JTTEE5 14:296-303
DOI: 10.1361/105996305X60925
1059-9630/$19.00 © ASM International

In The News

Conference/Workshop Information

First Asian Thermal Spray Conference (ATSC 2005)

November 28-29, Nagoya, Japan

The purpose of this annual conference is to bring together state-of-the art developments on all aspects related to thermal spray in Asia. This conference will be held in countries such as China, Korea, Singapore, and Japan alternately in the future. The conference will provide a forum for presenting the latest advances in thermal spray by researchers and engineers from industry, research laboratories, and academia. It is also expected to provide younger engineers and researchers in Asia with opportunities to learn about this fast-evolving technology, meet experts, and attain international experience. Both invited and contributed papers will be included. ATSC 2005 is organized and sponsored by the Asian Thermal Spray Committee, the Japan Thermal Spraying Society, and the Thermal Spray Division of the High Temperature Society of Japan.

Contact: Conference Secretariat: Prof. S. Oki, e-mail: sachio@mech.kindai.ac.jp; Prof. Y. Ando, e-mail: yando@ashitech.ac.jp; Web: www.j-tss.jp/atsc2005.

Second International Meeting on Thermal Spraying

December 1-2, Lille, France

The objectives of the meeting are multiple. The congress will be the place of exchange of information, results of research, innovations, and contacts in the field of thermal spraying. It will also help with creation of a forum for science and technology of thermal spraying for the specialists in this area and, more generally, in the area of surface treatment.

Tentatively, the plan is to devote the first day to presenting the scientific innovations in the field of thermal spraying, such as the new techniques of:

- Thermal spraying (cold spray, suspension spray, nanostructural deposits)
- Diagnostic of spray process
- Pre- and postspray treatment
- Materials manufacturing for thermal spray (suspensions, powders, etc.)
- Characterization of sprayed deposits

The second day should be devoted to the presentation on the spray markets in France, Germany, Europe, and all the world on surface treatment, coatings sprayed using new spray processes (suspension and cold), new applications of the coatings in the field automobile, electronic, biomedical, metallurgical, aeronautical, and so forth. The topics related to safety in thermal spraying, norms and standards, and environmental issues will be discussed.

Contact: Lech Pawlowski, ENSCL; tel: (+33) 320.33.61.65; e-mail: Lech.Pawlowski@ensc-lille.fr ; Jacky Lesage, IUT A; tel: (+33) 320.67.73.26; e-mail: jacky.lesage@univ-lille1.fr; Didier Chicot, IUT A; tel: (+33) 320.67.73.26; e-mail: didier.chicot@univ-lille1.fr.

Recent Conferences

International Thermal Spray Conference 2005 (ITSC 2005)

The ITSC 2005 (May 2-4, Basel, Switzerland) was coorganized by the DVS (German Welding Society), ASM International, and IIW (International Institute of Welding). More than 900 attendees from 35 countries met for these three days and presented about 220 oral presentations in 44 sessions. This meeting was not only a major TS scientific conference, but also a main market place for thermal spray in general. This is illustrated by the success of the commercial exposition and industrial forum. In this forum, 14 representatives from industry gave oral presentations on real-world applications and practical experience. The centrally localized exhibition hall and poster place offered excellent opportunities to meet during coffee breaks and poster sessions to discuss materials offered by 43 exhibitors and more than 100 posters.

Dr. P. Hanneforth, keynote speaker of the opening plenary session

E. Lugscheider, P. Heinrich, F. Gärtner, and R. Knight opening the 2005 exhibition

The audience at the opening plenary session

Exhibition hall provided great meeting and discussion place

Lugscheider (left) and Ernst

Lugscheider (left) and Costil

Lugscheider (left) and Dr. Monita Nestler, accepting on behalf of Kirsten

Lugscheider (left) and Dzulko

Lugscheider (left) and Richardt

Lugscheider (left) and Tsunekawa

ITSC 2005 Best Paper Awards

Professor Erich Lugscheider (RWTH Aachen University, Germany) presented ITSC 2005 Best Paper awards to:

