

# SPRAYTIME®

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## New Explosion Venting Requirements and Their Impact on Dust Collection Decisions

*By Lee Morgan and Tony Supine*

The hazard of combustible dusts in manufacturing plants is a topic that has never been more – pardon the expression – explosive. A recent segment on the CBS News series “60 Minutes” reported that “devastating dust explosions at American factories are more common now than ever. Since 1980, there have been at least 350 such explosions in the U.S., killing 133 people and injuring hundreds more.”

At the time of this writing, the Occupational Safety and Health Administration (OSHA) has contacted 30,000 companies that deal with combustible dusts, warning them of the danger of a deadly explosion if airborne dust particles come in contact with an ignition source. In addition, a measure that will require OSHA to impose new safety rules for combustible dust has been approved by the House of Representatives and awaits a Senate vote.

Though explosions are a risk in many areas of industrial plants, one potential location is the dust collection system. It is therefore timely to examine the new “National Fire Protection Association (NFPA) 68 Standard on Explosion Protection by Deflagration Venting”, a complete revision issued in 2007, which focuses on this topic. Readers can purchase a copy of the full standard online from the NFPA web site ([www.nfpa.org](http://www.nfpa.org)).

The intent of this article is to help readers better understand what has changed with the publication of this standard, and how future dust collection decisions will be impacted. The standard applies to all closed-vessel, dry collection systems such as cartridge-style dust collectors. The statements here reflect our best efforts at this time to

comprehend and interpret NFPA 68 as it relates to cartridge dust collection systems.

**Basically, NFPA 68 has five key implications:**

**1. It has changed from a “guideline” to a “standard”.**

The new NFPA 68 provides mandatory requirements for dust collection applications involving explosive dusts. This recent change from a “guideline” to a “standard”, which incorporates much more stringent requirements than past editions, is echoed by OSHA, which has launched a National Emphasis Program (NEP) focusing on the safe handling of combustible dusts. Simply stated, it is the role of NFPA to set the standard and the role of OSHA and local authorities to enforce it.



**A staged explosion in a dust collector.**

Most insurance agencies and local fire codes state that NFPA standards shall be followed as code, so in nearly every town and county in the U.S., NFPA 68 is to be treated as legal code. The only exceptions would be where the authority having jurisdiction (AHJ) specifies another safety approach such as Factory Mutual.

**continued on page 2**

OSHA defines combustible dusts as “a combustible particulate solid that presents a fire or deflagration hazard when suspended in air or some other oxidizing medium over a range of concentrations, regardless of particle size or shape”. The OSHA National Emphasis Program on safe handling of combustible dusts is available on the OSHA web site ([www.osha.org](http://www.osha.org)) and can be found by searching for cpl 03-00-008 or use the direct link as follows: [www.osha.gov/OshDoc/Directive\\_pdf/CPL\\_03-00-008.pdf](http://www.osha.gov/OshDoc/Directive_pdf/CPL_03-00-008.pdf)

What does all this mean to plant operations and safety personnel? The new requirements hold major significance because many companies will now have to install updated dust collection/explosion venting equipment to ensure regulatory compliance.

## 2. You now need to determine whether a dust is explosive.

In a closed vessel such as a cartridge dust collection system, an explosion usually begins when a suspended cloud of combustible dust is present in high concentration within the collector. As the fan draws in large volumes of air, an outside spark or ember can be sucked into the collector, colliding with the dust cloud under pressure to trigger the explosion. The source of the spark may be a production process, a cigarette butt thrown into a hood (believe it or not, this really happens), or a static electricity discharge due to improper grounding of nearby equipment.

To determine whether your dust is combustible, it must

undergo explosibility testing in accordance with ASTM test methods. NFPA 68 stipulates that if a dust sample is available, it must be tested. The standard further states that it is the responsibility of the end-user (i.e., the plant or safety engineer) to commission the required testing and report on results. Your dust collection supplier may ask you to supply a report of the test or, if not available, to supply in writing the Kst value (the explosive power of a dust, measured as the rate of pressure rise) you know the dust not to exceed.

Explosibility testing is available through several companies that specialize in explosion protection services. You can opt to go directly to such a company, or you can commission the testing through your dust collection supplier.

Both NFPA and Factory Mutual use Kst values in formulas to calculate the amount of explosion vent area required for a dust collector. Class 1 dusts are below 200 Kst, Class 2 dusts range from 200 - 300 Kst, and Class 3 dusts are rated above 300 Kst. As a rule of thumb, when dusts approach 600 Kst, they are so explosive that wet collection methods are recommended. In addition to Kst, other important measurements that factor into the standard include “Pmax” (the maximum pressure in a contained explosion) and “Pred” (the maximum pressure developed in a vented enclosure during a vented deflagration).

For comprehensive information on this topic, go to <http://www.hvbg.de/e/bia/gestis/expl/index.html>. This web site contains a European database known as “GESTIS-DUST-EX” that lists the combustion and explosion characteristics of more than 4,000 dusts. This database provides a useful reference point, although it is not a substitute for the required dust testing.

Figure 1 shows a standard explosion vent that has been sized for 200 Kst and manufactured in accordance with NFPA standards. For highly combustible dusts, vent sizing and ducting requirements become



Figure 1.

more complex and may require special calculations and equipment modifications to achieve compliance. (See “Design Considerations” on page 4.)

## 3. You now need to commission a hazard analysis (also called a risk evaluation).

Chapter 4 of NFPA 68 introduces a new hazard analysis requirement (4.2.3) stipulating that a plant will have to commission a risk evaluation performed on the dust collection system, and keep the report on file, to show to the local fire marshal or other official at a moment’s notice.

## 4. You now need to maintain extensive documentation.

A hazard analysis is not the only documentation required under NFPA 68. In Chapter 11, NFPA outlines many other types of documents that must now be maintained on file to satisfy the local fire marshal or other AHJ. Section 11.2

continued on page 4



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## INDEX

<b>ADVERTISERS LISTING</b> .....	33
<b>CALENDAR OF EVENTS</b> .....	28
<b>HELP WANTED</b>	
BASF Process Engineer - East Windsor, CT .....	23
<b>INDUSTRY APPLICATIONS</b>	
Unimec Chooses ARC140 System .....	18
<b>INDUSTRY NEWS</b>	
Albert Kay Inducted into Thermal Spray Hall of Fame .....	32
Bay State Surface Technologies Expands Facility .....	26
Chris Berndt Appointed Director of IRIS .....	30
Ellison Surface Technologies Announces "Ask an Engineer" .....	8
Exline Celebrates 136 Years in Business .....	8
Explosion Venting Requirements and Impact on Dust Collection Systems.....	1
F.W. Gartner Appoints Nathan Henry.....	30
Fabtech International AWS Welding Show Thermal Spray Pavilion .....	27
GTP is Now Part of Plansee Group .....	8
ITSC 2008 Award Recipients .....	24
ITSC 2009 Highlight .....	29
John Tartaglis of Stork Elected to Fellow of ASM International .....	33
Lineage Alloys New Email and Website Address .....	30
Longevity Coatings New Capabilities Brochure .....	14
Longevity Coatings Plant Relocation and Expansion .....	12
Maher Boulos Receives Prix du Québec Award .....	31
Mettech Receives 2007 Micro-Nano Tool of the Year Award .....	14
NanoSteel Announces New Coating Solution for Boiler Erosion and Corrosion .....	16
René Wasserman Award Ceremony .....	31
Robert Gage Inducted into Thermal Spray Hall of Fame .....	32
Springfield Manufacturing Announces Roger Miller as Manager .....	30
Thermal Spray Technologies Announces New Management Team Members.....	34
Wall Colmonoy Appoints Heminger and Huesing.....	34
<b>INTERNATIONAL THERMAL SPRAY ASSOCIATION</b>	
Company Member Listing and Membership Information .....	20-23
<b>TECHNICAL NOTES</b>	
Journal of Thermal Spray (ASM TSS) Technology Abstract .....	26
Sprayed Particle Diagnostics Series .....	9
The Manipulator Series - "The Programmable Manipulator" .....	17

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continued from page 2

lists 19 different types of documentation that must be kept on file. Some of these – such as manufacturers' equipment data sheets, instruction manuals and specifications – are readily obtained. Others – including a combustible material (dust) properties test report, user documentation of conformity with applicable standards, and employee training requirements – will present more substantial challenges to the plant or safety engineer in charge.

#### 5. You now have to schedule an annual inspection.

Chapter 11 also stipulates that an inspection shall be performed on explosion venting equipment at least annually and possibly more often, based on documented operating experience. The objective of this inspection is simply to determine that all components of the system are operating correctly. Section 11.4.4 outlines a 16-point vent inspection with this objective in mind. The plant owner or operator must also verify in writing that the production process material has not changed since the last inspection (11.4.5). Inspection reports must be filed with the other documentation listed in Section 11.2, above.

#### Design Considerations

When a dust collector is designed to incorporate explosion venting, the primary purpose is to save lives, not property. A well-designed explosion vent functions as a "weak element" in the pressure envelope of the equipment, relieving internal combustion pressure to keep the collector from blowing up into pieces. Figure 2 (page 5) depicts an

actual staged deflagration in a dust collector equipped with explosion venting.

Explosion venting will usually save the collector from being a total loss, but major internal damage may occur. Nonetheless, if personnel remain safe, the explosion protection system has done its job. Collectors for combustible dust applications are typically, though not always, located outside and are designed to vent away from buildings and populated locations (Figure 3, page 6).

NFPA 68 includes several chapters of detailed information on design requirements relating to the use of explosion venting equipment. Following are the most important areas of change and/or concern.

