

SPRAYTIME®

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Legislative Day 2006

by
Cliff Johnson



On May 24-25, twenty-seven NACE International representatives traveled to Washington, D.C. to meet with legislators and their staff to explain the extensive impact of corrosion in the United States and to discuss possible solutions to these escalating costs that are a threat to this nation's economic growth.

The current NACE strategic plan identifies tax incentives as a key tool for addressing the negative impact of corrosion on the US economy. During these visits, NACE was advocating for the passage of **H.R. 4913 (The Corrosion Prevention Act of 2006)**. The Corrosion Prevention Act of 2006 was introduced in the US House of Representatives on March 9, 2006. As currently written, the bill will provide a 50% tax credit on corrosion prevention investments for both new and existing privately owned structures in the US. This would have a significant impact on the US economy by making our businesses more competitive globally, creating and retaining jobs and providing incremental tax revenue to the US Treasury. It will also favorably impact the environment, safety, liability and, in turn, will reduce insurance claims and premiums. Benefits from the bill will affect not only the users of corrosion prevention strategies, but will also help grow our corrosion control industry by increasing demand for the products and services that NACE provides.

continued on page 2

Representatives at the United States Capital Building, Washington, DC (Left to Right)

Row 1: Teri Elliot - NACE, Tony Keane - NACE, Robin McMillan - PPG, James Weber - Sulzer Metco, April Pulvirenti - Catholic University, Jay Steele - Steel & Sons

Row 2: Susan Borenstein - Washington Gas, Helena Seelinger - NACE, Elaine Bowman - Champion Technologies, Lindsey Elliott, Walter Young - Corpro, Mike Baach - City of Medina, George Hays - Ashland, Lou Vincent - Corpro, Mike McLampy - KTA-Tator, Kevin Parker - CC Technologies, Jeff Schmucker - Carboline, Don Sampson - Stonhard, Eric Bonner - Allied Corrosion, Ashley Dunham - Champion Technologies, Cliff Johnson - NACE,

Row 3: Robert Kogler - Taku Engineering, Greg Tosi - Congressman Michael Fitzpatrick Office, David Krause - Corpro, Harvey Hack - Northrop Grumman, Ken Tator - KTA Tator, George Krewson - Matcor, Jeff Didas - Colonial Pipeline

continued from page 1

The first day in Washington was spent preparing for our visits to the legislative offices. The Executive Director and General Counsel of the Petroleum Transportation and Storage Association provided an informative presentation titled "Lobbying Your Members of Congress". They also heard from the Department of Defense Office of Corrosion Policy and Oversight representative Dan Dunmire, and NACE Congressional Affairs Subcommittee Chairman Mike Baach.

On the second day, Rep. Michael Fitzpatrick gave an overview of the bill status and the importance of the passage of this legislation and let us know that he strongly supported the passage of this bill. From there NACE members descended on the Capitol and met with over 20 members of Congress and their staff asking for their support in passing this bill. These meetings represented members from thirteen different states (New York, Georgia, New Jersey, Massachusetts, Virginia, Pennsylvania, Maryland, Ohio, Illinois, Michigan, Louisiana, Florida, and Texas).

We were able to demonstrate how tax credits would:

- result in reduced wasted investment on repair and replacement
- promote corrosion preventative strategies versus "find it and fix it" mentality
- redeploy wasted spending to productive use; create new jobs
- increase public and industrial safety
- protect the environment
- produce a substantial net tax revenue increase, and
- represent "good government".

The bill is currently in the US House of Representative Ways & Means Committee. We received a number of supportive comments on the legislation and added a new cosponsor to the bill. We now have five cosponsors and are continuing to work to reach the magic number of 216 to have this bill pass the House of Representatives.

This tax initiative won't happen overnight, but we've made a substantial impact in very short period of time.

What are our next steps?

- We will maintain close contact with Congressman Fitzpatrick and members of the Ways and Means Committee that has jurisdiction over tax incentive programs.
- We will promote increased member involvement at future NACE Legislative Days
- **We call on all interested individuals for support of this initiative.**
- We will be pursuing multi-district support and organizing a letter-writing campaign with NACE members and NACE member companies.

To become involved in this effort, please contact Cliff Johnson, Public Affairs Director, via email cliff.johnson@nace.org, phone at 281.228.6213, web www.nace.org

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Using The Internet For Patent Searches

by Paul Kammer, Kammer Associates

The on-line availability of patent databases allows a non-expert to obtain a great deal of patent information. However, a professional should be used if the purpose of the search is critical, such as for patentability or infringement concerns. Among the free databases that are available are one from the United States Patent and Trademark Office (USPTO) at www.uspto.gov and another at www.freepatentsonline.com.

The USPTO database contains both US patents and patent applications while the [freepatentsonline](http://www.freepatentsonline.com) database also contains some European documents. The USPTO database contains the full-text of patents that date from 1976 to the present time and images of patents that date from 1790 to the present. Publication of patent applications is relatively recent for the USPTO; applications are available for the period from 2001 up to the present.

First, "Why search for and review patents?" There are several reasons why you might do this; for example:

- Follow developments in areas of interest to you by reviewing information that otherwise might not be published.
- Track what your competitors are doing in a particular area.
- Look for patents that might be available for licensing.
- Learn things that you may be able to use in your own business as long as you do not infringe a patent that has not yet expired.
- Avoid reinventing the wheel; a lot of money can be spent

on a development only to subsequently find it is already patented.

- Guide a development project to avoid infringing an existing patent; for this one you should consult a patent expert.

The following remarks and examples are based on the USPTO database and its use. The search page for this database is at www.uspto.gov/patft/index.html. From this page you can search patents or applications. To view a complete patent you must install a TIFF viewer on your PC; a free version is available for downloading at www.alternatiff.com.

A US patent has several sections including: (1) abstract, (2) specification (a description what is being patented, background, and often, examples), and (3) claims (what is being patented). The patent also lists the inventor(s) and the assignee (company that owns the patent).

Note: *it is easier to follow these examples if you open up your PC to the indicated web page and then follow along.*

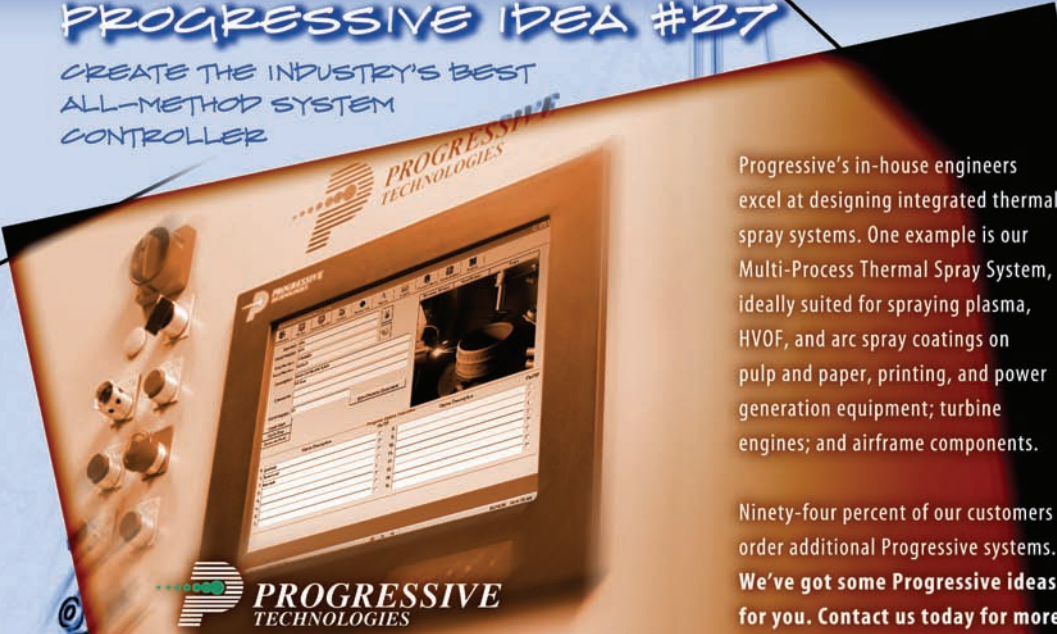
Go to the USPTO search page:

www.uspto.gov/patft/index.html.

If you have a patent number, you click on Patent Number Search (under Issued Patents) on the main search page and then enter the number on the next page. For example, if you saw the number 4,568,019 in the prior issue of SPRAYTIME and wanted to find out more, enter the number and click on search. You will be directed to a Browning patent "Internal burner type flame spray method and apparatus having material introduction into an overexpanded gas stream" issued on February 4, 1986. The abstract, references, claims,

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and full-text of the specification are shown. If you want to see the entire patent including drawings, click on the red box that says Images; and if you have the TIFF viewer installed, you will now see the complete patent which you can print or save if you wish.