- **Felix Ernst** (RWTH Aachen University, Germany), "Quality Control of Thermal Spray Process through Cost Effective Diagnostic Methods"
- **Sophie Costil** (LERMPS-UTBM, France), "Role of Laser Parameter on Ni-Al 5% Coatings Elaborated Using the Portal Process"
- **Dr. Andreas Kirsten** (Sulzer Metco Woka GmbH, Germany), "Carbide Containing Materials for Hard Chromium Replacement by HVOF Spraying"
- **Dr. Mark Dzulko** (University of the Federal Armed Forces Munich, Germany), "Plasma Torch Developments"
- **Kathrin Richardt** (RWTH Aachen University, Germany) "Property Analysis of Thermal Sprayed Glass-Composite Coatings"
- **Prof. Yoshiki Tsunekawa** (Toyota Technological Insitute, Japan), "Plasma Sprayed Cast Iron Coatings Containing Solid Lubricant Graphite and h-BN Structure"

Nassenstein (left) and Huang

Berndt (left) and Heberlein

Berndt (left) and Heberlein

Introducing ITSC World Congress 2007 in China, Beijing

Professor Xiaoou Huang from The Thermal Spraying Committee of China Surface Engineering Association was introduced at the banquet by Dr. Klaus Nassenstein (GTV mbH, Germany).

JTST Award to Christopher C. Berndt

Professor Christopher C. Berndt, FASM, received a recognition plaque for his services to JTST as Editor-in-Chief from 1992-2004 from Joachim Heberlein, FASM.

JTST Outstanding Service Award to Joachim Heberlein

Professor Joachim Heberlein, FASM, received the Outstanding Service Award for his services to JTST as chair of the editorial committee from Prof. Christopher C. Berndt, FASM.

Industrial News

Advanced Coating Celebrates 20 Year Anniversary

Advanced Coating S.A. is a Belgium SME located in Liege (Walloon region). The company was founded May 9, 1985 by Jean-Pierre Janssen for the Cockerill Sambre group. Currently the company has 16 employees including three engineers.

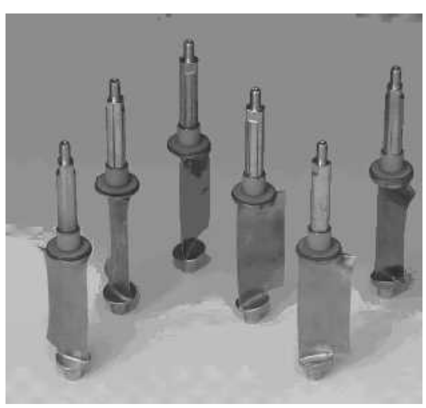
The Managing Director is J.P. Janssen, Technical Manager is F. Campana, and Marketing Manager is N. Janssen. Main technical partnerships are the in European research programs (Craft and Brite) and collaborations with main research centers, such as CEA, LERMPS, SPCTS, ENISE, ENSCL, and ENSMP, for example. The company is ISO 9001 certified from 1995 and ISO 14,000 since 2001.

Main Activities

Advanced Coating S.A. specializes in surface modification technologies and surface finishing. Thermal spray processes (plasma, HVOF, HP/HVOF, and cold spraying) are key processes for production.

Advanced Coating applies coatings of metals, alloys, ceramics, and carbides on all kinds and sizes of machine parts (up to 2 m diameter and 6 m length). Advanced Coating is a specialist in flat and cylindrical grinding as well as superfinishing and balancing of parts (up to 1524 mm diameter and 6 m length).

The company uses the latest robotics, which guarantees the adhesion, density, exceptional hardness, and overall quality of their coatings. All surface textures from 40 μm R_a (as-coated) down to 0.01 μm R_a (superfinish) can be achieved.



Parts coated by Advanced Coating S.A.

The company produces wear- and corrosion-resistant coatings, thermal spray barrier coatings with functional properties, surfaces with low and high friction coefficients, electrical conductivity or insulation, and uses thermal spray for restoring and repair machine components.