#### Performance-Based Design Option

The standard includes a performance-based design option (Chapter 5) saying that if there is another method for protecting the device from explosions that is acceptable to the AHJ, you can use that method instead of NFPA standards. The design methodology and data sources must be documented and maintained for the life of the dust collector.

An example is actual explosion testing of a dust collector to show that it will stand up to certain pressure conditions, instead of using the back pressure calculations in NFPA 68. Using a combination of field testing and full-scale dust collection laboratory test apparatus, Farr APC has performed such tests for explosion vent ducting applications. Our experience has shown that this approach



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Figure 2A - before the staged explosion.



Figure 2B - during the explosion.



Figure 2C - during the explosion.



Figure 2D - after the explosion.

can sometimes yield more accurate real-world performance data than the calculations provided in NFPA 68.

#### Vent Ducting and Sizing

For many years, explosion vents were sized using simple ratios – i.e., for a given dust collector volume, one square foot of explosion vent area was needed. The old formulas

no longer apply. Instead, the new design criteria set forth by NFPA 68 must be used in their place.

Chapters 7-9 provide the calculations that are now to be used for proper sizing of explosion vents, discharge ducts and other components. A reputable dust collector manufacturer will follow the equations for vent sizing in Chapter 8, and will be able to supply a calculations sheet that becomes part of the documentation kept on file to assure compliance.

Regarding vent discharge ducts, NFPA 68 stipulates that “Vent ducts and nozzles with total lengths of less than one hydraulic diameter shall not require a correction to increase the vent area” (6.8.4). For example, if an explosion vent has a hydraulic diameter of 40 in., a 40 in.-long duct can be used without any added back pressure consequences. However, above 40 in. in duct length (or whatever length is equivalent to the hydraulic diameter), it is necessary to follow much more stringent calculations to compensate for the estimated increase in back pressure to the collector.

Therefore, when longer ducts are required and the standard calculations cease to apply, you will have to work with your supplier to verify K<sub>st</sub> values, duct lengths and strengthening requirements. The performance-based design option may come into play when designing collectors for such applications. Longer ducting will usually be needed if a collector must be located inside.

The standard also notes that “To prevent snow and ice

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**Figure 3 - Cartridge dust collection system with explosion venting.**

accumulation, where the potential exists, and to prevent entry of rainwater and debris, the vent or vent duct shall not be installed in the horizontal position, unless any of the alternative methods in 6.5.2.3.1 are followed" (6.5.2.3). This means that if you are using or considering a dust collector with horizontally-mounted filter cartridges that have a horizontally-mounted explosion vent, extra steps might be required to achieve compliance.

The accepted "alternative methods" of protection for horizontal venting are fixed rain hats, weather covers mounted at an angle to shed snow, or deicing provisions such as a heated vent closure. If you elect to use one of these methods, additional safety components and testing may be required. For example, if you use a weather cover, the standard says that restraints shall be used and shall be designed and tested to prevent the cover from becoming a free projectile. The other option is to eliminate horizontal venting altogether through use of a dust collector with vertically-installed cartridges that use vertically-mounted explosion vents.

Also new in NFPA 68 is a section allowing flameless venting inside buildings. There are commercially available products in various configurations to meet the standard. Flameless venting devices allow you to vent an explosion safely indoors without allowing any flame (and pressure fronts) to escape from the collector. This is a viable option

to ducted explosion vents, but it is not recommended for toxic applications, due to the risk of dust being released into the room where venting occurs.

Here are some useful questions to ask when dealing with suppliers and contractors:

- Is the explosion venting equipment manufactured by a company specializing in this area, or is it "home-made" by the dust collection manufacturer? Either way, ask for documentation proving that the equipment has been manufactured in accordance with NFPA 68.
- Will the supplier provide a calculations sheet on vent sizing and vent ducting?
- Does the manufacturer have engineering and testing capabilities that allow use of the performance-based design option where needed?
- Can the supplier perform a hazard analysis or recommend a qualified consultant for this task?
- Does the supplier have access to, and familiarity with, alternative protection technologies such as flameless venting and explosion suppression (see below)?
- Is the installing contractor familiar with NFPA 68? There is no formal certification for this, so you will have to inquire about specific experience and capabilities.

#### **Explosion suppression and other protection methods**

For applications where it is not feasible to duct an explosion to the outside through a wall or ceiling, an explosion suppression or suppression-isolation system will be needed. A system like this may cost more than the dust collector itself.

Suppression methods are covered in a separate document, "NFPA 69: Standard on Explosion Prevention Systems", which has also just undergone a complete revision. Like NFPA 68, it too has gone from a guideline to a standard. NFPA 69 extends beyond the scope of explosion venting to address the whole dust collection system, i.e., inlet and outlet ducting, spark extinguishing systems, and methods for preventing an explosion from traveling back into the building.

Together, the two related standards will have a significant impact on the future design and cost of collection systems handling combustible dusts.

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## US Powder Expert GTP is Now Part of Plansee Group

Effective 1 August 2008, Plansee Group has acquired the business unit Global Tungsten & Powders (GTP) from Osram. The purchase agreement has already been signed on 22 April 2008. The purchase price has not been disclosed.

GTP is a leading supplier of powders, semi-finished products and components made from tungsten, molybdenum and phosphor. Says Michael Schwarzkopf, chairman of the Plansee Group executive board: "With GTP we will ensure our long-term supply of tungsten raw materials. And we will also strengthen our position in the refractory metals market in North America."

Bob Fillnow, president and CEO of GTP: "We are making good progress with the integration process. GTP will be positioned as the fourth division of Plansee Group with its own branding and its own management. And our customers should continue to expect the high levels of service and quality they have seen in the past." Fillnow hopes to complete the integration of GTP into Plansee Group before year's end.

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### Sprayed Particle Diagnostics

Third in a Series by Mo VandenBergh – VandenBergh & Associates

The last installment "Sprayed Particle Diagnostics – Part 2" concluded with cases outlining easy (Getting Started) returns on the investment in particle diagnostic tools having captured the data and reports of desired coatings.

The situations outlined were:

- Cell equalization
- Reduction in testing, or quicker cell certification
- Immediate feedback in training new spray technicians

As a transition from the easy (Getting Started) applications to more complex applications, the last of the "comparison to known results" based applications is process monitoring. Having developed limits based on target data for the spraying process, alarms can be set to notify the operator if particle characteristics or plume dimensions fall outside the limits chosen.

Although it may be less likely recognized, process monitoring has a much larger potential payback than the previously mentioned applications. The impact of the previous applications is almost immediate given a quick "cause and effect" that is sometimes hard to quantify economically. On the other hand the monitoring application is easier to calculate and quantify, but the benefits are longer term and there must be a history of the process and or economics in order to compare and recognize the benefits.

Following is an explanation of:

- Two extremes regarding payback of process monitoring
- Two physical setups in which monitoring can be performed
- Where return on investment or payback might be retrieved
- Sample of "before and after" calculation of benefits that might be obtained if an operator uses information from monitoring to keep the spray process within limits

Two extremes suggesting whether or not there is a payback to the use of a monitoring device greatly depends on the cost and value of the process:

- At one extreme, the least likely to generate a payback might be the hand manipulation of an electric arc spray or flame spray process applying a corrosion protective coating of a low-cost material.
- At the other extreme, the most likely to generate a quick payback is a case in which a mechanically manipulated, high energy cost spray process, spraying a high-cost powder fed radially, operating for long periods of time, on large parts or ganged small parts that have tight coating specifications or tolerances.

How to monitor the process is dependent mostly by the part to be coated, manipulation process (available space) and where in the plume the measurements are to be taken. The two options for monitoring can be termed "Intermittent" and "Continuous".

- Intermittent monitoring would entail locating the monitoring tool in a fixed position and bringing the spray torch to a measurement position between

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parts, between passes or some reasonable interval to see if there has been a change in the spray process.

This option may be used when:

- There is no room for the monitoring device to travel with the spray torch
- The parts being coated are small or the time required to spray the part, or gang of parts, is short, and the system is idled or started and stopped during part changes

- When measurements need to be taken at the actual spray distance
- Continuous monitoring, suggests that the monitoring device moves with the spray torch. This option is of particular value when spraying large parts or gangs of parts requiring long spray durations. The spray system is more likely to exhibit significant changes the longer the system operates.

