

Volume 13, Number 4

Fourth Quarter 2006

Thermal Spray Pavilion Planned for 2007 Fabtech International and AWS Welding Show in Chicago

The International Thermal Spray Association (ITSA) has announced plans to host a Thermal Spray Pavilion at the 2007 Fabtech International and AWS Welding Show November 11-14, 2007 at the McCormick Place in Chicago, Illinois. Sponsored by ITSA in collaboration with the American Welding Society (AWS), Society of Manufacturing

Engineers (SME), and Fabricators and Manufacturers (FMA), Association this Spray industrial Thermal Pavilion will be available to the more than 17,000 exposition attendees.

The Pavilion will feature several informative events and presentations as well as demonstrations and educational material on the benefits of thermal spray technology.

"As a company-member trade association with close ties to almost all major advanced in thermal spray technology as well as its market development, ITSA plays an integral role in informing the industrial manufacturing sector on the importance and unique benefits

of thermal spray technology," said ITSA chairman Ed Simonds. "We are pleased to feature our Thermal Spray Pavilion at this exciting show while having the opportunity to collaborate with these important industry partners to enhance awareness of thermal spraying."

Pavilion for 2007 or get more exposition information, please contact Joe Krall, Director of Exposition Sales, via email jkrall@aws.org or via phone 800.443.9353, ext. 297.

To reserve booth space in the Thermal Spray

The FABTECH International and AWS Welding Show is cosponsored by AWS, FMA, and SME. Based for decades in the industrial heartland of Chicago and Cleveland, the 2006



Thermal Spray Pavilion Contract Signed in Atlanta. (left to right) Joe Krall, AWS Director of Exposition Sales, Joseph P. Stricker, ITSA Officer and President of St. Louis Metallizing Company, and Kathy M. Dusa, ITSA Corporate Secretary.

technologies. A total number of 873 companies exhibited at the 2006 event, taking over 300,000 net square feet of exhibit space. This represents a more than six percent increase in the total number of exhibiting companies over continued on page 5

and infrastructure. The Show recently concluded at Atlanta's Georgia World Congress Center after three full days of impressive crowds and bustling exhibits. The show represented the largest showcase of metal forming, fabricating, tube and pipe, and welding equipment and technology in North America this year. More than 21,000 attendees from around the world visited the show to evaluate, purchase and explore innovative

manufacturing

I N D U S T R Y N E W

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ITSC 2007 - Global Coating Solutions May 14-16, 2007 at the Beijing International Convention Center in Beijing, China

It is our pleasure to extend to you an invitation to participate in the International Thermal Spray Conference & Exposition (ITSC) in May of 2007.

 $\cdot \mathit{Invited Speakers}$ - Visionaries and leaders in the field will present their views on the field of thermal spray

•*Technical Papers* - Outstanding papers by some of the leading researchers in the field of thermal spray will examine a diverse set of technical issues

 $\cdot Education\ Courses$ - Workshops offer the opportunity for indepth presentation, discussion and interaction on topics ranging from the highly technical to the geo-political. Registration is required

 $\cdot \textit{Awards}$ - Awards ceremony recognizes leadership in thermal spray technology

The event, co-sponsored by the ASM Thermal Spray Society (TSS), the German Welding Society (DVS) and the International Institute of Welding (IIW), will be the first to be held in the vibrant country of China. The bustling automotive, aerospace and heavy equipment manufacturing sectors of China serve as an ideal forum for discussing the latest advances in thermal spray technologies. Plus, Beijing is an exquisite host locale for this international event.

ITSC 2007 will offer thermal spray practitioners a unique opportunity to experience one of the world's most rapidly expanding markets. Delegates from more than 30 countries are expected to participate in the event which includes three



days of technical conference sessions. This year's event will feature both theoretical and applied industrial presentations that address the latest in research, development, application and equipment.

In addition to the anticipated 250+ technical papers, ITSC offers delegates opportunities for networking, equipment demonstrations, pre-event education courses, local industry tours and a world-class exposition. This exposition will feature exhibitors showcasing the latest in thermal spray equipment, powders, consumables, metallographic equipment, instrumentation and commercial job shop services.

ITSC 2007 is an opportunity for the global thermal spray community to meet, exchange information and conduct business. It is a truly unique opportunity to be part of an outstanding program in the fascinating city of Beijing, the cultural center of the People's Republic of China.

We look forward to seeing you in Beijing in 2007!

- Peter Hanneforth, Technical Chair, ITSC 2007
- E. Lugscheider, Technical Chair, ITSC 2007
- C. Ding, Technical Chair, ITSC 2007
- C. Li, Technical Chair, ITSC 2007

For more information, visit www.asminternational.org/itsc07

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For more information, visit www.tstcoatings.com.



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Empowering High Tech Materials

continued from page 1

the 2005 FABTECH International and AWS Welding Show in Chicago, Illinois

This is the largest event in North America dedicated to showcasing a full spectrum of metal forming, fabricating, tube and pipe, and welding equipment and technology.

