

# SPRAYTIME®

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## Breaking News

### International Thermal Spray Association Announces Alliance With American Welding Society

Fairport Harbor, OH, November 30, 2011 – The *International Thermal Spray Association* (ITSA) announced today that it has become a standing committee within the *American Welding Society* (AWS). The alliance allows for ITSA to retain its respective brand and organizational independence while simultaneously benefiting from AWS's size and resources.

Founded in 1948 as Metallizing Service Contractors and renamed International Thermal Spray Association in 1991, ITSA is a professional trade association of Companies dedicated to expanding the use of thermal spray technologies for the benefit of industry and society. The Association has been closely tied to major advances in thermal spray technology, equipment and materials, industry events, education, standards and market development in North and South America as well as Australia and parts of the Pacific Rim and Europe.

"ITSA has worked very closely with AWS in the past several years and it's really served to increase visibility of thermal spray technology," said David Wright, Chairman of ITSA. "The alliance with AWS allows ITSA the infrastructure to ensure that it can continue into the future as a solid, member-driven organization while placing more emphasis on promoting engineered surface coatings to Industry."

"We welcome this new alliance with ITSA," said Ray Shook, AWS Executive Director. "Thermal spraying is a key element in the core welding technologies covered by AWS, so the link is a natural one that should offer strong value to members of both AWS and ITSA."

Under the new alliance all ITSA member companies are now supporting members of AWS. As a supporting member, each ITSA member company will be given five individual AWS memberships as well as members' discounts to AWS publications.

Two other organizations similar in size to ITSA currently serve as AWS Standing Committees: The Resistance Welding Manufacturing Alliance (RWMA) and the Welding Equipment Manufacturers' Committee (WEMCO).

#### About ITSA

The International Thermal Spray Association (ITSA) was founded in 1948 and once known as the Metallizing Service contractors (MSC) with a mission to expand the use of thermal spray technologies for the benefit of industry and society. Headquartered in Fairport Harbor, Ohio, administered by one staff and led by a volunteer executive committee and officers, ITSA has 61 company members comprised of job shops, suppliers, associate members and supporting societies worldwide. ITSA's premier SPRAYTIME newsletter reaches an audience of 8700 readers including industrial leaders, engineers, researchers, scholars, policy-makers, and the public thermal spray community. For more information, visit the association website [www.thermalspray.org](http://www.thermalspray.org).

#### About AWS

The American Welding Society (AWS) was founded in 1919 as a multifaceted, nonprofit organization with a mission to advance the science, technology and application of welding and allied joining and cutting processes including brazing, soldering, and thermal spraying. Headquartered in Miami, Florida, and led by a volunteer organization of officers and directors, AWS serves more than 67,000 members worldwide and is composed of 22 Districts with 250 Sections and student chapters.

**For more information**, contact ITSA headquarters via [ITSA@thermalspray.org](mailto:ITSA@thermalspray.org)



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## Determining Total Cost Of Ownership Of Your Dust Collector Filters

by Tomm Frungillo and Tony Supine  
Camfil Farr Air Pollution Control

When it comes to choosing filters for cartridge dust and fume collectors, thermal spray operators have a wide array of filter designs and filtration media to choose from. Despite the choices, some buyers regard these items as more or less of a commodity and therefore opt for the lowest-priced filter. However, finding the best and most truly economical choice for your dust collection application requires a "Total Cost of Ownership" calculation.

Before starting your cost evaluation, it is important to make sure the filters you are considering for purchase will have adequate filtration efficiency and other characteristics needed to perform their primary function of air pollution control. OSHA has established permissible exposure limits (PEL) for hundreds of dusts ranging from nonspecific or "nuisance" dust to highly toxic substances. These limits are based on 8-hour time weighted average (TWA) exposure. Further information on PELs can be found at <http://www.osha.gov/SLTC/pel/>.

For some dusts such as hexavalent chromium, a known carcinogen, OSHA has set thresholds as low as 5 micrograms (0.005 milligram) per cubic meter TWA. This is 10 times stricter than the limits for some other toxic dusts. Dust collectors need to be equipped with very high

efficiency filtration media to meet such requirements. In addition, the EPA is implementing a strict new regulation that will no longer allow plants in nine metal fabricating and finishing source categories to exhaust contaminated air outside. The new emissions requirements may again require many plants to incorporate high efficiency filtration to ensure compliance.

How do you know if your dust collector filters will comply with emission thresholds? The equipment supplier should provide a written guarantee stating the maximum emissions rate for the equipment over an 8-hour TWA. Filter efficiency stated as a percentage is not an acceptable substitute, even if the supplier promises 99.9 percent efficiency. OSHA, which regulates indoor air, and the EPA, which governs air exhausted outdoors, only care that the quantified amount of dust in the air is below established limits.

Also, what are the size(s) and shape(s) of the dust particles to be collected? Is the dust combustible? Is it sticky or dry? These are just some of the characteristics that will also determine the best filter choice. Testing a sample of your dust is the only way to get an accurate picture of its properties. Dust testing is available from independent laboratories and many equipment suppliers.