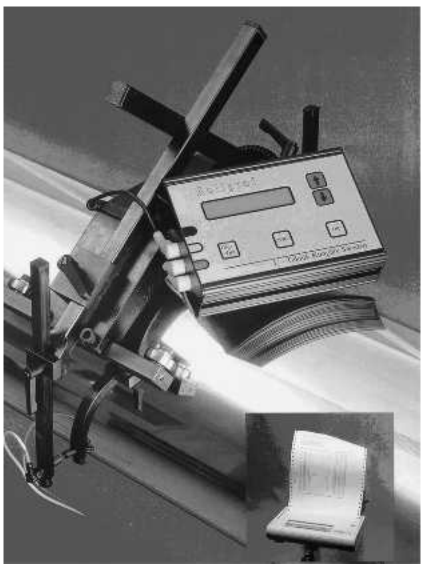
Coatings produced by the company are finding applications in a wide variety of industrial areas such as steel, food, textile, and chemical industries, as well as automotive, aerospace, and defense applications.

Advanced Coating commercializes and ensures the aftersales service of three measuring systems:

Penetrascope is a metal hardness tester, accurate, consistent, and adaptable, using the 136° diamond pyramid indentation principle. The Penetrascope has been tested by the National Physical Laboratory and its consistent accuracy reproducibility has been proven by a number of research applications, both in Europe and overseas. It is readily transportable and may be used to test a wide variety of materials ranging from thin metal strip to heavy components or assemblies weighing several tons.

Rollprof is a system for the measurement and the storage of profiles (rolls or cylinders). Developed for use in a workshop environment, the system is accurate and easy to use. Due to its small size and battery power, Rollprof allows measurements of profiles at positions almost inaccessible, such as annealing furnace rolls, leveler rolls, and calenderers without dismantling them. Therefore, for example, the wear zones can be easily identified before maintenance starts allowing for better planning.

Alpaga 500 nano is a fully automatic device dedicated to powder quality characterization (size and morphometric measurements). This unique imaging system works with a proprietary ultraviolet collimated light (UVCL) combined with high-quality telecentric lenses. This combination provides an embedded powerful image analysis software (CALLISTO) with the best images in current technology. An innovative, efficient and nondestructive dry powder disperser (VDD270) completes the system. Sixteen parameters are measured in 5 min: sieve size, width, height, equivalent diameter, roundness, roughness, elongation, convexity, reactivity, crystallinity, hole detection, volume, area, perimeter, shape factor, and specific surface.

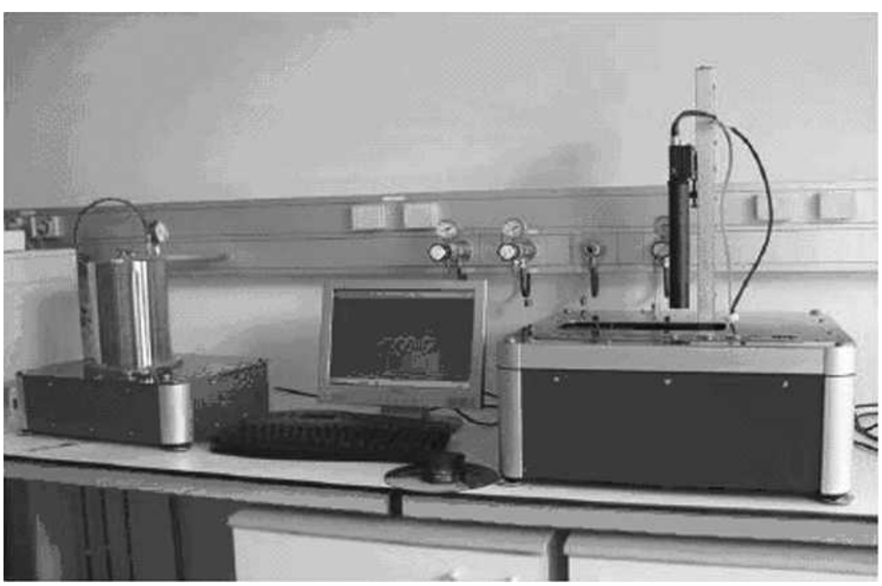


Rollprof system

Equipment

Advanced Coating is equipped with:

- Plasma spray system A-2000 (Plasma Technik)
- F1, F2, F4, and F100 Connex guns
- HVOF Continuous Detonation Spraying (CDS) processes (Plasma Technik)
- O_2 + CH_4 and O_2 + C_3H_8
- HP/HVOF JP5000 spray process (Tafa)
- Cold Spray process (CGT)
- DPV2000 and PlumeSpector systems (Tecnar)
- Shot- and sand-blasting equipment
- Cylindrical grinding systems (4): up to 1524 mm diameter and 6000 mm length
- Plane grinding system (4): 4250 by 450 mm or 1000 mm diameter
- Diamond superfinishing systems (4)



Alpaga 500 nano device

Furthermore, the company has its own control laboratory that allows metallographic preparation (sectioning, hot mounting, vacuum mounting, automatic grinding, and polishing) and coating microscopic characterization (optical microscope, image processing software, automatic microhardness tester, adhesion tests, and powder grain size and shape measurements). The laboratory received in 2004 the agreement for aeronautic customers (SNECMA group).

Contact: Florent Campana, Rue de l'Avouerie, 7, B-4000 Liège—Belgium, tel: +32 4 254 50 11 ; fax: +32 4 254 50 10; e-mail: f.campana@advanced-coating.com.

Florida MEP Helps JetAir Secure Training Grants to Implement New Plasma Spray Process

Many companies, even small ones like JetAir Support, Inc. (JetAir), a Miami-based firm that repairs and overhauls jet engine components employing 21 people, often subcontract work to other companies.

While this is a common practice, for an FAA Certified Repair Station like JetAir the loss of control over production time and quality can be an issue. A job the company was subcontracting, recoating jet engine components with metal through a plasma spray process, was costing them tens of thousands of dollars a year and strained their bottom line.

When the company found the necessary equipment to bring the plasma work in-house, they jumped at the chance, but they also realized there would be significant training costs involved in equipping employees with the necessary skills, so they called in the Florida Manufacturing Extension Partnership for assistance (Florida MEP). JetAir had worked with the Florida MEP in the past to help them achieve ISO certification, a designation illustrating the highest level of quality and international standards in manufacturing, so they had confidence in the organization's expertise.

"JetAir had to send its employees through special FAA approved training to become certified in the plasma spray process," said Wilheilm Barb, Florida MEP project manager. "This type of high level training can be cost prohibitive for a company their size, so we helped them secure a training grant to offset the costs and enable them to bring the process in-house. This helped them control quality and product turnaround time and control costs."

Through the grant, the Florida MEP also assisted JetAir in developing the plasma spray process and training employees on setup and production of plasma coated components, allowing the company to lower manufacturing times and create more job capacity.

What was once a subcontracted task has become a profit center for the company and JetAir is even subcontracting plasma spray jobs for other manufacturers. The in-house plasma spray process has led to $100,000 in increased sales, creation of two new jobs and a $70,000 reduction in outsourcing costs.

The Florida MEP is an affiliate of the National Institute of Standards and Technology (NIST) under the U.S. Department of Commerce. The national MEP is a network of manufacturing extension centers that provide business and technical assistance to smaller manufacturers in all 50 states, the District of Columbia, and Puerto Rico. Through MEP, manufacturers have access to more than 2000 manufacturing and business "coaches" whose job is to help firms make changes that lead to greater productivity, increased profits, and enhanced global competitiveness.

Contact: Florida MEP program, tel: 321/939-4000.

News from NASA

Depth-Penetrating Luminescence Thermography of Thermal Barrier Coatings

Temperatures at depths can be measured by luminescence decay of suitable thermographic phosphors.

A thermographic method has been developed for measuring temperatures at predetermined depths within dielectric material layers—especially thermal barrier coatings. This method will help satisfy a need for noncontact measurement of through-the-thickness temperature gradients for evaluating the effectiveness of thermal barrier coatings designed to prevent overheating of turbine blades, combustor liners, and other engine parts.

Heretofore, thermography has been limited to measurement of surface and near-surface temperatures. In the thermographic method that is the immediate predecessor of the present method, a thermographic phosphor is applied to the outer surface of a thermal barrier coating, luminescence in the phosphor is excited by illuminating the phosphor at a suitable wavelength, and either the time dependence of the intensity of luminescence or the intensities of luminescence spectral lines is measured. Then an emissivity-independent surface-temperature value is computed by use of either the known temperature dependence of the luminescence decay time or the known temperature dependence of ratios between intensities of selected luminescence spectral lines. Until now, depth-penetrating measurements have not been possible because light of the wavelengths needed to excite phosphors could not penetrate thermal barrier coating materials to useful depths.

