

In The News

Conference and Workshop Information

Third International Symposium on Aerospace Materials and Manufacturing: Emerging Materials, Processes, and Repair Techniques

October 1-4, 2006, Montreal, Canada

The Third International Symposium on Aerospace Materials and Manufacturing is being organized jointly by The Materials Performance & Integrity Section and The Materials Science & Engineering Section of METSOC—The Metallurgical Society of CIM. It is cosponsored by the ASM Canada Council. The Symposium will be held from Oct 1 to 4, 2006 at the Centre Sheraton Hotel in Montreal, Canada.

The proceedings of the symposium will be published in book form and will be available at the meeting. Both the symposium and its proceedings will be in English. All papers will be refereed and edited prior to final acceptance and publication.

The symposium will focus on four major areas; however, papers on other topics are equally welcome:

Materials:

- Superalloys and intermetallics
- High-temperature titanium alloys
- High-performance aluminum alloys
- Applications of polymer-based composites

Processes:

- Advanced joining technologies such as friction stir welding (FSW), linear friction welding (LFW), laser and electron beam welding
- Modeling and optimization of forming and joining processes such as forging, TLP and diffusion bonding, FSW, and laser welding
- Application of emerging manufacturing technologies such as metal injection molding and hydroforming to aerospace components
- Fiber placement, EB curing, and joining of thermoplastic composites

Component Degradation and Protection:

- Hot corrosion
- Corrosion-fatigue
- Applications of advanced coating technologies such as EB-PVD and plasma spray for innovative thermal barrier and erosion-resistant coatings

Repair and Life-Cycle Management Technologies:

- Remanufacturing of damaged components using laser and EB-based technologies
- Repair of single-crystal superalloys
- Rebuilding and cladding technologies for the repair of eroded components

A one-day postconference tour to major aerospace companies and research cen-

ters in the Montreal region will be organized. These will include Pratt & Whitney, Bombardier Aerospace, Rolls-Royce Repair Centre, Heroux-Devtek, as well as Aerospace Manufacturing Technology Centre of NRC.

A one-and-a-half day short course will be offered immediately before the symposium. The short course is designed to complement the symposium.

Topics will include:

- Aerospace materials properties and selection
- Damage modes and life-cycle management
- Adapting new manufacturing technologies to component repair
- High-speed/high-performance machining of aerospace materials
- Case studies of the application of new technologies to manufacturing and repair of components

The short course will be limited to 35 participants, and a separate registration will be applied.

Contact: For abstract submission or additional information on the International Symposium on Aerospace Materials and Manufacturing: M. Jahazi, Aerospace Manufacturing Technology Centre, Institute for Aerospace Research, National Research Council Canada, 5145 Decelles, Montreal, Quebec, Canada, H3T 2B2; tel: 514/283-9154; e-mail: mohammad.jahazi@cnrc-nrc.gc.ca; Web: www.metsoc.org/conferences/com2006.

Recent Conferences

Second International Meeting on Thermal Spraying (2IMTS)

December 1-2, 2005, Lille, France

The Second International Meeting on Thermal Spraying was held at the Ecole Nationale Supérieure de Chimie de Lille (ENSCL). The organizing committee, headed by Professor Lech Pawlowski, organized the event, which attracted about 70 scientists, professionals, and students

from overseas (Algeria, Canada, Japan, Venezuela) and Europe (England, Finland, France, Germany, Italy, Poland, Spain, Sweden, Switzerland).

Altogether, 16 invited papers, 17 oral contributions, and 11 posters were presented; they focused on a wide range of subjects ranging from feedstock powders preparation and prespray techniques through novel spray techniques (cold spray and suspension spray), process characterization (e.g., Prof. Pierre Fauchais, University of Limoges, France,



Dinner presented a great place for discussion and exchange of ideas.



Second International Meeting on Thermal Spraying participants

“New Developments in Plasma Spraying: Applications, Modeling, On-Line Control”), to applications of the thermal spray coatings in automobile, energy, or mechanical industries (e.g., Gérard Barbezat, Sulzer Metco, “Application of Thermal Spraying in Automobile Industry,” and Prof. Detlev Stöver, from Forschungszentrum Jülich, Germany, “Plasma Sprayed Components for SOFC Applications”).