Another interesting feature is on the first page that came up when you searched by number. Above the list of references cited is a blue "Referenced By". Click on this and you will get a list of nine patents, issued after the Browning patent that referenced it. This allows you to track developments in the topic that followed after Browning.

A handy tool that can be used to easily scan such a list as you found in the above search, is called "Browster" that is available free for downloading at www.browster.com. This plug-in for Internet Explorer allows you to preview each patent in the list without having to go back and forth between complete web pages.

If you do not have a patent number, it is easy to search by several other terms by clicking on Quick Search on the search home page. For example, if I entered my last name (Kammer) as Term 1 and selected Inventor Name (Field 1) and entered powder as Term 2 and selected Abstract as Field 2; I would be directed to a list of three patents. Two of these are for a flame spray powder and the third is for a welding electrode that has a powder in its coating.

If I wanted to see what Sulzer Metco was doing in regard to patents on powders, I enter Sulzer as Term 1 and select Assignee Name for Field 1. If I search with only these entries, I obtain a list of over 2400 patents. To reduce the list I could, for example, enter powder as Term 2 and Abstract as Field 2 and then I obtain a list of 26 patents that I could look through (using Browster) to find those that I want to look at.

Starting at the search home page I could follow a similar approach for patent applications. For this example (Sulzer and powder) I find that there are eight applications. By looking at the applications, you should obtain a more up-to-date view of Sulzer's patent activity in the area of powders than if you searched only for Sulzer patents.

There is a more complex search method found by clicking on Advanced Search on the search home page. If you do a lot of searching, you may want to learn to use it, but for simple searches the Quick Search works well. Note that patents from 1790 through 1975 are searchable only by Issue Date, Patent Number, and Current US Classification

Many thanks to John Bohland, Registered Patent Agent (johnbohland@cox.net) who reviewed this article for me.

For more information, contact Paul Kammer, Kammer Associates, Inc., tel: 252-633-9825, email: pakammer@cs.com. (See advertisement page 13.)

FREE Thermal Spray Patent Copy

Copies of the original Schoop thermal spray patent - suitable for framing - are available from the International Thermal Spray Association. This is a photograph copy of the original February 19, 1914 "Apparatus For Spraying Molten Metal and Other Fusible Substances" by M. U. Schoop from the United States Patent Office. Send an email request to kathydusa@thermalspray.org.

SPRAYTIME® Continues as Industry Newsletter

The International Thermal Spray Association is pleased to announce that it will continue to provide *SPRAYTIME* free-of-charge to the thermal spray community. If you have been receiving *SPRAYTIME*, you will continue receiving *SPRAYTIME*. If you or your colleagues wish to sign up for a free subscription, visit www.spraytime.org and choose the *SPRAYTIME* logo to complete a short questionnaire.

SPRAYTIME will continue to grow by reaching across other industries (AWS, SAE, NACE, ASME, etc.) for pertinent information-sharing and additional readership. As a result of this collaboration with other professional industries, open enrollment and expanded readership, we expect our circulation to increase significantly to 10,000 in this decade.

If you are a member of the thermal spray community or have an interest in thermal spray, *SPRAYTIME* is your newsletter and we continue to encourage and welcome your contribution of articles, news, and events.

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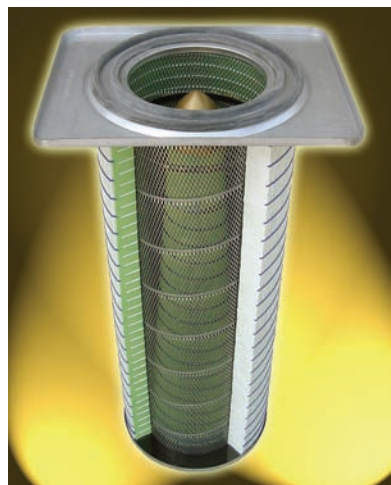
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A new "HemiPleat™ HE (High Efficiency)" filter from Farr Air Pollution Control (APC) offers an unsurpassed MERV 15* efficiency rating, coupled with up to twice the service life



and half the pressure drop of standard dust collector cartridge filters. Available in filter sizes to fit any cartridge collector, the HemiPleat HE media is ideal for the capture of toxic and other ultra-fine dusts, and for applications where process air is recirculated downstream of the collector for energy savings.

The filter combines the HemiPleat technology with an HE synthetic fine fiber media that yields the industry's best filtration efficiency of 99.999 percent on 0.5 micron particles and larger. A patent-pending design holds the pleats of the filter open, making virtually all the media surface available for filtration - unlike conventional cartridges, which are packed too tightly to maximize media use. The wide, uniform spacing results in lower pressure drop for more efficient performance. This



design allows dust to eject readily from deep within the pleats during pulse cleaning. The cartridge also holds a larger volume of dust before requiring cleaning than filters with more tightly packed media.

*Minimum Efficiency Reporting Value (MERV) was determined by independent testing performed in accordance with ASHRAE Standard 52.2.

New CD Catalog Showcases Farr APC Dust Collectors

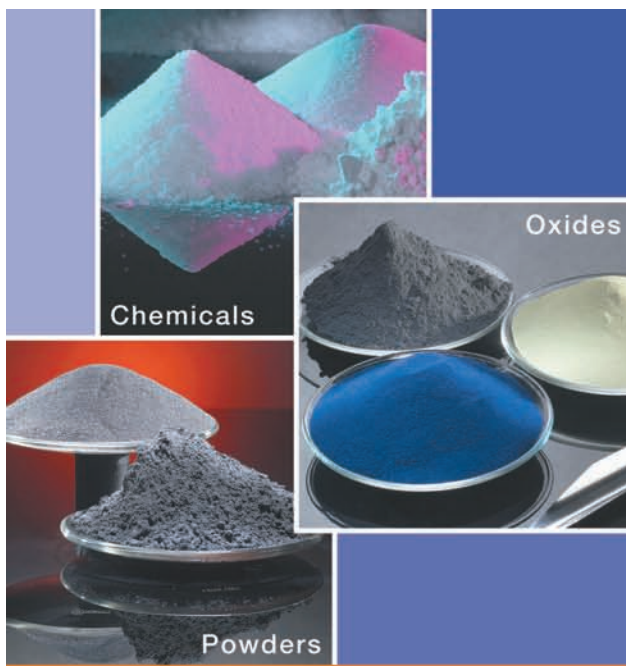
Farr Air Pollution Control (APC) has published a new CD that provides a comprehensive electronic catalog of the company's dust, mist and fume collection equipment. The CD contains in-depth information on dust collectors for all types of applications, including the popular line of "Gold Series®" cartridge collectors with patent-pending HemiPleat™ filter technology.

Product literature, technical data, application guidelines, photos and drawings, and PowerPoint presentations are included for key products. The CD also contains a library of technical papers and case studies on dust collection topics.

For more information or a free copy of the new Farr APC CD 2.0, contact Farr Air Pollution Control 3505 South Airport Road, Jonesboro, AR 72401 USA, phone 800.479.6801; fax 800.222.6891; email filterman@farrapc.com, website www.farrapc.com

(See advertisement page 10.)

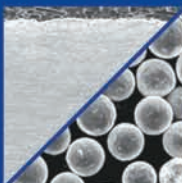




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Fiber Network Introduces a New Software Interface that Revolutionizes Thermal Spray Coating with a 9MP-CL Powder Feeder

Fiber Network is pleased to announce that it has released a new complete interface package that controls a 9MP-CL Powder Feeder. The new kit named VCP Redirector PF includes a state-of-the-art software program that allows real time adjustments of feed rate and carrier flow without shutting down the thermal spray coating process. The software also captures the data in 5 second intervals. It gives immediate feedback to make sure your coating parameters are correct while graphing the data and dumping the data points into a spreadsheet for further review.



Walter Guiles from Fiber Network says "This new package will save an enormous amount of production and testing time as well as verify that the coating process was consistent. When you can hand someone a graph and a spreadsheet along with the coated products proving consistency, that's when you are entering the six sigma range of quality control. In my 16 years of working in the technology field I've never seen a product with so much potential."

The VCP Redirector PF package includes:

- Laptop (configured)
- Powder feeder control module
- Graphing module.
- Serial server (configured)
- Data collection module

The package is capable of:

- Controlling a 9MP-CL powder feeder in real time
- Adjusting feed rate on the fly
- Adjusting carrier flow on the fly
- Changing the gas type if the powder feeder is not in operation
- Showing a real time graph of the process in 5 second intervals
- Dumping the collected data points into a spreadsheet for further review.

There is always a need for improvement and greater efficiency. This product truly revolutionizes this process and provides a level of quality control that wasn't available before. It is presently in use in a facility in the United States and has proven to be a necessary tool in the thermal spray industry.