To learn more about the FABTECH International and AWS Welding Show, please visit websites www.aws.org/expo and www.fmafabtech.com

About ITSA: The International Thermal Spray Association is professional trade а organization dedicated to expanding the use of thermal spray



More than 21,000 people from around the world attended the 2006 brazing, soldering, and Show in Atlanta.

Headquartered in Miami, Florida, and led by a volunteer organization of officers and directors, AWS serves nearly 50,00 members worldwide and is composed of 22 Districts with more than 200 local Sections. For more AWS information, visit www.aws.org and page 6 of this publication.

About FMA: The Fabricators and Manufacturers Association Internationa, headquartered in Rockford, IL USA, is the world's largest nonprofit education association dedicated exclusively to metal forming and fabricating professionals. For more FMA information, visit www.fmanet.org

About SME: The Society of Manufacturing Engineers is the leading professional society worlds's supporting manufacturing education. Through its member programs, publications, expositions, and professional development resources, SME promotes an increased awareness of manufacturing engineering and helps keep manufacturing professionals up to date on leading trends and technologies. For more SME information, visit www.sme.org

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technologies for the

benefit of industry and

society. For more ITSA

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About AWS: The

(AWS)

founded in 1919 as a

multifaceted, nonprofit

organization with a

mission to advance the

and

joining and cutting

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SPRAYTIME will continue to grow by reaching across other industries (AWS, SAE, NACE, ASME, etc.) for pertinent information-sharing and additional readership.

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ITSA is proud of starting SPRAYTIME in 1992 and the future expansion plans for news and circulation.



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The American Welding Society (AWS) was founded in 1919 as a multifaceted, nonprofit organization with a mission to advance the science, technology and application of welding and allied joining and cutting processes, including brazing, soldering, and thermal spraying. Headquartered in Miami, Florida, AWS is supported by a staff of more than 100 professionals and serves nearly 50,000 members worldwide. AWS is led by a volunteer organization of officers and directors, and is composed of 22 Districts with more than 200 local Sections throughout the US and the world. AWS continues to lead the way in supporting welding education and technology development to ensure a strong, competitive and exciting way of life for all Americans.

AWS Membership: AWS serves nearly 50,000 Individual Members, including Student Members, and more than 1,500 Corporate Members worldwide. Individual Membership consists of engineers, educators, researchers, welders, inspectors, welding foremen, company executives and business owners. Corporate Members include welding manufacturers, independent welding shops, job shops, distributorships, end users, educational institutions and more. Member interests include automatic, semi-automatic and manual welding, as well as brazing, soldering, cutting, ceramics, lamination, robotics, lasers and safety and health.

AWS Foundation: The AWS Foundation was established by AWS in 1989 to support programs that ensure the growth and development of the welding industry by strengthening research and educational opportunities in welding and related fields. The Foundation provides funding through scholarships for entry level welding training, trade school and community college courses and degrees and engineering undergraduates and fellowships for welding research. Since its inception, the AWS Foundation has awarded over \$3.1 million to nearly 2,000 students seeking careers in welding and allied processes. Scholarships are awarded locally by AWS Sections, regionally by AWS District Councils and nationally by the AWS Education Scholarship Committee.

AWS Publications: Keeping its members on the cutting edge of the industry is paramount at AWS. That is why its publications, instructional and reference materials are among the industry's most widely consulted. The *Welding Journal*, a major monthly magazine dedicated to the welding and manufacturing industries, has won over 60 editorial and design awards and features an assortment of authoritative articles, industry news and welding research. Inspection Trends, published quarterly by AWS, is tailored to materials inspection and testing professionals and covers new technology, trends and safety. AWS also publishes over 300 books, charts, videos, procedures, software and 160 AWS-developed codes, recommended practices, and guides produced under strict American National Standards Institute (ANSI) procedures, including one of the world's most consulted codes, *D1.1 Structural Welding Code - Steel*.

AWS Show, Conferences and Seminars: AWS has become a world-renowned organization providing quality educational opportunities through a variety of welding conferences and seminars that present new technology and topical subjects for the welding industry. Every year, AWS joins forces with the industry's other leading associations, the Society of

Manufacturing Engineers and the Fabricators and Manufacturers Association, to present the FABTECH International & AWS Welding Show, the largest event in North America dedicated to showcasing a full spectrum of metal forming, fabricating, tube and pipe, and welding

equipment and technology. Thousands welding of professionals from over 20 countries gather at this event to exchange state-of-the-art products and services, form new business relationships, problemsolve, share best practices, and find new procedures and processes that will improve their operations.

AWS Education Programs: AWS

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welding training programs the award-winning program SENSE

(Schools Excelling through National Skills Education), which

implements national skill standards and associated

curriculum guides to train and gualify welders. The program

advances students through three different levels, from entry

to expert welder, to prepare students for today's workforce

widely recognized certification programs to assist the

industry in identifying gualified welding personnel and to

AWS Certification Programs: AWS offers a number of

provide opportunities for welding professionals. The premier AWS certification is the Certified Welding Inspector (CWI) program, which is distinguished internationally and trusted to ensure the highest level of quality workmanship. Established in 1976, this AWS service has certified over



American Welding Society - Miami, Florida.

fabricators and more.