First Asian Thermal Spray Conference

November 28-29, Nagoya, Japan

The First Asian Thermal Spray Conference (ATSC), held at the Nagoya Congress Center, was organized by Asian Thermal Spray Committee-J, Japan Thermal Spraying Society, and High Temperature Society of Japan. The chairman of the ATSC was Professor Masahiro Fukumoto of Toyohashi University of Technology. The total number of participants was 148, coming from China (10), Germany (1), Korea (26), Singapore (2), Japan (109), and others (2).

The conference started with the opening remarks by Dr. Kazuo Ueno of National Institute of Advanced Industrial Science and Technology, who is the chairman of Japan Thermal Spraying Society, followed by two plenary lectures. The first plenary lecture was given by Prof. K.A. Khor from Nanyang Technological University, Singapore, about thermal spraying of calcium phosphate for medical applications. The second plenary lecture was given by Dr. Swarnima Deshpande from Tokyo Institute of Technology, formerly of Stony Brook University, NY. She talked about microstructural investigation of TBS system response to high-temperature exposure using single-splat approach.



Nagoya Congress Center



Prof. Khor (left) giving the first plenary lecture, and Dr. Deshpande (right) giving the second plenary lecture

The conference had 10 sessions of oral presentations and one poster session. The sessions were organized into Characterization, New Techniques, Cold Spray, Ceramics, Modification, New Applications, Cermets, Mechanical Properties, Thermal Barrier Coatings, Metals and Amorphous, High-Temperature Materials, Applications, Corrosion, and Post-sprayed treatment. Oral presentations were given by 40 speakers and 18 posters were displayed.

The exhibition was held simultaneously with the conference presentation. Eighteen exhibitors displayed their equipment, supplies, and products.



Exhibition



Fukumoto (left) and Lee



Motomachi factory of Toyota Motor Corporation

ATSC 2005 Best Paper Award

Professor Fukumoto (Toyohashi University of Technology) presented ATSC 2005 Best Paper award to Professor Changhee Lee (Hanyang University, South Korea) for “Critical Velocities for High Speed Particle Deposition in Kinetic Spraying.”

Industrial Tour

An industrial tour to visit the Motomachi factory (body assembly line) of Toyota Motor Corporation was conducted.

Recent conference information submitted by Dr. Jin Kawakita and Dr. Makoto Watanabe, two of the conference participants.

The Combustion Turbine Coatings Symposium 2005

October 25-27, 2005, Houston, Texas

The ASM Thermal Spray, an affiliate Society of ASM International hosted The Combustion Turbine Coatings Symposium 2005 (CTCS 2005) at the NASA Hilton. This premier North American event highlighted various surface engineering technologies for industrial gas turbine (IGT) applications. The conference had more than 35 technical presentations and more than 150 attendees from all over the world. Technical aspects of coatings were discussed as well as business, market, and commercial needs of the total supply chain in eight different sessions. Reliability issues and cost reduction issues were also addressed. A panel discussion discussed the Future of Thermal Spray Coatings in the IGT market. A summary of this conference and panel discussion is:

- Higher operating efficiencies will place greater demands on high technology coatings.
- Durability of components in gas turbines is an important issue. This implies that the reliability of coatings is important. A systems approach has to be taken to develop reliable maintenance intervals. Coatings are not always the life-determining factor of a component; sometimes the component itself has a shorter life than the applied coatings. When looking at cost, the total life-cycle cost is important.
- A lowest-cost supplier does not always translate to the most cost-effective coating solution. (Experience, quality, and technical know-how are important.)
- Focus should be on optimizing existing technologies as well as implementing new products or processes.
- Many advanced coatings developed for aeroengines are being adapted for use on IGT engines.
- Low-k thermal barrier coatings with longer lives through improved sintering resistance and other characteristics will be important in the years ahead as will advanced metallic and ceramic abrasible systems.
- Sensor diagnostic technology will be important to monitor and control ther-

mal spray processes to ensure coatings meet OEM engineering design guidelines and to minimize coating costs.

- Industry must recognize the differences between applying coatings to new and engine run gas turbine components.
- More work is needed in the field of coating removal and reapplication.
- Due to the capital cost of EB-PVD, research is being done in areas outside of EB-PVD to develop high-quality coating solutions.
- Universities and research institutes play an important role in training and educating the new generation of engineers and scientists. Practicing engineers and scientists must constantly maintain their technical currency by attending conferences and reading the literature.

In addition to the technical session, the conference created an opportunity for networking and discussion. This was clearly seen at a poolside dinner, sponsored by Sulzer Metco, and at the coffee breaks hosted by BW Grind, and at the tabletop exhibits.