Fiber Network will look into additional interface needs as they are quite impressed with the power of this software and the potential need for similar interfaces that can save as much time and prove to be as comprehensive in quality control.

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(See advertisement page 27.)

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Nusteel Bridges and Gantries Protected by Thermal Spraying by Metallisation Limited

Metal or thermal spraying is a technology that protects or extends the life of a wide variety of products, including bridges and gantries, in the most hostile environments and in situations where coatings are vital for safety and performance. Coatings can be used for anticorrosion and engineering applications, including wear and slip coatings and temperature-resistant coatings.

Structural steelwork can be sprayed with a variety of different coatings depending on the circumstances, e.g. pure zinc, pure aluminium and their alloys.

Metallisation has been synonymous with surface coatings since 1922. From its beginnings as a company providing an answer to corrosion problems on structural steelwork, successive generations of highly respected principals have led Metallisation to its current position, where it is respected as an expert in the technology of surface coatings.



In December last year, Nusteel Structures, based in Kent, purchased an additional Metallisation MK73 Flame Spray System. Nusteel has been a customer of Metallisation for over 25 years. Nusteel is one of the leading suppliers of steel bridge and sign gantry structures in the UK, providing complete design and build solutions to the infrastructure industry. Nusteel is an approved Highways Agency and Network Rail applicator.

Surface coating and finishing is undertaken at the purpose-built manufacturing facility in Hythe, where quality assurance procedures aim for zero defects. All new structures must be sealed and coated to the recommended highway specification Item 159. Surfaces are first grit blasted to SA 3 cleanliness and then sprayed with 100µm (0.004 in) of aluminium using Metallisation's MK73 Flame Spray system, as



per the client specification. A single coat of a two-part aluminium epoxy sealer is then applied at a spreading rate of 15 - 20 sq m (160-215 sq ft) per litre (0.26 gal) to seal the aluminium metal spray, followed by a coat of two pack zinc phosphate primer followed by a two pack MIO, and a final top coat

of a two pack polyurethane, total film build of the system is 400µm (0.02 in) including the metal spray. The inclusion aluminium coating should guarantee a protective, maintenance free surface in excess of 20 years, in a difficult access environment, such as a public Highway.

The Metallisation Flame Spray Process

In the Metallisation flame spray process, the raw material in the form of a single wire, cord or powder, is melted in an oxygen-fuel gas flame. This molten material is atomised by a cone of compressed air and propelled towards the work piece.

The molten spray solidifies on the component surface to form a dense, strongly adherent coating suitable for corrosion

protection or component reclamation. Sprayed coatings may also be used to provide wear resistance, electrical and thermal conductivity or insulation or free standing shapes. Major advantages of the flame spray process are that the coatings are available for almost instant use with no drying or curing times and there is no risk of damaging the component.



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The Metallisation Mark 73 represents a breakthrough in anti-corrosion spraying. With a new choice of continuous or stop/start nozzles, throughputs have been raised by 33%. With its predecessor already one of the fastest guns around, this new development puts the Mark 73 way ahead of the field. The combination of the new head with an improved valve and pilot assembly and a high power air motor drive must make this the fastest and most reliable system in existence.

Simon Slinn, Quality Assurance Manager at Nusteel Structures says: "We use Metallisation equipment because our clients' specify that all surfaces must be arc sprayed or flame sprayed as part of a Highways (Difficult Access) or Rail Track Paint system. Due to the size of bridges and gantries it is not generally possible to galvanise the structure. The addition of the metal spray used in conjunction with paint system, affords a greater level of protection to the steel substrate from corrosion. The Metallisation equipment is easy to use and very reliable, something that is important to us at Nusteel."

Metallisation Equipment is Vital in Modernisation of Liège Station

Metallisation's Arcspray equipment has been used to protect the new Liège train station in Belgium from corrosion.

Pintura Y Decoración Industrial Del Rio S.L., a customer of Spanish distributor Descon Química S.L., has thermal sprayed the whole of the steel structure that makes up the new station, using the Metallisation Arcspray 140/S450 system and Mark 73 guns.

Euro Liege TGV is managing the modernisation of Liège train station as part of a major project. The aim of which is to

transform the railway stations between Brussels and Liège from basic transport functions, to hot spots of urban life and commerce. The project should contribute to the renewal of the urban areas close to the station and the river Meuse. The result will be lots of open space, a link from the river to the train station and a new traffic interchange between rail and water.

Work started on Liège train station back in November 2000, and is now in its final phase of a four-phase program due to be completed in the summer of 2006. Liège train station is



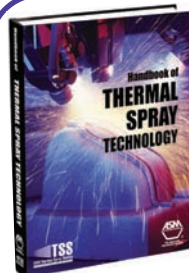
the biggest in Europe and has been designed by Spanish architect, Santiago Calatrava. The new structure is made totally of steel and has been thermal sprayed to protect against

corrosion by Pintura Y Decoración Industrial Del Rio S.L. using 2.3 mm (0.09 in) of zinc aluminium - 85/15 wire. The steel structure was thermal sprayed off site away from the train station, prior to being installed.

Once installed, a number of retouches were required. Using the Metallisation Mark-73 gun and 3.17 mm (0.125 in) and 2.5 mm (0.100 in) wire, Pinturas Del Atlantico S.L., another customer of Descon, retouched each welding point on site. The whole project has taken over 90 metric tonnes (99 tons) of wire to spray the original steelwork and over 10 metric tonnes (11 tons) of wire for the retouching.

Ignacio Sanchiz, Director at Descon Química S.L says: "This has been such an exciting project for our customer to be involved with. We are very pleased that we have been able to assist in delivering an efficient and reliable system for them to do justice to such a project. Metallisation equipment has always been strong and reliable. It has proved to be a success once again for our business and our customers."

For more information, contact Stuart Milton at Metallisation, email sales@metallisation.com, tel +44.1384.252.464, web www.metallisation.com



Handbook of Thermal Spray Technology Highlight

"Surface Preparation: A variety of techniques are used to prepare the surfaces for the tensile test. Certainly, the surface must be clean; applicable methods are those described following the sectioning of coated panels

prior to metallographic mounting. Some laboratories prefer to grind the surface of the coating prior to applying the adhesive. While this minimizes the mechanical interlocking, it may tent to activate the surface for"

From "Testing of Coatings - Surface Preparation", in the *Handbook of Thermal Spray Technology*

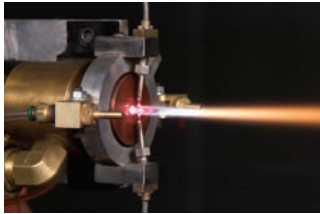
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5th Anniversary for 100HE™

Progressive Technologies celebrates the fifth anniversary of the 100HE™ plasma gun this year with an expanding range of successful commercial applications.

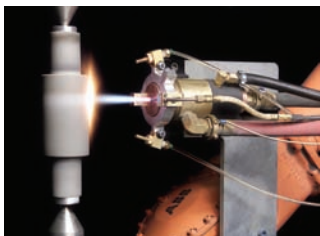
With its first commercial installation in late 2001, Progressive Technologies 100HE™ plasma gun has been gaining worldwide acceptance and notoriety within the thermal spray industry as a leader in producing high quality coatings while reducing total costs. "Knowing the record of other high performance plasma systems, we wanted to ensure that we had a verifiable track record and a bullet-proof product" says Bill Barker, sales engineer for Progressive.



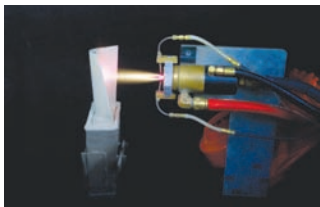
100HE in high velocity mode.

100HE Plasma systems are currently installed at customer locations in North America, Europe and Asia with an ever increasing list of applications. Some of these applications include:

- Chrome Oxide coatings on anilox rolls at Spray rates of 80-100 grams/minute with deposit efficiencies of greater than 60%. Superior coatings enable laser engraving of up to 3,500 lines per linear inch (12,250,000 cells per sq in)!
- High bond strength 316 stainless steel coatings on butterfly valves. Customer originally planned to use two HVOF systems to achieve the required production rate, but was able to exceed the required production rates with only one 100HE system.
- High porosity thermal barrier coatings and dense vertically cracked ceramic coatings for industrial gas turbine applications.
- Dense dielectric coatings for electronic applications.



100HE spraying chrome oxide on roll.



100HE spraying TBC on turbine bracket.

