

# SPRAYTIME®

Published by *The International Thermal Spray Association*  
*A Standing Committee of The American Welding Society*

Volume 20, Number 2

Second Quarter 2013

## **New Laser Cladding Technology Provides Throughput, Precision, and True Metallurgic Bonding**

By Frank Gaebler and Heiko Riedelsberger, Coherent GmbH

### **Introduction**

The infrared laser is in many ways an ideal localized thermal energy source for melting cladding materials in either wire or powder form. But, while lasers have achieved widespread acceptance in many industrial processes, such as metal cutting and welding, until recently they serviced only a few niche cladding applications. This sporadic use is a direct result of the limitations of available laser technologies, which often matched up rather poorly with the needs of most cladding tasks. Now, this situation has changed quite dramatically with the advent of a new type of industrial laser – the high power, direct-diode laser (HPDDL). This article compares HPDDLs to traditional spraying and arc welding approaches. We then review the experiences of a user (FW Gartner Thermal Spray), including their objective assessment of the types of applications that can best benefit from these new tools.

### **Some Pros and Cons of Traditional Methods**

Most readers of SPRAYTIME will be more than familiar with the advantages and disadvantages of thermal spraying methods such as flame spraying, arc spraying, plasma spraying and HVOF (high-velocity oxygen fuel). However we briefly summarize them here for comparison with the new laser method.

The primary advantages of all thermal spraying techniques are the low heat input into the part, process and materials versatility, and the near-complete absence of any dilution or metallurgical “side effects”. Thermal spraying also supports a very broad process window of coating thicknesses that can be achieved and the deposition rates supported. And of course, thermal spraying is relatively industrially mature, simple and inexpensive to implement.

The biggest limitation of thermal spraying is that the bond between the clad layer and the substrate material is primarily mechanical, and not metallurgical, making the coatings potentially fragile in specific situations. This can lead to problems with adhesion where point loading, severe impact, or rapid thermal cycling are part of the service environment. Additionally, coatings are typically imperfect, having some level of inherent porosity, which may provide corrosion paths through the coating. Plus residual stresses that are not optimal can make them prone to cracking or mechanical failure.

### **Some Pros and Cons of Arc Welding Methods**

Unlike thermal spraying, arc welding techniques (e.g., GTAW, PAW, SAW) generally deliver a fully welded, metallurgical bond having high strength, good impact properties and low porosity. Arc welding methods also offer high deposition rates (which translates into high throughput) and relatively low capital cost for the equipment.

The major negatives of arc welding cladding are high heat input into the part, which often requires significant post-processing, and typically high dilution of the clad material. The heat input may also cause volatile alloying elements to evaporate, and can result in surface hardening of some materials. In addition, it is not always possible to realize in practice the high deposition rates of which arc welding processes are theoretically capable because these negative effects increase with arc energy.

### **Laser Cladding**

Laser cladding is conceptually similar to arc welding methods, but in this case, the laser is used to melt the surface of the substrate and the clad material, which can be in wire, strip or powder form. The laser provides much better spatial (xyz) control over heat delivery than either thermal spraying or arc welding. As a result it combines

**Continued on page 4.**

PRSR\_T STD  
U.S. POSTAGE  
PAID  
MENTOR, OH  
PERMIT NO. 2

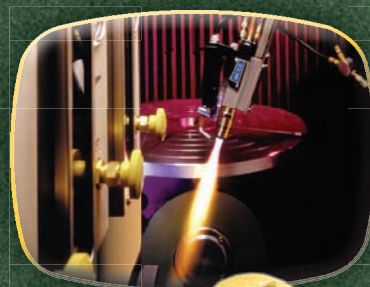




Looks Like a Safe Because It's

# BUILT LIKE A SAFE™

DUST PROBLEMS SOLVED



Ceramics  
HVOF  
Cold Spray  
Grit Blasting  
Aluminum  
Plasma  
And More!



Wire Arc  
D-Gun



**HEMI-PLEAT**  
SAVING YOU MONEY



Toll Free:

877-611-8644

International Calls:

1-870-933-8048

**camfil**  
AIR POLLUTION CONTROL

Call us about NFPA Explosive Dust Compliance Issues.

[www.camfilapc.com/thermalspray](http://www.camfilapc.com/thermalspray)

Follow. Connect. Watch. Learn.



Virtual ride and fly  
through a Farr Gold Series



# SPRAYTIME®

*Published by*  
**International Thermal Spray Association**  
*A Standing Committee*  
*of the American Welding Society*

**Mission:** 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.

**Kathy M. Dusa** Managing Editor

**Jason Falzon** Editor

**Joe Stricker** Technical Editor

SPRAYTIME (ISSN 1532-9585) is a quarterly publication of the International Thermal Spray Association.



Printed on Recycled Paper

Copyright© 2013 by the International Thermal Spray Association.

The International Thermal Spray Association is not responsible for the accuracy of information in the editorial, articles, and advertising sections of this publication. Readers should independently evaluate the accuracy of any statement in the editorial, articles, and advertising sections of this publication which are important to him/her and rely on his/her independent evaluation.

Article submissions (subject to acceptance and edit), advertising insertions, address correspondence, subscription request, back issue copies, and changes of address should be sent to:

**Editorial and Production Office**  
**Kathy M. Dusa, Managing Editor**

Post Office Box 1638

Painesville, Ohio 44077

United States of America

voice: 440.357.5400

fax: 440.357.5430

email: [spraytime@thermalspray.org](mailto:spraytime@thermalspray.org)

**A subscription to SPRAYTIME® is free for individuals interested in the thermal spray and coatings industry. Visit [www.spraytime.org](http://www.spraytime.org) to subscribe.**

## INDEX

### INDUSTRY NEWS

Advertisers Listing .....	31
ASM TSS Journal of Thermal Spray Technology Abstract.....	25
ASM International Commemorates Centennial Anniversary .....	21
Calendar of Events .....	26
CeralUSA Announces AS9100C Compliance.....	23
Fabtech Enters Exhibition Partnership in India .....	7
Fabtech Chicago Thermal Spray Activities .....	8
Free DIN Standards Poster .....	25
Free GTS/Linde Thermal Spray Process Poster.....	25
HVOF: Replacement of Hard Chrome Plating .....	23
IMR Test Labs Earns GulfStream Approval .....	15
International Thermal Spray Association .....	16-19
Laser Cladding Technology Provides Throughput, Precision .....	1
Recycling Thermal Spray Overspray Dust and More .....	22
Search Engine Optimization for Thermal Sprayers .....	10

### PEOPLE IN THE NEWS

Dick Mason Retires .....	28
David Somerville - TAFE Incorporated.....	28

### IN MEMORIAM

John M. Foy .....	31
Richard Moore .....	31

*A well-known spray house buyer  
found particulate costs quite dire.  
The Solution to the trouble  
saw profits double,  
By switching-from-powder-to-wire.  
James Browning, 2000*

# WE'LL GET YOU WIRED.



When you want a thermal spray wire that consistently performs the best in the industry, choose the company who has built its reputation delivering the highest quality wire on the market at a reasonable price with the best service in the industry. **Choose Polymet.**

Call, let Polymet get you wired and receive free shipping on your first order.



**Polymet**

1.888.765.9638  
+1.513.874.3586  
[www.polymet.us](http://www.polymet.us)  
[sales@polymet.us](mailto:sales@polymet.us)

Continued from page 1.

some of the important advantages of both methods while avoiding some of their limitations.

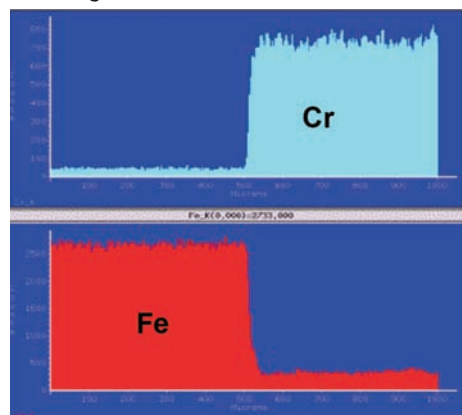


Figure 1a. SEM line trace of C22 clad with a high power diode laser at 4 kW and 0.5 m/min.

A major benefit of laser cladding is that it typically produces a high quality clad. That is, a metallurgically bonded clad characterized by extremely low dilution, low porosity and good surface uniformity, as demonstrated in the graph and photo in figure 1. Moreover, laser cladding transfers minimal heat to the part, which largely eliminates distortion and the need for post processing, and avoids the loss of alloying elements or hardening of the base material. In addition, the rapid natural quench experienced with

laser cladding results in a fine grain structure in the clad layer. Additionally, as the heat source is basically a light beam, the electromagnetic stirring that takes place in every other welding process (other than oxy acetylene brazing) is completely absent, again reducing the tendency for dilution or mixing with the base material. Plus, there are no consumables, or parts to erode or degrade during service, so a laser can deliver outstanding process consistency.

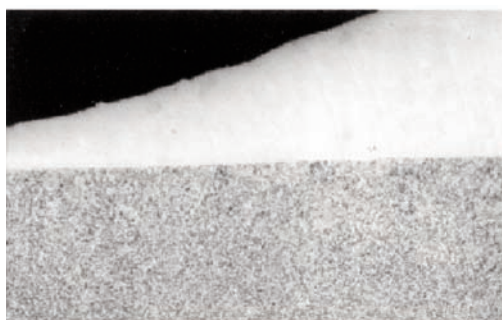


Figure 1b. SEM photo of the clad cross-section shows essentially no dilution of the substrate material.

With all these advantages, why has laser cladding not seen more widespread adoption? Because the practical limitations (power, cost, ease of use, etc.) of available laser technologies frequently offset these advantages; laser cladding has been performed with CO<sub>2</sub> lasers, and sometimes various types of Nd:YAG lasers, and more recently, fiber lasers. CO<sub>2</sub> lasers offer the lowest cost per Watt and feature industrial reliability. But their long wavelength (10.6 µm) is strongly reflected by most metals so the power utilization is quite inefficient. Nd:YAG and fiber lasers emit at a shorter wavelength (around 1 µm). However, their cost to own and operate is usually higher than CO<sub>2</sub> lasers, particularly for higher power models. Additionally, all three laser types are physically quite large and emit their light as a narrow pencil like beam. This is an excellent beam format for welding or cutting, but not for performing cladding over large areas at practical speeds. So, the cost and relatively slow speed of laser cladding has limited its use to small area, high-value applications where clad quality is paramount.

#### HPDDL Configuration

To avoid these limitations and better meet the needs of cladding applications, Coherent developed the HighLight™ series of cladding lasers based on high power laser diode technology.

Laser diodes are the ubiquitous semiconductor laser chips that have long been used at low power levels for medical and telecommunications purposes. Their short wavelength output (around 0.8 – 0.95 µm) is absorbed well by most metal surfaces, wires and powders.

A typical, individual diode laser emitter might produce at most, a few Watts of output power. However, numerous emitters can be fabricated on a single monolithic semiconductor substrate or bar with a total output of 100W or higher. These linear bars can, in turn, be combined in horizontal and vertical stacks to produce high power direct-diode laser systems with total output power in the multi-kilowatt range. Various innovations in diode



**Green Belting Industries**

## THERMAL SPRAY TAPES

High performance masking tapes for the Thermal Spray Industry, capable of withstanding many of the most aggressive applications are manufactured by GBI in a complete line, all available in various widths.



#### PRODUCT LINE INCLUDES:

- Aluminum foil tapes
- Fiberglass tapes
- Plasma spray tapes (Silicone rubber)
- Special combination tapes

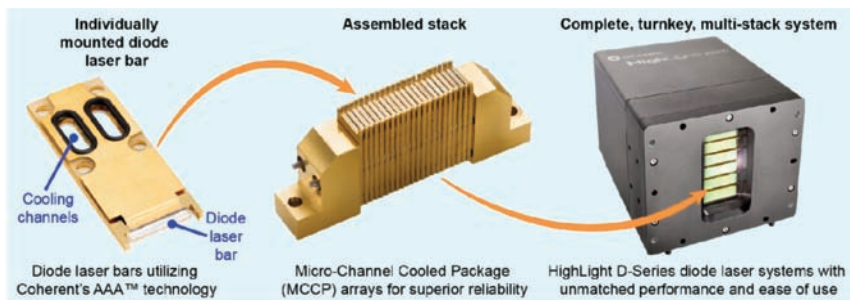
Canada/International  
**905-564-6712**

U.S.  
**800-668-1114**



**Where is your article?** We encourage you to send articles, news, announcements and information to [spraytime@thermalspray.org](mailto:spraytime@thermalspray.org).