52,000 welding inspectors and currently, more than 22,400 are certified. This AWS certification has been a major contributor to improved weld quality and reduced inspection costs. AWS offers additional certification programs for welding supervisors, engineers, radiographic interpreters. educators, robotic arc welding operators and technicians,

AWS Executives: Ray Shook, Executive Director; Frank Tarafa, Deputy Executive Director and Chief Financial Officer; Cassie Burrell, Associate Executive Director; Jeff Weber, Associate Executive Director

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Unique Thermal Spray Cabinets

(Fulfilling the Latest Occupational Health and Environmental Regulations) by M. van Wonderen, KLM engineering and maintenance at Schiphol-Airport, The Netherlands

KLM is the oldest airline in the world (1919) and its founder, Mr. Plesman, had foreseen the fact that maintenance, repair and overhaul (MRO) would be an important part of the economic and technical survival of an airline. For this reason he founded more than 80 years ago the first MRO shop for aircraft and aircraft engines in the world. Since then, lots of existing and innovative new repair processes were introduced and used at the KLM engineering and maintenance division with its nowadays base at the Schiphol-Airport in the Netherlands. KLM started incorporating thermal spraying in their engineering and maintenance division in 1969 with flame spray equipment (acetyleneoxygen). In the mid-70s the first plasma spray equipment was bought. In 1987 the first fully automated and robotized plasma spray system was introduced. In 1993 KLM received as first airline in the world a full process approval from General Electric to use twin wire electric arc spraying as the aew thermal spray process for repairing aircraft engines.

Environment and occupational laws: Whenever a new thermal spray process is introduced at the MRO shop at KLM, it has to fulfill the newest occupational health and environmental regulations.

The last couple of decades the EU has introduced many new directives on exposure levels for the environment and people involved with dangerous materials. Especially materials like



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asbestos, silicon oxides, cadmium, lead, chromium, nickel, etc. are on the so-called 'hot-list'.

But KLM also has to comply with all Dutch regulations. In the Dutch legislation one has to fulfill the so-called NeR, which are the Dutch Emission Regulations. For the above mentioned dangerous materials the environment exposure must be < 0.1 μ g/m³.

According the Dutch occupational health laws the following regulations concern exposure of people with dangerous materials:

- #1: Take the operator out of the process;
- #2: If #1 is not possible, then try to minimize the exposure as much as possible; this is the so-called "Minimalization Obligation";
- #3: One must fulfill the "Minimalization Obligation" by introducing the latest "State-of-the-Art" in industry;
- #4: Within the state-of-art techniques one must provide four levels of exposure reduction:
 - a. contain the process
 - b. provide source extraction
 - c. provide "point" extraction
 - d. provide room extraction (e.q., by plenums)
 - e. provide means of personal protection
 - (e.q., masks)

When KLM started using thermal spraying (1960s), the occupational health regulations were guite different from today. In the figures 1, 2 and 3 one can see examples of the 'traditional way' of spraying at KLM.



Figure 1. Manual thermal spraving.

State-of-the-art: In 2002 KLM was planning to build a complete new MRO engine shop at Schiphol-Airport in the Netherlands. Therefore Process, Equipment the and Materials Development Figure 3. Manual thermal Department started to make a Spraying.



Figure 2. Manual thermal spraving.



'never seen before' specification for a thermal spray cabinet with unique features in industry.

Features: According to this specification the MRO engine shop of KLM purchased the most advanced thermal spray cabinets ever.

The unique features include a combined down flow floor extraction and plenum extraction with a possibility of 10 to 90% recirculation of filtrated air. All of the dangerous material dusts in the extracted and thus contaminated air is directed towards the cartridge filtration system.. After the first cartridge filtration step, the air is pushed through a second step by means of a HEPA #14 filtration unit. After this 2nd step the air is monitored by a computer-controlled continuous particle measuring system. Then the air is pushed

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through a 3rd step HEPA #14 filtration unit. Subsequently the ultra-filtrated air is divided by electrical valves to recirculation piping or exhaust piping outside the building. The recirculation percentage can be manually changed or in certain ways computer controlled and depends on gas and temperature sensors in the cabinet. On top of that the extracted air-quantity is PLC-monitored and adjustable by frequency controlled ventilators.

Measurements of the filtrated air showed that this system has a dust emission lower than 1.5 nanogram per cubic meter of air(ng/m³), which is unique in the world for process repair cabinets including thermal spray processes. This means that the recirculated or exhausted air has a 1000 times lower value than the most stringent proposed Chromate (VI) exposure level of the Dutch Health Council (see Figure 4).

Figure 4. Proposed levels for Chromate levels			
Limits	PEL value	Time weighted average	
Current PEL value in The Netherlands	10 µg/m³	15 minutes	
Proposed PEL value of the Dutch Health Council [2] (risk of cancer: 4 out of 1000 employees)	2 µg/m³	8 hour	
KLM guideline	0.5 µg/m³	8 hour	
Results of the new state of the art filtration systems	< 1.5 ng/m ³	8 hour	

In the following figures, examples of all cabinets and air-filtration units are shown.