- Hard Chrome Carbide wear coatings sprayed at 80 g/min and 75% deposit efficiency.
- Friction and wear coatings on large carbon fiber printing rolls.
- Abradable coatings sprayed in aircraft engine compressor sections at major U.S. turbine engine OEM. System can spray at up to 300 g/min with 80+% deposit efficiency.
- Ceramic thermal barrier and abrasion resistant coatings on industrial conveyor belts manufactured by a casting equipment OEM.
- Wide range of coating repair operations performed by one of the world's largest airline engine overhaul facilities.

Progressive continues to develop new applications for the 100HE and is excited to work with industrial companies to reduce their cost of applying coatings.

For more information, please contact Progressive Technologies at 800.986.0871, email us at ptisales@ptihome.com, or visit our website at www.ptihome.com



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Send your letter to SPRAYTIME by e-mail to spraytime@thermalspray.org or via fax to 440.357.5430; electronic submissions as a Word document are preferred. Letters must be signed and must give the author's name, affiliation, and phone or e-mail address. The author's name will be published. Letters of fewer than 300 words will be given preference. Longer letters may be abridged by the editor. Please give the headline and issue number if referring to a specific article previously published.

The editor reserves the right to select letters for publication, and due to space and time limitations not all letters will be published nor acknowledged. If you have any questions please contact SPRAYTIME via email spraytime@thermalspray.org, or via phone 440.357.5400.



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Surface Engineering Technology Group

Purpose: Drawing on the resources of NRC's Engineering Institutes, the Surface Engineering Technology Group (SURFTEC) was created to provide Canadian industries with a forum for the acquisition

of advanced surface modification technologies.

Summary: Using thermal spray deposition and related technologies, SURFTEC provides its members with capabilities in materials development and in the optimization of processes for surface engineering, particularly thermal deposition. This program facilitates the fine-tuning or improvement of various aspects of coating development:

- Formulation of deposition materials for specific applications
- Effect of thermal spray conditions on deposition and coating characteristics
- Diagnostics and control during processing
- Physical, microstructural, and mechanical properties of coatings
- Coating performance through laboratory and in-service testing.

The technology is generic and is suitable for all types of materials: metals, ceramics, polymers, and their composites. It is of particular value to equipment and component manufacturers, repair and overhaul companies, as well as end-users in industries where high-performance equipment is operated under severe conditions of high temperature, friction, wear, and corrosion. It is also of particular value to companies such as coating material suppliers, coating specialists, and machinery suppliers.

Membership: Membership provides a range of benefits:

- Direct input into the planning of the SURFTEC research program
- Leverage effect of membership fees
- Access to the results of the SURFTEC R&D program
- Confidential one-to-one technical and scientific assistance
- Access to expertise in surface modification technologies resident in NRC's Industrial Materials Institute (IMI), Institute for Aerospace Research (IAR), and Institute for Fuel Cell Innovation (IFCI)
- A focal point for networking
- Strategic information on material applications and processes worldwide
- Selected validation experiments and prototype development
- Personnel training
- Specific and confidential analysis of scientific and technological information from NRC's Canada Institute for Scientific and Technical Information (CISTI)
- Privileged access to NRC's exploratory research results
- Participation in specific NRC workshops.

Research Program: Created in 1995, the SURFTEC program has focused on the aerospace and other industrial sectors. It has provided its members with extensive results in coating performance assessment, coating optimization and material evaluation. In particular, the program steered by its members and NRC's institutes has provided world-class results in various areas:

- Performance evaluation under dry or slurry erosion of numerous coatings produced by plasma, arc and HVOF spraying

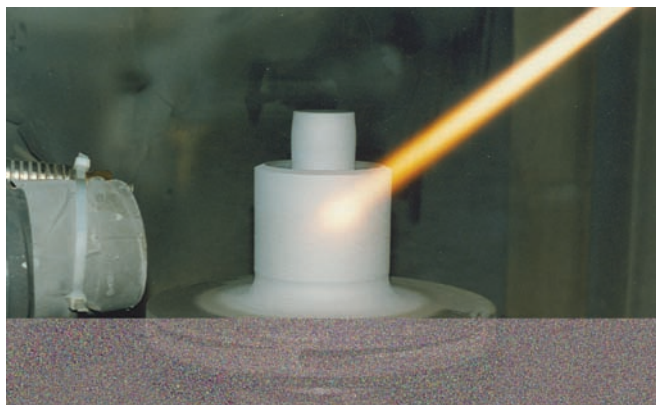
- Performance evaluation of thermal barrier coatings, both through burner rig testing and in terms of high temperature sulfidation, vanadization and oxidation.
- Optimization of HVOF-sprayed and thermal barrier coatings
- Coating process diagnostics and control strategies
- Effect of feedstock materials and gun aging
- Evaluation of hot corrosion of CeO₂- and Y₂O₃-stabilized zirconia, calcia-silica and lanthanum zirconate thermal barrier coatings
- Evaluation of the degradation and performance of TBC bond coats
- Optimization and comparison of different high velocity technologies: JP-5000, DJ2700, JP-5000 ST and the Mettech Axial III gun
- Hard chrome replacement solutions
- Performance evaluation of corrosion under wet and high temperature conditions
- Optimization of blend materials for erosion-corrosion applications.

SURFTEC offers a dynamic program, focused on the members' needs. It evolves with both the interests of the members and advances in technology to address what is of prime importance for its members.

It can cover a broad scope of subjects:

- Surface preparation
- Deposition (feedstock) materials
- Plasma deposition
- Arc deposition
- HVOF deposition
- Control and diagnostics
- Characterization and performance of coatings
- Non-destructive evaluation of coatings.

Success Story: HVOF Application of WC-Co on bitumen feed



pumps - The results and knowledge of HVOF coating optimization generated within the SURFTEC-Resources program has led to a six-fold increase of bitumen pump life at Syncrude. The use of SURFTEC expertise has led to optimized HVOF spray conditions to increase the centrifugal pump life from 3,500 service hours to more than 22,000 hours. These improvements have resulted in annual savings of more than \$ 280,000 per pump for Syncrude.

For more information on how being a member of SURFTEC can help with your high temperature, wear, corrosion and materials problems, please contact IMI representatives Dr. Basil Marple, em: basil.marple@cnrc-nrc.gc.ca tel: 450.641.5229 or Blaise Labrecque, em: blaise.labrecque@cnrc-nrc.gc.ca, tel: 450.641.5229, fax: 450.641.5105, web: www.imi.nrc-cnrc.gc.ca

NEW FEATURE

SPRAYTIME®--Ask the Experts

SPRAYTIME now has a panel of "experts" (see below) to answer your thermal spray questions.

Daryl Crammer, 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 TFA

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 review 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.

If you need further information before submitting your questions, please contact Kathy Dusa at SPRAYTIME via email spraytime@thermalspray.org, or via phone 440.357.5400



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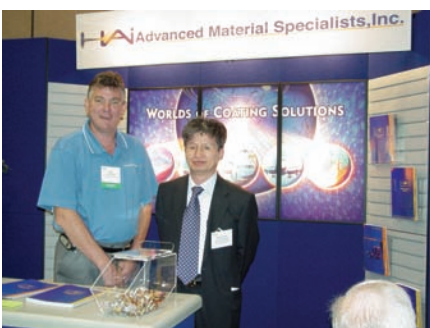
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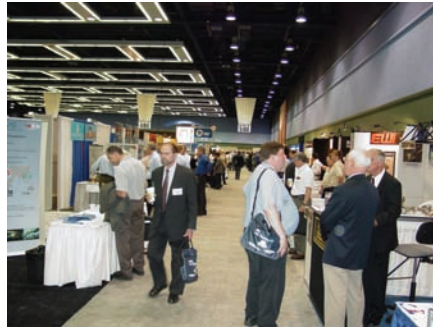
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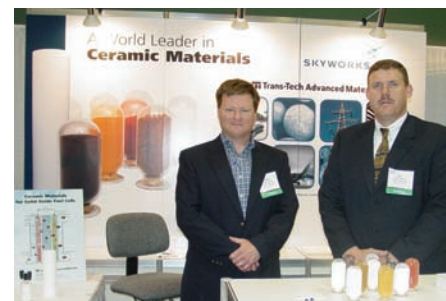
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*Hello from ITSC 2006
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Miller Thermal Reunion

by Larry Pollard

In late 1985, Miller Electric purchased Plasmadyne Corp, of Tustin, CA and Alloys Incorporated in Baytown, TX, and 6 months later Metallizing Company of America (MCA) in Sullivan, IL. These three companies became Miller Thermal Technologies, Inc., which was shortly there after changed simply to Miller Thermal, Inc. (MTI). In mid-1988 the Plasmadyne and MCA divisions were moved to Appleton, WI where Miller Electric's world headquarters is located. The powder plant, Alloys Incorporated, remained in Texas. Ray Selby and myself are the only two ex-Plasmadyne employees in the picture. Dale Gilbert and Trudy Johnson were ex-MCA employees and Gordon Jones and Dave Dugas were ex-Alloys Inc. employees.