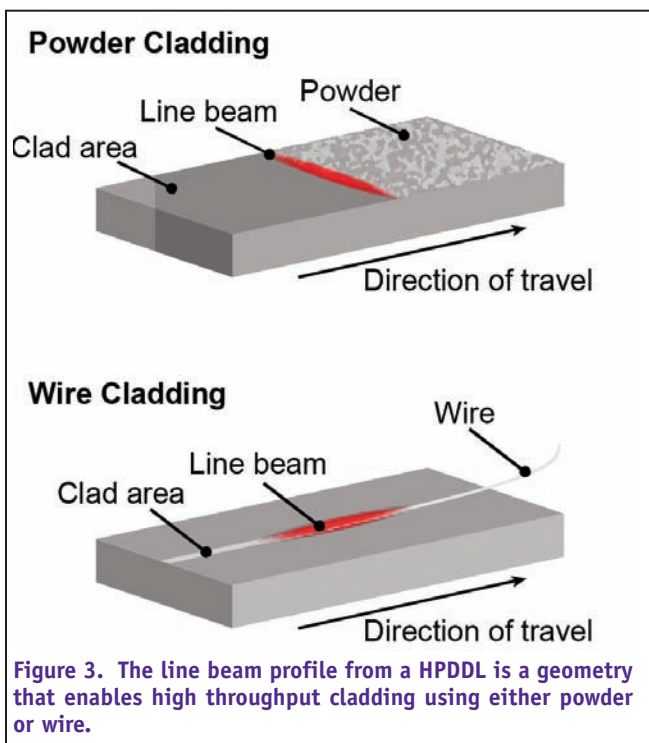




**Figure 2. Progression from a single laser diode bar to a compact, 8 kW diode laser system. Coherent is the only vertically integrated supplier of high power diode lasers, producing everything from the wafer level through to finished systems.**

architecture and system cooling have combined to deliver exceptional reliability, and HPDDL systems now offer typical lifetimes of 20,000 hours.

HPDDLs naturally emit a rectangular beam of light, which is ideal for high throughput cladding of extended areas. For example, Coherent's HighLight 8000D Series laser at 8 kW produces a line beam of 1 mm in width, and either 6, 12, 18, 24, 30 or 36 mm in length. Lower power systems have additional beam lengths of 3 mm, 4 mm, or 5 mm. Furthermore, an optional beam shaping accessory can expand the 1 mm beam width dimension from 2 to 12 mm. Thus, the output can easily be optimized to match a wide range of process requirements.



**Figure 3. The line beam profile from a HPDDL is a geometry that enables high throughput cladding using either powder or wire.**

Since the area illuminated by the laser beam on the work surface is typically smaller than the area to be clad, the beam is usually scanned across the part. In the case of powder-based cladding with the HighLight 8000D, the long axis of the line beam is oriented perpendicular to the scan direction, enabling large areas to be processed rapidly, as shown in figure 3. Alternatively, in the case of wire feed cladding, it is usually advantageous to orient the beam

such that the short axis is in the direction of travel. In addition to process efficiency, this configuration allows the back of the line to smooth out the weld bead similar to a "follower" torch used in the GTAW or PAW processes.

### Advantages of HPDDL Cladding Systems

These new high power direct-diode laser cladding systems offer unique advantages for cladding over any other currently available technology. When

compared to arc welding methods, they deliver lower heat distortion, reduced dilution (typically < 4%), lower porosity (< 1%) and better surface uniformity. Together, these properties largely eliminate the need for post processing and its associated cost and time. The high quench rate of the HighLight laser produces a finer grain structure in the clad. Furthermore, these benefits apply at any power level, and hence, deposition rate; this is unlike arc welding, in which clad quality suffers with increasing power and deposition rate. Finally, the line beam shape can process large areas rapidly with a high degree of control over clad width, thickness and deposition rate – see figure 4 on page 6.

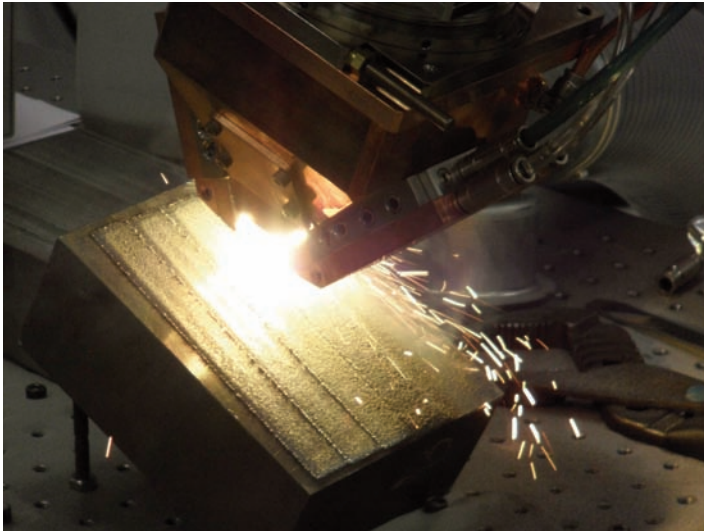
Both the HighLight laser and thermal spraying techniques avoid significant heat input into the part and minimize dilution. However, unlike thermal spraying, HighLight laser cladding forms a true metallurgical bond with the base material. The result is better adhesion and wear resistance. Furthermore, clads produced with the HighLight can withstand compression and tension without cracking or delamination.

When compared to other lasers, HighLight systems offer superior output characteristics and also a number of practical advantages. One reason for this is that the shorter wavelength output of the HighLight is better absorbed by cladding materials than the light of the Nd:YAG and especially the mid-infrared CO<sub>2</sub> laser. This means that a HighLight laser can melt a given clad material using substantially less output power than a CO<sub>2</sub> laser.

In addition, HighLight lasers offer a substantial cost advantage over other laser types. One reason for this is that their electrical efficiency (conversion of input electrical energy to useful light output) is four times higher than for CO<sub>2</sub> lasers, about three times higher than diode pumped Nd:YAG lasers, and nearly twice that of fiber lasers. When combined with the higher absorption due to its short wavelength, this translates into lower operating costs, a smaller carbon footprint, and increased deposition efficiency. All this translates into reduced cost of ownership, and the ability to clad at deposition rates that are competitive and in many cases superior to traditional overlay technologies.

### Perspective from the Shop Floor

F.W. Gartner Thermal Spray ([www.fwgts.com](http://www.fwgts.com)), a business unit of Curtiss-Wright Technologies, is a leading contractor

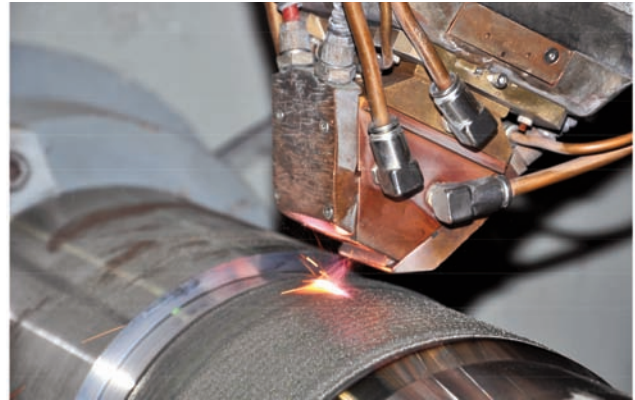


**Figure 4.** Their combination of a large area beam and short output wavelength (and hence high absorption) makes HPDDLs ideal for applications needing fast deposition as in this example showing large area plate cladding using a Highlight 8000D laser from Coherent.

supplying both laser and traditional thermal spraying services to a broad range of industries, with many critical applications, including cladding of new parts and reclamation of worn parts. Michael Breitsameter, Director of Sales and Marketing at FWGTS, explains, "Thermal spraying is a low-cost method of reclaiming the original dimensions for a part, but this should not be confused with restoring

original mechanical integrity. The bond between the coating and substrate is a mechanical bond only, so the coating is less robust, potentially compromising any use involving impact or point loading. In contrast, the new laser process melts both the cladding material and the very outer surface of the substrate resulting in a true metallurgical bond. This integrity delivers excellent physical properties, in some cases superior to those of the original bulk material."

Breitsameter notes that, "A direct-diode laser is an industrially mature tool that is truly optimized for everyday use in terms of reliability, repeatability and operational simplicity. The rapid development of this technology has significantly expanded the range of applications for laser cladding." To clarify which applications are best suited to laser processing, Breitsameter explains, "Laser cladding is not a panacea and at FWGTS we use both laser and traditional cladding and coating methods. For us, the laser method is always a first choice for point loading applications, where thermally sprayed coatings could be compromised. We've found that it's also best for applications where thicker (e.g., several millimeters) coatings or reclamation are required, where thermal spraying coatings become impractical due to internal stresses."



**Figure 5.** The output of a 4 kilowatt direct diode laser system (Coherent 4000L) applying a tungsten carbide blend on a seal area to provide a highly wear resistant surface. Image courtesy of F.W. Gartner Thermal Spray.

### Summary

Lasers have long been touted as next generation tools for cladding because they offer a high quality clad, with excellent physical characteristics and a true metallurgical bond, yet without significant heat input into the part. But, practical issues with implementing older laser technologies have limited their use in cladding. HPDDL technology has now eliminated these drawbacks. These lasers are much more economical to operate than other cladding laser sources, and their small physical size simplifies their integration and use. Laser cladding is now finally poised for widespread use.

**For more information,** contact author Heiko Riedelsberger, email [heiko.riedelsberger@coherent.com](mailto:heiko.riedelsberger@coherent.com), and visit [www.coherent.com](http://www.coherent.com)



DeWAL Industries offers the highest quality, most complete line of thermal spray tapes — aluminum foil, fiberglass fabric, silicone-impregnated fiberglass, and combinations of these materials.

For wire arc and HVOF, DeWAL double-ply tapes reduce set-up time and withstand the harshest environments. DeWAL tapes can be single-ply or multi-layer.

DeWAL tapes adhere aggressively, ensuring sharp edges, resisting high temperatures, and removing cleanly after spraying.

Call DeWAL today, then thermal spray away.



15 Ray Trainor Drive  
Narragansett, RI 02882  
[www.dewal.com](http://www.dewal.com) [usa1@dewal.com](mailto:usa1@dewal.com)  
800-366-8356

Quality of Product...First (International: 001-401-789-9736)

**Quality Approvals:** GE, Pratt & Whitney, Rolls Royce, etc.





## FABTECH Enters Exhibition Partnership in India

FABTECH, North America's largest metal forming, fabricating, welding and finishing event, is expanding to the fast-growing industrial marketplace of India. The first FABTECH India exposition will be co-located with India's premier welding exposition, the Indian Institute of Welding's Weld India, from April 10 to 12, 2014, in New Delhi.

"More and more buyers from India have been coming all the way to FABTECH to see U.S. welding and manufacturing technologies," said Ray Shook, executive director of the American Welding Society, one of FABTECH's sponsors. "Now we can take U.S. technology exhibitors right to the Indian market in an easy, affordable way."

Metal technology companies who want to penetrate the Indian economy can benefit from this new opportunity to meet prospective partners and gain a foothold in the world's most populous country.

In recent years, the FABTECH exposition brand has expanded from annual shows in the United States to include the annual FABTECH Mexico and the biennial FABTECH Canada. FABTECH India will be presented every three years, and the first is timed to coincide with the 2014 International Congress of the International Institute of Welding.

FABTECH India and Weld India will be held at New Delhi's Pragati Maidan exhibition complex, where India's largest trade shows are hosted.

About 250 international exhibitors and 10,000 attendees are projected to exchange challenges and solutions at the exposition. Attendees will represent India's fast-growing industries, such as energy, refining, infrastructure, and manufacturing.

**For more information**, companies who want to exhibit their welding and fabrication technologies to the Indian industrial community should visit [www.fabtechexpoindia.com](http://www.fabtechexpoindia.com) or contact Joe Krall at (800) 443-9353, Ext. 297 or [jkrall@aws.org](mailto:jkrall@aws.org).

### About FABTECH

FABTECH is co-sponsored by five industry-leading associations: the American Welding Society (AWS), the Fabricators & Manufacturers Association, International (FMA), the Society of Manufacturing Engineers (SME), the Precision Metalforming Association (PMA), and the Chemical Coaters Association International (CCAI).

**Where is your article?** We encourage you to send articles, news, announcements and information to [spraytime@thermalspray.org](mailto:spraytime@thermalspray.org).

**Thermal Spray Jobs listed at "For Hire"** [www.thermalspray.org](http://www.thermalspray.org)

**Precisely!**

The **Proci**se Process<sup>®</sup>

- thorough upfront discovery
- process-specific design
- lifetime support

**Progressive**  
SURFACE<sup>®</sup>

*"Each step in Progressive's Proci*se Process is detailed and meaningful. As a result of their approach, they consistently exceed expectations."

*"I wish all of our suppliers conducted business this way,"* offers an aerospace customer.

*"Progressive sets the bar for, not only focusing on the needs of the customer, but always being accessible and open to input along the way."*

**"Simply pros!"**

Find out how Progressive Surface can exceed your expectations, **Precisely!**<sup>®</sup>

[progressivesurface.com](http://progressivesurface.com)



## Thermal Spray Technology

### Highlighted At Fabtech Show

McCormick Place, Chicago, IL

November 18-21, 2013

### Thermal Spray Pavilion Exhibitors

November 18-21 • Visit Aisle 400 North

### Thermal Spray Metal Art Display

November 18-21 • Booth N1401

### Thermal Spray Technologies: High Performance Surfaces Conference

17 Speaker Presentations • 9:00 AM - 5:00 PM

Tuesday, November 19th • Registration Code: W26

### Thermal Spray Basics: Putting Coatings To Work

Free Tutorial • 1:00 - 4:00 PM

Wednesday, November 20th • Registration Code: W25

Visit [www.fabtechexpo.com](http://www.fabtechexpo.com) to Register



North America's largest metal forming, fabricating, welding and finishing event will be held at the North and South Halls of McCormick Place, Chicago, Illinois, USA, November 18-21, 2013. The upcoming event is expected to cover more than 550,000 net square feet and anticipates over 35,000 attendees and 1,500 exhibiting companies including a **Thermal Spray Pavilion** and a **Thermal Spray Conference**.



Join the International Thermal Spray Association at the Fabtech Thermal Spray Pavilion this year in Chicago.