Figure 5. 'Manual' thermal spray cabinet with floor and plenum extraction plus recirculation of filtrated air.



Figure 6. Robotic thermal spray cabinet with floor and plenum extraction plus recirculation of filtrated air.



Figure 7. 56-cartridge filtration system.



Figure 8. Collection bins.

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Figure 9. Anti-vibration muffling.







top - Figure 14. Particle measurement system.

left Figure 13. Double HEPA filtration.



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Figure 11. PLC and frequency controller.

Figure 12. PLC controlled electrical valves for recirculation or 'outside' exhaust determination.

Results: Measurements in the recirculation air always showed a dust concentration of less than 2 ng/m³. See Figure 15 for one of the measured results during electric arc spraying of nickel-aluminum wire at 150 g/min into the suction plenum.



Figure 15: Result of concentration of dust measurements (Y-axis: dust values in ng/m^3 ; X-axis: time line in seconds)

The results show that the filtration system is indeed, as specified, capable of producing filtered recirculation air more than 1000 times better than the proposed PEL value of the Dutch Health Council [2]

Summary: The KLM has introduced new unique state-ofthe-art thermal spray cabinets with, in addition to other things, unique features on dust suction and filtration. By introducing this unique cabinet KLM engine services is capable of fulfilling all the environmental and occupational health legislation of the EU and the Netherlands.

Conclusion: KLM has invested in the next generation thermal spray cabinets in order to continuously establish a safe and healthy labor environment. With these cabinets KLM will stay in the front line of the Aircraft MRO market and can promote their Center Of Excellence (COE) in thermal spraying. A paper on this subject has been presented at the "Thermal Spray Information Workshop" organized by the Technical Committee Thermal Spraying of the Dutch Welding Institute (Nederlands Instituut voor Lastechniek) in 2004 [1].

Acknowledgement:

The author acknowledge Mr. Nico van Velsen and Mr. Mark Bannink, for their helpful input on cabinets and filtration in general and, specifically, on particle counters and HEPA filtration.

References:

1. M. van Wonderen, presentation: *State-of-the-Art Thermal Spray Cabinets*, TC-1c "Thermal Spray Information Day", Nieuwegein, the Netherlands, 6-apr-2004

2. Dutch Health Council: "Chromium and its inorganic compounds" 1998-00664, 24-sept-1998

For more information, contact author M. van Wonderen at email mseg-van.wonderen@td.klm.com

3M Announces Expansion of Superabrasives Manufacturing Operations

Growing Demand Spurs Move to Custom-Designed Facilities

3M recently announced plans to expand manufacturing operations for their growing superabrasives business. Operations currently housed in a small facility in Whippany, New

Jersey, will move to a larger 3M facility in Flemington, New Jersey. All employees from the Whippany operations will be offered employment in the upgraded Flemington facility, located approximately 35 miles from the current location.

"We're excited about the opportunities this move brings us to create a new, better work environment for our employees, while at the same time adding space for growth," said Chris Holmes, general manager, 3M Abrasives Division. "We anticipate that our superabrasives manufacturing lines in Flemington will be a center of excellence for the industry." Holmes continued, "This expansion signals 3M's commitment to the superabrasives business and will help us achieve our growth plans through investments in new technologies and improved manufacturing processes."

The transition of operations from Whippany to Flemington is scheduled to begin in the spring of 2007 and completed by early in the fourth quarter. 3M's existing medical products manufacturing operations in Flemington will continue to be located there.

For more information, visit www.mmm.com

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Is Your Event Listed? Send your event notice to spraytime@thermalspray.org

CALENDAR OF EVENTS JANUARY 2007

14-18 Sharm El Shiekh, Egypt International Round Table on Thermal Plasma Fundamentals and Applications - contact Prof. Maher Boulos, tel: 819.821.7168, email: maher.boulos@usherbrooke.ca

30-31 Biloxi, MS USA ShipTech 2007 sponsored by Office of Naval Research - contact Tricia Wright, tel: 814.269.2597, email wright@ctc.com, web: www.nmc.ctc.com

FEBRUARY 2007



11-14 Dallas, TX USA *Paint & Coatings Expo* (PACE 2007) visit www.pace2007.com

FEB 25 - MAR 1 Orlando, FL USA TMS2007

136th Annual Meeting and Exhibition - contact TMS tel: 724.776.9000 x243, fax: 724.776.3770, email: mtgserv@tms.org, web: www.tms.org

MARCH 2007

11-15 Nashville, TN USA NACE Int'l. Corrosion 2007 contact Cindy Euton, tel: 281.228.6274, fax: 281.228.63.74, email: cindy.euton@nace.org, web: www.nace.org/c2007

25-28 Rosemont, IL USA MetalForm 2007, contact Precision Metalforming Assoc., tel: 216.901.8800, web: www.metalform.com or www.pma.org