Where will the payback come from? Costs associated with

Payback (Before and After Illustration)							
Operations			Results				
Variables	Before	After		Before	After	Change	% Change
Hours Available for Spraying	2,000	2,000	Material Used				
Labor Rate (\$/hr.)	20	20	Bond Coat (lb.)	1,184	1,172	(12)	-1%
Men required per booth	1	1	Top Coat (lb.)	7,816	7,003	(813)	-10%
			Costs				
Booth Utilization (%)	50.0%	45.4%	Bond Coat (\$)	23,684	23,438	(247)	-1%
			Top Coat (\$)	328,263	294,137	(34,126)	-10%
Roll Diameter (in.)	5	5	Energy (\$)	16,431	14,925	(1,506)	-9%
Roll Length (in.)	20	20	Consum. Parts (\$)	9,000	8,175	(825)	-9%
Traverse Extension (in.)	3	3	Fines Disposal (\$)	2,935	2,574	(360)	-12%
Total area (sq. in.)	361.28	361.28	Total Variable Cost	380,313	343,250	(37,063)	-10%
Bond Coat Thickness (in.)	0.005	0.005		-	-		
Top Coat Thickness (in.)	0.015	0.014		-	-		
			Labor Cost	40,000	40,000	-	0%
Bond Coat Spray Rate (lb/hr.)	9.0	9.0	Maintenance / Calibration Cost	-	-		
Top Coat Spray Rate (lb/hr.)	9.0	9.0					
				-	-		
Bond Coat Material Cost (\$/lb.)	20.00	20.00	Total Costs	420,313	383,250	(37,063)	-9%
Top Coat Material Cost (\$/lb.)	42.00	42.00					
			Outputs				
Bond Coat DE (%)	65	65	Number of Rolls	1,534	1,518	(16)	-1%
Top Coat DE (%)	65	67					
			Potential Sales (sq. in.)	963,844	953,806	(10,039)	-1%
Consumable Parts Costs (\$/hr.)	9.00	9.00	Less Rework	48,192	38,152	(10,039)	-21%
DC Fines Disposal (\$/lb.)	0.75	0.75	Sales	915,652	915,652	-	0%
			Measurements				
Income (\$/sq.in.) (Sales Price)	2.00	2.00	Profits (sales -costs of coating only)	495,339	532,403	37,063	7%
Rework Rate	5%	4%	Profitability (sales/cost)	2.18	2.39	0.21	10%



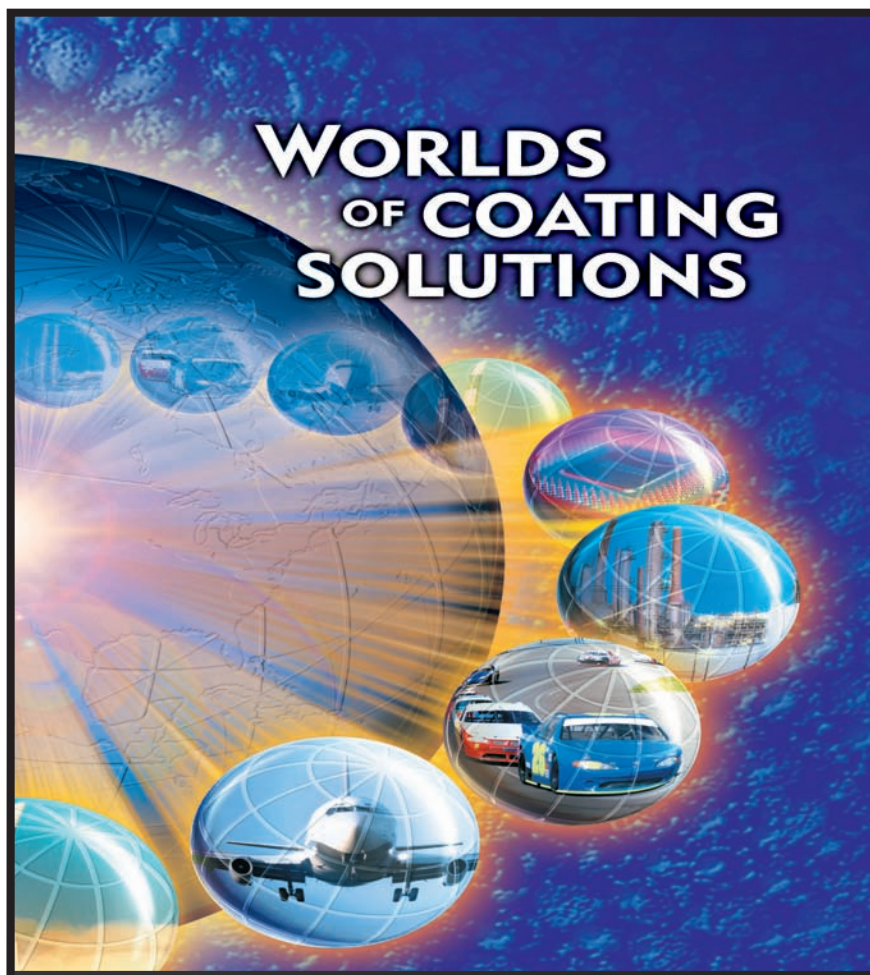
a process are derived from materials, energy, labor, and capital invested and they are controlled by efficiencies or interruptions of the same. Interruptions, unless they have become habits or acceptable practices (one example, stopping and starting to measure coating thickness) are usually noticeable and efforts are taken to eliminate them. Inefficiencies on the other hand may be deemed as a sporadic unknown, invisible or go fully unnoticed if there are no measurements for identification. For example one of the least identifiable sources of inefficiencies in the thermal spray process is consistency of powder feed. Changes in particle distribution, powder flow, carrier gas pressure and volume (poor gas path integrity) and wear of injection ports amongst other things can affect where and how material is injected in to the energy plume. These changes will in turn be transferred to the process as changes in deposition efficiency, possibly the coating itself (increased rework) and/or the operators decision to add some additional material to the part (safety stock). These same changes in powder feed can also be detected by the monitoring system. The following "Before and After" calculations below illustrate possible benefits of being able to compensate for changes just posed.

About the "Before and After" model on page 10:

- The savings in variable cost is \$37,063; a reduction of approximately 10% which can be applied directly to a 10% increase in profitability.

- The illustration is of a hypothetical cell spraying both a bond coat and topcoat on rolls. The cell has a potential during the year of spraying 2000 hours. Booth utilization is the percentage of time the parts are actually being sprayed.
- The model was based on standard parameters for a plasma system with gas and energy usage and prices considered typical for the Midwest. There were no changes in the parameters in "Before" and "After" but in actuality there will most likely be adjustments but these will have minor influence on cost.
- No consideration was given to effects to return on capital or to possible change in labor costs which are considered a constant.
- Three assumptions were made:
  - As an average – increased DE by two percentage points for the top coat, from 65 % to 67%
  - Better control – reduced safety stock of top coat on a average - 0.001 in
  - Decrease in rework – 1%, from 5% to 4%
- In order to realize all the savings based on changes and not dilute savings by allowing more parts to be produced, the cell utilization was changed from 50% to 45.4% producing the same available sales. Due to the reduction in rework, 16 less rolls needed to be produced.

continued on page 12



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The objectives of the model are to illustrate that small changes can greatly affect the bottom line, to stimulate creative thought to show that improvement in one area can have positive affects in several others, and lastly to minimize some of the concerns about the return on investment in particle diagnostics. There could be other benefits. Could excess cell utilization be used for more production? Could there be a multiplication of benefits if the cell is utilized a second and or third shift?

Upcoming installments will focus on, the more complex uses of particle diagnostics - Process Development and Process Optimization.

*If you have any questions or suggestions* please feel free to contact Mo VandenBergh at VandenBergh & Associates, Inc., 5641 Station Hill Dr., Avon, IN 46123 or phone 317.718.8403, e-mail Mo\_VandenBergh@earthlink.net, website: [www.MoVandenBergh.com](http://www.MoVandenBergh.com)

## Spurred by Early Growth, Thermal Spray Coater Undertakes Plant Relocation and Expansion



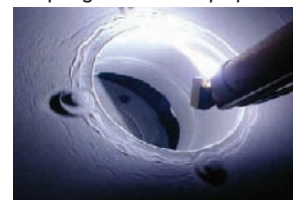
**Longevity Coatings**, a thermal spray coating service firm, has relocated its production plant from Pen Argyl, PA, to a newly acquired office and production facility on a two-acre site near Allentown, PA.

The company, founded in 2005, now occupies 8,800 sq ft in two single-story buildings at 6047 Adams Lane, East Allen Township, about a mile west of the Lehigh Valley International Airport.

Longevity Coatings, serving Lehigh Valley (PA) and the Pennsylvania-New York-New Jersey area, specializes in the

application of thermal spray coatings to wear and machine parts used in a wide variety of industrial applications. The coatings—usually carbides, ceramics or metals—are used to protect machine parts from wear, abrasion and corrosion and extend their useful life.

The company employs computer-programmed equipment to precisely control the applications of protective coatings through various thermal spray coating processes, including HVOF (high velocity oxygen fuel), plasma coatings, electric arc, combustion flame spraying, and fused coatings (diffusion bonded) processes.



Mark A. Purington, founder and president of Longevity Coatings, pointed out that industrial management has always looked for new ways to extend the life span of production machinery and reduce downtime. With the advent of breakthrough coatings products in recent years, design engineers have increasingly specified hardface coatings for new machine parts as a way to accomplish management's goals. This, in turn, has led to unprecedented growth for the thermal spray coating industry in general and for Longevity Coatings in particular, he added.

The East Allen plant is fully equipped to handle completely manufactured, coated and ground components, including parts in excess of 18 ft long at a diameter of 50 in. The facility also is equipped with an outside tailgate loading dock and three drive-in loading doors.

Although the Pen Argyl facility adequately met Longevity's immediate and near-term needs, "our unexpectedly rapid

**continued on page 14**

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growth in little more two years of operation necessitated that we look to the future and future growth," explained Purington, "The acquisition of a modern facility, along with two acres of developable ground, should meet our needs for many years to come."

### New Capabilities Brochure Available

A four-page, four-color brochure, describing the capabilities and services of Longevity Coatings is available upon request to industry professionals.



The new literature utilizes product and equipment photographs to showcase the company's special expertise in applying protective coatings to industrial machine and wear parts.