### Thermal Spray Technology: High-Performance Surfaces Conference • November 19, 2013

Conference Chairs: Dan Hayden, Jory Wright

#### Keynote Presentation

**Thermal Spray: Science, Engineering, Art, Myths, and Tribal Knowledge**, Daryl E. Crawmer, FASM, TS-HoF, Thermal Spray Technologies, Inc., Sun Prairie, WI

**Uses of Robotics in Thermal Spray**, Daniel C. Hayden, Hayden Corporation, West Springfield, MA

**Capabilities of the Delta Triple Anode DC plasma Spraying Torch in Industrial Production Applications**, Alan Burgess, SprayWerx Technologies Inc., Vancouver, Canada and Thomas Schlaefer, Andreas Wank, GTV Verschleiss-Schutz GmbH, Luckenbach, Germany

**Improved Coating Yield Through Powder Feed Optimization**, Mo VandenBergh, Oseir, Tampere, Finland

**Fabrication of an Erosion Resistant Coating for Be-Cu Alloys in Harsh Environments by HVOF Thermal Spray Process**, Khorameh Farokhzadeh, A. Demiri, A. Edrisy, K. Farokhzadeh, R. Fillion, University of Windsor, Ontario, Canada, and A. Granger, J. Vitek, Sharkskin Coatings Ltd., Ontario, Canada

**A Method of Preparing, Tracking, and Achieving an Industry Quality Standard**, Jory Wright, Accuwright Industries, Gilbert, AZ

**Thermal Spray Starts with Training**, Dale Moody, Plasma Powders and Systems Inc., Marlboro, NJ

## "Durable and Repeatable"

### Thermal Spray Metal Masking and Fixtures

- Low Pressure Plasma
- Air Plasma
- HVOF
- EBPVD
- Pack Coating
- Cat Arc
- Aluminide
- CVD
- Plating Components
- ABS 3D Modeling



Accuracy - Consistency - Productivity



91 Highland Dr, Putnam CT 06260, 860-928-1199  
[info@erwinc.com](mailto:info@erwinc.com) - [www.erwinc.com](http://www.erwinc.com)



**Wire Arc Spray Advances in Equipment, Coatings and Applications**, Bob Unger, Polymet Corporation, Cincinnati, OH

**Hard Chrome Alternatives Using Thermal Spray**, Joseph P. Stricker, St. Louis Metallizing Company, St. Louis, MO

**NIOSH Recommendations on Hexavalent Chromium - 2013 Update**, Jeffrey Abelson, Donaldson Company, Inc., Bloomington, MN

**Metal Spray an Overview of Thermal Spray Processes**, Jaren Wright, Accuwright Industries, Gilbert, AZ

**Life without Thermal Spray: The Cost to Industry - Two Case Studies**, Jean Mozolic, The Mozolic Group, Londenberry, NH

**Beyond the Repair**, Bruce Dulin, Hausner Hard Chrome, Owensboro, KY

**TCW's...Tubular Constructed Wire, the Latest Advancement in Thermal Spray Consumable Technology**, David J. Urevich, ArcMelt Company L.C., Bridgeton, MO

**Novel Molten Metal Corrosion Resistance Thermal Sprayed Coatings**, Curt Glasgow, MesoCoat, Inc, Euclid, OH

**Recycling Thermal Spray Overspray Dust and More - How to Maximize**

**the Value of Overspray Materials and Do Right by the Earth**, Scott McLaughlin, McLaughlin & Associates Thermal Spray, Inc., Naperville, IL

**Robotic Control in Thermal Spray Coating Using Tool Center Points and Work Objects**, Frank Accornero, Robotic Synergy LLC, Port Orange, FL

**Applying Thermal Spray Anodic Coatings (Zn, Al, and their Alloys) to Less Than "Ideally" Prepared Surfaces**, James Weber, Sulzer Chemtech USA, Humble, TX

**For event information**, visit [www.fabtechexpo.com](http://www.fabtechexpo.com).

**For Conference**, use Registration Code W26. Price: \$550 for AWS member, \$635 for non-member (Non-member price for AWS Sessions only includes a one-year AWS Individual Membership.)

## Phill and Phlux, The Splat Brothers



PROVIDING the thermal spray industry with the **TECHNOLOGY** to **SUCCEED**

**Flame Spray Technologies** [www.fst.nl](http://www.fst.nl)



## Search Engine Optimization For Thermal Sprayers

Thermal spraying, as you know, is a competitive business. The customer pool is limited and the customers themselves have limited amounts of time to look for new suppliers. If they don't know you, or if they are not thinking of you, they are not going to spend a lot of time looking for you. They will talk to the thermal spray company they know or that pops up when they keystroke, "thermal spray," on Google.

Does your site pop up? Is it "well-positioned" when they look for your specific services?

You may believe that you did everything necessary when you spent a lot of time and money developing a site, but does your beautiful, informative website appear when the Boeing engineer types in, "afterburner coating", or have you created a beautiful, informative brochure that just sits in the back closet?

A website that needs positioning is more the rule than the exception. Websites are built by website designers, and website designers, like most graphic designers, are not the techies who feast on source codes and talk in acronyms like SEO, SERP, ISP and AJAX. It's the techies, a.k.a. geeks, who can get your website high in the rankings, where your customers and potential customers can find it.

For most business websites, the Google search engine is the leading driver of traffic. A full 70% of all new traffic starts with Google, and the chances are that if customers are not finding you on Google, they are not finding you. You, or someone in your company, may be smart and technically adept enough to build the site and make it discoverable for someone looking for it, but if someone is

not looking specifically for your company, will that person find it? Google changes its algorithm, the way it ranks websites, over 200 times per year. Do you have enough time to keep up with the changes? Your time might be better spent overseeing a geek who spends his free time playing video games and browsing blogs about web positioning.

The person who built your site could be your daughter, who is smart and technically adept, but maybe she really wants to concentrate on her degree, or her job, or her new baby. She's too busy for full-scale combat with everyone else seeking top spots on Google.

Your role is really to find the techie and know how to supervise that person. To do it well, you need to know the general topography of the battlefield and the right strategy questions to be asking your techie. Here is enough background to make you dangerous:

### **Paid Campaigns**

The quickest way to improve search engine results is to set up a cost-per-click Adwords campaign on Google. Basically, you create a short text ad, select the keywords you would like to target, set a maximum bid per click and a monthly budget, and let Google do the rest.

If your bid is high enough, your ad will show up on the top or right hand side of the Google results page. On the positive side, you pay only when a user clicks through to your site. On the negative side, some keywords are pricey and competition is often fierce, especially for top positions.

Your campaign should be monitored at least monthly, to see if it is effective. Check the budget and the position of each paid keyword to ensure it is on the first page. Make sure your campaign filters out negative, overpriced, overly

**Recognize Quality...**

**THERMACH INC.**  
THERMAL SPRAY AND MACHINING

**...Quality Products**  
**...Quality Service**  
**...Quality in Thermal Spray**



See all of our  
products at  
[www.thermach.com](http://www.thermach.com)

ph: (920) 779 - 4299  
fax: (920) 779 - 4452  
[salesatThermach@gmail.com](mailto:salesatThermach@gmail.com)



general and useless keywords. Are you spending a small fortune on a "metal coating" ad because everyone who is looking for powder coating types in "metal coating" and clicks through to your site?

Question the number of pages that paid viewers are requesting, their time on the site, the time of day they visit, their geographic location, and their IP addresses. Serious visitors spend time on your site and visit a lot of pages. If they always visit between 9 a.m. and 6 p.m., you can stop running your ad evenings and weekends. You can limit your ad geographically, running it locally or only in certain regions of the country. You can use special apps to identify keywords that are used when people search for your services, words that you might not think of. You can sometimes identify not only a visitor's IP address but his company, too.

Create different ads for the same keywords so Google can rotate the ads. If one ad is performing better than the others, run it more often. A drawback to paid campaigns is this: many users don't click on sponsored ads, so if you put all of your eggs in this basket, you won't reach your entire market.

#### Organic Site Improvement

Organic positioning, or search engine optimization (SEO),

**Where is your article?** We encourage you to send articles, news, announcements and information to [spraytime@thermalspray.org](mailto:spraytime@thermalspray.org).

is getting your site to show up near the top in unpaid search engine listings. Unpaid listings are the main body of listings, not the ads surrounding them.

Unlike a paid campaign, you don't pay Google or Microsoft for a good position, but organic improvements do cost in the time, money, patience and effort necessary to make the improvements that get the better positions.

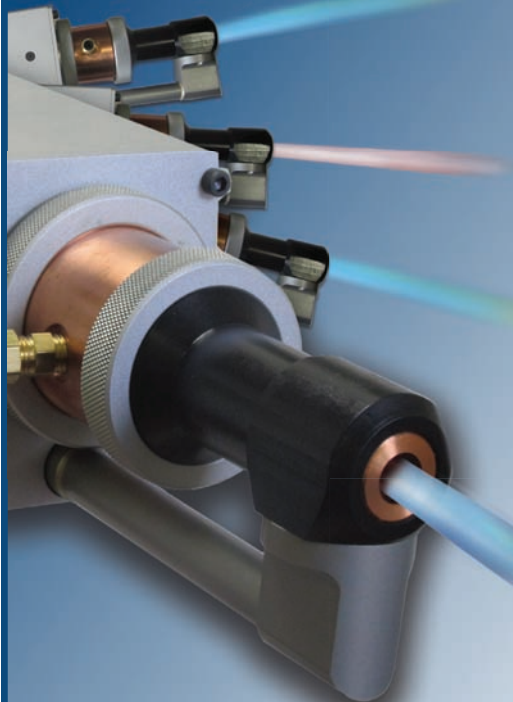
Start by analyzing the structure of your site. Are the pages titled with commonly searched, appropriate keywords? Are the terms specific to what you are offering? In addition to the page titles, are the URLs named with appropriate, searchable terms?

Google positions you largely because of background information that for the most part a visitor never sees. This includes directory structure, system architecture, domain registration, keyword density, keyword proximities, and alternative content (alt tags, link title tags, screen reader tags, long descriptions and more). Have all these controllable, internal factors been maximized for positioning when the site was organized and constructed? If not, do it now.

In addition to the structure of your site, think of its content. Fresh, unique content is the single most important thing that can be done to generate consistently high search engine rankings.

*Continued on page 12*

## A Tradition of Exceptional Quality and Customer Satisfaction....



For over 30 years, Genie Products has been providing high quality replacement parts for the metalizing industry. Today we offer a full compliment of products and services, along with technical support to help our customers meet or exceed their production demands.

- *Torches*
- *Replacement Parts*
- *Hoses and Cables*
- *Powders, Wires*
- *Complete Systems*

Genie Products can meet all of your metalizing requirements. We inventory 2800 replacement parts, ready to be shipped same day or overnight. Our goal is 100% customer satisfaction, which means getting our customers back into operation as quickly as possible.

Contact: [sales@genieproducts.com](mailto:sales@genieproducts.com) or 828-862-4772

**GENIE**  
PRODUCTS INC.

*Genie Products is an ISO 9001: 2008 registered company.*

PO Box 1028, Rosman, NC 28772

[www.genieproducts.com](http://www.genieproducts.com)

Continued from page 11

Correctly formatting, or coding, good content to maximize its appeal to the search engine virtually guarantees good results. Ensure that the code meets web development standards, known as W3C. In general, these standards establish acceptable scripting formats. There are several layers of standards set by the World Wide Web Consortium, and you don't have to meet the strictest, but it is a good idea to meet one of them. A few things to watch:

- Ensure that all possible categories of tags, even hidden categories, are filled.
- Make sure that you have style sheets optimized for mobile devices.
- Ensure that everything is done to quicken page loading.
- Meet Section 508 standards, coding for the impaired.

In addition to site content, don't forget to register your domain properly. When you renew domain registration, do it for three years or more. Google likes to know you're going to be around awhile.

Do not engage in any "black hat" optimization techniques that would worsen your positioning or even get you black-listed. Like everyone else, you have undoubtedly received an email from someone who "happened to see your site and can make it rank much higher" with the search engines. This is probably someone using black hat techniques. These techniques include keyword stuffing, duplicate content, having additional content that is the same color as the

background, and using multiple gateway pages, each page designed to meet the preferences of a certain search engine. Sometimes these techniques are temporarily beneficial, but they will come back to haunt you.

Perhaps the worst black hat technique is using a link farm. Everyday, a company somewhere with a high search engine ranking neglects to renew its registration and loses the name of its site, which is then bought by a link farm agent.

The agent may operate his own link farm or may sell the site to others who run link farms. In either case the link farm's proposition is made to you, and to thousands of others, to buy a backlink from that high ranking site, as part of a block of backlinks, for, say, \$100. The backlinks show up on the link farm sites every time they are visited. You pay the \$100, the link farm puts up backlinks to your site, and Google increases your ranking because it sees your new backlinks. Google, however, is not dumb. It sees your backlink, along with hundreds of others, on a page totally unrelated to your business, finds the link farm and stops spidering its sites, effectively putting it out of business. There goes your \$100. Something else happens, too. You are an accomplice and your site is showing false popularity. The search engine may blacklist it. This does not happen every time, but do you want to chance it?

Continued on page 14

## One Nation . . . Infinite Possibilities!

**HVOF • Plasma • Arc Spray**

Nation Coating is North America's leader in the development and use of application-specific thermal spray coatings. We specialize in innovative, high-performance solutions for aerospace, military, powergen, automotive, petrochem, pulp and paper, printing, and industrial applications.