In the present method as in the method described above, one exploits the temperature dependence of luminescence decay time. In this case, the phosphor is incorporated into the thermal barrier coat at the depth at which temperature is to be measured. To be suitable for use in this method, a phosphor must (1) exhibit a temperature dependence of luminescence decay time in the desired range, (2) be thermochemically compatible with the thermal barrier coating, and (3) exhibit at least a minor excitation spectral peak and an emission spectral peak, both peaks being at wavelengths at which the thermal barrier coating is transparent or at least translucent.

Conventional thermographic phosphors are not suitable because they are most efficiently excited by ultraviolet light, which does not penetrate thermal barrier coating materials. (Typical thermal barrier coating materials include or consist of various formulations of yttria-stabilized zirconia.) Only a small fraction of phosphor candidates have significant excitation at wavelengths long enough (>500 nm) for sufficient penetration of thermal barrier coatings. One suitable phosphor material—yttria doped with europium (Y_2O_3:Eu)—has a minor excitation peak at 532 nm and an emission peak at 611 nm. In experiments, this material was incorporated beneath a 100 μm thick thermal barrier coating and subjected to excitation and measurement by the luminescence-decay-time technique. These experiments were found to yield reliable temperature values up to 1100 °C. At the time of reporting the information for this article, a search for suitable phosphors other than (Y_2O_3:Eu) was continuing.

This work was done by Jeffrey Eldridge of Glenn Research Center. For further information, access the Technical Support Package (TSP) free on-line at www.techbriefs.com/tsp under the Physical Sciences category.

Inquiries concerning rights for the commercial use of this invention should be addressed to NASA Glenn Research Center, Commercial Technology Office, Attn: Steve Fedor, Mail Stop 4-8, 21,000 Brookpark Rd., Cleveland, OH 44135. Refer to LEW-17617-1.

Engineers Evaluate Cold Spray Coating Processes

Tungsten carbide-cobalt coatings are alternatives to chrome plating on high-strength steel landing gear components.

AFRL engineers identified two cold spray deposition technologies that can apply tungsten carbide (WC)-cobalt (Co) coatings to high-strength steel aircraft components. If follow-on testing is successful, these technologies could provide the Air Force (AF) with an alternative to electrolytic hard chrome (EHC) plating. AF Air Logistics Centers use EHC plating extensively during maintenance operations to rework, rebuild, and repair worn components of aircraft landing gear, hydraulic cylinder actuators, propeller hub assemblies, and gas turbine engines. Chrome plating provides beneficial metallurgical properties such as hardness, wear resistance, corrosion resistance, and lubricity. EHC plating, however, uses hexavalent chromium—a known carcinogen; therefore, federal and state regulatory agencies strictly control its use and

Fig. 1 SAE 4340 steel test specimen with HVOF-applied, 0.003 in. thick, WC-Co coating following fatigue testing at 200 ksi

Fig. 2 SAE 4340 steel test specimen with AC-HVAF applied, 0.003 in. thick WC-Co coating following fatigue testing at 220 ksi

disposal. Complying with these regulations results in increased disposal costs, as well as increased liability and risk for the AF.

The AF and other Department of Defense organizations are presently investigating the use of high-velocity oxygen fuel (HVOF) thermal spray of WC-Co to replace EHC plating. Laboratory engineers initiated several projects to demonstrate and validate the capabilities and limitations of HVOF thermal spray coatings. They determined that HVOF-applied WC-Co will crack, delaminate, and spall when the high-strength steel substrate is subjected to stresses greater than 190 ksi (see Fig. 1). The high temperature that the coating material experiences during the HVOF application process creates brittle phases of WC, along with a coating that is under high internal stress. Cold spray deposition processes operate at a lower temperature and may provide a malleable coating similar to that produced by EHC plating.

Using Air Force Materiel Command Weapon System Pollution Prevention program funding, the laboratory initiated the Alternative Technology Evaluation Screening project to conduct low-cost, short-term, top-level analysis of materials and processes that could provide environmental advantages. As one of the tasks of this project, engineers evaluated five different cold spray deposition technologies to find acceptable WC-Co coating processes for high-strength steel applications.