All the others joined after the move to Appleton. When the closure of Appleton was announced in January of 2000 the head count was close to 60 people. Between 35 and 40 were offered positions with Praxair TAFE in Concord, NH; no one decided to relocate. Most of the ex-MTI employees are still in the thermal spray community in some capacity.

The time line more or less went like this:

- 1985: Miller Electric purchased Plasmadyne and Alloys, Inc.
- 1986: Miller Electric purchased MCA.
- 1988: The Plasmadyne and MCA divisions were moved to Appleton, WI.
- 1993: Miller Electric was Purchased by Illinois Tool Works (ITW), Chicago, IL.
- 1996: Miller Electric (ITW) spun off MTI to Praxair, Indianapolis, IN.
- 1997: Alloys Inc. in TX was closed with some equipment moved to Indianapolis, IN.
- 1999: Praxair purchased TAFE, Concord, NH.
- 2000: Appleton plant was closed and the work force was disbanded the 1st of September.
- 2000: I stayed on after the plant was closed to facilitate the building turnover to Miller Electric (ITW) and to help TAFE sort out the equipment and products that were shipped from Appleton. At the end of November I joined Progressive Technologies in Grand Rapids, MI.

For more information, contact author Larry Pollard, email lfpp@ptihome.com



Back row left to right: Dave Lewisen - Thermach, Kevin Johns - Praxair, Todd Snyder - Progressive Technologies, Daryl Cawmer - Thermal Spray Technologies, Ray Selby - Selby Co., Dale Gilbert - Hardface Alloys, Tim Vandenheuvel - Thermach. Front row left to right: Jeff Calaway - Thermach, Al Hildebrandt - Universal Thermal Systems, Gordon Jones and David Dugas - Lineage Alloys, Scott Goodspeed - H.C. Starck, Mo Vandenberg - Vandenberg Assoc., Mike Bultman - ADCAM, Bill Leteau - Thermach, Larry Pollard - Progressive Technologies, Trudy Johnson - Thermach. In attendance but not in the picture are Ray Wagner - Praxair, Jeff Geisfeldt - Brycoat, Rick Schmidt - Thermach, Alan Marshal - H.C. Starck, Tom Glynn - Stellite, Paul Norman and Eileen Stelfox - CTA Limited.

ITSA Technical Program Open to Public



The International Thermal Spray Association member companies have agreed to encourage non-member attendees 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.

In revising their long-standing "member only" attendance policy for the Technical Program, ITSA is responding to interest from non-member individuals wanting to take advantage of these valuable thermal spray educational opportunities.

The October 2006 Technical Program will be held in Hartford, Connecticut. The cost for non-members to attend the ITSA Technical Program is \$300, which includes breakfast and lunch.

For more information, contact Kathy Dusa, phone 440.357.5400, email: kathydusa@thermalspray.org

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Larry Grimenstein (left) of Nation Coating Systems and Ed Simonds of Cincinnati Thermal Spray, Inc. at International Thermal Spray Association booth.



Larry Grimenstein of Nation Coating Systems presenting paper in thermal spray session.



Waiting to board the Norfolk cruise ship.



Jim Weber of Sulzer Metco (US) Inc.

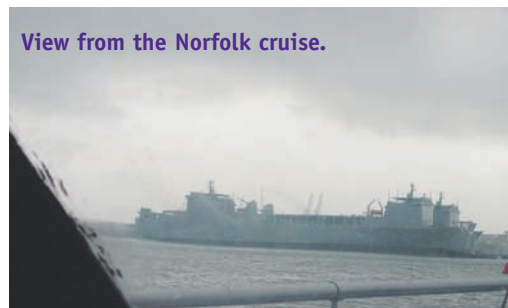
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View from the Norfolk cruise.



Bob Betts of Cincinnati Thermal Spray presenting paper in thermal spray session at MegaRust 2006

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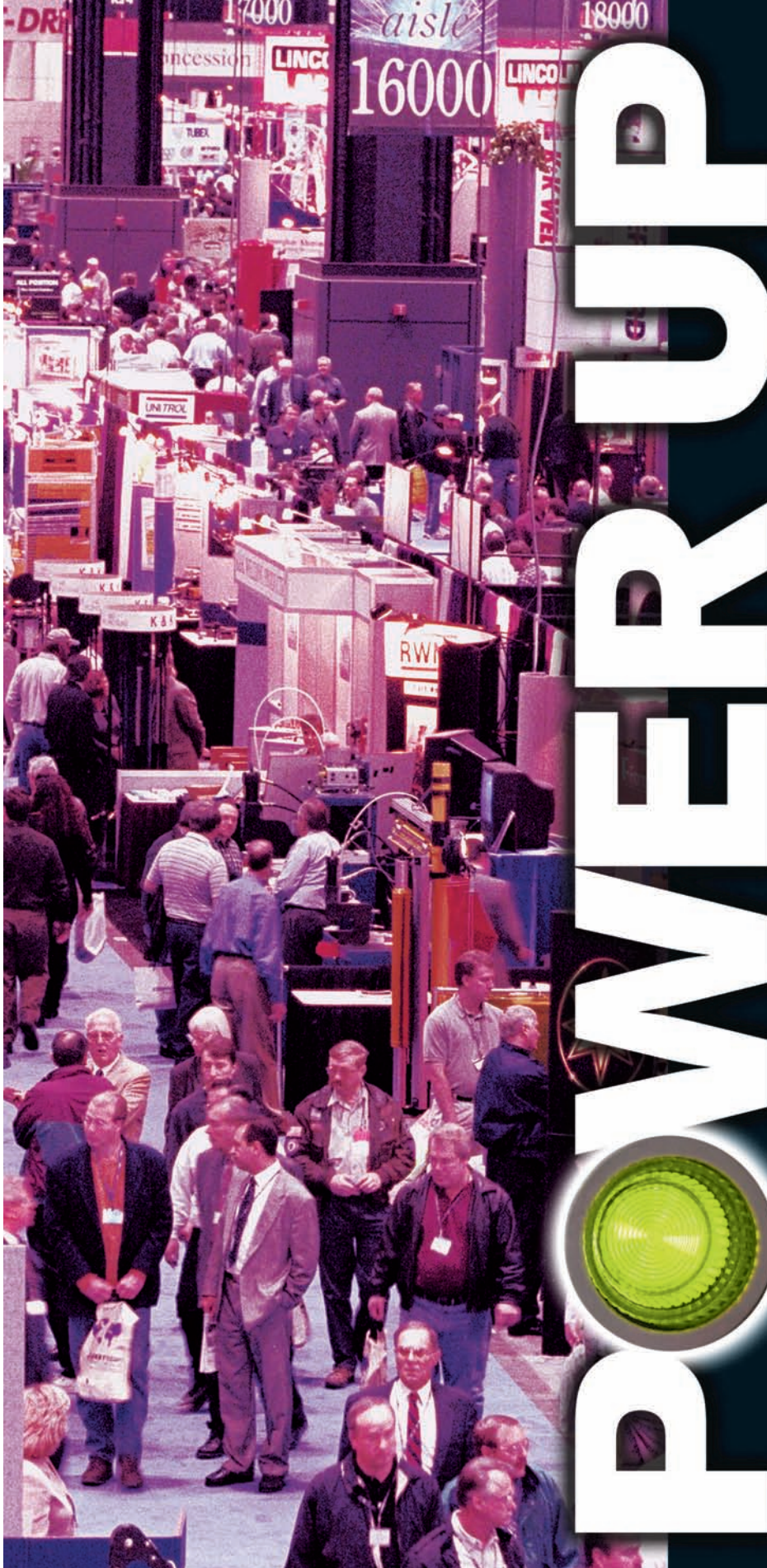
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Journal of Thermal Spray Technology 2004 Best Paper Award

"Neural Computation to Predict In-Flight Particle Characteristic Dependences From Processing Parameters in the APS Process"

Sofiane Guessasma, Ghislain Montavon, Christian Coddet (Universite de Technologie)

Journal of Thermal Spray Technology 2005 Best Paper Award

"Advanced Microstructural Characterization of Plasma-Sprayed Zirconia Coatings Over Extended Length Scales"

Anand A. Kulkarni, Allen Goland, and Herbert Herman (State University of New York at Stony Brook), **Andrew J. Allen, Jan Ilavsky, and Gabrielle G. Long** (National Institute of Standards and Technology), **Francesco DeCarlo** (Advanced Photon Source, Argonne National Laboratory)

ITSC 2006 Best Paper Awards

Impact of Partially Molten Plasma-Sprayed Zirconia Particles on Glass Surfaces

C. Moreau (National Research Council Canada), **S. Chandra, A. McDonald** (University of Toronto)

Metal-Glass Based Composites for Application in TBC-Systems
D. E. Mack, S. M. Gross, R. Vaßen (Forschungszentrum Jülich GmbH)

Introduction of Bioactivity to Plasma Sprayed TiO₂ Coating with Nanostructured Surface by Post-Treatment
X. Liu, X. Zhao, C. Ding (Shanghai Institute of Ceramics, Chinese Academy of Sciences)

Effect of Substrate Roughness on Splatting Behavior of HVOF Sprayed Polymer Particles: Modeling and Experiments
M. Ivošević, R. A. Caincross, R. Knight, T. E. Twardowski, V. Gupta (Drexel University) **J. A. Baldoni** (Duke University)

Optimal Design of a Convergent-Barrel Cold Spray Nozzle by Numerical Method

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.