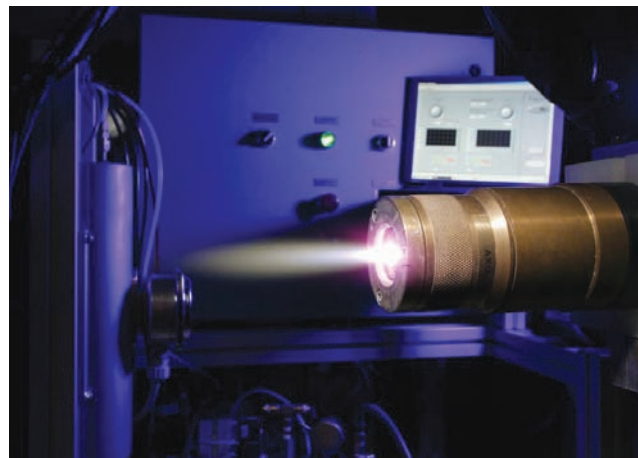
Thermal spray coatings, the literature explains, are gaining wide acceptance in industry as a means for improving part performance and lengthening component life, restoring failing parts, improving the properties of parts, reducing downtime and costs, and improving productivity. In recent years, the creative use of thermal spray coatings has helped top performing companies achieve a competitive edge in their respective industries and a reputation as technology leaders.

**For additional information or to request a brochure copy,** contact Longevity Coatings, 6047 Adams Lane, Allentown, PA 18109; tel: 610.871.1427 fax: 610.871.1217; email: [info@longevitycoatings.com](mailto:info@longevitycoatings.com) web: [www.longevitycoatings.com](http://www.longevitycoatings.com)

### Mettech Receives 2007 Micro/Nano Tool of the Year Award

Northwest Mettech Corp. has received a prestigious award for the best new nanotechnology product at the international Small Times NanoCon conference in Santa Clara. Northwest Mettech's NanoFeed Liquid Powder Feeder won The Small Times 2007 Best of Small Tech Micro/Nano Tool of the Year award, recognizing the breakthrough nature of their product.

Plasma spray coatings are used worldwide to deliver the highest quality surfaces on components used in jet engines, petrochemical equipment, printing machines and electronic devices. The increased durability of components using nanomaterials in these coatings has long been recognized. Mettech has enabled plasma spray equipment to directly deposit nanomaterials as high performance ceramic coatings. This capability greatly improves the heat, wear, impact, and corrosion resistance of many industrial and aerospace components.



Speaking about the award, Mettech's CEO, Gary Albach commented, "We are delighted to receive this award, and for our achievement in developing this breakthrough product to be recognized by leading industry experts. The nanotech industry is set for massive expansion, and we are proud to be playing a significant role in this." Mettech has been developing their feeder in cooperation with the Industrial Materials Institute (IMI) of the National Research Council in Montreal, and holds an exclusive license from IMI for the use of a number of new technologies.

Northwest Mettech Corp.'s Model 650 Nanofeed Liquid Powder Feeder is a tool aimed at producing thermal spray coatings of nanopowder and ultra-fine micron powders. Its availability increases the viability as a commercial option to replace coatings currently produced through higher cost

**continued on page 16**

INDUSTRY NEWS



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continued from page 14



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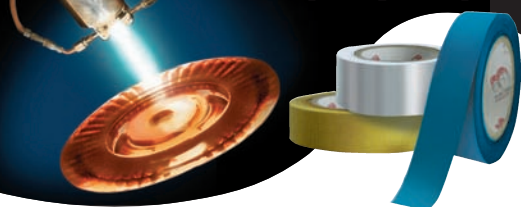
methods, such as PVD. Applications include thermal barrier, fuel cell, catalytic, and solar cells.

The Best of Small Tech awards honor significant achievements in leadership and product development -- in nanotechnology, MEMS (Micro-Electro-Mechanical Systems) and microsystems -- during the past year. Small Times presented its respected awards at NanoCon International conference and exhibition - the most important nanotechnology and MEMS industry networking event, attracting hundreds of attendees from around the world. This is the

### **SPRAYTIME Circulation Reaches 7000**

SPRAYTIME thermal spray industry newsletter has reached a circulation of over 7,000 copies.

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## **NanoSteel® Announces New Coating Solution for Boiler Erosion and Corrosion**

*SHS 8000 increases the lifetime of boiler components over leading industry standard coatings in elevated temperature environments*

The NanoSteel® Company, a leader in nanostructured steel alloy surface technologies for industrial applications, announces the commercial availability of a new Super Hard Steel® alloy, SHS 8000, for coating solutions in the power generation industry that improves reliability and availability, and increases the lifetime of pressure parts over leading industry standard coatings.

SHS 8000 is a cored wire solution for electric arc thermal spraying that excels in the elevated temperature environments of pulverized coal and fluidized bed boilers. SHS 8000 features an ultra-refined crystalline microstructure, up to a thousand times finer than existing solutions, resulting in exceptional corrosion, erosion and wear resistance, a unique high hardness/toughness combination and extremely high bond strength without the necessity of a bond coat.

"SHS 8000 offers superior performance to current industry standard coatings," says Dave Paratore, president and CEO. "SHS 8000 will reduce maintenance costs, minimize unplanned outages from tube failure and feature excellent field repairability."

**For a more detailed comparison of SHS 8000** to current industry standard coating solutions, visit [www.nanosteelco.com/product/8000\\_twas.html](http://www.nanosteelco.com/product/8000_twas.html).

The NanoSteel Company, Inc., headquartered in Providence, R.I., develops and markets a patented portfolio of Super Hard Steel nanostructured alloy coating, overlay and wear plate solutions that effectively solve or alleviate many operational challenges faced in critical industries today, including wear, erosion and corrosion in a wide range of complex service environments.

**For additional information,** call toll free 1-877-293-NANO or visit [www.nanosteelco.com](http://www.nanosteelco.com).

### **ITSA Thermal Spray Pavilion at**

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*Plan to attend a FREE "Learn About Thermal Spray" seminar on Monday, October 6th, 2008 at the Las Vegas Convention Center. This three-hour seminar will be presented in the morning at 9 am and repeated again in the afternoon at 1:30 pm.*

*To attend the Fabtech International and AWS Welding Show, register now at [www.fmafabtech.com](http://www.fmafabtech.com) for the FREE "exhibits only" badge which will grant you access to the Thermal Spray Pavilion and you can sign up for the thermal spray seminar (morning code W95) or (afternoon code W96)*

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## The Programmable Manipulator

*Sixth in a Series from Plasma Powders and Systems  
Robot Continuous Path, Singularities  
and the Tool Center Point*

As noted in an earlier article, the paths, not the end points, are key for thermal spray operations. In some point-to-point robotic operations (such as in palletizing), the robot may pause at each end-point in the path. This is unacceptable for many thermal spray operations; therefore, the continuous path. The path is continuously and smoothly controlled by the coordinated motion of the robot joints.

In addition to specifying each segment of the path, the programmer needs to select how the robot transitions in moving from one path segment to the next. For a continuous positioning path, the robot approaches a path segment end-point, does not stop at the point and moves along to the next segment. How closely the robot approaches each segment end-point may be defined by specifying a value for each motion command, usually from 0 to 100. When 100 is specified, the robot moves along to the next segment without decelerating; only performing a change in direction at the segment end-point. When 0 is specified, the robot decelerates in order to approach close to the end-point of the segment before moving on to the next path segment. A "Fine" positioning option may also be included for the case where the robot is to move precisely to a segment end-point before proceeding along the next segment. Thermal spray operations normally do not require "Fine" positioning.

The singularity must also be considered when teaching linear or circular motion path segments. A singularity occurs when two of the robot axes are parallel. If a move statement is taught near or through a singularity, the robot may move differently than when taught.

When a six-axes robot travels through or near a wrist singularity (axis 4 and 6 in line), motion performance becomes undesirable because: 1) axis 4 and axis 6 may each rotate through a large angle, 2) the overall speed of the robot will slow down as a result of limiting the wrist axes joint speed, and 3) the path might deviate from the programmed path if motor speed limit is exceeded. The programmer needs to be aware of singularities when developing the motion program and position the robot to avoid singularities.

In addition to the end-points of each segment, a path velocity is defined. However, for an articulated robot, each part of the robot may be moving at a different speed. Robot speed is in

reference to what part of the robot? This is where the Tool Center Point (TCP) comes into play. The TCP is usually referenced to the final axis of the robot and is defined by the operator. For thermal spray operations, the point of interest is the center of the spray on the part. When the gun is mounted to the robot, the TCP is a point in front of the gun at the stand-off distance required for the coating. It needs to be "taught" for each gun and for each unique stand-off distance for that gun.

Three approaches are generally available for teaching the TCP: the Three-Point Method, the Six-Point Method and Direct Entry. Direct Entry requires measurements on the mounted gun and can be prone to error. The Three-Point Method is fine for operations where the tool orientation is of minor importance; however, for thermal spray operations, the gun orientation (which way the gun is pointing) is very important. Therefore, the Six-Point Method is recommended.

For the Six-Point Method, a "straw" is usually inserted in the gun nozzle and extends in front of the nozzle the required stand-off distance. A point target is located in the spray area and is "touched" by the end of the straw with three different orientations of the gun. The next three points are used to teach the robot the axis of the gun and the "up" direction for the gun. Once taught, the gun is easily moved along the part during programming. For example, when jogging the robot in the tool coordinate system, only one key is needed to move the gun closer or further from the piece being coated.

**Next time, Mounting the gun.**

*For more information,* contact series author, Dale Moody via email [dalermoody@aol.com](mailto:dalermoody@aol.com)

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### Unimec Chooses ARC140 System

Unimec, based in Romania, which manufactures metal hardware for low and medium voltage power lines, has been using the Metallisation Arc140 system for over 4 years to spray small parts that historically have been hot-dip galvanized or zinc plated.