26-28 Cambridge United Kingdom Fatigue 2007: Fatigue & Durability Assessment of Materials, Components & Structures - contact Engrg Integrity Soc UK tel: +44(0)114.262.1155, email: fatigue@e-i-s.org.uk, web: www.e-i-s.org.uk

APRIL 2007

2-4 Shanghai, China 2nd Pan-Asian Conf on Advancing PM Tech (PMAsia2007) email: pmasia2007@inovar-events.com, web: www.pmasia2007.com

9-13 San Francisco, CA USA 2007 MRS Spring Meeting, tel: 724.779.3003, email: info@mrs.org, web: www.mrs.org/spring2007

16-20 Detroit, MI USA SAE World Congress - Contact tel: 877.606.7323 or 724.776.4970, fax: 724.776.0790, email: customerservice@sae.org, web: www.sae.org

26 - 28 Chandler, AZ USA International Thermal Sprav Association Membership Meeting and Technical Program - contact Kathy Dusa tel: 440.357.5400, email: kathydusa@thermalspray.org

MAY 2007

7-10 Indianapolis, IN USA AISTech 2007, Iron & Steel Technology -Association for Iron & Steel Technology tel: 724.776.6040, fax: 724.776.1880, web: www.aistech.org

13-16 Denver, CO USA PowderMet 2007 - contact Metal Powder Industries Federation tel: 609.452.7700, email: info@mpif.org, web: www.mpif.org

14-17 Beijing, China Intl Thermal Spray Conference & Expo ITSC 2007 - contact ASM Int'l, tel: 800.336.5152 (ext. 6) or 440/338-5151, web: www.asminternational.org, email: customerservice@asminternational.org

14-17 Montreal, Canada ASME Turbo Expo 2007 presented by the Int'l Gas Turbine Institute visit www.turboexpo.org



28-31 Moscow, Russia Schweissen & Schneiden Russia cosponsored by the DVS German Society for Welding and Allied Processes and the Russian Assoc of Non-Destructive Testing and Welding (NAKS) - contact Messe Essen GmbH tel: +49(0)201.7244.227, email: regiani@messe-essen.de, web: www.messe-essen.de

JUNE 2007

4-7 San Diego, CA USA MegaRust 2007 Marine Marine Coatings & Corrosion Conference - contact Karen RUSI kchitwood@nstcenter.com, Chitwood, web: www.nstcenter.com

5-7 Baltimore, MD USA SAMPE 2007 - contact Doris Weaver, tel: 626.331.0616, email: doris@sampe.org, web: www.sampe.org

12-16 Düsseldorf, Germany 9th Intl Trade Fair & Symposium for Thrmo Process Technology THERMPROCESS and 7th Intl Metallurgical Technology Trade Fair METEC - tel: 312.781.5180, email: info@mdna.com, web: www.mdna.com or www.thermprocess.de

19-21 Aachen Germany 8th Intl Conference on Brazing, High Temperature Brazing and Diffusion Bonding LÖT2007 - contact DVS German Welding Society, tel: +49(0)211.1591.302, email: tagungen@dvs-hg.de, www.dvs-ev.de/loet2007

19-22 Shanghai China Beijing Essen Welding - contact Messe +49(0)201.7244.227,Essen GmbH tel: email: regiani@messe-essen.de, web: www.messe-essen.de

25-28 Baltimore, MD USA 18th Advanced Aerospace Materials & Processes Conf & Expo (AeroMat2007) - contact

ASM Int'l, tel: 440/338-5151, web: www.asminternational.org, email: customerservice@asminternational.org

AUGUST 2007

6-9 Fort Lauderdale, FL USA 40th Intl *Metallographic Society IMS Convention* - contact ASM International, tel: 800.336.5152 or 440.338.5151 x5900, fax: 440.338.4634; em: cust-srv@asminternational.org, web:

www.asminternational.org

6-9 Fort Lauderdale, FL USA Microscopy & Microanalysis 2007 - contact Phillip Ridley tel: 312.644.0828, email pridley@bostrom.com, web: http://microscopy.org/MMMeetings/MM07

SEPTEMBER 2007

10-17 Nürnberg, Germany Euromat 2007 European congress & Exhibition on Advanced Materials & Processes - contact tel: +49.69.75306.747, email: euromat@fems.org, web: www.euromat2007.fems.org

17-19 Detroit, MI USA Materials Science &

Tech. Conf & Expo (MS&T'07) - organized by ASM, ACerS, AIST, AWS, and TMS, and held in conjunction with ASM Heat Treating Society Conf./Expo, contact ASM Int'l. tel:

440.338.5151 x5900, em: cust-srv@asminternational.org, web: www.asminternational.org

17-20 Detroit, MI USA 24th ASM Heat Treating Society Conf & Expo - held in conjunction with MS&T'07 - contact ASM Int'l, tel: 800.336.5152 or 440/338-5151 ext. 6, fax: 440.338.4634, web: www.asminternational.org, email: customerservice@asminternational.org

NOVEMBER 2007

4-8 San Jose, CA USA 33rd Int'l Symposium for Testing & Failure Analysis (ISTFA2007) contact ASM Int'l, tel: 440/338-5151 ext. 6, web: www.asminternational.org, em: customerservice@asminternational.org

11-14 Chicago, IL USA FABTECH Int'l & AWS Welding Show with a Thermal Spray Pavilion - organized by American Welding Society, web:

www.aws.org,Fabricators & Mfgrs Assoc, web: www.fmafabtech.com, Society of Manufacturing Engineers, web: sme.org/fabtech



WHERE IS YOUR ARTICLE?