H. Liao, W. Y. Li, G. Zhang, C. Coddet (University of Technology Belfort-Montbéliard), **H. T. Wang, C. J. Li** (Xi'an Jiaotong University)

Cold Gas Dynamic Spraying of Fe-Based Amorphous Alloy
L. Ajdelsztajn, E. J. Lavernia (University of California, Davis), **B. Jodoin** (University of Ottawa)

A New Approach to Online Thickness Measurement of Thermal Spray Coatings
A. Nadeau, L. Pouliot (Tecnar Automation Ltee)

Mechanisms Resulting in Improved Ductility of Cold Spray Coatings After Annealing
A. C. Hall (Sandia National Laboratories), **T. J. Roemer** (Ktech Corporation), **D. A. Hirschfeld** (New Mexico Institute of Mining and Technology)

Hypersonic Plasma Particle Deposition - A Hybrid Between Plasma Spraying and Vapor Deposition
S. L. Girshick, J. Hafiz, R. Mukherjee, X. Wang, W. Mook, J. Herberlein, P. McMurry, W. W. Gerberich (University of Minnesota)

Development of Composite Nano-Coatings by Comprehensive Thermal Plasma Deposition
H. Huang, J. Li, T. Ma, K. Eguchi, T. Yoshida (University of Tokyo)

ITSC 2006 Certificates of Merit

Kinetic Sprayed Rare Earth Iron Alloy Composite Coatings
T. H. Van Steenkiste (Delphi Research Labs)

Optimization of Laser Cladding Process Using Taguchi and EM Methods for MMC Coating Production
L. St-Georges (REMAC Industrial Innovators), **L. Dubourg** (National Research Council Canada)

Scientific, Technological and Economic Aspects of Rapid Tooling by Electric Arc Spray Forming
P. S. Grant, S. R. Duncan (Oxford University), **C. F. Johnson, A. Roche** (Ford Motor Company)

Effect of Substrate Temperature and Droplet Characteristics on Plasma Sprayed Zirconia Splats
H. Salimijazi, J. Mostaghimi, T. W. Coyle, L. Pershin (University of Toronto), **L. Rosenzweig, E. Moran** (GE Global Research)

Ambient and High Temperature Thermal Conductivity of Thermal Spray Coatings
W. Chi, S. Sampath (State University of New York at Stony Brook), **H. Wang** (Oak Ridge National Laboratory)

Microstructure and Properties of Thermally Sprayed Al-Sn Based Alloys for Plain Bearing Applications
T. Marrocco, D. G. McCartney, S. J. Haris, A. J. Horlock (University of Nottingham)

The effect of the Substrate Hardness on Particle Morphology in High Velocity Thermal Spray Coatings
W. J. Trompetter, A. Markwitz (Institute of Geological and Nuclear Sciences), **M. M. Hyland** (University of Auckland), **D. McGrouther, P. Munroe** (University of New South Wales)

Evaluation of Adhesion Strength and Residual Stress of HVOF Sprayed Metallic Coatings

M. Watanabe, K. Yokoyama, S. Kuroda (National Institute for Materials Science), **Y. Gotoh** (Science University of Tokyo)

**ASM TSS Thermal Spray Hall of Fame
2006 Class of Inductees**

Prof. Atsushi Hasui

Professor Emeritus, Keio University

"Professor Hasui has contributed immensely to the development of thermal spray technology through his pioneering and innovative research, his books, and his leadership in the Japanese Thermal Spray Society and in establishing industry standards."

Dr. Mark F. Smith

Deputy Director Mfg Process Science & Technology, Sandia Nat'l Laboratories

"For significant and sustained technical contributions to advance the science and technology of thermal spray, especially process diagnostics and modeling, and for more than twenty years of service in professional society leadership as an active proponent of thermal spray."

Donald M. Yenni

Union Carbide Corporation

"For the invention of wire and powder fed plasma spray torches and deposition processes and the development of many ancillary thermal spray machines and thermal spray applications."

**GTS Association
2006 Ring of Honor**



**2007 GTS Ring of Honor recipient
Dr. G. Kraume
DVS Deputy Executive Director.**

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**2006 Thermal Spray Hall of Fame Inductee
Dr. Mark Smith with his wife Betty.**



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CALENDAR OF EVENTS

SEPTEMBER 2006

17-22 Hyannis, MA USA *6th Intl Conference on Fatigue Damage of Structural Materials* - Sophie Peters, email: s.peters@elsevier.com, web: www.fatiguedamage.elsevier.com

18-20 Cincinnati, OH USA *Materials Science & Tech 2006 Conf @& Expo (MS&T'06)* - organized by ASM, ACerS, AIST, AWS, and TMS, contact ASM Int'l, tel: 800.336.5152 (ext. 5900) or 440.338.5151, fax: 440.338.4634, email: customerservice@asminternational.org, web: www.asminternational.org

18-21 Milwaukee, WI USA *SUR/FIN 2006 - American Electroplaters and Surface Finishing* contact Cheryl Clark, SFIC Events, tel 202-457-8403, fax: 202-530-0659, email: cclark@sfic.org, web: www.aesf.org and www.sur-fin.net

25-29 Vienna Austria *15th Int'l Federation for Heat Treatment & Surface Engineering Congress* - contact Austrian Society for Metallurgy and Materials, tel: +43(0)3842.45189, fax: +43(0)3842.402.2202, email: asmet@unileoben.ac.at, web: www.asmet.at/ifhtse2006

21-23 Hartford, CT USA *International Thermal Spray Association Membership Meeting and Technical Program* - contact Kathy Dusa tel: 440.357.5400, email: kathydusa@thermalspray.org

OCTOBER 2006

1-4 Montreal, Canada *3rd Symposium on Aerospace Materials and Manufacturing: Emerging Materials, Processes, and Repair Techniques* - contact M. Jahazi, Institute for Aerospace Research, mohammad.jahazi@cnrc-nrc.gc.ca, tel: 514.283 9154, web: www.metsoc.org

11-12 Worcester, MA USA *Vacuum Carburizing* - contact ASM Int'l, tel: 800.336.5152 (ext. 5900) or 440.338-5151, fax: 440.338.4634, email: customerservice@asminternational.org, web: www.asminternational.org

16-19 Cincinnati, OH USA *Materials Science & Technology 2006 Conference & Exhibition (MS&T 2006)* Organized by ASM, ACerS, AIST, AWS, and TMS. contact ASM Int'l, tel: 800.336.5152 (ext. 5900) or 440/338-5151, fax: 440.338.4634, email: customerservice@asminternational.org, web: www.asminternational.org

23-25 Ghent, Belgium *Euro PM2006 Congress* - European Powder Metallurgy Assn, tel: +44(0)1743.248899, web: www.euroblech.com, email: eb.enquiries@mackbrooks.co.uk,

31 OCT - 2 NOV Atlanta, GA USA *FABTECH Int'l & AWS Welding Show* - organized by American Welding Society, web: www.aws.org, Fabricators & Mfgs Assoc, web: www.fmafabtech.com,



Society of Manufacturing Engineers, web: sme.org/fabtech

NOVEMBER 2006

12-16 Austin, TX USA *32nd Int'l Symposium for Testing & Failure Analysis (ISTFA2006)* - ASM Intl, tel: 800.336.5152 or 440.338.5151, web: www.asminternational.org/events, fax: 440.338.4634; email: cust-srv@asminternational.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

26-28 Cambridge United Kingdom *Fatigue 2007: Fatigue & Durability Assessment of Materials, Components & Structures* - contact Engineering Integrity Soc UK tel: +44(0)114.262.1155, fax: +44(0)114.262.1120, email: fatigue@e-i-s.org.uk, web: www.e-i-s.org.uk

APRIL 2007

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

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

14-17 Beijing, China *Intl Thermal Spray Conference & Expo ITSC 2007* - contact ASM Int'l, tel: 800.336.5152 (ext. 5900) or 440/338-5151, web: www.asminternational.org, email: customerservice@asminternational.org