- Advanced Met Lab for R&D and testing
- Dedicated spray booth for client and academic testing
- FAA Repair – AS9100:2009 Rev C – NADCAP

**Let's find an answer to your coating challenge!**  
**Call (888) 665-5525**



Sister Company of  
Stronghold Coatings  
A Veteran-owned Business

Now in Our **20<sup>th</sup>** Year of Service



**www.nationcoatingsystems.com**



# Global Engineering Coating Equipment

## Mass Flow Control Systems

Metallisation's Plasma, HVOF and automated flame spray systems all have mass flow control for ease of operation and optimum repeatability. The systems are PLC controlled with a familiar Windows interfaced touch screen that users find easy to operate. All of Metallisation's systems are high quality, compact and easy to use.



**METJET 4L -**  
Liquid Fuel HVOF system



**Plasma PS50M-PC -**  
50kW Plasma Spray system



**MK74-PC -**  
Powder Flame Spray system



**PCC - Pistol Control Console**  
Our proven mass flow control system that can be configured to operate a range of plasma or HVOF pistols, powder feeders and power supplies commonly used in the industry. The system can operate liquid fuel or gas fuel HVOF pistols and plasma pistols up to 80kW.



**MK66E-PC -**  
Wire Flame Spray system

## Manual Spray Systems

Metallisation's manual systems are suitable for engineering coatings where a combination of manual and tool post mounted spraying is required. Our range includes oxy-acetylene flame spray systems and a full range of hand held or automated arc spray systems from 250A to 1,500A.

## Excellent Customer Service

Metallisation's customer service is second to none, including an exceptional after sales service. With a network of distributors around the globe, and a team of fully qualified and highly experienced service engineers, customers can rely on the highest standard of care, wherever they are in the world.

Continued from page 12  
**Social media**

Social media is hot in 2013. Do you need a Facebook page for your business? LinkedIn? Are you on Google Places? Do you have videos on YouTube?

Creating and maintaining these takes time. A blog is meant to establish pertinent conversations about specific topics. What good is a blog if you set it up and never engage in conversation? It has some benefits, but maybe not what you were hoping for.

Even more important is the targeting question. Are you customers on Twitter? If not, why bother?

If you decide your market may be spending time on Facebook, Twitter and LinkedIn, is there a link from your website to your Twitter feed, and is there one in the opposite direction, from Twitter to your site? If you post a news release on your website, is it posted on Facebook, too? When using social media, remember to keep tabs on posts, so content detrimental to your business doesn't remain there.

We talked earlier about backlinks, the links to your site from other sites. Look for legitimate possibilities that will link to your site. Industry association websites, trade media online buyers guides, DMOZ.org, and the original (and still working) Yahoo Directory are all places where backlinks can be found. Check your company listing in the ITSA membership directory ([www.thermalspray.org](http://www.thermalspray.org)). Is your logo up? Does the description accurately describe your services? Legitimate backlinks are good, but don't use paid backlinks unless they are from organizations or publications directly involved in thermal spray.

**Uncontrollable Factors, and how to control them**

Certain factors in search engine optimization are out of your control, but some can be influenced. Traffic to your site is a major factor in search engine rankings. You can influence it with paid advertising. You can also improve positioning organically by splitting up pages on your site, which increases URLs, titles and the amount of content that gets spidered.

Rate your hosting service. If you are on a shared server with thousands of other sites, you will be ranked lower than if you were on a server with dozens of other sites. Even better would be to be on a dedicated server with no other sites.

If you are serving businesses mostly nearby, having a prominent address and phone number on all of your pages

gives you an advantage in your local area. Better yet, Google Places, a social media site, puts you on a map and adds a listing. Google "thermal spray companies" and click on "Maps." Who shows up? If for marketing reasons you don't want to publicize nationally the location of your company, you can put the address in the header metadata. Google will find it.

**Final — and important — suggestions**

Set realistic goals and realistic timeframes. Try first to be on page one, not to be number one, and don't expect to get there overnight. Give your changes three months to work, then look again.

Check competitive sites. Are they providing more content and are the sites more easily navigated?

Watch your back. Your number one ranking only lasts until somebody takes it from you. Check your position regularly.

Use metrics. Number one for a key phrase that is never searched is not as good as number ten for a phrase that is searched often, so check the traffic for different key words and phrases.

Look at your site — and this very important, too-often-ignored advice goes for all your marketing communications — from a user's point-of-view. The customer should want to click on your site because he sees something interesting there. What is it? Why should he do business with you?

Paul Streicker is president of Streicker & Company Inc., a business-to-business marketing communications agency that emphasizes website development and advertising, both internet and print, for manufacturers and manufacturing service industries.

**For more information**, contact Paul Streicker via email [advertise@streicker.com](mailto:advertise@streicker.com)

**Where is your article?** We encourage you to send articles, news, announcements and information to [spraytime@thermalspray.org](mailto:spraytime@thermalspray.org).



**LINEAGE ALLOYS**  
1901 Ellis School Road  
Baytown, Texas 77521

**Tungsten Carbides  
Chromium Carbides  
Metal Powders  
Pure Metal Powders  
Special Order**


**Lineage Alloys** offers a comprehensive range of thermal spray powders to the industry.

Please visit our website [www.lineagealloysllc.com](http://www.lineagealloysllc.com) to view our products, services and special order capabilities.

**Lineage Alloys** technical staff are ready to discuss your thermal spray powder requirements and determine how we can best meet your needs.

For information, contact us at 281.426.5535, fax: 281.426.7484, email: [lineage@lineagealloysllc.com](mailto:lineage@lineagealloysllc.com)


## Nickel Powder



**Hunter Chemical**

Offers Hydrogen-reduced type, with various particle size distributions available. Special pricing for -200+325. Ask about our R&D credit.

866.461.8882  
[info@hunterchem.com](mailto:info@hunterchem.com)  
[www.hunterchem.com](http://www.hunterchem.com)







## IMR Test Labs Earns GulfStream Approval

IMR Test Labs' New York facility recently passed a GulfStream audit for materials testing. This approval includes mechanical, chemical, metallurgical and corrosion evaluation services.

IMR's New York laboratory also carries approvals for major OEM's including GE, Pratt & Whitney, Sikorsky, Boeing, Bombardier, Lockheed Martin and Rolls Royce, as well as Nadcap and ISO/IEC 17025 accreditation. For over 15 years, IMR Test Labs has provided high-quality testing to the aerospace industry, testing thermal spray coatings, metals, polymers and composites. With accurate reports, and most jobs completed in three days or less, IMR meets the aerospace industry's critical need for reliability and accuracy.

*For more information,* please visit [www.imrtest.com/who\\_we\\_are/accreditations](http://www.imrtest.com/who_we_are/accreditations).

### About IMR Test Labs

IMR is headquartered in Ithaca, NY and operates state-of-the-art laboratory facilities in NY, Louisville, KY, Portland, OR, Singapore and Suzhou, China. IMR Test Labs is a Nadcap (NY, OR, SPR, SUZ), A2LA - ISO/IEC 17025 (NY, KY, OR, SUZ), SAC - ISO/IEC 17025 (SPR), Pratt & Whitney MCL (NY, OR, SPR) and GE S-400 (ALL) approved materials testing laboratory offering a complete scope of independent

analytical services for metals, polymers, composites and ceramics. IMR Test Labs is a business unit of Curtiss-Wright Surface Technologies.

*For more information,* visit: [www.imrtest.com](http://www.imrtest.com)

### About Curtiss-Wright Surface Technologies

Curtiss-Wright Surface Technologies, headquartered in Paramus, NJ, is the metal treatment business segment of Curtiss-Wright Corporation. This business segment provides precision shot peening, laser peening, heat treating and protective coating services to the aerospace, automotive, power generation and general industrial markets through a global network of locations.

*For more information,* visit [www.cwst.com](http://www.cwst.com)

**Thermal Spray Jobs listed at  
"For Hire" [www.thermalspray.org](http://www.thermalspray.org)**

*A well-known spray house buyer  
found particulate costs quite dire.  
The Solution to the trouble  
saw profits double,  
By switching-from-powder-to-wire.  
James Browning, 2000*

INDUSTRY NEWS

# What:

## Thermal spray coating equipment and consumables from Praxair



Thermal spray powder and wire



Replacement parts

# Why:

- **TAFE4**-brand coating equipment

- **Services:** installations and training, calibrations and repairs

- Half a century of leadership



HP/HVOF®, arc spray, plasma systems and more

[www.praxairsurfacetechologies.com](http://www.praxairsurfacetechologies.com)

Copyright © 2012 Praxair S.T. Technology, Inc. All rights reserved.  
Praxair, the Flowing Airstream design, the TAFE logo and the FLAME design are trademarks of Praxair S.T. Technologies, Inc. TAFE Incorporated is a wholly owned subsidiary of Praxair Surface Technologies.

**PRAXAIR**  
SURFACE TECHNOLOGIES



### ITSA Mission Statement

*The International Thermal Spray Association, a Standing Committee of the American Welding Society, is a professional industrial organization dedicated to expanding the use of thermal spray technologies for the benefit of industry and society.*

### JOB SHOP MEMBER COMPANIES

- Accuwright Industries, Inc.** - Gilbert, AZ, USA  
www.accuwright.com 480.892.9595  
Mr. David Wright, dave@accuwright.com
- Atlas Machine & Supply, Inc.** - Louisville, KY USA  
www.atlasmachine.com 502.584.7262  
Mr. Richie Gimmel, richie@atlasmachine.com
- Bender US** - Vernon, CA USA  
www.benderus.com 323.232.2371  
Mr. Doug Martin, dmartin@benderus.com
- Byron Products** - Fairfield, OH USA  
www.byronproducts.com 513.870.9111  
Mr. Keith King, kking@byronproducts.com
- Cascadura Industrial S.A.** - Sorocaba SP Brazil  
www.cascadura.com.br 55.15.3332.9622  
Mr. Ricardo Leoni, ricardo.maffei@cascadura.com.br
- Castolin Eutectic** - Lausanne, Switzerland  
www.castolin.com 0041.21.694.1132  
Ms. Christina Swan, cswan@castolin.com
- Cincinnati Thermal Spray, Inc.** - Cincinnati, OH USA  
www.cts-inc.net 513.793.0670  
Ms. Cindy Abbott, cabbott@cts-inc.net
- Curtiss-Wright Surface Technologies** - East Windsor, CT USA  
www.metalimprovement.com 860.623.9901  
Mr. Peter Ruggiero, peter\_ruggiero@metalimprovement.com
- Ellison Surface Technologies, Inc.** - Cincinnati, OH USA  
www.ellisonsurfacetech.com 513.770.4920  
Mr. Tim Perkins, tperkins@ellisongroup.com
- Exline, Inc.** - Salina, KS USA  
www.exline-inc.com 785.825.4683  
Mr. Doug Porter, d.porter@exline-inc.com
- F.W. Gartner Thermal Spraying** - Houston, TX USA  
www.fwgts.com 713.225.0010  
Mr. Jason Falzon, jfalzon@fwgts.com
- Ferrothermal Spray Coating** - Monterrey N.L. Mexico  
www.drexel.com.mx 52.818.331.0816  
Mr. Renato Drexel, renato@drexel.com.mx
- Hausner Hard-Chrome** - Owensboro, KY USA  
www.hausnerinc.com 270.684.2279  
Mr. Bruce Dulin, bruce.dulin@hausnerinc.com
- Hayden Corporation** - West Springfield, MA USA  
www.haydencorp.com 413.734.4981  
Mr. Dan Hayden, daniel.hayden@haydencorp.com
- Nation Coating Systems** - Franklin, OH USA  
www.nationcoatingsystems.com 937.746.7632  
Mr. Larry Grimenstein, ncslgrimen@aol.com
- New England Plasma Development Corp.** - Putnam, CT  
www.neplasma.com 860.928.6561  
Ms. Maureen M. Olszewski, molshewski.nep@snet.net

- Plasma Coatings** - Union Grove, WI USA  
www.plasmacoatings.com 262.878.2445  
Mr. Daniel Cahalane, info@plasmacoatings.com
- Plasma Technology, Inc.** - Torrance, CA USA  
www.ptise.com 310.320.3373  
Mr. Robert D. Dowell, salespti@ptise.com
- St. Louis Metallizing Company** - St. Louis, MO USA  
www.stlmetallizing.com 314.531.5253  
Mr. Joseph P. Stricker, jpstricker@stlmetallizing.com
- Sharkskin Coatings and Surface Technologies** - Canada  
www.sharkskincoatingsltd.com 519.627.0060  
Ms. Shari Webber, swebber@sscoat.com
- Southwest United Industries, Inc.** - Tulsa, OK USA  
www.swunited.com 918.587.4161  
Mr. Bill Emery, aandoe@swunited.com
- Spraymetal, Inc.** - Houston, TX USA  
www.schumachercoinc.com 713.924.4200  
Mr. Andrew Schumacher, ars@schumachercoinc.com
- Superior Shot Peening, Inc.** - Houston, TX USA  
www.superiorshotpeening.com 281.449.6559  
Mr. Albert Johnson, ajsspi@aol.com
- Technetics Group** - Daytona Beach, FL USA  
www.taratechnologies.com 386.253.0628  
Ms. Amy Davis, amy.davis@techneticsgroup.com
- United Surface Technologies** - Altona, Melbourne Australia  
61.393.98.5925  
Mr. Keith Moore, keith.moore@ust.com.au

