later than 31 July 1997.

International Conference on Surface Engineering

18-21 November, 1997. ICSE Shanghai '97 is developed carefully to address the rapid economic growth and technology changes that accelerate the design and manufacturing of world-class products and to bring together engineers and researchers to forecast the perspective of surface engineering toward the 21st century.

Topics: Fundamental research in surface engineering; advanced manufacturing technologies; energy-and-material-saving techniques; environmental protection technologies; hybrid surface techniques; technical design in surface engineering; surface protection and treatment corrosion resistance including wear resistance, antifriction, application, decoration, renovation, damping of vibration, sound attenuation and fatigue resistance; application of surface engineering in various industrial sectors; methods of evaluating surface coating microstructures and properties; and developments on surface engineering equipment, instruments, and new materials.

Contact: Conference Secretariat: The Chinese Mechanical Engineering Society, 46 Sanlihe Rd., Beijing 100823, China; fax: (86 10) 6859 5314/(86 10) 6853 3613; e-mail: cmesdpfg@public.bta.net.cn.

United Thermal Spray Conference

Responding to the need for an annual, high-quality international thermal spray conference and exhibition, the ASM Thermal Spray Society (TSS) and German Welding Society (Deutscher Verband für Schweisstechnik, or DVS) have agreed to merge their respective conferences, NTSC and TS.

The societies' first jointly sponsored event, the United Thermal Spray Conference (UTSC), will be held 15-19 September 1997 in Indianapolis, IN. The conference and its accompanying exposition will provide a single forum where materials and design engineers, research scientists, manufacturers, suppliers, and users of thermal spray can discuss the latest advances and applications.

No TSS and DVS activities are planned in 1998 because of ITSC '98, the International Thermal Spray Conference in Nice, France.

In 1999, the second event jointly sponsored by TSS and DVS will initiate a new thermal spray event that will rotate annually between locations in North America, Europe, and the Pacific Rim.

In those years when the joint conference is held outside the United States, TSS will organize a Thermal Spray Symposium to be held in conjunction with ASM-TMS Materials Week.

For more information about membership in TSS, an Affiliate Society of ASM International, contact the ASM Member Services Center, Materials Park, OH 44073; tel: 216/338-5151, ext. 900; fax: 216/338-4634; e-mail: mem-serv@po.asm-intl.org; <http://www.asm-intl.org>.

Recent Conferences

Thermal Spray '97

8-10 April 1997, Atlanta, Georgia

- Mario H. Kyd (President, Sulzer Metco, US Inc.), "Redefining the Thermal Spray Coating Industry"
- Paul A. Kammer (Senior Executive, Eutectic + Castolin Group), "Eutectic + Castolin - Advancing Thermal Spray into the 21st Century"

- David Harvey (Technical Specialist, Surface Engineering TWI), "Novel Industrial Applications for HVOF Sprayed Coatings"
- Keith O. Legg (President, Rowan Catalyst), "Thermal Spray Markets—Potential, Processes, Pitfall"
- Dr. James B.C. Wu (Vice President of Technology, Stoodly Deloro Stellite, Inc.) and Damodaran Raghu (Technical Director, Stellite Coatings Division), "Developments in High Velocity Thermal Spray Processes & Materials - An Evaluation"
- Michael Haw (Business Manager, Powders Division London & Scandinavian Metallurgical Co.), "Opportunities for Novel SHS TiC-Based Thermal Spray Powders"
- William R. Martin (Vice President, Technology Transfer Lockheed Martin Energy Research Corp.), "Surface Enhancement Technology at Oak Ridge"
- Norbert Czech (Manager, Siemens AG Power Generation), "The Use of Thermal Spray Coatings in Advanced Stationary Gas Turbines"
- Thomas Tom (Director, Advanced Technology Howmet Corp.), "Spray Forming Gas Turbine Components"
- Richard Litton (Director, Litton Consulting), "Outlook for Demand of TS in Worldwide Overhaul & Repair of Gas Turbine Engines"
- Paul Lawton (Vice President, Business Development, Chromalloy, New York), "Current and Future Applications of Electron Beam Physical Vapor Deposited Thermal Barrier Coatings (EB PVD TBC)"
- Dr. Mark F. Smith (Senior Member of Technical Staff, Sandia National Laboratories), "Production Spraying of Cylinder Bores in Aluminum Automobile Engines"
- Anthony J. Rotolico (Commercial Director, Engelhard Surface Technologies), "Ceramic Thermal Barrier Coatings for Diesel Engines"
- Dr. Robert C. McCune (Staff Technical Specialist, Ford Motor Co.), "Recent Experience with the Cold Gas-Dynamic Spray Method"
- Dr. Jeffery A. Colwell (Research Leader, Battelle), "Engineered Surfaces for Industrial Applications"
- Art Ehrenbergh (Production Manager, Harper Corp. of America), "Printing and Thermal Spray: What's the Connection?"
- Dr. Christian Moreau (Research Officer, National Research Council Canada), "Consistency in Thermal Sprayed Coatings: An Issue for the Development of New Markets"
- Jean Mozolic (National Sales Manager, H. Cstarck), "Hard Chrome Replacement - Opportunities Abound as Regulations Tighten"
- Douglas H. Harris (President, APS-Materials, Inc.), "The Use of Thermal Spray to Replace Decorative Chrome Plate"
- Dr. Michael Graham (Research Scientist, BIRL Industrial Research Laboratory) and Keith O. Legg (President, Rowan Catalyst), "HVOF as a Repair Technology Replacement for Hard Chrome"
- John O. Hayden (President, Hayden Corp.), "Chrome Plating Market Opportunities for Thermal Sprayers"