You and your company have the opportunity to help design the content of your thermal spray community newsletter. The SPRAYTIME Editorial Staff encourages and welcomes your contribution.

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INDUSTRY NEWS

Ask The Experts

Powders by Mitch Dorfman

Question: How do environmental conditions in my powder storage area effect coating quality and/or repeatability

Answer: Storage conditions will have a huge affect on the powder. If material is stored in a humid environment, powder will pick up moisture which could cause flow problems or clumping. This would be apparent when the bottle is opened (powder will be clumpy, or appear sticky). Poor flow results in inconsistent feeding implying non-uniform melting of the powder. Non-uniform melting will result in inconsistent coating microstructures and coating thickness. Typically, powders that are clumpy are dried at low temperatures for short periods of time.

WHERE IS YOUR ARTICLE?

You and your company have the opportunity to help design the content of your thermal spray community newsletter. The SPRAYTIME Editorial Staff encourages and welcomes your contribution.

Send news and articles via email to spraytime@thermalspray.org

NEW FEATURE SPRAYTIME[®] Ask the Experts SPRAYTIME now has a panel of "experts" (see below) to answer your thermal spray questions.

Daryl Crawmer, Thermal Spray Technology, Inc. - Safety -Plasma Spraying - Applications

Mitch Dorfman, Sulzer Metco (US) Inc. Powders Frank Hermanek, Retired - Turbine Applications and Materials Paul Kammer, Kammer Associates Combustion Spraying and Atomized Powders

Sanjay Sampath, State University of New York - Coatings' Properties and Characterization

Mark Smith, Sandia National Laboratories Cold Spray Richard Thorpe, Praxair TAFA - Equipment and HVOF Spraying Bob Unger, Polymet Corporation Electric Arc Spraying

These individuals are ready to answer your questions in an educational manner to share with the entire SPRAYTIME readership. Questions are not limited to the subject areas listed above. If your question is outside the expertise of these panel members, we will find the right person to answer your question. *Guidelines are as follows:*

- Questions should be 25 words or less and submitted only by e-mail to SPRAYTIME@thermalspray.org
- Upon reveiw and acceptance, questions will be distributed to appropriate panel member(s)
- Due to the publication time schedule, should not be a question for which the individual needs an immediate answer.
- The question must be accompanied by the name and affiliation of the submitter; however, the name will not be published.
- SPRAYTIME reserves the right to edit any question (and the answers) and due to space and time limitations only questions selected for publication will be answered.
- For more information, contact Kathy Dusa at SPRAYTIME via email spraytime@thermalspray.org

International Thermal Spray Association Welcomes Air Products and Chemicals

Air Products and Chemicals has joined the International Thermal Spray Association.

As a worldwide leading industrial gas supplier, Air Products delivers an unmatched level of consistency that lets you create high-guality thermal spray

coating. Air Products full line of high purity gases—oxygen, nitrogen, hydrogen, argon, helium and gas blends—are delivered through liquid, bulk and microbulk solutions.

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Specifically, services offered include, but not limited to: thermal spray coatings; thermal spray processes; diffusion coatings; compressor coatings; powder sprayability; heat treating; engineering consulting; and technical representation. ASM also represents other



independent manufacturers of surfacing materials and equipment. ASM is continually forming joint partnerships with independent sup-

ASM new building.

pliers and vendors to strengthen their portfolio of services.

ASM is housed in a brand new building in the heart of the turbomachinery business - Houston, Texas, conveniently located close to major highways.

Surface modifications of industrial components continue to grow as the need for surface enhancement is clearly seen as an economic advantage. ASM, LLC has been formed to address this growing demand.

For more information, contact a representative via tel: 713.975.1330, fax: 713.975.0069, email: sales@asm-llc.com, website: www.asm-llc.com.

SPRAYTIME advertising rates at www.spraytime.org

White Engineering Surfaces Corporation Sales Professionals/Sales Manager-Thermal Spray Coatings

White Engineering Surfaces Corporation, founded in 1963, is looking for an experienced Sales Manager and Sales People to manage our sales team, service existing and potential accounts, and the development of new markets. Successful candidate must be experienced with Thermal Sprayed Coatings, using Plasma, HVOF and Wire Arc, etc deposition technologies. This position offers a competitive salary and commission structure.