### SUPPLIER MEMBER COMPANIES

- 3M Abrasive Systems Division** - St. Paul, MN USA  
www.mmm.com 800.362.3550 or 651.736.4970  
Mr. Nick Orf, naorf2@mmm.com
- Advanced Material Services** - West Chester, OH USA  
513.907.8510  
Mr. Jim Ryan, jryan-ams@cinci.rr.com
- ArcMelt** - Bridgeton, MO USA  
www.arcmelt.com 314.801.6900  
Mr. David Urevich, durevich@arcmelt.com
- AMETEK, Inc.** - Eighty-Four, PA USA  
www.ametekmetals.com 724-225-8400  
Ms. Cindy Freeby, cindy.freeby@ametek.com
- Ardleigh Minerals, Inc.** - Shaker Heights, OH 44122 USA  
www.ardleigh.net 216.464.2300  
Mr. Ernie Petrey, epetrey@ardleigh.net
- Bay State Surface Technologies, Inc.** - Auburn, MA USA  
www.baystatesurfacetech.com 508.832.5035  
Mr. Jay Kapur, jkapur@aimtek.com
- Camfil APC** - Jonesboro, AR USA  
www.farrapc.com 800.479.6801  
Mr. Dale Gilbert, dale.gilbert@camfil.com
- Carpenter Powder Products** - Pittsburgh, PA USA  
www.carpenterpowder.com 412.257.5102  
Mr. Chip Arata, warata@cartech.com
- Centerline Windsor Limited** - Windsor, ON Canada  
www.supersonicspray.com 519.734.8464  
Mr. Julio Villafuerte, julio.villafuerte@cntrline.com



**Donaldson Torit** - Minneapolis, MN USA  
www.donaldsontorit.com 800.365.1331  
Ms. Lori Lehner, llehner@mail.donaldson.com

**Flame Spray Technologies, Inc.** - Grand Rapids, MI USA  
www.fst.nl 616.988.2622  
Mr. Terry Wilmert, t.wilmert@fstincusa.com

**Fujimi Inc.** - Arlington Heights, IL USA  
www.fujimico.com 847.398.6544  
Mr. Michael Akiyoshi, makiyoshi@fujimico.com

**Genie Products, Inc.** - Rosman, NC USA  
www.genieproducts.com 828.862.4772  
Mr. Richard Grey, rwgrey@genieproducts.com

**Global Tungsten and Powders Corp** - Towanda, PA USA  
www.globaltungsten.com 570.268.5393  
Mr. Paul Sedor, Paul.Sedor@globaltungsten.com

**Globe Metal, Inc.** - Sainte-Catherine, QC Canada  
www.globemetal.com 450.645.9397  
Mr. Adam Rubin, adam@globemetal.com

**Green Belting Industries LTD** - Mississauga, ON, Canada  
www.greenbelting.com 905.564.6712  
Mr. Tim Connelly, tconnelly@greenbelting.com

**H.C. Starck North American Trading LLC** - Newton, MA USA  
www.hcstarck.com 617.407.9960  
Ms. Ana Duminie, ana.duminie@hcstarck.com

**HAI Advanced Material Specialists** - Placentia, CA USA  
www.hardfacealloys.com 877.411.8971  
Mr. Daren Gansert, dgansert@haiams.com

**Haynes International** - Mountain Home, NC USA  
www.haynesintl.com 828.692.5791  
Mr. Richard Hoskinson, rhoskinson@haynesintl.com

**Kennametal Stellite Company, Inc.** - Goshen, IN USA  
www.stellite.com 574.534.8631  
Mr. David A. Lee, David.A.Lee@Kennametal.com

**Linde Gas USA LLC** - Murray Hill, NJ USA  
www.us.linde-gas.com 908.771.1353  
Dr. Joe Berkmanns, joachim.berkmanns@us.linde-gas.com

**Lineage Alloys** - Baytown, TX USA  
www.lineagealloys.com 281.426.5535  
Mr. Gordon Jones, gjones@lineagealloysllc.com

**MesoCoat, Inc.** - Euclid, OH USA  
www.mesocoat.com 216.453.0866  
Mr. Anupam Gildyal, aghildyal@mesocoat.com

**Metallisation Limited**  
Dudley West Midlands, United Kingdom  
www.metallisation.com +44.1384.2524646  
Dr. Terry Lester, rd@metallisation.com

**North American Höganäs** - Hollsopple, PA USA  
www.hoganas.com 814.361.6875  
Mr. Andy Hoffman, andy.hoffman@nah.com

**PM Recovery, Inc.** - Harrison, NY USA  
www.pmarecovery.com 860.536.5396  
Mr. Paul Sartor, paul@pmrecovery.com

**Polymet Corporation** - Cincinnati, OH USA  
www.polymet.us 513.874.3586  
Mr. Bob Unger, runger@polymet.us

**Praxair Surface Technologies** - Concord, NH USA  
www.praxair.com/thermalspray 603.224.9585  
Mr. Richard Thorpe, richard\_thorpe@praxair.com

**Progressive Surface** - Grand Rapids, MI USA  
www.ptihome.com 800.968.0871  
Mr. Bill Barker, wnb@ptihome.com

**Saint-Gobain Ceramic Materials** - Worcester, MA USA  
www.coatingsolutions.saint-gobain.com 508.795.2351  
Mr. Howard Wallar, howard.wallar@saint-gobain.com

**Sulzer Metco (US) Inc.** - Westbury, NY USA  
www.sulzermetco.com 516.334.1300  
Ms. Mae Wang, mae.wang@sulzer.com

**Thermach, Inc.** - Appleton, WI USA  
www.thermach.com 920.779.4299  
Mr. David Lewisen, davelewis@thermach.com

**Thermion, Inc.** - Silverdale, WA USA  
www.thermioninc.com 360.692.6469  
Mr. Dean Hooks, dean@thermioninc.com

## ASSOCIATE MEMBER ORGANIZATIONS

**Advanced Materials and Technology Services, Inc.**  
Simi Valley, CA USA  
www.adv-mts.com - 805.433.5251  
Dr. Robert Gansert, rgansert@adv-mtv.com

**ASM Thermal Spray Society** - Materials Park, OH USA  
http://tss.asminternational.org 440.338.5151  
Randall S. Barnes, randall.barnes@asminternational.org

**State University of New York at Stony Brook**  
Stony Brook, NY USA  
www.ctsr-sunysb.org 631.632.8480  
Prof. Sanjay Sampath, ssampath@ms.cc.sunysb.edu

## SUPPORTING MEMBER SOCIETIES

**DVS, The German Welding Society**  
www.die-verbindungs-spezialisten.de  
Mr. Jens Jerzembeck, jens.jerzembeck@dvs-hg.de

**GTS e.V., The Association of Thermal Sprayers**  
www.gts-ev.de +49.89.31001.5203  
Mr. Werner Kroemmer, werner.kroemmer@gts-ev.de

**IMM, Institute of Materials Malaysia**  
www.iomm.org.my 603.5882.3584  
Mr. Johar Juhari, johar\_juhari@petronas.com.my

**JTSS, Japan Thermal Spray Society**  
+81.6.6722.0096 www.jtss.or.jp  
Mr. Nick Yumiba, jtss@mb8.seikyoku.ne.jp

**MPIF, Metal Powder Industries Federation**  
www.mpif.org 609.452.7700  
Mr. James R. Dale, jdale@mpif.org

**TSCC - Thermal Spraying Committee of China Surface Engineering Association**  
www.chinathermalspray.org +86.10.64882554  
Prof. Huang Xiaou, Xiaou@chinathermalspray.org

## ITSA Headquarters

Post Office Box 1638, Painesville, OH 44077 USA  
voice/cell: 440.357.5400 • fax: 440.357.5430  
itsa@thermalspray.org • www.thermalspray.org

Visit us at [www.thermalspray.org](http://www.thermalspray.org)



The **International Thermal Spray Association** is closely interwoven with the history of thermal spray development in this hemisphere. Founded in 1948, and once known as Metallizing Service Contractors, the association has been



**Chairman Falzon**

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

A company-member association, ITSA invites all interested companies to talk with our officers, and company representatives to better understand member benefits. A complete list of

ITSA member companies and their representatives can be found at [www.thermalspray.org](http://www.thermalspray.org)

### ITSA Mission Statement

*The International Thermal Spray Association, a Standing Committee of The American Welding Society, is a professional industrial organization dedicated to expanding the use of thermal spray technologies for the benefit of industry and society.*

### Officers

Chairman: **Jason Falzon**, FW Gartner Thermal Spraying

Vice-Chairman: **Bill Mosier**, Polymet Corporation

Corporate Secretary: **Kathy Dusa**

**Executive Committee** (above officers plus the following)

**Richard Grey**, Genie Products, Inc.

**Larry Grimenstein**, Nation Coating Systems

**Dan Hayden**, Hayden Corporation

**David Wright**, Accuwright Industries, Inc.

### ITSA Scholarship Opportunities

The International Thermal Spray Association offers annual Graduate 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](http://www.thermalspray.org) for

criteria information and a printable application form.

### 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, OH and the State University of New York at Stony Brook in the Thermal Spray Research Center, 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 historic 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. This newsletter is free and can be viewed online at [www.spraytime.org](http://www.spraytime.org).

*Member listing pages 16-17*

### Become a Member of The International Thermal Spray Association

Your company should join the International Thermal Spray Association (ITSA) now! As a company-member, professional industrial association, our mission is dedicated to expanding the use of thermal spray technologies for the benefit of industry and society.

ITSA members invite and welcome your company to join us in this endeavor.

**New - All ITSA company members are now also Supporting Members of the American Welding Society which includes five individual AWS memberships.**

Whether you are a job shop, a captive in-house facility, an equipment or materials supplier, an educational campus, or a surface engineering consultant, ITSA membership will be of value to your organization.

The most valuable member asset is our annual membership meetings where the networking is priceless! Our meetings provide a mutually rewarding experience for all attendees - both business and personal. Our one-day technical program and half-day business meeting balanced by social activities provide numerous opportunities to discuss the needs and practices of thermal spray equipment and processes with one another.

As an ITSA member, your company has excellent marketing exposure by being listed on our website along with a multitude of additional benefits.



ITSA member companies are also highlighted in the ITSA booth at several trade shows throughout the year (International Thermal Spray Conference ITSC, Fabtech Thermal Spray Pavilion and Conference, FABtech Canada, Power-Gen, Society of Vacuum Coaters (SVC), TurboMachinery, NACE and TurboExpo).

*If you would like to discuss the benefits* of your company becoming a member of the International Thermal Spray Association, we suggest you contact Kathy Dusa at ITSA headquarters office, phone 440.357.5400 or visit the membership section at [www.thermalspray.org](http://www.thermalspray.org).

### NEW "Supporting Societies" Membership

The International Thermal Spray Association now has a "Supporting Societies" membership category to establish communication with other associations/societies involved in thermal spray and surface engineering activities worldwide.

*See the Supporting Societies listing on page 19.*

This is ideal for membership exchange between organizations. Contact Kathy Dusa at the headquarters office via email to [itsa@thermalspray.org](mailto:itsa@thermalspray.org)



Jason Falzon (left) and David Wright.

### Jason Falzon New Chairman of International Thermal Spray Association

**Jason Falzon**, a managing partner at FW Gartner Thermal Spraying was elected to the *Chairman position for the International Thermal Spray Association* at the June annual membership meeting in Ogden, Utah.

Jason was born into the thermal spray industry as the fifth generation successor at FW Gartner in Houston, TX. He began his tenure with the company at the age of 14, working in the shop during summer breaks from high school. After earning an engineering degree from Texas A&M University in 2005, he came back to the company full time. As current managing partner, Jason is actively involved in day to day activities handling various internal/external projects, managing customer relationships, and is a part of Gartner's engineering team.

Jason and his wife Kelsey have been married for 7 years and have two children, Jack and Sarah. He is active in his church, plays drums for their praise team, and enjoys participating in endurance sports.

*For more information*, contact Jason at FW Gartner via email [jfalzon@fwgts.com](mailto:jfalzon@fwgts.com)

### David Wright Honored for his Chairmanship

**David W. Wright**, President of Accuwright Industries, Gilbert, AZ, was honored with a plaque for his two-year position as Chairman for the International Thermal Spray Association at the June annual membership meeting in Ogden, Utah.

**David W Wright**, President of Accuwright Industries, Inc. is a 30 year veteran of the thermal spray processes. He began his career as a thermal spray operator in his home town of Ogden Utah, working for a small jet engine manufacturer in 1981. Recruited to Phoenix Arizona in 1984 by a start up company repairing and overhauling jet engine components, he managed the thermal spray processes for 12 years and helped to groom that company which later sold for 9 times its original purchase price. Since 1996, he has served as President of Accuwright Industries, Inc. as a leader in thermal spray processes and began working on cold spray applications over five years ago. Today, he is a leader for the cold spray industry in production applications of low, medium, and high pressure applications of cold spray.

*For more information*, contact David at Accuwright via email [dave@accuwright.com](mailto:dave@accuwright.com)

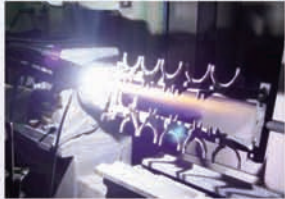
PH: +91-291-2747601/2/3



FAX : +91-291-2746359

A Brand Next To The Best

# Metallizing Equipment Co. Pvt. Ltd.



PLASMA



HVOF



ROD SPRAY



ARC



FLAME SPRAY



## THERMAL SPRAY

*Complete Solution Provider  
since 1967*



[www.mecpl.com](http://www.mecpl.com)

HOME

FAQ

APPLICATIONS

PRODUCTS

APPROVALS

R & D

TRAINING

CLIENTS

SITE MAP





## ASM International to Commemorate Centennial Anniversary with Celebratory Gala

ASM International (ASM), the Materials Information Society, will commemorate its 100th anniversary with a celebratory gala from 5:30-10 p.m. on Oct. 27 in Montreal, Quebec, Canada. The anniversary gala will be held during the Society's annual Materials Science & Technology Summit (MS&T), also in Montreal.