Contact: Gorham Advanced Materials, Inc., P.O. Box 250, Gorham, ME 04038, USA; tel: 207/892-5445; fax: 207/892-2210; e-mail: gorham@goradv.com.

TBC Workshop 1997

19-21 May 1997, Cincinnati, Ohio

- P.G. Klemens and M. Gell (University of Connecticut); "Thermal Conductivity of Thermal Barrier Coatings"
- C.M. Spuckler and R. Siegel (NASA-Lewis Research Center) "Analysis of Thermal Radiation Effects on Temperatures in Aircraft Engine Thermal Barrier Coatings"
- R.E. Taylor (Thermophysical Properties Research Laboratory) "Thermal Conductivity Determination of TBCs"
- A.J. Slifka, B.J. Filla, and J.M. Phelps (NIST), "Thermal Conductivity of Functionally Graded Thermal Barrier Coatings"
- M.J. Maloney and R. Barkalow (Pratt & Whitney), "Development of Low Thermal Conductivity Thermal Barrier Coatings"
- S. Bose (Pratt & Whitney), "Degradation Modes for Thermal Barrier Coatings - Engine Experience at Pratt Whitney"
- A.G. Evans, J.S. Wang, and D. Mum (Harvard University), "Analysis and Models of Spalling Mechanisms for Oxide Scales and Thermal Barrier"

- A.M. Freborg, B.L. Ferguson, G.J. Petrus (DCT, Inc.) and W.J. Brindley (NASA-Lewis Research Center), “Modeling Oxidation Induced Stresses in Thermal Barrier Coatings”
- P.K. Wright (GE Aircraft Engines), “The Effect of Cyclic Strain on Life of a PVD TBC”
- N.S. Bornstein, W.P. Allen, M. Trubeljia, and D.M. Nissley (UIRC), “Industrial Environment-Hot Corrosion-Thermal Barrier Coatings”
- B.A. Pint, I.G. Wright, W.-Y. Lee, and K.B. Alexander (ORNL), “Substrate and Bond Coat Compositions: Factors Affecting Alumina Scale Adhesion”
- J.C. Schaeffer (GE Aircraft Engines), “The Effect of Alumina Phase Transformations on the Durability of Thermal Barrier Coatings”
- P. Zombo (Westinghouse Electric), “Development of NDE Techniques for TBC Systems”
- D.M. Zhu and R.A. Miller (NASA-Lewis Research Center), “Influence of High Cycle Thermal Loads on Low Cycle Thermal Fatigue Behavior of Thick Thermal Barrier Castings”
- Y.C. Lau and C.A. Johnson (GE Corporate Research and Development), “Intelligent Processing of Materials for Plasma Deposition of Thermal Barrier Coatings”
- F. Azad (GE Corporate Research and Development), “Dynamic Model for Simulation of Heat Transfer, Vaporization, Vapor Transport, and Deposition in EB-PVD Process”