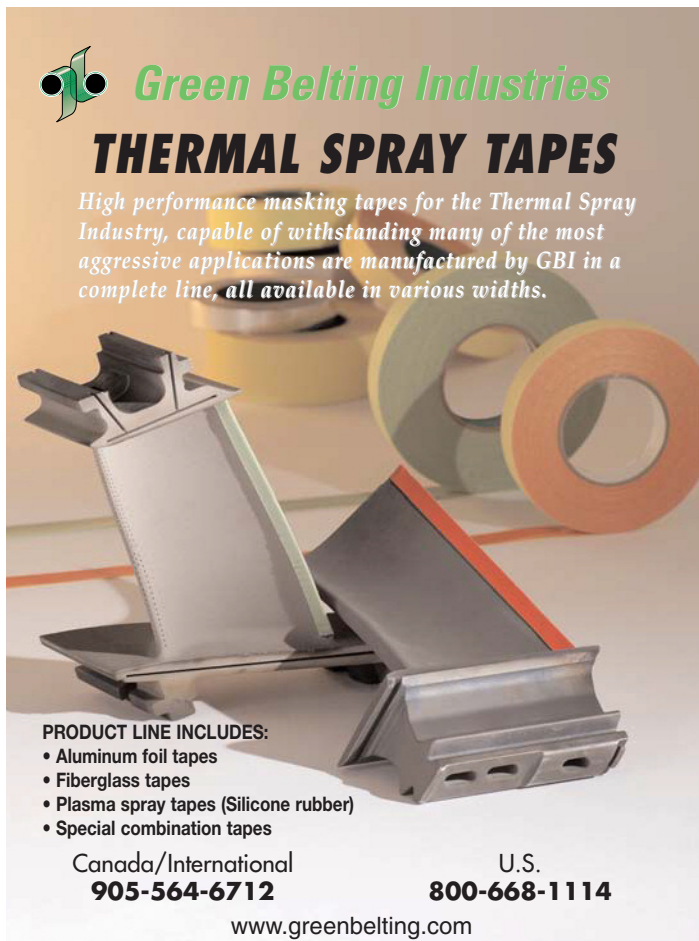
### How much does a filter really cost?

Let's assume you have identified the dust characteristics through testing, determined the required filtration efficiency, and narrowed the choice to two products with the same rated efficiency, Filter A and Filter B. Total cost of ownership (TCO) can now be applied to help you decide what filter to select. Similar in concept to life-cycle costing, TCO incorporates a step-by-step evaluation process encompassing three categories:

- **Energy** – the amount of energy required to operate the dust collector from day to day, including electrical costs, compressed air usage and CO2 emissions.
- **Consumables** – the items that are replaced periodically throughout the life of the equipment.
- **Maintenance and Disposal** – the time it takes to service the equipment and the costs of disposing of the consumables.

If you are considering the purchase of a complete new dust collection system, you will have control over more of these variables, such as the selection of electrical

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

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components that impact energy use. But even if you are simply assessing what replacement filters to use in an existing dust collector, a TCO analysis can yield useful information and surprising results.

**Figure 1 - Dust Collector Filter Total Cost of Ownership Data Collection Worksheet**

I. General system information

How many days will the system operate per year?	_____ days
How many hours will the system operate per day?	_____ hours
What is the volume of air required to operate the system?	_____ m <sup>3</sup> /h (cfm)
How much does a kilowatt-hour cost?	_____ per kWh
What is the cost of no production for one hour?	\$ _____
What is the labor and overhead rate for one hour?	\$ _____
How many filter cartridges are in the dust collector?	_____ filters
How much does a variable frequency drive (VFD) cost?	\$ _____
Will there be a VFD operating the system?	Yes or No
What is the current interest rate?	_____ %

II. Filter information (Complete this section for each filter being evaluated)

Filter product name/description: \_\_\_\_\_

What is the unit cost per filter?	\$ _____
What is the shipping cost per filter?	\$ _____
What is the disposal cost per filter?	\$ _____
How many minutes does it take to change a filter?	_____ minutes
What is the expected filter service life?	_____ hours
What is the expected pressure drop through the system?	_____ Pa (in. w.g.)

**Figure 1** is a dust collection worksheet used to gather TCO data. Following is a more in-depth look at some of the key items that may be included in such a worksheet and how they impact TCO.

#### Energy

Many factors influence a dust collector's electrical energy consumption. Though there can be numerous electrical loads associated with a dust collector – timer boards, rotary airlock motors, etc. – the largest portion of the electrical load relates to the fan or blower required to move air through the system.

It is important to understand that differential pressure losses are directly proportional to the amount of air moved through the system, and the amount of air in turn is directly proportional to the cost of electrical energy consumed by the fan. While ducting should be optimized at the time of installation to reduce the amount of pressure loss, we will focus on the energy control devices and filters which contribute to variable pressure losses during dust collector operation.