The five candidate technologies ranged from university research studies to commercially available processes. Through laboratory testing, engineers determined the ability of each cold spray deposition process to successfully apply a WC-Co coating to SAE 4340 high-strength steel specimens. They then evaluated the integrity of the coating when they subjected the substrate to stresses at the high end of its elastic range. Of the five technologies tested, only two commercially available processes—Activated Combustion-High-Velocity Air Fuel (AC-HVAF), developed by UniqueCoat Technologies, and Kinetic Metallization (KM), developed by Inovati Corporation—successfully applied the WC-Co coating to the substrate and met the metallurgical criteria established by General Electric Aircraft Engines for HVOF coatings. Engineers rated the KM coating integrity as equal to that of an HVOF-applied coating, and they rated the AC-HVAF coating as superior to the HVOF coating and equal to EHC plating (see Fig. 2).

Unlike HVOF-applied coatings, cold spray coatings did not spall or delaminate when the substrate was subjected to high stress levels. Due to the favorable results of this initial evaluation, the laboratory will conduct a more comprehensive demonstration and validation project to determine the mechanical properties of coatings applied by the best-performing processes. Cold spray technology could help to mitigate the environmental compliance, hazardous waste disposal, and worker safety challenges the AF faces with continued use of EHC plating.

This article was written by Mr. Thomas A. Naguy, Mr. Joseph R. Kolek (consultant), and Mr. Timothy R. Anderl (Anteon Corporation), of the Air Force Research Laboratory's Materials and Manufacturing Directorate. For more information, contact TECH CONNECT at 800/203 6451 or place a request at www.afrl.af.mil/techconn/index.htm. Reference document ML-03-26.

Multicomponent, Rare-Earth-Doped Thermal Barrier Coatings

Thermal conductivities are reduced while maximum use temperatures are increased.

Multicomponent, rare-earth-doped, perovskite-type thermal barrier coating materials have been developed in an effort to obtain lower thermal conductivity, greater phase stability, and greater high-temperature capability, relative to those of the prior thermal barrier coating material of choice, which is yttria-partially stabilized zirconia. As used here, "thermal barrier coatings" (TBCs) denotes thin ceramic layers used to insulate air-cooled metallic components of heat engines (e.g., gas turbines) from hot gases. These layers are generally fabricated by plasma spraying or physical vapor deposition of the TBC materials onto the metal components.

A TBC as deposited has some porosity, which is desirable in that it reduces the thermal conductivity below the intrinsic thermal conductivity of the fully dense form of the material. Undesirably, the thermal conductivity gradually increases because the porosity gradually decreases as a consequence of sintering during high-temperature service. Due to these and other considerations such as phase transformations, the maximum allowable service temperature for yttria-partially stabilized zirconia TBCs lies in the range of about 1200-1300 °C. In contrast, the present multicomponent, rare-earth-doped, perovskite-type TBCs can withstand higher temperatures. A material of this type comprises the following ingredients:

- The base material is a high-melting-temperature perovskite oxide—a compound having the chemical formula ABO_3, where A is a metal cation having a valence of +2 and B is a metal cation having a valence of +4. Examples of A include Sr, Ba, Ca, and variable valence rare-earth and transition metals; examples of B include Zr and Hf.
- The base material is doped with a pair or multiple pairs of highly stable oxides of general chemical formula M_2O_3, where M is a metal cation of valence +3. The pairing of the oxides is such that they are related as electron donor and acceptor, respectively. The paired oxides can be divided into two groups, denoted I and II. Group I comprises scandia and ytterbia. The radii of their trivalent cations are smaller than those of zirconia and hafnia. The group I cations are believed to typically become incorporated into B sites, where they are further believed to act as electron acceptors. Group II comprises neodymia, samaria, gadolinia, and lanthania. The radii of their trivalent cations are larger than that of yttria. The

- group II cations are believed to typically become incorporated into *A* sites, where they are further believed to act as electron donors. The incorporation of the dopant trivalent cations into *A* and *B* sites enhances the stability of the base material phase and promotes the formation of significantly higher concentrations of immobile extended defects and clusters of defects, thereby greatly reducing the intrinsic thermal conductivity and the rate of sintering.
- Yttria can be included as a phase stabilizer in addition to, or instead of, the aforementioned dopant oxides.