There was also a half-day education and training session on October 25, 2005 with more than 45 attendees. The class was presented by Don Boone of BWD Turbine; Hans van Esch, of TEServices, and Mitch Dorfman of Sulzer Metco. The objectives of class were to give the audience a quick overview of what types of overlay and diffusion coatings are used in IGT applications and what benefits they provide to the engine.

Sixth Industrial Symposium "Surface and Heat Treatment Technology" and Eighth Material-Technical Colloquium

September 29-30, 2005, Chemnitz, Germany

The Sixth Industrial Symposium "Surface and Heat Treatment Technology" and Eighth Material-Technical Colloquium was organized by the Institute for Composite Materials of Chemnitz University of Technology. This event drew interest from both small and medium-size



David Clarke, speaking at CTCS 2005

industrial companies as well as university research laboratories, from Ukraine, Czech Republic, Poland, Spain, Austria, Liechtenstein, China, and France. Guests of honor included: Prof. Gitzhofer from the University of Sherbrooke, Canada, Prof. Pawlowski from the University of Villeneuve in France, Prof. Pokhmurskii from the Karpenko Physico-Mechanical Institute NAS of Ukraine, and Prof. Stefens from University of Dortmund, Institute of Materials Engineering, Germany. Professor Wielage was the chairman. Dr. Hollend-Letz, from the Society for Processing and Development e.V., which co organized this event, and Prof. Matthes from the University by the Rector of the Chemnitz University of Technology, also greeted participants.

The Material-Technical Colloquium is dedicated each year to a particular subject of the materials engineering. This year the topic was thin-film technology with the following topics: galvanotechnics, anodizing, surface layer treatment, thermal spraying, deposition welding, thin-film technology, nanomaterials in the coating technology, and characterization. Lectures and posters—together 67 contributions—showed a variety of innovations and formed the basis for fruitful discussions.

The following notable keynote lectures introduced sessions and gave an overview of the present state-of-the-art in the area:

- Dr. Siegmann presented a contribution on "The Role of the Nanoparticles in Thermal Spraying," in which he discussed the role of nanoparticles—already of high importance in other applications—in thermal spray.
- Dr. Doering held a lecture with the topic "Gotek Composite—Vacuum-Sintered Composite Elements Against Heavy Abrasive Wear."

- PD Dr. Kessler summed up in his contribution “Development Tendencies in the Heat Treatment of Surface Layers of Steel,” the various possibilities in this area.
- Prof. Blau gave an overview on “Trends in Applications of the Plasma Surface Technique” for the different substrate materials.

The conference, attended by approximately 180 participants presented a forum for informal discussions—both in the field of research and development as well as in practical applications. During the last number of years, Chemnitz has developed into the center of modern materials engineering and was therefore a very appropriate place for the industrial exhibition, held in parallel with the conference. The conference contributions are summarized in the conference proceedings, which can be ordered on www.wtk.tu-chemnitz.de.

Colloquium in Honor of Professor Steinhaeuser

A special colloquium was held to celebrate the 65th birthday of Professor Dr. Dr.-Ing. Siegfried Steinhaeuser during the conference. Professor Wielage presented the main speech, in which he reviewed the extensive lifelong work of Prof. Steinhaeuser in the area of surface treatment methods, wear, corrosion, coating technology, metallurgy, and nonferrous metals. Professor Matthes, rector of Chemnitz University of Technology,



Prof. Wielage opens the conference.

thanked Dr. Steinhaeuser on behalf of the university for the long-time work. Further talks were presented by Prof. Paatsch from the Federal Institute for Materials Research and Testing (BAM) in Berlin, by Prof. Jakob, TU Illmenau, Dr. Reinhold from AUDI AG, Ingolstadt, and Prof. Kanani from ATOTECH Germany GmbH.

Colloquium 2006

The series of the Material-Technical Colloquia in Chemnitz will continue on Sept 7 to 8, 2006 in Chemnitz, when the topic will be “Composite Materials and Material Joining.” Lectures and poster presentations related to metal-matrix composite materials, ceramic-matrix composite materials, and plastic-matrix composite materials, as well as to the topics of soldering and brazing, thermal spraying, galvanotechnics, and thin-film technology are invited.



Dr. Stephan Siegman (EMPA, Switzerland)



Professor Matthes presents lifetime achievement plaque to Prof. Steinhaeuser during the colloquium.

Contact: Institute of Composite Materials, TU Chemnitz, 09107 Chemnitz, Germany; tel: 0371/531-6171; Web: wtk@wsk.tuchemnitz.de.