14-17 Montreal, Canada ASME TURBO EXPO
 Turbo Expo 2007 presented by the Power for Land, Sea & Air
 Int'l Gas Turbine Institute - visit www.turboexpo.org

JUNE 2007

4-7 San Diego, CA USA MegaRust 2007 Marine Coatings and Corrosion Conference - visit www.nstcenter.com



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

SEPTEMBER 2007

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 International, tel: 800.336.5152 or 440.338.5151 x5900, fax: 440.338.4634; 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. 5900), fax: 440.338.4634, web: www.asminternational.org, email: customerservice@asminternational.org

Journal of Thermal Spray Technology®

A publication of the **ASM Thermal Spray Society**
 (An abstract from June 2006 VOL. 15: NO. 2)

The Cold Spray Process and Its Potential for Industrial Applications

Frank Gärtner, Thorsten Stoltenhoff, Tobias Schmidt, and Heinrich Kreye

Cold spraying has attracted serious attention since unique coating properties can be obtained by the process that are not achievable by conventional thermal spraying. This uniqueness is due to the fact that coating deposition takes place without exposing the spray or substrate material to high temperatures and, in particular, without melting the sprayed particles. Thus, oxidation and other undesired reactions can be avoided. Spray particles adhere to the substrate only because of their high kinetic energy on impact. For successful bonding, powder particles have to exceed a critical velocity on impact, which is dependent on the properties of the particular spray material. This requires new concepts for the description of coating formation but also indicates applications beyond the market for typical thermal spray coatings. The present contribution summarizes the current "state of the art" in cold spraying and demonstrates concepts for process optimization.

Read the entire article in the June 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

NOVEMBER 2007

11-14 Chicago, IL USA FABTECH Int'l & AWS Welding Show - organized by American Welding Society, web: www.aws.org, Fabricators & Mfrs Assoc, web: www.fmafabtech.com, Society of Manufacturing Engineers, web: sme.org/fabtech



Scholarship Opportunities



The International Thermal Spray Association will award up to two (2) Graduate scholarships worth \$2,000.00 each to be awarded each calendar year and up to three (3) Undergraduate scholarships worth \$750.00 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.

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Strain Tolerant Ceramic Coating For Protection of Rotating Blade Tips

Introduction: Control of the clearance gap between rotating and static components is important for efficient operation of gas turbines. The larger the gap, the less efficient the operation due to gas leakage and the loss of internal pressure between stages. Decreasing the gap improves efficiency but increases the risk of contact or a rub between the components. Where contact occurs sliding and adhesive wear can occur. In addition, frictional forces cause localised heating which lead to the expansion of the rotating component and further contact occurs. Temperatures can rise sufficiently to cause localized thermal stress cracking and plastic deformation. In extreme cases, particularly where titanium alloys are used, fires have occurred.

One method frequently used to improve gap control is abradable sealing systems. These rely on a sacrificial material that is either porous or soft or both that allows the rotating component to cut and form a sealed track. Materials used include abradable thermal sprayed coatings, honeycomb and metal fibers. These rely on a good cutting action of the blade tip and problems can occur from the hardening of the seal material due to oxidation and sintering. There may also be a reduction of blade hardness due to continual rubbing against the seal.

The damage to rotating components can be difficult and expensive to repair. Providing a protective tip coating to minimise component damage and improve cutting action can prove very cost-effective.

Strain Tolerant Ceramic Coating (STCC): Sermatech has developed a strain tolerant ceramic coating (STCC) to protect the tips of rotating components. It is based on a two-layer thermal sprayed system using a metallic bondcoat and a ceramic top coat of 8% yttria stabilised zirconia. STCC has the following benefits:

- Suitable for both compressor and turbine blades
 - Survival between overhaul periods and still be able to provide protection against a rub at the end of the period
 - Avoiding metal-to-metal contact
 - Easy to apply, remove and reapply for overhaul
 - Does not involve any additional heat treatment
 - Sufficiently abrasive to cut into seal materials
 - Capable of being ground to size to fit casings.
- At lower temperatures, a simple plasma sprayed Ni-5%Al bond coat has proved effective. Using the same plasma

system as for the ceramic top coat, both coatings can be applied using one equipment setup so keeping costs down. For higher temperatures, a MCrAlY bondcoat is used. This provides a bond for the ceramic layer and also protects the component tip from oxidation. An HVOF applied bond coat gives the best results; although plasma applied MCrAlY also performs well. Typically the bond coat thickness is 75 to 150 μm (0.003 - 0.006 in) and the top coat is 100 to 500 μm (0.004 - 0.020 in), although it has been successfully sprayed up to 1 mm (0.04 in) thick.

The STCC coating was developed specifically for high temperature wear applications. It differs from standard 8% yttria stabilised zirconia in a number of ways. The powder material has greatly reduced impurity levels as it is well known that these can affect the performance of the ceramic coating. For example silica promotes sintering which was considered deleterious for the long term survival of the coating. The spray parameters were developed to ensure a dense microcracked structure. This structure enables the coating to survive the arduous environment in which it has to operate.

The testing of the coating has been rigorous. The coating has repeatedly survived:

- 65 cycles quenching from 870 °C (1600 F) into ambient water
- 20 cycles quenching from 1000 °C (1830 F) into ambient water
- 1500 cycles from 815 °C (1500 F) to ambient air.

In other testing the coating has performed well on simulated rub test rigs. Coated blades tips were subjected to rub testing against a seal segment. Typical tip speeds were in the order of 260 m/s (850 ft/s) with a target rub depth of 750 μm (0.03 in). At the end of the test a ratio of tip wear to seal wear is calculated. The "ideal" ratio is 0.05 or less. Test readings taken for this coating average 0.017, which is well below the "ideal" ratio.

An important feature of a tip coating is the ability to be able to grind the coating. This is required to ensure the rotor fits in the casing and that the tip clearance is well controlled. In order to test feature three blades were mounted on a surface grinder and then individually machined without any lubricant or cooling fluid. All three blades survived without any chipping, cracking or delamination and the coating proved easy to grind leaving a good surface finish.

Operational History: STCC coating is standard build for two turbine stages of an industrial gas turbine and on which it has been operating successfully for a number years. The turbine temperatures are between 900° to 1000 °C (1650 to 1830 F) operating against a MCrAlY rub tolerant seal. The coating has so far successfully survived 10,000 hr. It has also successfully passed bench testing for a flight engine and is currently undergoing engine testing.

For more information, contact Adrian Weatherill, Sermatech UK Development Manager, email aweatherill@sermatech.com, website: www.sermatech.com



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Ellison Acquires Special Processes of Arizona

Ellison Surface Technologies (EST), a subsidiary of the Ellison Group, has acquired Phoenix-based coatings specialists Special Processes of Arizona (SPOA). Ellison Surface Technologies is a leading provider of engineered surface coatings that enhance the performance of metals, plastics and elastomers. The combination of EST and SPOA significantly increases the workload capacity for customers of both companies.

"Our acquisition of NADCAP certified SPOA aligns with Ellison's corporate strategy to add thermal spray coating capacity to meet the needs of our customers," says Michael Ellison, President and CEO of the Ellison Group. Recently, we added 10,000 sq ft at our Rutland, Vermont facility with a state-of-the-art system that can spray both HVOF and plasma spray coatings. We've also increased our capacity at the Hebron, Kentucky plant by two new state-of-the-art booths with both HVOF and plasma spray capability."

In addition to increased capacity, the purchase of SPOA allows EST to offer two new services - heat treatment and brazing - to their existing clients.

"Ellison Surface Technologies has been a leader in the aerospace and power generation industries for 20 years," adds Ellison. "This new plant will help us meet the increased capacity demands of our customers, improve our service to manufacturers in the western United States and broaden our service offerings."

Ellison Surface Technologies operates facilities in Arizona, Tennessee, Kentucky, Texas and Vermont with corporate headquarters located near Cincinnati, Ohio.

Founded in 1986 by Michael Ellison, EST sales top \$20 million annually and they employ 150 people in 4 states.

For more information, visit www.ellisonsurfacetech.com
(See advertisement page 6.)

Northwest Mettech Has Moved

The new address and contact information for Northwest Mettech Corporation is 467 Mountain Highway, North Vancouver, BC, Canada V7J 2L3, Phone: 1-604-987-1668, 1-604-244-1663, Fax: 1-604-987-1669, 1-604-244-1673, Email: alan.burgess@mettech.com, website: www.mettech.com

For more information, contact Alan Burgess, President

Hexavalent Chromium Information

Visit websites listed below for recent articles on Hexavalent Chromium.

www.pfonline.com/columns/0406touch.html

www.citizen.org/pressroom/release.cfm?ID=2144

Visit www.osha.gov/SLTC/hexavalentchromium to view the safety/health topics and the final rule of February 2006.