The Society, recognized for its ASM Handbook series, technical journals, conferences as well as other educational offerings, has a legacy of publishing high-quality materials content by and for the member community. Founded in 1913, the organization began as the Steel Treathers Club in Detroit, Michigan, with fewer than 20 members. Today, ASM International is a thriving society with more than 30,000 members and nearly 100 worldwide chapters.

ASM International's headquarters, complete with its acclaimed geodesic dome, is located in Materials Park, Ohio.

The anniversary gala will feature a nostalgic review of ASM's impressive past and a look toward the future during the cocktail reception, dinner, historical tributes and live entertainment. The gala will also feature a keynote speech by Dr. Peter Diamandis, chairman and CEO of the X Prize

Foundation and the New York Times Bestselling author of Abundance – The Future is Better Than You Think.

"ASM International has been serving the materials community for over 100 years now....because of and through our members, countless contributions have been made to industry, government, academia and the general public," said Thom Passek, Managing Director of ASM International. "We can't wait to reminisce about the organization and celebrate its future with our lifelong society friends this October."

**For more information**, visit [www.asminternational.org](http://www.asminternational.org) ASM International anniversary milestones webpage for more about the organization's history.

### Join the ASM Thermal Spray Society Online Community Forum

ASM TSS members welcome visitors to register and access the new **searchable** forum, as well as explore the new online community.

**To subscribe**, visit <http://tss.asminternational.org>, choose networking and forum for instructions.

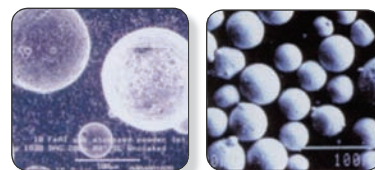
**Where is your article?** We encourage you to send articles, news, announcements and information to [spraytime@thermalspray.org](mailto:spraytime@thermalspray.org).

# Thermal Spray Powders

Whether your finished part requires low, medium or high degrees of hardness, machinability, impact and abrasion or corrosion resistance, we have an alloy to meet your needs.



The table below describes some of the standard alloys available from AMETEK. We also manufacture custom atomized powders for special applications.



Alloy	C	CR	FE	NI	B	SI	CU	MO	CO	Rc. Hardness	MELT TEMP (F°)
PF20	.03	--	1.5	BAL	1.5	2.5	--	--	--	12-20	2000
PF25	.06	--	1.5	BAL	1.5	3.5	--	--	--	20-30	1975
PF35	.05	10.5	2.0	BAL	2.0	3.3	--	--	--	32-40	1925
PF40	.30	7.5	1.5	BAL	1.4	4.0	--	--	--	40-48	1925
PF50	.65	14.0	4.2	BAL	2.8	3.8	--	--	--	48-54	1900
PF60	.90	16.5	4.5	BAL	3.3	4.3	--	--	--	56-62	1900
AM58	.90	16.5	4.5	BAL	3.3	4.3	--	--	--	56-62	1900
316L	.03	17.0	BAL	12.0	--	0.8	--	2.5	--	Rb78	2525
80/20	--	20.0	--	80.0	--	--	--	--	--	--	--
PCN38	--	--	0.4	38.0	--	--	61.5	--	--	Rb60	2400
*PHAC	.05	15.5	8.0	BAL	--	0.8	--	16.0	--	--	--
*PI600	.02	14.0	10.0	BAL	--	1.0	--	--	--	Rb74	2600
*PM400	.02	--	--	66.5	--	0.5	32.5	--	--	--	--

**AMETEK®**  
SPECIALTY METAL PRODUCTS  
Innovative & Advanced Metallurgical Technology

**U.S. HEADQUARTERS**  
1085 Route 519  
Eighty Four, PA 15330 USA  
Tel: +1 724-225-8400  
Fax: +1 724-225-6622  
E-mail: [sales@ametek.com](mailto:sales@ametek.com)

[www.ametekmetals.com](http://www.ametekmetals.com)



## Recycling Thermal Spray Overspray Dust and More: *How to Maximize the Value of Overspray Materials and Do Right by the Earth*

By Scott McLaughlin

Want to keep your thermal spray waste and by-products out of landfills and generate some extra cash at the same time? Your overspray dust has value and there are recyclers willing to pay you for it. This article will discuss simple ways to get the most out of your overspray dust, spent dust cartridges and all other materials for which you no longer have a use. Furthermore, sending your overspray materials to landfills as hazardous waste is extremely expensive and unnecessary. You can recycle them and in many cases be paid for your materials, converting the overspray dust from an expensive cost center to a cash generating profit center. Let's talk about dust first. One of the first questions I get is, "Do I need to have the different materials segregated?" The simple answer is no. There are qualified recycling vendors who can take a mix of all your overspray dust and separate it out for resale to other manufacturers. So if your collector hoppers contain a mix of tungsten carbide, chromium, cobalt, nickel, aluminum oxide, zinc, chrome oxide it can still be recycled and kept out of landfills.

Overspray dust is never resold to thermal spray powder suppliers because it will not meet purity and particle size requirements and will likely contain a high percentage of fines. Overspray dust is usually sold to other industries. For instance chrome oxide dust is sold to manufacturers of stainless steel as a source for chromium.

However, if operationally practical, segregating various overspray materials will definitely increase the value of your materials in the eyes of the recycler. If at all possible it is best to keep ceramics like chrome oxide  $\text{Cr}_2\text{O}_3$  and aluminum oxide  $\text{Al}_2\text{O}_3$  separate from metals like tungsten carbide, cobalt, nickel and chrome. Chrome oxide and Al oxide are low value materials and pull down the value of the other metals which are high value. Plus, although possible, it is more difficult to separate chrome oxide and aluminum oxide from the metals. You will have to weigh the value of increasing your settlement from a recycling company against the operational inconvenience of keeping the materials separate by dedicating a booth and a collector to one or more coatings.

Another common mistake thermal spray shops make is allowing contraband to get tossed into bins or drums of recyclable materials. Keeping latex gloves, string, wood, pop bottles, rubbish, etc out of dust and grit containers is by far the fastest way to increase the value of your recyclable materials.

Two very common but relatively unknown recyclable materials are grit from abrasive blasting, coating prep and solids removed from coating masking. While grit blast material, typically  $\text{Al}_2\text{O}_3$ , will generally only provide a small if any settlement payback, you can keep it out of landfills by recycling it. You do not have to send it to a hazardous waste site either. The best practice would be to keep shipping costs to a minimum by sending the grit along with

a load of "good stuff" like Ni, W, Co, etc.

That brings up another frequent question. Who pays for shipping? The answer is, it is up to you. If you prefer to have the recycling company pick up the freight charges, they will be more than happy to do so. However, the recycler will then deduct the shipping charges from your settlement. The better option is to make the shipping arrangements yourself with your usual shipping/freight hauler. You already have a relationship with them and they want to keep your business so they are most likely to give you the best rate. Then your recycling settlement can be maximized.

Spent dust collector cartridges are also recycling candidates. The metal or ceramic dust stuck in the cartridge filter media can be reclaimed just like the material in the hoppers. The metal caps and cages are then sold as scrap to metal recyclers. To assist in shipping the cartridges to your recycler, keep the original boxes the cartridges were sent to you in. Replace the cartridges into the boxes and palletize them for shipping to the recycler.

Proper exhaust ventilation is important to collect as much dust as possible. This keeps your employees safe from metal dust and fumes and captures as much dust as possible for recycling. Make sure the ventilation is drawing airflow away from the nozzle at a 90 degree angle. If the airflow is vertical (such as with an overhead hood) the metal overspray may coat the torch on the way to the ductwork. This creates operational problems for the torch. The metal will foul the torch making for a lot of unnecessary maintenance and torch rebuilds. Both of which lead to unplanned downtime and delayed deliveries.

What factors determine the settlement payback? Number one would be the type of material. Then believe it or not volume is probably the second biggest factor. The more you generate the more attractive the material will be to the recycler. Purity, absence of contraband, metals market fluctuations, and shipping distance also play into the value of waste materials. It is important the recycler understands your business and has multiple "homes" (manufacturers who will buy the materials to be made into other products) for your materials.

There are plenty of other waste materials generated in a coating shop which can be recycled besides overspray dust. These include powder bottles, wire snippets from thermal spray wires, copper nozzles, electrodes, anodes, cathodes and scrap customer parts made of valuable alloys such as Inconel, Hastalloy, Stellite, etc. Powder bottles are sold to a manufacturer who grinds them up and compresses them into square blocks. The blocks are then used as energy absorbing devices for highway guardrails.

When recycling materials are sent to the recycler they need not be shipped as hazardous waste. They are product, just like the powder was when it was originally shipped to

**Where is your article?** We encourage you to send articles, news, announcements and information to [spraytime@thermalspray.org](mailto:spraytime@thermalspray.org).



you from the powder supplier. Your recycler should be able to help you interpret and comply with federal and state environmental laws and regulations, whether the recycler is based in your same state or not.

Make sure your recycler provides a certificate of recycling to document your materials are not sent to a landfill. This protects you and your company. All materials sent to a landfill are forever your responsibility. Cradle to grave. Record keeping is a critical responsibility for the generator of waste/recycling materials. Most highly functioning coating job shops assign this task to an individual whom is experienced and knowledgeable with records and procedures, such as the quality manager or HSEA manager. All in all recycling is good for your business and good for the Earth!

**For more information**, contact Scott McLaughlin, phone: 630-922-7198, website: [www.mclaughlinthermalspray.com](http://www.mclaughlinthermalspray.com), email: [scott@mclaughlinthermalspray.com](mailto:scott@mclaughlinthermalspray.com)

©2013 McLaughlin & Associates Thermal Spray, Inc.

### HVOF: Replacement of Hard Chrome Plating

Hard chrome plating (HCP) has been a trusted industry solution for wear, erosion, corrosion resistance and dimensional reclamation for many years. It can be applied at a reasonable cost per unit of surface area, but has limitations on thickness build-up, part size, and in some instances performance in service.

Hard chrome plating utilizes chromium in the hexavalent state which is known as Carcinogen (a factor to cause cancer) As a result, the Environmental Protection Agency (EPA) has issued stringent air emission standards for hex-Cr and the Occupational Health and Safety Administration (OSHA)

has established permissible exposure limits (PEL) for hex-Cr in the workplace at significantly reduced levels.

As a result, it is estimated that the cost of compliance for hard chrome plating facilities to upgrade their equipment to meet the standards will significantly increase the cost of hard chroming and will result in a number of plating facilities closing down operations.

HVOF (high velocity oxy-fuel) process has proven much superior to HCP for wear and corrosion resistance application as per the conclusion of many researches done in this field. This process uses oxygen-fuel (LPG/Hydrogen) combustion for melting of material and compressed air for atomisation of that semi molten material. Oversprayed carbide particles can be simply trapped by using spray-booth with dust collector.

Following are the advantages of HVOF:-

- increased wear resistance and service life
- improved corrosion resistance
- higher bond strength
- higher hardness
- no physical distortion
- controllable thickness variation
- grinding as post treatment can be done
- environmentally safe process

- can be done in-house as well as on-site
- less number of steps included in the process.
- The most important is variety of available coating materials. This means that coating materials can be successfully tailored to specific applications in various operating environments where electrolytic hard chrome would not perform well or in fact, may not be considered at all.

Following are the some of applications where HVOF coating has replaced hard chrome plating:

- valves – metal to metal ball valves and gate valves
- hydraulic cylinder rods
- landing gear
- paper mill rolls
- mandrels
- pump housing and impellers etc.

**For more information**, please contact Metallizing Equipment Co. Pvt. Ltd., E-101, M.I.A., Basni II phase, Jodhpur 342005 India, Rajasthan, phone: +91-291-2747601/02, fax: 2746359

**See advertisement page 20.**

### CeralUSA Announces AS9100C Compliance

CeralUSA LLC, manufacturer of environmentally friendly coatings for the aerospace, power generation, and oil and gas industries, announced today that its Quality Management System was recently audited and found to be in full compliance with the wide-ly adopted and standardized quality management system for the aerospace industry, AS9100C. The Moore Norman Technology Center's certified AS9100C auditors deemed CeralUSA's processes and internal documentation to be fully compliant.

Having announced their ISO 9001:2008 compliance in April, AS9100C was a natural progression in the company's business model. Aerospace manufacturers and suppliers worldwide recognize AS9100C as the standard quality system in the industry, and many require compliance as a condition of doing business with them.

"Our industry demands the utmost standards of quality control," said Suzanne Bodger, Managing Partner of CeralUSA. "CeralUSA is committed to excellence in quality, to the satisfaction of our cus-tomers, and to perpetual growth in the aerospace and other industries, as evidenced by the compliance of our quality system to ISO and AS9100C standards."

#### About CeralUSA

CeralUSA is a Woman Owned Small Business based in Oklahoma City, Oklahoma. In the short time since its inception in 2008, CeralUSA has become well known for its "green" coatings, making waves in the industry with their low-chrome drop-in replacement for legacy carcinogenic Aluminum Ceramic coatings.