Metallisation's Romanian distributor, Straaltechniek Minex, who delivered the first Arcspray 140 system to Unimec, has since been cooperating with the company with technical support and materials supply. Unimec uses the Arcspray 140 system to metal spray small pylon components to protect them from corrosion. The



components include brackets, hinges, horizontal supporting consoles, stretching consoles, aluminium clamps and supporting rods. Metal spraying the components with zinc will ensure the longevity of the individual parts.

At the inception of Unimec, these small components were hot-dip galvanized or mainly electro-zinc plated, which meant Unimec had to send the parts out to a third party. Both of these processes are commonly used for coating smaller parts for corrosion protection. However, the protection granted by these processes was not proving adequate in some of the more highly corrosive environments that the pylons were being installed. Now with the new Arcspray 140 arc spray system, Unimec has total control over the production and quality of all components and can deliver them to meet customers' time scales. Also, due to the harsh environment the components face, Unimec has found that metal spraying offers much greater anticorrosion protection than galvanizing or electro-zinc plating.

Due to the volume of parts Unimec sprays the company has to run two daily shifts to meet the demand for metal sprayed components. Each component is grit blasted to SA 2.5 and then coated with 2 to 4 mils (50 to 100 microns) of zinc.

Major advantages of arc spraying are that coatings are available for almost instant use, with no drying or curing times, and there is no risk of damaging the component



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through heat distortion. The thickness of the coatings can be locally controlled by the operator, allowing variations in the level of corrosion protection depending on the environment. With increasing transportation costs becoming an issue, the process can easily be installed in-house. This not only reduces costs but also increases internal control over quality, production planning and shorter response times.



The Metallisation arc spray process is normally used to protect large steel structures such as, vessels, tanks, buildings and bridges, but is also proving itself to be a viable option for smaller components as described here.

In the electric arc spray process the raw material, in the form of a pair of metallic wires, is melted by an electric arc. This molten material is atomized by a cone of compressed air and propelled towards the work piece. The molten spray solidifies on the component surface to form a dense, strongly adherent coating suitable for corrosion protection or component reclamation. Sprayed coatings may also be used to provide wear resistance, electrical and thermal conductivity.



Straaltechniek Minex has been a Metallisation distributor for over ten years and is proud of its knowledgeable pre-sales and after-sales support. Adrian Hentulescu, Technical Director for Straaltechniek Minex, says: "Unimec needed a

supplier that understood the problems corrosion can cause and could supply appropriate advice as well as the most flexible and reliable equipment. As a Metallisation distributor we always work with the client before they purchase any equipment, to ensure we understand his needs, and we pride ourselves on our excellent after sales service. The new Arcspray equipment has enabled Unimec to increase its output and respond much quicker to its clients demands, which is great news for all concerned."

**For more information** on Metallisation equipment contact Stuart Milton, sales and marketing manager on +44 (0) 1384.252.464 or visit [www.metallisation.com](http://www.metallisation.com)

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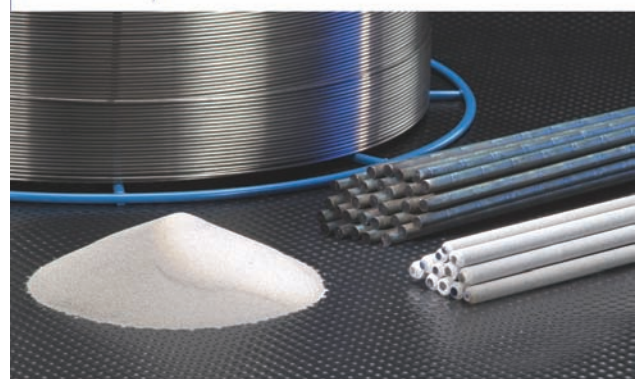
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Mr. Mike Murphy, mjmurphy@nooter.com

**Plasma Coatings** - Union Grove, WI USA  
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Mr. Daniel Cahalane, info@plasmacoatings.com

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Mr. Thomas F. Lewis III, tlewis@sermatech.com

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713.921.0012  
Mr. Jim Hollingsworth, jimh@schumachercoinc.com

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Dr. Rajan Bamola, rajanb@surfacemodificationsystems.com

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Mr. Bill Lenling, blenling@tstcoatings.com

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61.393.98.5925  
Mr. Keith Moore, kmoore@ust.com.au

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Mr. Dan Noonan, noonand@actionsuper.com

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Mr. Stewart Stringer, stringrs@airproducts.com

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Mr. Lloyd Johannesen, lloyd@alloysales.com

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Mr. Richard Mason, dick.mason@ametek.com

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### International Thermal Spray Association

#### Headquarters Office

208 Third Street • Fairport Harbor, Ohio 44077

voice: 440.357.5400 • fax: 440.357.5430

email: itsa@thermalspray.org

web: 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



**Chairman Froning**

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

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

company representatives to better understand member benefits. A complete list of ITSA member companies and their representatives are at [www.thermalspray.org](http://www.thermalspray.org)

### ITSA Mission Statement

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

### Officers

Chairman: **Marc Froning**, BASF Catalysts LLC  
 Vice-Chairman: **Dan Hayden**, Hayden Corporation  
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**John Read**, National Coating Technologies  
**Scott R. Goodspeed**, H. C. Starck, Inc.  
**John Hayden**, Hayden Corporation  
**Joeseeph Stricker**, St. Louis Metallizing Company

### ITSA Scholarship Opportunities

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

### ITSA Materials Camp Student Sponsor

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

### ITSA Thermal Spray Historical Collection

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

Growing in size and value, there are now over 30 different spray guns and miscellaneous equipment, a variety of spray gun manuals, hundreds of photographs, and several thermal spray publications and reference books.

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

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

### ITSA SPRAYTIME Newsletter

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

For a free **SPRAYTIME** subscription, visit [www.spraytime.org](http://www.spraytime.org) and complete the short questionnaire.

### ITSA Headquarters

208 Third Street, Fairport Harbor, Ohio 44077 USA  
 tel: 440.357.5400 fax: 440.357.5430  
[itsa@thermalspray.org](mailto:itsa@thermalspray.org) [www.thermalspray.org](http://www.thermalspray.org)

### SCHOLARSHIP OPPORTUNITIES

**Up to two(2) Graduate scholarships worth \$2,000.00 each to be awarded each calendar year.**

**Up to three(3) Undergraduate scholarships worth \$750.00 each to be awarded each calendar year**

Since 1991, the ITSA Scholarship Program has contributed to the growth of the Thermal Spray Community, especially the development of new technologists and engineers. The International Thermal Spray Association is very proud of this education partnership and encourages all eligible participants to apply.

New Application Dates: Scholarship applications are now accepted annually April 15 through June 30 ONLY for both the Graduate and Undergraduate scholarships.

**Please visit** [WWW.THERMALSPRAY.ORG](http://WWW.THERMALSPRAY.ORG) Scholarship area for details and a printable application form.



Bringing Technology and Technique Together





## Become a Member of The International Thermal Spray Association

Your company should join the International Thermal Spray Association now! As a company-member, professional trade 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.

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, in every issue of SPRAYTIME, as well as in our free edition of "What Is Thermal Spray?". ITSA members also receive an additional 10% advertising discount in the SPRAYTIME newsletter. ITSA member companies are also highlighted in the ITSA booth at several trade shows throughout the year (International Thermal Spray Conference ITSC, Fabtech International and AWS Welding Show Thermal Spray Pavilion, Weldmex Mexico, and TurboExpo in 2008).

*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 our headquarters office or our membership chairman Jim Ryan at james.ryan@hcstarck.com or visit the membership section of our [www.thermalspray.org](http://www.thermalspray.org) website.

### International Thermal Spray Launches New Website

The ITSA website now includes an "employment" and "for sale" area.

SPRAYTIME issues are included in this website with content search capability.

Visit [www.thermalspray.org](http://www.thermalspray.org) to see our new look and valuable industry information.

## ITSA Thermal Spray Pavilion at

Fabtech International & AWS Welding Show  
Las Vegas • October 6-8, 2008

*Plan to attend a FREE "Learn About Thermal Spray" seminar on Monday, October 6th, 2008 at the Las Vegas Convention Center. This three-hour seminar will be presented in the morning at 9 am and repeated again in the afternoon at 1:30 pm.*

*To attend the Fabtech International and AWS Welding Show, register now at [www.fmafabtech.com](http://www.fmafabtech.com) for the FREE "exhibits only" badge which will grant you access to the Thermal Spray Pavilion and you can sign up for the thermal spray seminar (morning code W95) or (afternoon code W96)*

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Qualified candidates will have an Engineering degree, along with a minimum of 3 years' engineering experience and 5 years of thermal spray experience. Must also possess a strong understanding of manufacturing processes and computer skills including Word, Excel and AutoCAD. Root cause analysis skills, strong management skills, and excellent written and verbal communication skills are also necessary.