In a preferred composition, the total concentration of yttria and/or the other phase-stabilizing oxides lies between 4 and 30 mol%. Ytterbia is favored over scandia as the group I oxide due to the high cost of scandia. Alternatively, scandia in a concentration of as much as 20% of that of yttria can be used to overdope the group I oxide. Other alternative formulations are also possible.

Compositions tested to date include $SrZrO_3$ + yttria (up to 6 mol%) + group I oxide (ytterbia) up to 2 mol% + group II oxide (gadolinia) up to 2 mol%. Presintering thermal conductivities, as determined by a laser heat-flux test at an initial surface temperature of about 3000 °F (about 1650 °C), have ranged between 0.6 and 0.8 W/m · K. Test data have also indicated that sintering essentially ceases after 20 h. The thermal conductivities in the cases of compositions that include the paired doping oxides have been found to range from about one-third to one-half of the thermal conductivities of undoped $SrZrO_3$ and of $SrZrO_3$ doped with yttria only. Excellent durability has also been demonstrated in the sintering and thermal cycling tests at temperatures up to about 3000 °F (about 1650 °C).

This work was done by Robert A. Miller of Glenn Research Center and Dongming Zhu of the U.S. Army Research Laboratory. For further information, access the Technical Support Package (TSP) free on-line at www.techbriefs.com/tsp under the Materials category. Inquiries concerning rights for the commercial use of this invention should be addressed to NASA Glenn Research Center, Innovative Partnerships Office, Attn: Steve Fedor, Mail Stop 4-8, 21,000 Brookpark Rd., Cleveland, OH 44135. Refer to LEW-17432-1.

New Products and Industry News

New Thermal Barrier Coating Technology

Scientists at the Department of Energy's Ames Laboratory and Iowa State University have developed a new bond coat for thermal barrier coatings (TBCs) that may allow gas turbine engines in aircraft and other power-generating technologies to better withstand severe, high-temperature environments.

By experimenting with various nickel-aluminum-platinum samples, researchers found that platinum additions significantly improved the oxidation resistance of nickel-rich bulk alloys having the same type of structure as the turbine alloy. They also found that by adding zirconium or hafnium to the nickel-rich compositions, the oxidation rates went down by up to an order of magnitude.

In current aluminum-rich bond-coat alloys, only a small amount (<0.1 wt.%) of zirconium or hafnium may be added to improve oxidation before adding too much is detrimental, causing catastrophic oxidation failure.

In commercial coating production, it is extremely difficult to achieve an adequately uniform distribution of such a small amount of metals like these in a cost-effective way. In the new nickel-rich bond coat, significant reductions in oxidation rates over a wide concentration, from 0.5-4 wt.% Hf, have been realized.

Working with an aeroengine manufacturer, researchers have demonstrated that their new coatings can offer significant benefits over current state-of-the-art bond coatings used in advanced TBC systems.

Contact: Greg Geiger, tel: 614/794-5858; e-mail: ggeiger@ceramics.org.

Titania Nanomaterial Coating Provides Superior Strength

Coatings composed of titanium dioxide nanoparticles provide superior strength, durability, and corrosion resistance, according to Altair Nanotechnologies Inc., Reno, NV. Nanosized titanium dioxide materials act as crack arresters, enhancing toughness in coatings applied to materials used in harsh environments. Coating strength is also significantly higher, because the porosity of the Altair material is 2.5 times less than that of conventionally applied traditional materials. The coatings can be applied with a high-velocity oxyfuel, which is less expensive than the traditional method of air plasma spray.

F.W. Gartner, Houston, TX, has been using Altair's titanium dioxide nanomaterial to coat industrial titanium ball valves for the chemical, mining and petroleum industries. According to Gartner's Jimmy Walker, "We are delighted with the results we have been achieving with the Altair materials and the development of proprietary coating processes (U.S. utility patent No. 6835449). Our customers are using a coating with twenty-five times the dry sand abrasion resistance and three times the erosion resistance of conventional coatings."

Other applications include coatings for rotor blades in gas turbine engines and aircraft jet engines.