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E-mail jdemetriou@whiteengineering.com



Scholarship Opportunities

The International Thermal Spray Association will award up to two (2) Graduate

scholarships worth \$1,500.00 each to be awarded each calendar year and up to three (3) Undergraduate scholarships worth \$500.00 each to be awarded each calendar year

Since 1991, the ITSA Scholarship Program has contributed to the growth of the Thermal Spray Community, especially the development of new technologists and engineers. The International Thermal Spray Association is very proud of this education partnership and encourages all eligible students to apply. Scholarship applications are now accepted annually **April 15 through June 30 ONLY** for both the Graduate and Undergraduate scholarships.

For more information, please visit www.thermalspray.org scholarship area for details and a printable application form.



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is closely interwoven with the history of thermal spray development in this hemisphere. Founded in 1948, and once known as Metallizing Service

Bringing Technology and Technique Together

INTERNATIONAL

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Contractors, the association has been closely tied to most major advances in thermal spray technology, equipment and materials, industry events, education, standards and market development.

A company-member trade association, ITSA invites all interested companies to talk with our officers, committee

Chairman Simonds with our officers, committee chairs, and company representatives to better understand member benefits. A complete list of ITSA member companies and their representatives are at www.thermalspray.org

ITSA Mission Statement

The International Thermal Spray Association is a professional trade organization dedicated to expanding the use of thermal spray technologies for the benefit of industry and society.

Officers

Chairman: *Ed Simonds*, Cincinnati Thermal Spray, Inc.
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Treasurer: *Bill Mosier*, Polymet Corporation
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4-Year Term: *John Hayden*, Hayden Corporation
2-Year Term: *Joe Stricker*, St. Louis Metallizing Company

ITSA Scholarship Opportunities

The International Thermal Spray Association offers annual Graduate and Undergraduate Scholarships. Since 1992, the ITSA scholarship program has contributed to the growth of the thermal spray community, especially in the development of new technologists and engineers. ITSA is very proud of this education partnership and encourages all eligible participants to apply. Please visit www.thermalspray.org for criteria information and a printable application form.

ITSA Materials Camp Student Sponsor

Commencing in 2001, the International Thermal Spray Association provides an annual \$1,500 student scholarship to the ASM International Foundation Materials Camp.

ITSA Thermal Spray Historical Collection

In April 2000, the International Thermal Spray Association announced the establishment of a Thermal Spray Historical Collection which is now on display at their headquarters office in Fairport Harbor, Ohio USA.

Growing in size and value, there are now over 30 different spray guns and miscellaneous equipment, a variety of spray

gun manuals, hundreds of photographs, and several thermal spray publications and reference books.

Future plans include a virtual tour of the collection on the ITSA website for the entire global community to visit.

This is a worldwide industry collection and we welcome donations from the entire thermal spray community.

ITSA SPRAYTIME Newsletter

Since 1992, the International Thermal Spray Association has been publishing the **SPRAYTIME** newsletter for the thermal spray industry. The mission is to be the flagship thermal spray industry newsletter providing company, event, people, product, research, and membership news of interest to industrial leaders, engineers, researchers, scholars, policymakers, and the public thermal spray community.

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ITSA Headquarters

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SPRAYTIME solicits letters to the Editor for publication in our new column. Letters are solicited that comment on a recent SPRAYTIME article, on a topic of general interest to the thermal spray industry, on a recent event in the industry, or on a recently published letter to the editor.

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Cincinnati Thermal Spray Announcements



Bill Menth to Sales Manager

Cincinnati Thermal Spray, Inc. (CTS) announces the promotion of Bill Menth to the position of Sales Manager, CTS-Midwest, Cincinnati. In his new position, Bill will report directly to Dan Classen. Bill will have responsibility for both the Sales and

Customer Service organizations at CTS-Midwest. Ed Simonds to Manager of Business

Development and Commercial Sales

CTS announces *Ed Simonds* will assume the newly created position of Manager of Business Development and



Commercial Sales. In this role, Ed will be responsible for finding new business

opportunities, providing technical support to the CTS sales group, marketing, and sales to commercial customers.

Daniel C. Classen, CTS President

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stated "Please join me in wishing both Bill and Ed the best of success in their new positions."

For more information, contact Bill Menth at email and contact Ed Simonds at email esimonds@cts-inc.net, and visit website www.cts-inc.net

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Journal of Thermal Spray Technology®

A publication of the ASM Thermal Spray Society (An abstract from September 2006 VOL. 15: NO. 3) Effect of Grit-Blasting on Substrate Roughness and Coating Adhesion

Dominic J. Varacalle, Jr., Donna Post Guillen, Douglas M. Deason, Villiam Rhodaberger, and Elliott Sampson