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## ITSC 2008 Award Recipients

These awards were presented at the *International Thermal Spray Conference 2008* in Maastricht, The Netherlands

### Young Scientists

#### *Thin and dense yttria partially stabilized zirconia electrolytes for IT-SOFC manufactured by suspension plasma spraying*

G. Montavon, E. Brousse\*, P. Fauchais, A. Denoirjean, H. Ageorges, V. Rat, J. Coudert, K. Wittmann-Ténèze  
Elodie Brousse; SPCTS-UMR CNRS 6638 - Faculty of Sciences - University of Limoges; Limoges; France

#### *Understanding coating formation in real time via monitoring of residual stress development*

A. Valarezo\*, E. Mari, S. Sampath  
Alfredo Valarezo; SUNY Stony Brook University; Center for Thermal Spray Research; Materials Science & Engineering Department; Heavy Eng. Building. Room 103; 11794 Stony Brook; USA; avalarezo@notes.cc.sunysb.edu

### Best Paper

#### *Development and investigation on new composite and ceramic coatings as possible abrasible seals*

C. Giolli\*, U. Bardi, A. Scrivani, G. Rizzi, A. Fossati, F. Borgioli, K. Partes, T. Seefeld, D. Sporer  
Carlo Giolli; Turbocoating SpA; Via Mistrali 7; 43040 Rubbiano di Solignano; Parma; Italy; carlo.giolli@gmail.com

#### *Improving the properties of HVOF sprayed $Cr_2O_3$ by nanocomposite powders*

T. Varis\*, J. Knuuttila, T. Suhonen, U. Kanerva, J. Silvonen, J. Leivo, E. Turunen  
Tommi Varis; VTT Technical Research Centre of Finland; P.O. Box 1000; FIN-02044 VTT; Finland; tommi.varis@vtt.fi

#### *Development of WC-Co coatings deposited by warm spray process*

P. Chivavibul\*, M. Watanabe, S. Kuroda, J. Kawakita, M. Komatsu, K. Sato, J. Kitamura  
Makoto Watanabe; National Institute for Materials Science; Ibaraki; Japan

#### *Plasma transferred wire arc spraying of novel wire feed-stock onto cylinder bore walls of AlSi engine blocks*

T. Schläfer\*, K. Bobzin, F. Ernst, J. Zwick, F. Schreiber, A. Schwenk, M. Hahn, C. Verpoort, G. Flores  
Thomas Schläfer; RWTH Aachen University, Surface Engineering Institute; Juelicher Str. 344a; 52070; Aachen; Germany; schlaefer@iot.rwth-aachen.de

#### *Single impact erosion studies of $Cr_3C_2$ -NiCr coating: the role of microstructure variation*

S. Matthews\*, M. Hyland, B. James  
Steven Matthews; Institute of Technology and Engineering; Massey University; Private Bag 102 904; North Shore Mail Centre; Albany Highway; Albany; Auckland; New Zealand; S.Matthews@massey.ac.nz

#### *Thermal conductivity of AlSi/polyester abrasible coatings*

R. Bolot\*, J. Seichepine, F. Vucko, D. Sporer, P. Fiala, B. Bartlett, C. Coddet  
Christophe Verdy; LERMPS-UTBM; Site de Sevenans; F-90010 Belfort; France; christophe.verdy@utbm.fr

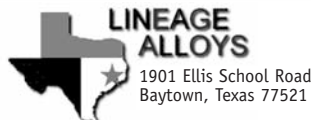
Please join the thermal spray community in congratulating these individuals.

### SPRAYTIME®--Letters To The Editor WRITE US!

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

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

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



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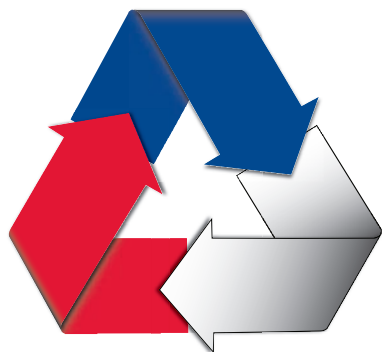
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### *Journal of Thermal Spray Technology®*

A publication of the *ASM Thermal Spray Society*

**Abstract: Development and the Implementation of High-Temperature Reliable Heaters in Plasma Spray Technology**

**Maria Prudenziati**

Many problems have been encountered during development of reliable high-temperature heaters by means of atmospheric plasma spray and procedures commonly adopted in thermal spray technology, especially due to poor steel substrate corrosion resistance, notably affected by grit-blasting operations, but also deriving from contamination of insulating layers, dielectric arcs, and failures due to hot spots in the heating elements. While seeking the origin of these problems, a close scrutiny of every single step of the preparation process and analyses of the coatings were carried out using laser confocal scanning microscopy, optical and electronic microscopy, fluorescence analysis, X-ray diffraction, and ancillary techniques. The electrical properties of both alumina layers and metal strips prepared with Ni, NiCr, NiAl commercial powders for the heating elements were studied and cross-related to the failures in the heaters. The article reports the main results of these investigations, delineates the innovations introduced to overcome or circumvent the problems, and underlines the distinct characteristics of new heaters, whose reliability has been proven up to now with temperatures of up to 600°C in air.

**Read the entire article in the June 2008**

***Journal of Thermal Spray Technology.***

**For more information,** visit [www.asminternational.org/tss](http://www.asminternational.org/tss)

**Editor:** Christian Moreau

**Associate Editors:** Kendall Hollis, Seiji Kuroda, and Armelle Vardelle

### **International Thermal Spray Launches New Website**

The ITSA website now includes an "employment" and "for sale" area. *SPRAYTIME* issues are included in this website with content search capability.

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

to see our new look and valuable industry information.

### **Bay State Surface Technologies Expands Facility**

Bay State Surface Technologies, a long-time manufacturer of thermal spray equipment, including the original PlasmaGun, has recently moved to a newly expanded 20,000 sq ft facility in Auburn, MA USA. The new facility features a state-of-the-art spray cell for parameter development, equipment manufacturing, thermal spray powder manufacturing, and thermal spray wire processing.

The new facility was built to support a continual increase in equipment sales. Bay State Surface Technologies has been manufacturing thermal spray equipment and materials for over 40 years. Products include 80 kw power supplies, PLC-based control consoles, powder feeders, plasma guns, and electric arc spray equipment. Other products include robots, turntables, acoustic enclosures, chillers, and dust collectors, for complete turnkey solutions.

Bay State is a subsidiary of Aimtek, Inc., a global award-winning supplier of brazing and welding alloys. Bay State is also affiliated with Atech Turbine Components, an FAA-certified Overhaul and Repair facility for aircraft engine components.

Bay State is now located at 201 Washington Street, Auburn, MA USA 01501.

**For more information,** please visit our website at [www.baystatesurfacetech.com](http://www.baystatesurfacetech.com), or call us toll-free at 1-800-772-0104.



# Fabtech International and AWS Welding Show



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**Monday, October 6th**

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**FREE Seminar**

***Introduction to Thermal Spray***

*Morning or afternoon session  
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*Instructors:*

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*Bringing Technology and Technique Together*

## CALENDAR OF EVENTS SEPTEMBER 2008

**2-3 Hanover, Germany** *Aluminum Brazing Seminar* - by European Assoc for Brazing and Soldering- visit EABS Secretariat website at [www.brazingandsoldering.org](http://www.brazingandsoldering.org)

**8-11 Memphis, TN USA** *SAMPE Fall Technical Conference* - Society for the Advancement of Materials and Process Engineering, [www.sampe.org](http://www.sampe.org)

**14-18 Champion, PA USA** *11<sup>th</sup> Int'l Symposium on Superalloys (Superalloys 2008)* - contact TMS tel: 724.776.9000 x 243, email: [mtgserv@tms.org](mailto:mtgserv@tms.org), web: [www.tms.org](http://www.tms.org)

**23-25, Toronto, Canada** *Canadian Manufacturing Week with Weld Expo Canada* - visit [www.cmwshow.ca](http://www.cmwshow.ca), tel: 888.322.7333

**29 SEP-1 OCT Mannheim, Germany** *EuroPM2008 Int'l Conference* - contact European Powder Metallurgy, tel: +44(0)1743.248899, web: [www.epma.com](http://www.epma.com)

## OCTOBER 2008

**6-8 Las Vegas, NV USA** *FABTECH Int'l & AWS Welding Show - with a Thermal Spray Pavilion* - organized by American Welding Society, [www.aws.org](http://www.aws.org), Fabricators and Mfrs Assoc, [www.fmafabtech.com](http://www.fmafabtech.com), Society of Manufacturing Engineers, [sme.org/fabtech](http://sme.org/fabtech)

**6-9 Pittsburgh, PA USA** *Materials Science & Technology*

**2008 Conference & Exhibition (MS&T'08)** - organized by ASM, ACerS, AIST, and TMS tel: 440.338.5151 web: [customerservice@asminternational.org](mailto:customerservice@asminternational.org), [www.asminternational.org](http://www.asminternational.org)

**15-16 Hartford, CT USA** *TSS Aerospace Coating Symposium* - contact ASM Int'l tel: 440.338.5151, web: [www.asminternational.org](http://www.asminternational.org), email: [customerservice@asminternational.org](mailto:customerservice@asminternational.org)

**29-30 Paris, France** *Industrial Gas Turbine O&M Conference* - contact Ruth Martin, email [ruth@gasturbine-events.com](mailto:ruth@gasturbine-events.com), tel: +44 207 932 5587,

## DECEMBER 2008

**1-5 Boston, MA USA** *2008 MRS Fall Meeting & Exhibit* - contact MRS tel: 724.779.3003, email: [info@mrs.org](mailto:info@mrs.org), web: [www.mrs.org](http://www.mrs.org)

**2-3 Montreal, Quebec Canada** *Symposium on Improving Reliability and Control in Thermal Spray* - Sponsored by ASM Thermal Spray Society, email contact [Kristin.Minihan@asminternational.org](mailto:Kristin.Minihan@asminternational.org)

**7-10 Bangkok, Thailand** *PMP-III 3rd Int'l Conference on Processing Materials for Porperities* - contact TMS tel: 724.776.9000, email: [mtgserv@tms.org](mailto:mtgserv@tms.org), web: [www.tms.org](http://www.tms.org)