**For more information** or for detailed information, write to [info@ceralusa.com](mailto:info@ceralusa.com) or visit [www.ceralusa.com](http://www.ceralusa.com).

**Thermal Spray Jobs listed at  
"For Hire" [www.thermalspray.org](http://www.thermalspray.org)**

SAVE THESE DATES **MAY 3-8, 2014**



## **SOCIETY OF VACUUM COATERS**

57<sup>TH</sup> ANNUAL TECHNICAL CONFERENCE, HYATT REGENCY CHICAGO, ILLINOIS, USA

**MAY 5-8 TECHNICAL PROGRAM** featuring a Symposium on

### **ADVANCED COATINGS FOR TRANSPORTATION**

This Symposium will highlight the role of coatings and thin films providing essential functionality in all modes of transportation: land, rail, marine, air, and space. With increasing demands to improve reliability, performance, lifetime, safety and energy efficiency in all vehicle systems, the latest advances in coatings technology towards this goal will be discussed in several technology tracks.

The SVC Technical Advisory Committees will explore the Symposium topic in depth together with other topics as part of the traditional Technical Sessions:

WEBTECH ROLL-TO-ROLL COATINGS FOR HIGH-END APPLICATIONS • COATINGS FOR ENERGY CONVERSION AND RELATED PROCESSES • PROTECTIVE, TRIBOLOGICAL AND DECORATIVE COATINGS • EMERGING TECHNOLOGIES • HIGH POWER IMPULSE MAGNETRON SPUTTERING (HIPIMS) • OPTICAL COATINGS • PLASMA PROCESSING • LARGE AREA COATINGS • VACUUM PROCESSES AND COATINGS FOR BIOMEDICAL APPLICATIONS

Abstract Submission Deadline **OCTOBER 1, 2013**

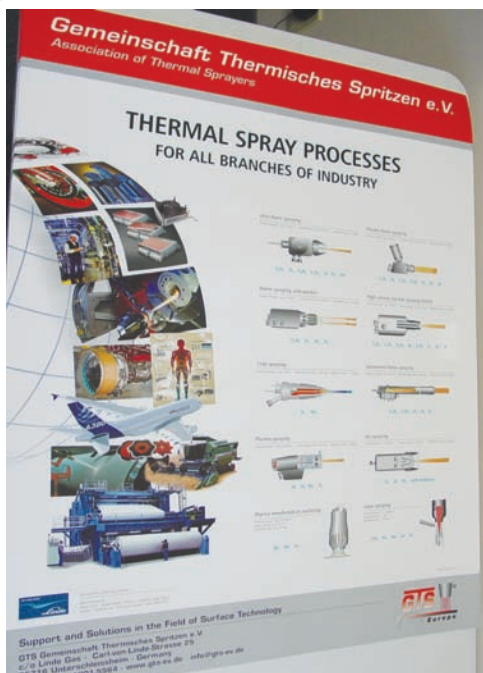
**MAY 3-8 EDUCATION PROGRAM** Problem-Solving Tutorial Courses

**MAY 6-7 EQUIPMENT EXHIBIT** Dedicated to Vacuum Coating Technologies

**MAY 5-8 INTERACTIVE NETWORKING** Forums and Discussion Groups

FOR MORE INFORMATION: [SVCINFO@SVC.ORG](mailto:SVCINFO@SVC.ORG) . 505-856-7188 . [WWW.SVC.ORG](http://WWW.SVC.ORG)





### Free Poster

From Linde and the GTS (Association of Thermal Sprayers) illustrates the different thermal spray processes (suitable for framing).

Send request for poster via email to [itsa@thermalspray.org](mailto:itsa@thermalspray.org)

**Where is your article?** We encourage you to send articles, news, announcements and information to [spraytime@thermalspray.org](mailto:spraytime@thermalspray.org).

### Scholarship Opportunities

Since 1991, the **International Thermal Spray Association Scholarship Program** has contributed to the growth of the thermal spray community. ITSA offers up to three Graduate Scholarships of **\$2,000.00 each**.

**Applications accepted April 15 through July 15 ONLY.** Visit [www.thermalspray.org](http://www.thermalspray.org) scholarship area for details.

### Become a Member of the International Thermal Spray Association

Your company should join the International Thermal Spray Association (ITSA) now! As a company-member professional industrial association, our mission is dedicated to expanding the use of thermal spray technologies for the benefit of industry and society.

**ITSA members invite your company to join us in this endeavor. See pages 16-19.**

### Journal of Thermal Spray Technology®

A publication of the **ASM Thermal Spray Society**

### HVOF Coating Case Study for Power Plant Process Control Ball Valve Application

**Luc Vernhes, David A. Lee, Dominique Poirier, Duanjle Li, and Jolanta E. Klemberg-Sapieha**

This case study is the result of an investigation on HVOF 80/20 Cr<sub>3</sub>C<sub>2</sub>-NiCr coating failure of on-off metal-seated ball valve (MSBV) used in supercritical steam lines in a power plant and solution. HVOF 80/20 Cr<sub>3</sub>C<sub>2</sub>-NiCr coating is used to protect thousands of MSBVs without incident. However, in this case, the valves are challenged with exposure to rapid high-pressure and -temperature variations resulting in a unique situation where the coating experiences cracking and cohesive failure. It was found that carbide precipitation is a major factor causing embrittlement of the coating. Once the coating toughness and ductility is reduced, thermal, mechanical, and residual stresses can initiate and propagate cracks more easily, causing coating failure when exposed to thermal shock. To alleviate the above mentioned issues, possible coating alternatives were then evaluated.

**Read the entire article in the October 2013 Issue**

Visit [www.asminternational.org/tss](http://www.asminternational.org/tss)

**Editor:** Christian Moreau • **Lead Editor:** Basil Marple

**Editor Emeritus:** Christopher C. Berndt

**Associate Editors:**

Kendall Hollis, Seiji Kuroda, Chang-Jiu Li, and Armelle Vardelle

### Free DIN Standards Poster

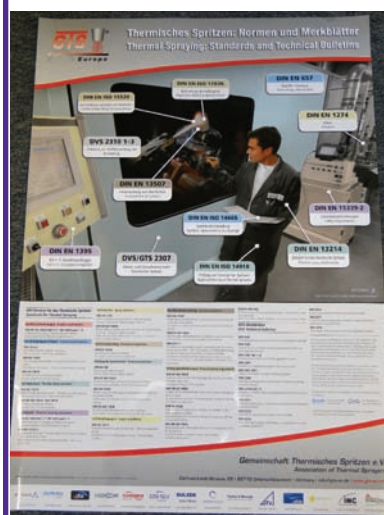
GTS – the Association of Thermal Sprayers – has produced this spectacular new poster of **“Thermal Spraying: Standards and Technical Bulletins”**.

The poster identifies DIN Standards for Thermal Spraying and the DVS Technical Bulletins. The

standards/bulletin names are in German and in English.

The poster provides contact information for obtaining the complete version Standards and Bulletins.

The International Thermal Spray Association is proud to be one of the sponsors of this project.



Send request for poster to [itsa@thermalspray.org](mailto:itsa@thermalspray.org).

## CALENDAR OF EVENTS 2013

### SEPTEMBER 2013

**15-18 San Diego, CA USA** *9th International Corrosion Solution* - [www.aticorrosionconference.com](http://www.aticorrosionconference.com)

**16-21 Essen, Germany** *Int'l Trade Fair Joining Cutting Surfacing* - visit [www.schweissen-schneiden.com](http://www.schweissen-schneiden.com)

**24-26 São Paulo, Brazil** *Power-Gen Brazil* - [www.power-genbrasil.com](http://www.power-genbrasil.com)

**30 SEP-30 OCT Hamburg, Germany** *ASME 2013 Turbine Blade Tip Symposium & Course Week* - email [igtiprogram@asme.org](mailto:igtiprogram@asme.org)

### OCTOBER 2013

**1-4 São Paulo, Brazil** *Brazil Welding Show and Congress* - visit [www.brazil-welding-show.com](http://www.brazil-welding-show.com)

**2-4 Bangkok, Thailand** *Power-Gen Asia* - visit [www.powergenasia.com](http://www.powergenasia.com)

**27-31 Montreal, Quebec, Canada** *Materials Science and Technology Conference and Exposition (MS&T) 2013* - visit [www.asminternational.org](http://www.asminternational.org) "events"

**29-31 Greenville, SC USA** *South-Tec* - visit [www.southteconline.com](http://www.southteconline.com)

### NOVEMBER 2013

**12-14 Orlando, FL USA** *Power-Gen 2013* - visit [www.power-gen.com](http://www.power-gen.com)

**14-15 Frankfurt, Germany** *NACE Bring On the Heat Europe* - visit [www.efcweb.org](http://www.efcweb.org)

**18-21 Chicago, IL USA** *FABTECH with a Thermal Spray Pavilion and Conference* - visit [www.fabtechexpo.com](http://www.fabtechexpo.com)

### DECEMBER 2013

**10-12 New York, NY USA** *CHEM Show and AIChE Northeast Mfg Conference*, visit [www.chemshow.com](http://www.chemshow.com)

**16-17 Abu Dhabi, UAE** *NACE Bring On the Heat Abu Dhabi* - visit [www.nace.org](http://www.nace.org)

**17-20 New Delhi, India** *Int'l Trade Fair for Surface Technology* - visit [www.surface-india.com](http://www.surface-india.com)

## 2014

### MARCH 2014

**9-13 San Antonio, TX USA** *Corrosion 2014* - visit [www.nace.org](http://www.nace.org)

**17-19 Cape Town, South Africa** *Power-Gen Africa* - visit [www.powergenafrika.com](http://www.powergenafrika.com)

**18-20 Toronto, Canada** *Fabtech Canada* - visit [www.fabtechcanada.com](http://www.fabtechcanada.com)

### APRIL 2014

**10-12 New Delhi, India** *FABTECH India and Weld India* - visit <http://www.fabtechexpo.com/fabtech-india>

**23-26 Tokyo, Japan** *Japan Int'l Welding Show* - visit [www.weldingshow.jp/english](http://www.weldingshow.jp/english)

**24-26 Savannah, GA USA** *Int'l Thermal Spray Association Annual Membership Meeting* - contact Kathy Dusa [itsa@thermalspray.org](mailto:itsa@thermalspray.org)

### MAY 2014

**5-8 Chicago, IL USA** *57th SVC Annual Technical Conference* - visit [www.svc.org](http://www.svc.org)

**5-8 Indianapolis, IN USA** *2014 Iron and Steel Technology Expo* - visit [www.aistech.org](http://www.aistech.org)

**6-8 Mexico City, Mexico** *FABTECH Mexico* - visit [www.fabtechmexico.com](http://www.fabtechmexico.com)

**21-23 Barcelona, Spain** *Int'l Thermal Spray Conference ITSC 2014* - visit [www.itsc2014.com](http://www.itsc2014.com)

### JUNE 2014

**16-19 Orlando, FL USA** *AeroMat* - visit [www.asminternational.org](http://www.asminternational.org)

**16-20 Dusseldorf, Germany** *ASME TurboExpo* - visit [www.turboexpo.org](http://www.turboexpo.org)

**17-19 Houston, TX USA** *NACE Bring On the Heat 2014* - visit [www.nace.org](http://www.nace.org)

### NOVEMBER 2014

**TBD Atlanta, GA USA** *FABTECH with a Thermal Spray Pavilion and Conference* - visit [www.fabtechexpo.com](http://www.fabtechexpo.com)

### SEPTEMBER 2014

**18-22 Orlando, FL USA** *PM2014 World Congress* - visit [www.mpif.org](http://www.mpif.org)

## 2015

### APRIL 2015

**25-30 Santa Clara, CA USA** *58th SVC Annual Technical Conference* - visit [www.svc.org](http://www.svc.org)

**Is Your Event Listed? Send notice to [spraytime@thermalspray.org](mailto:spraytime@thermalspray.org)**



### Thermal Spray Technology

#### Highlighted At Fabtech Show

McCormick Place, Chicago, IL  
November 18-21, 2013

### Thermal Spray Pavilion Exhibitors

NOV 18-21 • Visit Aisle 400 North

### NEW this year

#### Thermal Spray Metal Art Display

NOV 18-21 • Booth N1401

### Conference

#### Thermal Spray Technologies: High Performance Surfaces

17 Speaker Presentations • 9:00 AM - 5:00 PM  
Tuesday, NOV 19th • Registration Code: W26

**See page 8 for more Conference details.**

#### Thermal Spray Basics: Putting Coatings To Work

Free Tutorial • 1:00 - 4:00 PM  
Wednesday, NOV 20th • Registration Code: W25

**Visit [www.fabtechexpo.com](http://www.fabtechexpo.com) to Register**





# MAYO 6 AL 8, 2014

*May 6th-8th, 2014*

## CENTRO BANAMEX, MEXICO, D.F.

*Centro Banamex, Mexico, City*

- 11,000 VISITANTES  
• *11,000 qualified visitors*
- 15,000 METROS CUADRADOS  
• *15,000 sq.meters*
- 500 EXPOSITORES  
• *500 exhibitors*

### Sea parte del evento industrial más importante de México

*Come and be part of the most important industrial show in Mexico*



Más información:

*More information:*

*In Mexico:*

**Marcela Ordaz**

**[marcela.ordaz@tradeshowsconsult.com](mailto:marcela.ordaz@tradeshowsconsult.com)**

**Phone: 52+(81) 8191 0444**

*In USA:*

**Chuck Cross**

**[chuck@tradeshowsconsult.com](mailto:chuck@tradeshowsconsult.com)**



American Welding  
Society



Fabricators & Manufacturers  
Association, Intl



Society of Manufacturing  
Engineers



Precision Metalforming  
Association

## Dick Mason Retires

**Dick Mason**, Vice President of Business and Market Development for the Specialty Metals Division of Ametek has retired in June of this year.