(Provided by Daryl Crawmer of Thermal Spray Technology.)

We would appreciate you sharing any information on this subject so that we can provide to the SPRAYTIME readers.

Send resource data to SPRAYTIME@thermalspray.org

Practice Guide Describes Engineering Standards

NIST The National Institute of Standards and Technology (NIST), in cooperation with the ASM International Surface Engineering Committee, has issued a guide to published standards for the measurement and characterization of inorganic material surfaces.

NIST Recommended Practice Guide: Surface Engineering Measurement Standards for Inorganic Materials (NIST Special Publication 960-9) directs the user to appropriate standards based on material type, property of interest, and measurement or characterization method. Each summary includes a general description of the standard, the intended application, specimen requirements, type of data produced and the limits of the method. NIST SP 960-9 may be downloaded in Adobe Acrobat format at www.mscl.nist.gov/practiceguides/SP960_9.pdf.

A free print copy may be obtained by contacting Joyce Harris, (301) 975-6045, joyce.harris@nist.gov.

(Reprinted from the August 26, 2005, issue of NIST TECH BEAT)

WHERE IS YOUR ARTICLE? You and your company have the opportunity to help design the content of this thermal spray community newsletter.

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Chairman Simonds

A company-member trade association, ITSA invites all interested companies to talk 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

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.

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Archivist: Frank Hermanek

Marketing Committee

Chair: Mae Wang, Sulzer Metco

Membership Committee

Chair: Jim Ryan - H. C. Starck

Meetings Planning Committee

Chair: Marc Froning - Engelhard Surface Technologies

Scholarship & Awards Committee

Chair: Alan Burgess - Northwest Mettech Corporation

Statistics Committee

Chair: Joe Stricker - St. Louis Metallizing Company

Website Committee

Chair: Chip Arata - Carpenter Powder Products

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, policy-makers, and the public thermal spray community.

For a free **SPRAYTIME** subscription, visit www.spraytime.org and complete the short questionnaire.

ITSA Headquarters

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fax: 440.357.5430

itsa@thermalspray.org

www.thermalspray.org



International Thermal Spray Association Booth at ITSC 2006.

Wall Colmonoy Appoints Morris Warino Business Development Manager



Morris Warino is the newly appointed Business Development Manager for Wall Colmonoy (WCC), Oklahoma City, which is part of the WCC Aeronautical and Aerospace Group. Morris earned a bachelor's degree in Industrial Technology from Kent State University. He gained seventeen years of marketing and sales experience as the National Sales Manager for a manufacturer of industrial process instrumentation.

He will be drawing on his experience with, and exposure to, many industrial processes and engineering disciplines in identifying new opportunities for WCC Oklahoma City.

For more information, visit the Wall Colmonoy Corporation website at www.wallcolmonoy.com

WHERE IS YOUR ARTICLE? You and your company have the opportunity to help design the content of this thermal spray community newsletter. The **SPRAYTIME** Editorial Staff encourages and welcomes your contribution.

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

SPRAYTIME advertising rates at www.spraytime.org

Lee Morgan Named President of Farr Air Pollution Control



Lee Morgan has been named president of Farr Air Pollution Control (APC), a leading manufacturer of dust collection equipment for IAQ control and product recovery. In the newly created post, Morgan will oversee all activities of the Farr APC operating unit, which has been consolidated and expanded to include all of North America.

Morgan joined Farr in 1997 and has held a variety of management posts in the company's air pollution control business unit. His 15 years of experience in the dust collection industry spans virtually every aspect of applications, equipment design and development, marketing, sales and customer service. He is chairman of ASHRAE Technical Committee 5.4 (Industrial Process Air Cleaning), which is working on developing a standard for stating dust collector performance.

For more information, contact Farr Air Pollution Control, 3505 South Airport Road, Jonesboro, AR 72401; phone 800.479.6801; fax 800.222.6891; e-mail filterman@farrapc.com, website www.farrapc.com.

For a free copy of the International Thermal Spray Association "What Is Thermal Spray?" publication, send an email request to itsa@thermal spray

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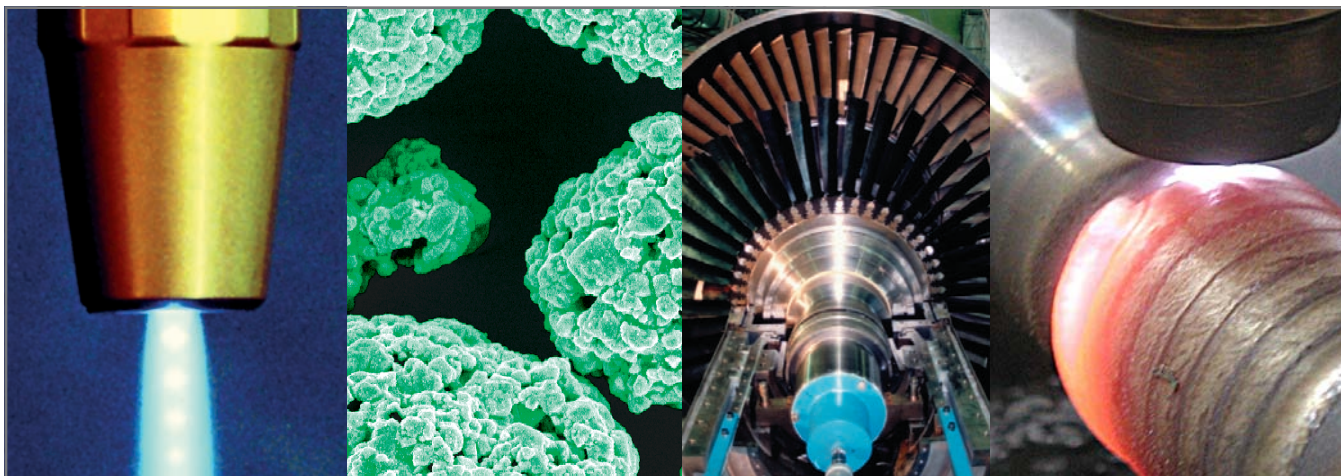


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James Ryan Appointed North American Business Manager



H.C. Starck - Ceramics & Surface Technology Group has appointed **James Ryan** as North American Business Manager.

Jim has been involved with the thermal spray industry for 17 years. For the past 4 years he has worked for H.C. Starck as Senior Product Manager. Prior work experience

includes Praxair and AIM, Inc.

Committed to the growth of the thermal spray industry, Jim has been Chairman of the International Thermal Spray Association (ITSA) membership committee for many years.

For more information, contact Jim at phone 513.293.0246, email james.ryan@hcstarck.com, website www.hcstarck.com



Scott R. Goodspeed is NE Regional Sales Manager

H.C. Starck announces the addition of **Scott R. Goodspeed** as Northeast Regional Sales Manager - Ceramics & Surface Technology Group.

Scott has been involved with the thermal spray industry for nearly 35 years, working for such companies as Bay State, Miller Thermal, Praxair, and most recently with Plasma Technology.

Committed to the growth of the thermal spray industry, Scott is a longstanding member and contributor to the International Thermal Spray Association (ITSA) and is currently an officer on the executive committee. Scott has been a active member of ASM International for over 20 years.

"Scott will be a valuable addition to the H.C. Starck Company and significantly strengthen communications and service to our customers" said James Ryan, North American Business Manager - Ceramics & Surface Technology Group.

For more information, contact Scott at phone 207.695.2377, email scott.goodspeed@hcstarck.com, website www.hcstarck.com

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2006 - 2007 ITSA Membership and Technical Program Meetings

October 2006 - Hartford, Connecticut
April 2007 - Phoenix, Arizona

Alan Marshall Manages Houston Warehouse

H.C. Starck Inc. - Ceramics & Surface Technology Group is pleased to announce the opening of its second North American warehouse in Houston, Texas.

This new office is managed by **Alan Marshall**, Southern Region Sales Manager, who recently relocated to Houston, Texas. Alan has 30+ years in the thermal spray industry.

This facility compliments the Akron, Ohio warehouse by improving delivery and support to customers in the Southern region of the United States.



New Houston office and warehouse.
8823 Fawn Trail
Suite 4
Conroe, TX 77385



For more information, contact Alan at phone 936.321.5877, email alan.marshall@hcstarck.com, website www.hcstarck.com

The background of the advertisement is a photograph of three sailboats racing on a deep blue sea. The sailboats have white sails with yellow accents and are numbered. The boat in the foreground is white with a yellow sail and is leaning to the right, with its crew members visible on deck. The other two boats are further back, also leaning and racing. The sky is a clear, deep blue.

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