## FEBRUARY 2009

**15-18 New Orleans, LA USA** *PACE 2009* - contact Society for Protective Coatings, web [www.pace2009.com](http://www.pace2009.com)

## APRIL 2009

**16-18 Orlando, FL USA** *International Thermal Spray Association Membership Meeting and Technical Program* - contact ITSA, [itsa@thermalspray.org](mailto:itsa@thermalspray.org), 440.357.5400

## MAY 2009

**3-6 Helsingør Denmark** *15th Int'l Conference on the Joining of Materials* - contact: JOM tel: +45.48355458, email: [jom\\_aws@post10.tele.dk](mailto:jom_aws@post10.tele.dk)

**4-7 Las Vegas, NV USA** *ITSC 2009 International Thermal Spray Conference & Expo* - contact ASM Int'l tel: 440.338.5151, web: [www.asminternational.org](http://www.asminternational.org), email: [customerservice@asminternational.org](mailto:customerservice@asminternational.org)

## JUNE 2009

**8-12 Orlando, FL USA** *ASME Turbo Expo 2009* - Orlando World Marriott Resort - visit [www.turboexpo.org](http://www.turboexpo.org)

**2-4 Monterrey, Mexico** *AWS Weldmex*, Cintemex Exhibition Center, Monterrey, Mexico - visit [www.aws.org](http://www.aws.org)

## JULY 2009

**12-17 Ottawa, Ontario Canada** *12th Int'l Conference on Fracture (ICF12)* - visit [www.icf12.com](http://www.icf12.com)

## SEPTEMBER 2009

**14-19 Essen, Germany** *International Trade Fair - Joining, Cutting, and Surfacing* - visit web: [www.messe-essen.de](http://www.messe-essen.de), contact email: [christina.kleinpass@messe-essen.de](mailto:christina.kleinpass@messe-essen.de)

## OCTOBER 2009

**19-20 Toronto, Ontario Canada** *Canadian Manufacturing Technology Show 2009* - visit [www.sme.org](http://www.sme.org)



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## NOVEMBER 2009

15-18 Chicago, IL USA **FABTECH Int'l & AWS Welding Show and Metalform- with a Thermal Spray Pavilion**

- organized by American Welding Society, [www.aws.org](http://www.aws.org), Fabricators and Mfgs Assoc, [www.fmafabtech.com](http://www.fmafabtech.com), Society of Manufacturing Engineers, [www.sme.org/fabtech](http://www.sme.org/fabtech)

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### Calendar Highlight

#### Expanding Thermal Spray Performance to New Markets and Applications



Join us for the world's foremost international conference and exposition for thermal spray technologists, researchers, manufacturers and suppliers.

This annual event in the world of thermal spray technology is jointly organized by the German Welding Society (DVS), the ASM Thermal Spray Society (ASM TSS), and the International Institute of Welding (IIW)

Welcome to the 2009 International Thermal Spray Conference and Exposition. ITSC is the preeminent global thermal spray annual event. This 2009 event will be held May 4-7, 2009 at the Flamingo Las Vegas Hotel in Las Vegas, Nevada

Our international delegation of materials and design engineers, research scientists, manufacturers, suppliers and users will gather to exchange ideas on meeting the challenges and opportunities of the years to come. During ITSC 2009, you will experience three days of premier technical programming from the world's leading thermal spray experts, an unparalleled exposition featuring the world's largest gathering of thermal spray equipment suppliers, consumable and accessory suppliers, as well as vendors and service providers. In addition, enjoy unmatched educational programs and networking events.

**For more information,** visit [www.asminternational.org/itsc](http://www.asminternational.org/itsc)



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### 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.



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### F.W. Gartner Appoints Nathan Henry

F.W. Gartner appoints **Nathan Henry** marketing, media and product development manager. With over 20 years experience developing thermal spray companies and specialty markets both overseas and domestically.



Nathan will now be focusing on promoting F.W. Gartner's general and specialty markets with a emphasis on the just released BR-4® non-wetting ceramic coating for the aluminum industry and FWG 622N nanomaterial.

**For more information,** contact Nathan, cell: 907.388.4693, email [nhenry@fwgts.com](mailto:nhenry@fwgts.com), and visit website [www.fwgts.com](http://www.fwgts.com)

### Chris Berndt Appointed Director of IRIS

IRIS, formally known as Industrial Research Institute Swinburne and located at Swinburne University of Technology (SUT) in Melbourne, Australia for some 15 years, has a long-standing and respected standing within the manufacturing sector of Australia. IRIS is a University Tier 1 Research Centre that resides within the Faculty of Engineering and Industrial Sciences. It has a staffing level of approximately 45 researchers; of whom 25 are post-graduate students, as well as professors, post-doctoral fellows, research engineers, technicians and administrative support staff.

Chris joined IRIS in December of 2007 under a university initiative that was designed to map future needs for manufacturing expertise. He brings several decades of international experience to Australia; primarily within the context of the USA. He assumed the role of Director of IRIS in early 2008.



The focus areas of intelligent manufacturing systems, laser technology, micro technology and robotics and noncontact inspection have been hallmarks of prior success for IRIS. This expertise will be brought under the umbrella of "surface science and interface engineering" by Prof. Chris Berndt, as well as expanded and enhanced by his expertise in thermal spray technologies and biomaterials.

IRIS is currently participating in the Defence Materials Technology Centre, the Advanced Manufacturing Cooperative Research Centre, the Automotive Cooperative Research Centre, CAST Cooperative Research Centre, and the Melbourne Centre for Nanofabrication; among other large collaborative activities.

**For more information,** contact Prof. Chris Berndt, +61 (03) 9214 8706 or email [cberndt@groupwise.swin.edu.au](mailto:cberndt@groupwise.swin.edu.au)

### Springfield Manufacturing Announces Roger Miller as Machining Business Development Manager

Springfield Manufacturing LLC announced today that it has added a key resource to their management team to address their strategic position in the marketplace with the increased growth in the gas turbine manufacturing, aerospace engine and medical markets. **Roger Miller** from Carmel, IN has joined them as their Machining Business Development Manager.

Roger Miller will assist Springfield Manufacturing LLC and Huffman Technologies LLC by developing strategies to increase their market penetration in the machining of gas turbine, aerospace engine, and medical parts starting June 16, 2008. Roger brings a wealth of technical sales, business development, and marketing experience having spent 8 years with MIC Group including 6 years as VP of Sales and Marketing. Recently he has worked with Reeder and Kline Machine Company assuring successful strategic market positioning which resulted in the increase of profit margins by over 50% in the first year.

Roger H. Hayes, President of S. E. Huffman Corporation said, "Roger Miller is coming from a customer industry and brings with him an insightful perspective that is highly valuable to increase our marketability."

Springfield Manufacturing started as the process development shop for the Huffman Corporation in the late 1980s developing the waterjet machining processes for the customers purchasing Huffman's waterjet machines. In 1996, Springfield Manufacturing, LLC became a separate spin off manufacturing business due to contract machining from Huffman Corporation. Over the last decade Springfield Manufacturing has grown to a 24-hour production shop whose customers read like a who's who of the aero and land based turbine and aerospace industries. The company's main products are multi-axis precision abrasive waterjet machine systems and the machining of flight, industrial gas turbine, and medical parts. Located in Clover, SC, a suburb of Charlotte, NC, Springfield is an ISO 9001:2000 and CE-approved supplier with global sales and service.

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



### New Email and Website Address for Lineage Alloys

Please note new addresses for Lineage Alloys. Their new email address is [lineage@lineagealloysllc.com](mailto:lineage@lineagealloysllc.com) and their new website address is [www.lineagealloysllc.com](http://www.lineagealloysllc.com).

Other contact information remains the same: telephone 281.426.5535, fax 281.426.7484.



## Two Winners at the René Wasserman Award Ceremony

The fourth bestowal of the René Wasserman Award turned out to be a bit of a surprise. This year two of the candidates fulfilled the criteria to such a high degree that the jury, Which included TLS president Christopher Wasserman and managing director Peter Heinrich of GTS (Association of Thermal Sprayers), decided to declare two winners in this exceptional case.

Therefore, the first prize is shared by the two companies **Rybak + Höschele RHV Technik** of German Waiblingen and **Eurocoating of Ciré-Pergine** in Italy. Both winners receive 10 000 Euros and an artwork sculpture.



(left to right) Peter Zeggel, DOT GmbH, Rostock in Germany, Claudia Hofmann, RHV-technik GmbH, Waiblingen in Germany, Jochen Rybak, RHV-technik GmbH, Waiblingen in Germany, Nelson Antolotti, Flametal S.p.A., Fornovo in Italy, Christopher Wasserman, TeroLab Surface Group SA in Switzerland, and Peter Heinrich, Linde Gas AG in Germany

The René Wasserman Prize was introduced in 1999. The award, donated by Terolab Services Management SA with its headquarters in Lausanne, Switzerland, not only takes into account technological aspects, but also criteria such as environmental compatibility and the readiness to innovate. The enterprise introduced the prize in memory of the scientist, entrepreneur and pioneer of welding, René Wasserman, who died in 1993.

This award was presented at the International Thermal Spray Conference - ITSC 2008 - in The Netherlands by Christopher Wasserman, president of TLS Terolab Services.

**Your employee should be listed here.**

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

### International Thermal Spray Launches New Website

The ITSA website now includes an "employment" and "for sale" area.

SPRAYTIME issues are included in this website with content search capability.

Visit [www.thermalspray.org](http://www.thermalspray.org) to see our new look and valuable industry information.