Contact: Roy Graham, Altair Nanotechnologies Inc., 204 Edison Way, Reno, NV 89502; tel: 775/858-3706; e-mail: rgraham@altairnano.com; Web: www.altairnano.com.

News from JTSS and SSPC

Japan Thermal Spray Society Appoints Ueno as New Chairman

Kazuo Ueno

At its annual meeting held on June 16-17 in Osaka, Japan, the Japan Thermal Spray Society (JTSS) appointed Dr. Kazuo Ueno as new society chairman for 2005-2007. Dr. Ueno belongs to the National Institute of Advanced Industrial Science and Technology (AIST) and is a deputy director of Energy Technology Research Institute. He was graduated from the Kyoto Institute of Technology and took a doctorate in chemistry from Kyoto University in 1981. Dr. Ueno won a Best Paper Award from the Thermal Spray Division of ASM International at the 1992 International Thermal Spray Conference (ITSC) for his work on plasma spray of SiAlON compound. JTSS is an academic society for thermal spray with approximately 340 individual members and more than 70 company members.

Contact: JTSS, Web: wwwsoc.nii.ac.jp/jtss/.

The Society for Protective Coatings

SSPC was founded in 1950 as the Steel Structures Painting Council, a nonprofit professional society concerned with the use of coatings to protect industrial steel structures. In 1997, the name of the association was changed to The Society for Protective Coatings to better reflect the changing nature of coatings technology and the ever-expanding types of construction materials.

SSPC is nonprofit association that is focused on the protection and preservation of concrete, steel, and other industrial and marine structures and surfaces through the use of high-performance industrial coatings. SSPC is the leading source of information on surface preparation, coating selection, coating application, environmental regulations, and health and safety issues that affect the protective coatings industry.

The association's many industry-specific products and services include:

- Standards development
- Technical publications (books, videotapes, CDs)
- Training courses
- Company and individual certification programs
- Publications
- Conferences
- Online resources

A monthly newsletter is available to inform about recent developments at SSPC Online, upcoming deadlines, and other important news and events. Visit SSPC Online at www.sspc.org.

People in the News

Nazzarett Promoted to General Manager of Wall Colmonoy (Los Lunas)

Daniel Nazzarett

Daniel Nazzarett has been promoted to General Manager of the Wall Colmonoy alloy manufacturing facility in Los Lunas, NM. He has the responsibility of supervising all functions at the facility, including operations, quality, maintenance, safety, training, and engineering.

An employee of Wall Colmonoy since 1975, Nazzarett most recently held the position of Plant Manager. He looks forward to "contributing to the continuous improvement in all facets of the operation, to help manufacture a quality product, in order to grow and remain profitable."

Contact: Wall Colmonoy, Web: www.wallcolmonoy.com.

Montavon Joins SPCTS, University of Limoges, France

Ghislain Montavon

Ghislain Montavon, assistant professor at the Technological University of Belfort-Montbéliard (UTBM), France, where he was carrying research activities at LERMPS, has been appointed full-time professor at the University of Limoges, France.

He will join in September the UMR CNRS 6638 SPCTS research team, where he will actively participate with its team members in the development of plasma spray processes and functional micro and nanostructured coatings related to new emerging applications.

Ghislain Montavon got a B.Sc. in Heat and Surface Treatments in 1988, an Engineer Diploma in Mechanical Engineering in 1991 in parallel with a M.Sc. in Energetic in 1992, a Ph.D. in Materials Science 1995, and a D.Sc. in Sciences for Engineers in 2002. For 18 months in 1993-1994, he was visiting researcher the Thermal Spray Laboratory at SUNY, Stony Brook, NY.

Contact: G. Montavon, tel:. +33 5 55 45 74 21; e-mail: ghislain.montavon@utbm.fr (until Dec 2005).

Ohmori Joins Tocalo

Akira Ohmori

Professor Dr. **Akira Ohmori,** chairman of ITSC 2004, retired from Joining and Welding Research Institute, Osaka University. He joined Tocalo Co., Ltd., one of the world's largest thermal spray coating job shops, as a senior technical adviser in June 2005. Tocalo Co., Ltd. was listed on the Tokyo Stock Exchange 1st Section on March 1, 2005.