Dick's retirement comes after almost 34 dedicated and highly successful years with Specialty Metals.

Dick started with Pfizer Special Metals in 1980 as a Milwaukee area Regional Sales Manager. He successfully built his region and enjoyed ever increasing sales and marketing

responsibilities and challenges before promotion to VP, Sales and Marketing for the Division in 2001. Through Dick's leadership, sales and specialty product opportunities grew significantly and expanded throughout 34 countries. In 2010, Dick accepted the challenge of increasing the Ametek global position by focusing his time working with the SMP sales and technical teams to develop business opportunities in Europe, Asia and the BRIC regions. Recently, Dick has added his extensive experience in the oversight of the Ametek clad and cookware product line.

Everyone at SMP has been proud to work with and for Dick and wish both him and his wife Joyce health and happiness in their future endeavors.

**For more information**, contact Dick via his new consulting business, Mason Global Management, email [rmason@masonglobalmanagementllc.com](mailto:rmason@masonglobalmanagementllc.com)

## TAFI Incorporated Announces David Somerville Research and Development Manager

TAFI Inc., a Praxair Surface Technologies company, is pleased to announce **David Somerville** has joined the company as Manager - Applications Development/R&D, effective February 18, 2013.



Somerville has been involved in the thermal spray industry for the last 35+ years. Early contributions were primarily associated with equipment development; groundbreaking early devices include the Jet Kote, JP-5000, and PlazJet. In later years, most of his focus has been with thermal spray

coatings support for production / manufacturing, and development of aerospace coatings such as the hard chrome replacement coatings for critical fatigue components in aircraft flap systems, power transmission, and landing gear.

Somerville started his thermal spray industry career with Browning Engineering in 1977 as an Engineer Assistant to Jim Browning for approximately 8 years which was the

spark that ignited his interest in thermal spray. His primary tasks were to manufacture and test experimental devices designed by Browning, and provide feedback on the next experimental design. Somerville progressed from equipment manufacturing into coating development in the 1980's for aircraft engine applications. In the 1990's Somerville moved into aircraft airframe coating applications. Somerville is listed as one of the co-inventors for application of HVOF coatings onto composites. Somerville was most recently Senior Thermal Spray Engineer for Southwest United Industries, Inc. where he served as project coordinator for significant thermal spray activities at company sites and also established OEM specification compliance through thermal spray R & D activities. Somerville has also held key positions at Cabot Stellite Wear Technology, Plasma Technology Inc., Teleflex Sermatech, and Engelhard Surface Technologies.

### About Praxair Surface Technologies

Praxair Surface Technologies offers a comprehensive slate of high-performance coatings and technologies to the aviation, energy, and other industries. By continuously advancing coatings technologies, Praxair Surface Technologies helps customers improve environmental performance, decrease energy consumption, extend component life, improve productivity, minimize downtime, reduce operating costs, and produce higher quality products.

**For more information** on Praxair Surface Technologies, visit [www.praxairsurfacetechologies.com](http://www.praxairsurfacetechologies.com).



### Thermal Spray Technology

#### Highlighted At Fabtech Show

McCormick Place, Chicago, IL  
November 18-21, 2013

### Thermal Spray Pavilion Exhibitors

NOV 18-21 • Visit Aisle 400 North

#### NEW this year

### Thermal Spray Metal Art Display

NOV 18-21 • Booth N1401

### Conference

#### Thermal Spray Technologies: High Performance Surfaces

17 Speaker Presentations • 9:00 AM - 5:00 PM  
Tuesday, NOV 19th • Registration Code: W26

**See page 8 for more Conference details.**

#### Thermal Spray Basics: Putting Coatings To Work

Free Tutorial • 1:00 - 4:00 PM  
Wednesday, NOV 20th • Registration Code: W25

**Visit [www.fabtechexpo.com](http://www.fabtechexpo.com) to Register**



# Düsseldorf

GERMANY | June 16-20, 2014



# TURBO EXPO

Turbine Technical Conference and Exposition

Presented by ASME International Gas Turbine Institute

The Most Important Conference  
for Turbomachinery Professionals



[www.turboexpo.org](http://www.turboexpo.org)

ASME INTERNATIONAL GAS TURBINE INSTITUTE

phone +1-404-847-0072 | fax +1-404-847-0151 | [igti@asme.org](mailto:igti@asme.org)



# Bringing the Heat Around the World

The use of fireproofing, high-temperature, and other coatings on facilities with high-temperature infrastructure is becoming more widespread around the world. The NACE International Bring on the Heat conferences bring together industry personnel from across the globe to discuss the use of these coatings, including:

- Corrosion Under Insulation
- Corrosion Under Passive Fire Protection
- Passive Fire Protection
- Thermal Spray Aluminum (TSA)
- Field Joint Coatings
- High-Temperature Coatings

**Register Today**  
to save up to **\$100**

## Bring on the Heat Conferences:

**Bring on the Heat Europe**  
Frankfurt am Main, Germany  
November 14 -15, 2013  
[www.efcweb.org/both](http://www.efcweb.org/both)

**Bring on the Heat Abu Dhabi**  
Abu Dhabi, UAE  
December 16 -17, 2013  
[www.nace.org/bothabudhabi](http://www.nace.org/bothabudhabi)

**Bring on the Heat 2014**  
Houston, Texas  
June 17 - 19, 2014  
[www.nace.org/both2014](http://www.nace.org/both2014)

Official Publications:





## In Memoriam

### John M. Foy

**John M. Foy**, 63, of Spring Lake, passed away on Monday, May 20, 2013, at Green Acres Manor, Toms River, after a brief illness.



John was born in Jersey City and raised in Bayonne, before coming to the Shore area many years ago. He enjoyed a diverse career, having worked in the advertising industry in New York, as well as managing auto dealerships in New Jersey, before becoming the Vice-President and

General Manager at Plasma Powders and Systems, Inc., Marlboro. A true humanitarian, John started two programs to brighten the lives of the less fortunate; Buddy Bears, in which Bayville Police patrol cars were equipped with Teddy Bears to immediately give to injured or traumatized children at the scene of an accident, and, through Applegate Garden Center, Bayville, a program to provide Christmas trees and lights to families otherwise unable to afford them. This program will be continued by his family in John's Memory. John's giving nature also extended to his four-legged friends, and, over the years, he shared countless hours of love and laughter with his cats, BlackJack, Noel, Mackey and Shadow.

John was predeceased by his parents, Peter and Alice (Erickson) Foy, as well as his sister, Kathy Foy Bertoli. He is survived by, and will be dearly missed by, Doreen Foy, with whom he shared a special, loving relationship. He is also survived by his brother and sister-in-law, Peter and Linda Foy, of Spring Lake, and his sister and brother-in-law, Sharon and Ronnie Constantino, of Cinncinnatus, NY, as well as his nephews and niece, Michael and Jeffrey Foy, John, Nicholas, and Jesse Constantino, and Samantha Farron. John is also survived by nine great-nephews and nieces, his Uncle, John Erickson, and other relatives and friends.

In lieu of flowers, donations in John's memory may be made to the American Cancer Society, 2310 Rt. 34, Suite 1D, Manasquan, NJ 08736. Condolences can be sent directly to Plasma Powders via website [www.plasmapowders.com](http://www.plasmapowders.com)

### Richard Moore

**Richard Moore** passed away unexpectedly on June 20, 2013.



Richard began his career attending the Repco Apprentice Training School in Carlton, Victoria (Australia). He subsequently transferred to the field of cast metal technology and whilst working with some of the best metallurgists in the country and attending Royal Melbourne Institute of Technology (RMIT), Richard was awarded a world travel scholarship that resulted in his employment with George Fischer-Schaffhausen in Switzerland, John Williams in Cardiff in Wales, and Robert Taylor and Sons in Scotland during the period 1981-84.

Moving back to Australia, Richard took the commissioning role and running of the new electric melting systems at Ajax Pump foundry. It was in 1986, while working at the renowned big casting manufacturer Graham Campbell Ferrum in Footscray as a Quality Manager and Methods Engineer, that Richard, with his father Keith, started Ceramcoat-Setech.

Over time, Richard became more instrumental overseeing the growth of the company, including the merger with Halky's Hardfacing in 1992 to form United Surface Technologies (UST). Richard became very active in the thermal spray industry globally, and UST was one of the first members of the International Thermal Spray Association, and with Keith he also became involved from the very early days with the hard chrome alternatives technologies (HCAT) group.

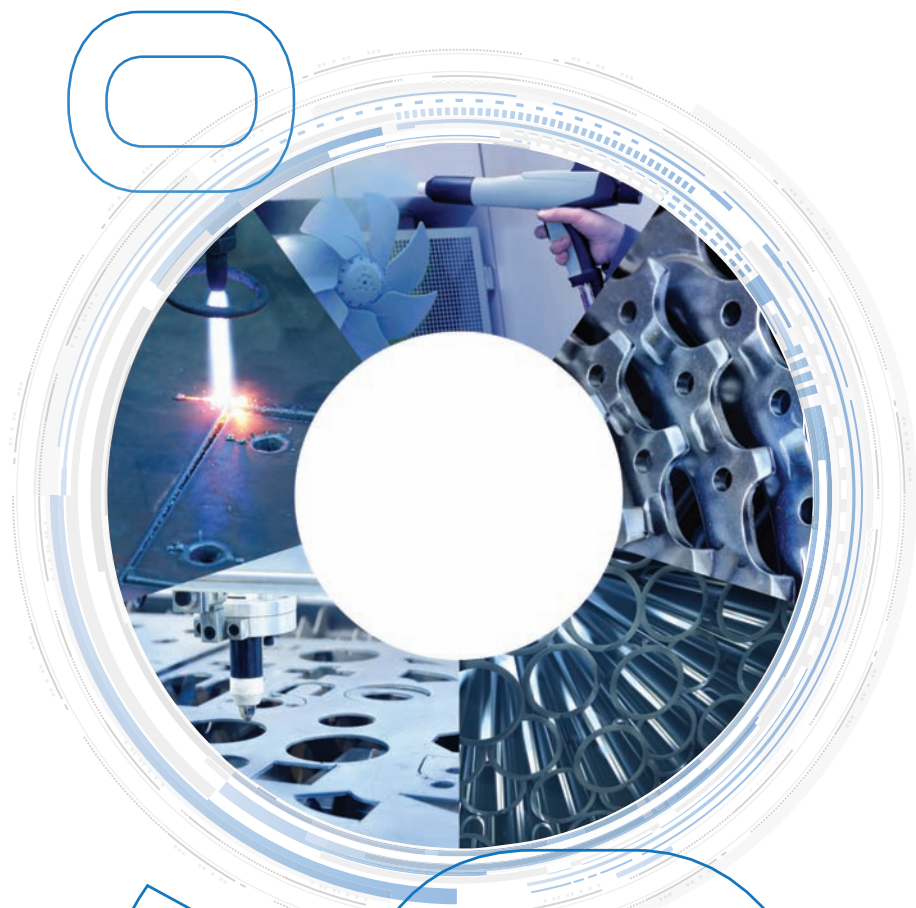
Richard was a regular attendee at International Thermal Spray Association Annual Meetings and ASM ITSC events, proudly flying the Australian flag. He also strongly believed in maintaining a strong relationship with academia, resulting in close cooperation between UST and partners such as CSIRO and Swinburne University of Technology.

Condolences can be sent directly to United Surface Technologies via website [www@ust.com.au](http://www@ust.com.au)

## ADVERTISERS LIST

**Your SPRAYTIME newsletter is provided to you at no charge by our advertisers. We encourage you to thank these advertisers by visiting, contacting, and referring their products and services at every opportunity.**

Ametek.....21	Genie Products, Inc. ....11	Polymet Corporation .....3
Camfil Farr APC.....2	Green Belting Industries .....4	Praxair Surface Technologies.....15
DeWal Industries, Inc. ....6	Hunter Chemical .....14	Progressive Surface .....7
ERW, Inc. ....8	Lineage Alloys .....14	Saint-Gobain Coating Solutions..17
Fabtech .....32	Metallisation .....13	Society of Vacuum Coaters .....24
Fabtech Mexico.....26	Metallizing Equipment Co. ....20	Thermach, Inc. ....10
Flame Spray Technologies.....9	NACE Bring On The Heat .....30	TurboExpo.....29
	Nation Coating Systems .....12	



DON'T MISS THE  
THERMAL SPRAY PAVILION  
& CONFERENCE!

---

A 360° VIEW OF THE MOST  
INNOVATIVE TECHNOLOGY AND  
PROCESSES. **FABTECH 2013.**

---

METAL FORMING | FABRICATING  
WELDING | FINISHING

FABTECH represents every step of the metal manufacturing process from start to finish. It's where new ideas, products and technology are highlighted through interactive exhibits, education and networking. Compare solutions from 1,500+ exhibitors, find machine tools to improve quality and productivity, and learn ways to increase profit. **REGISTER NOW** for the show with a degree of difference.

---

**November 18–21, 2013 | Chicago, IL**  
[fabtechexpo.com](http://fabtechexpo.com)

---



**North America's Largest Metal Forming,  
Fabricating, Welding and Finishing Event**

Cosponsors:



Follow us:



Scan code to  
watch video.