## Maher Boulos Receives Prix du Québec Award

**Maher Boulos** received the Lionel Boulet 2007 prize from Minister Raymond Bachand at the Québec national assembly in Québec City on November 6, 2007. This prize is one of 'Prix du Québec' which are the highest distinctions offered by the province of Québec to leading persons in science, literature and arts.



**Maher Boulos (left) receiving award from Minister Raymond Bachand, Minister of Economic Development, Innovation and Export of the province of Québec.**

The Prix du Québec have existed in their current form since 1977. Each year, the government attributes six such awards in the cultural field and five in the scientific field. The purpose of this tribute is to recognize the career of women and men who have demonstrated a passion for their calling. Individuals who have stood out by their creative or innovative spirit and whose work has contributed to the influence of Québec around the world and to the evolution of Québec society in their respective fields.

**For more information**, contact Maher via email [Maher.Boulos@videotron.ca](mailto:Maher.Boulos@videotron.ca) and visit award website [www.prixduquebec.gouv.qc.ca](http://www.prixduquebec.gouv.qc.ca)

### ITSA Thermal Spray Pavilion at

**Fabtech International & AWS Welding Show  
Las Vegas • October 6-8, 2008**

**Plan to attend a FREE "Learn About Thermal Spray" seminar on Monday, October 6th, 2008 at the Las Vegas Convention Center. This three-hour seminar will be presented in the morning at 9 am and repeated again in the afternoon at 1:30 pm.**

**To attend the Fabtech International and AWS Welding Show, register now at [www.fmafabtech.com](http://www.fmafabtech.com) for the FREE "exhibits only" badge which will grant you access to the Thermal Spray Pavilion and you can sign up for the thermal spray seminar (morning code W95) or (afternoon code W96)**

**REGISTER ONLINE and pick up your badge onsite.**

## Gage, Kay Inducted into Thermal Spray Hall of Fame

Two of the leading names in thermal spray technology – **Robert Gage** and **Albert Kay** – have been inducted into the International Thermal Spray Hall of Fame. The Hall of Fame was established by the ASM Thermal Spray Society (TSS) in 1993 to recognize significant contributions to the technology's practice, education, management and advancement.

"The Hall of Fame is comprised of the giants in our field," said TSS President Peter Hanneforth. "Their names include Max Ulrich Schoop, whose landmark contributions as the inventor of the thermal spray process provide the foundation for today's modern thermal spray industry."

"The late **Robert Gage** was the R&D Manager for Union Carbide Corporation, Linde Division, now Praxair," Hanneforth said, "but we honor him as the father of plasma spray." Gage was instrumental in transferring his developments to production. In addition to the use of plasma spray within Union Carbide, the technology was licensed to Metco and other companies, and manufactured and used throughout the world.



Gage was cited "for the initial invention and development of transferred and non-transferred arc plasma spray torches and coatings using powder or liquid feed stock, and seminal developments in the use of gases to effect reactions during spraying." William Jarosinski, Program Development Manager, Praxair Surface Technologies, Inc., accepted the award.



**Albert Kay** is President of ASB Industries, Inc., headquartered in Barberton, Ohio. Under his direction, ASB was the first commercial thermal spray facility to adopt the HVOF system in the late 1980s, and aggressively developed new applications for it. Similarly, in 1995, ASB was the first to introduce the cold spray systems that had been developed in Russia.

"Al Kay continues to serve both ASM International and the Thermal Spray Society in many roles, and he is internationally known for his leadership in the thermal spray industry," Hanneforth said.

Kay was cited "for excellence in recognizing and commercializing emerging technologies such as HVOF and cold spray and for his proactive role in ASM and TSS committees leading to the spread of thermal spray in many industries."

The awards were presented at ITSC 2008, the International Thermal Spray Conference and Exposition, held in Maastricht, The Netherlands.

Founded in 1994 as an Affiliate Society of ASM International, TSS is comprised of 1,500 individuals around the globe representing over 500 leading companies, research institutions and universities.

**To learn more about TSS** and its ongoing efforts to serve the worldwide thermal spray community, contact Sarina Pastoric, Administrator, Affiliate Programs at 440/338-5151 ext. 5513 or [sarina.pastoric@asminternational.org](mailto:sarina.pastoric@asminternational.org)

### Would You Prefer to Receive SPRAYTIME Electronically?

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## Dr. John M. Tartaglia of Stork CRS Elected to Fellow of ASM International

Senior Metallurgical Engineer and Engineering Manager honored "for contributions in alloy development and testing of metallic and semiconductor materials and extensive research, failure analysis and publication on fatigue, mechanical testing and materials performance."

With more than 25 years of work in materials engineering and failure analysis, **Dr. John M. Tartaglia** of Stork Climax Research Services has been honored by ASM International ("The Materials Information Society"), a materials engineering professional organization that predates World War I and boasts worldwide membership.

Dr. Tartaglia's peers in materials science nominated him, and the ASM International Board of Trustees elected him to the position of Fellow of the Society "for contributions in alloy development and testing of metallic and semiconductor materials and extensive research, failure analysis and publication on fatigue, mechanical testing and materials performance." Dr. Tartaglia will receive the honor at the Convocation of Fellows during the ASM Awards Dinner on Tuesday, October 7, 2008, in Pittsburgh, Pennsylvania. ASM members have annually nominated Fellows since 1969; honorees serve as advisors to the Board of Trustees for the rest of their careers.

Stork Climax Research Services General Manager Mark Smith said, "We are delighted to hear that John has been recognized for his scientific career in materials and metals. He is not only an outstanding scientist, but he is a valuable contributor to our business and a generous colleague and mentor to the entire Stork CRS team and the ASM community."

Dr. Tartaglia said, "Becoming an ASM Fellow is a career capstone for me because although I hold membership in other materials societies, I have long devoted the most time and energy to ASM. I am honored and gratified that

my peers selected me after reviewing my technical achievement, my mentoring of other material professionals, and my service to ASM members. I am proud to be a part of this organization and very proud to be a member of the 2008 Class of Fellows."



Dr. Tartaglia holds BS and PhD degrees in Materials Engineering from Rensselaer Polytechnic Institute in Troy, New York, and is an expert in wrought steels, aluminum, magnesium, fatigue, failure analysis, scanning and transmission electron microscopy, and energy dispersive spectroscopy. He is an experienced speaker, educator, and expert witness in failure analysis litigation, and a member of ASTM metallography, mechanical testing, and fatigue committees.

**For more information** on John Tartaglia, visit [www.storksmt.com/page.html?id=15585](http://www.storksmt.com/page.html?id=15585)

**For more information** on Stork Materials, visit [www.storksmt.com](http://www.storksmt.com)

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Farr Air Pollution Control .....	2	Lineage Alloys .....	24	Thermal Spray Pavilion .....	27
Flame Spray Technologies .....	13	Nation Coating Systems.....	6	TurboExpo .....	15



## Wall Colmonoy Appoints Heminger and Huesing

Wall Colmonoy announces the appointment of **Robert M. Heminger** as Vice President of Finance and Administration for Wall Colmonoy Corporation.



Bob holds a CMA (Certified Management Accountant), affiliate CPA, and MBA degree. He had just completed twenty years of employment with Wall Colmonoy as Corporate Controller.

Reporting to Bob will be the Finance, Accounting, IT, and Purchasing departments, and he will also serve as a member of the Board of Directors of Wall Colmonoy Corporation.

Wall Colmonoy announces the appointment of **Marianne Huesing** as Corporate Human Resource Manager for Wall Colmonoy Corporation, U.S. locations.



Marianne has completed thirty years of employment with Wall Colmonoy, most recently as General Administrative/Technical Services Coordinator. Her previous responsibilities

included management of the Health, Safety, Anti-Drug and Environmental Programs. Marianne began her career at Wall Colmonoy as Administrative Assistant to the Vice President of Manufacturing. Her extensive knowledge of the company's products and services will be an asset to her in this new position.

**For more information**, visit the Wall Colmonoy website at [www.wallcolmonoy.com](http://www.wallcolmonoy.com)

**For a free copy of the International Thermal Spray Association "What Is Thermal Spray?" publication, email a request to [itsa@thermal spray](mailto:itsa@thermal spray)**

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You can request an online version only (no print copy will be sent to you) **or** both an online **and** a print copy

We will then send you an email message when the next *SPRAYTIME* issue is ready to be viewed online.

## Thermal Spray Technologies Announces New Management Team Members

TST is excited to announce a few new faces on their management team! As our business grows, so does our staff.

**Karen Hitchcock** replaced Andrea Loppnow in June. Andrea is now working part time for TST as a Systems Engineer and Karen will be taking over the Quality Assurance Department. Karen brings with her many years of QA experience and has been the key component to implementing quality standards in her previous companies. Please direct all past and current quality comments, questions, and issues to Karen from now on.



We are also pleased to announce the addition of our Plant Accountant, **Suzanne Bowen**. Suzanne will be working with TST's financials on a daily basis. Please direct all accounting, invoicing, and accounts payable to Suzanne.



Today, TST employs approximately 80 high-tech employees. Their innovation has developed coating solutions for many diverse applications for some of the worlds leading OEM manufacturers.

Additionally, **Kyle Robbins** joins the Engineering team as a Project Engineer. Kyle brings over 15 years of engineering experience to TST.

From the initial incorporation TST's mission has been: "Dedication to fully satisfying the needs of its customers by engineering, improving and continuously providing high quality application-specific coatings and coated components."




Please join TST in welcoming these new faces to their TST team!

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

## WHERE IS YOUR ARTICLE?

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





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