Statistically designed experiments were performed to compare the surface roughness produced by grit blasting A36/1020 steel using different abrasives. Grit blast media, blast pressure, and working distance were varied using a Box-type statistical design of experiment (SDE) approach. The surface textures produced by four metal grits (HG16, HG18, HG 25, and HG40) and three conventional grits (copper slag, coal slag, and chilled iron) were compared. Substrate roughness was measured using surface profilometry and correlated with operating parameters. The HG16 grit produced the highest surface roughness of all the grits tested. Aluminum and zinc-aluminum coatings were deposited on the grit-blased substrates using the twin-wire electric arc (TWEA) process. Bond strength of the coatings was measured with a portable adhesion tester in accordance with ASTM standard D4541. The coatings on substrates roughened with steel grit exhibit superior bond strength to those prepared with conventional grit. For aluminum coatings sprayed onto surfaces prepared with HG16 grit, the bond strength was most influenced by current, spray distance, and spray gun pressure (in that order). The highest bond strength for the zinc-aluminum coatings was attained on surfaces prepared using the metal grits. Read the entire article in the September 2006 Journal of

Read the entire article in the September 2006 Journal of Thermal Spray Technology. For more information visit www.asminternational.org/tss or contact ASM Customer Service Center, ext. 5900 tel: 800.336.5152 (toll free in United States) or 440.338.5151; fax 440.338.4634; email: customerservice@asminternational.org

Editor: Christian Moreau

Associate Editors: Jan Ilavsky, Seiji Kuroda, Lech Pawlowski, and Armelle Vardelle

ITSA Technical Program Open to Public

The *International Thermal Spray Association* welcomes non-member participation at the Technical Program portion of their membership meetings. ITSA semi-annual membership meetings are typically three-day events with a thermal spray technical program on Friday from 8:00 am

through 5:00 pm.

This is in response to interest from nonmember individuals wanting to take advantage of these valuable thermal spray educational opportunities.

The April 27, 2007 Technical Program will be held in Chandler, Arizona. The cost for non-members to attend is \$300, which includes breakfast and lunch.

For more information, contact Kathy Dusa, ITSA corporate Secretary, email: kathydusa@thermalspray.org





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Handbook of Thermal Spray Technology Highlight

"Splat is the term given to a single impacted droplet/particle as illistrated in Fig 2. Many overlapping splats (illustrated in cross section in Fig.3) solidify and adhere to one another to form a continuous coating layer. Thus, the splat is the basic structureal building block

in thermal spray coatings. Splats are created when the accelerated, molten particles impact a prepared surface." From "Coating Structures, Properties, and Materials" in the Handbook of Thermal Spray Technology

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Cold Spray Technology Book

This "Cold Spray Technology" is the first book on the cold spray process. The important feature of the book is that it covers a wide spectrum of various technology aspects including gas-dynamics, physics of interaction of high speed solid particles with a substrate as well as equipment, technologies, and applications. The book includes results of original studies conducted at the Institute of Theoretical and Applied Mechanics of the Siberian Division of the Russian Academy of Science for more than 20 years (1984-2005) as well as results of studies conducted at most of research centers over the world. The authors' goal was to explain basic principles and advantages of the Cold Spray process, to give practical information on technologies and equipment, and to present the current state of research and development in this field throughout the world.

The book provides coverage and data that will be of interest for users of Cold Spray technology as well as for other coating experts. The book can be useful for the broad reading public, in particular, for engineers, scientists, technicians, undergraduate and postgraduate students as well as for specialists who are interested in studies of advanced technologies, gas dynamics of supersonic gas flows and physics of high speed collisions of the particles with the target.

To order Cold Spray Technology, visit www.elsevier.com (Elsevier Publication, 2006)

Authors: Anatolii Papyrin, Vladimir Kosarev, Sergey Klinkov, Anatolii Alkhimov, Vasily Fomin. Edited by Anatolii Papyrin

Exhibitor Registration Now Open The *MegaRust 2007 Marine Coatings and Corrosion Conference* will be held June 4-7 in San Diego, California.

The exhibitor registration is now open at the website www.nstcenter.com

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ASM TSS Email Discussion Group

Over 600 subscribers from 40 countries use this lively discussion forum. Sharing information and networking with colleagues is a key goal of the ASM Thermal Spray Society. All thermal spray related communication is welcome. The forum has seen ideas on applications for thermal spray, coating properties, equipment for sale, positions wanted and job openings, calls for papers, and other news of interest to the thermal spray community. *Join the group now!* Visit www.asminternational.org/tss and choose *"Technical Resources"* for subscribing information.

In Memoriam

Randy White 1954 - 2006



Randy White, 52, owner of Top Koat Custom Powder Coating, passed away September 15, 2006, at an Arlington, Texas hospital.

Randy was born Aug. 19, 1954, in Fort Worth. Randy was the previous owner and President of WearMaster, Inc. in Kennedale, Texas.

Randy was an innovative person with two patents on thermal spraying devices.

He was known for his generosity of spirit, kind soul, sense of humor and beautiful blue eyes.

He was surrounded by his wife, Janice, and family when he passed away.

Survivors are his wife, Janice White; daughter, Crystal White; stepson, Ryan Klump; sister, Beverly Wolfe; brother, David White; niece, Lisa Wolfe; nephews, Jacob White and James Wolfe; and many other relatives and friends.

Top Koat is still open for business and you may send condolences there at 110 Industrial Drive, Kennedale, TX 76001, tel: 817.478.0797, email: info@topkoat.com, website: www.topkoat.com



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