When running a dust collector with a constant speed fan (i.e., with no energy control device), the amount of air moving through the collector will vary during the service life of the filters. Why does this occur? When filters are clean and differential pressure is at its lowest, more air blows through the system than required, essentially wasting energy. As filters become loaded with dust, static pressure is increased and less air is moved as a result. Thus, filters use more energy in the early stages of service life and less in the final stages.

One way to reduce this problem is via a mechanical damper at the blower outlet. Depending on the type of filters used, periodic adjustment of the damper to regulate air flow can save an average of 1" w.g. (250 Pa) of static pressure over the life of the filter.

A far more effective approach is the use of a variable frequency drive (VFD) that electrically controls fan speed. When filters are new, speed is decreased to obtain the desired air flow. When filters become loaded, the fan is sped up to

*continued on page 6*

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maintain a constant air flow. The electrical control is highly efficient in maintaining desired air flow, and energy consumption is greatly decreased. The use of a VFD has been proven to save an average of 4" w.g. (1000 Pa) of static pressure over the life of the filter. The added capital cost of installing a VFD on a dust collector will vary. However, the return on investment is typically under one year.

Additional factors that impact energy use are:

- **Premium efficiency vs. standard efficiency fan motors:** Industrial electric motors are the single largest consumer of electricity in the U.S. Premium efficiency motors that meet or exceed requirements of the Energy Independence and Security Act (EISA) are designed to combat the energy waste that occurs with conventional motors. Used to power a dust collector fan, a premium efficiency motor can pay for itself in reduced electrical power use and/or through rebates and incentive programs offered by many electric utilities. These motors run cooler and last longer, making them ideal for use with VFDs for optimum fan speed control and energy savings.
- **Compressed air usage:** The amount of compressed air required to perform pulse-cleaning of filters and maintain a lower pressure drop is important to consider. Compressed air requirements will vary significantly depending on filter design.

- **CO2 emissions cost:** Although this does not contribute tangibly to TCO, the amount of CO2 emissions from operation of a dust collector should be considered and stated as a cost impact on the environment.

#### Consumables, Maintenance and Disposal

The items in these two categories are straightforward and can be summarized as follows:

- **Cartridge replacement** – the amount of money spent on replacement filters alone.
- **Transportation cost** – the amount of money required to have replacement filters delivered to the operation site.
- **Inventory cost** – Typically, replacement filters are not received the day they are replaced in the system. This component is the amount of money required to carry inventory of replacement filters.
- **Labor cost** – the cost of labor required for maintenance personnel to change filters.
- **Disposal cost** -- Depending upon the type of material being filtered, there is a cost associated with properly disposing of used filters. Process dusts that contain hazardous materials can increase the cost of cartridge disposal. By reducing filter change-out frequency, associated disposal costs are also reduced.
- **Downtime cost** – This will vary from facility to facility, but it refers to the amount of time in lost production due to shutting down the collector for a filter change. Clearly, when viewed on an annualized basis, all of these



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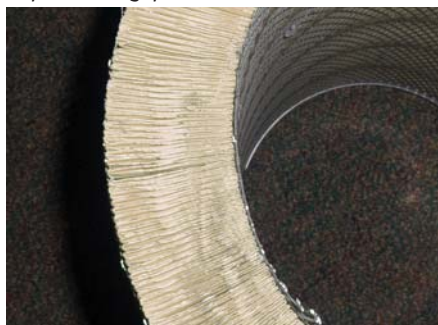
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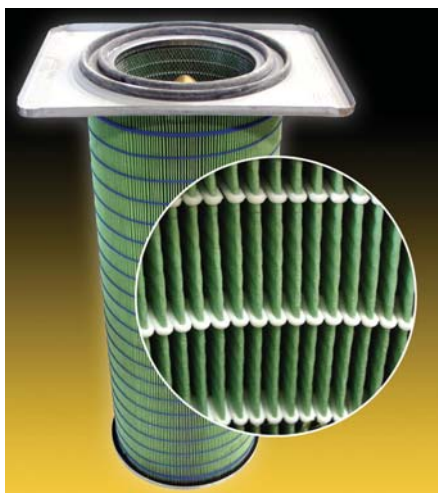
factors are largely dependent on the anticipated service life of the filter. The change-out schedule will determine how many filters you can expect to buy, transport, store and dispose, as well as the costs of labor and downtime associated with filter service.

#### TCO example

To cite a real-world example, a military contractor was experiencing problems of short filter life on thermal spray



Filter A - Cutaway view of dimple-pleat filter media.



Filter B - Open pleat with cutaway.

booths used for metalizing of aircraft engine parts. The spray booths had three identical dust collection systems operating at 8,000 cfm airflow.

The original equipment filter cartridges ("Filter A") were a conventional dimple-pleat design with standard

efficiency fire-retardant media. Cartridges were plugging every 1,000 hours, creating a loss of airflow through the system, and had to be replaced and disposed of as hazardous waste due to the heavy metal particulate in the thermal spray process. This added to the cost of each change-out as well as the cost for production downtime.

The company decided to test "Filter B" in two of the three collectors. Filter B was a high efficiency, open-pleat style cartridge filter with flame-retardant media and was designed for extended service life and lower pressure drop operation.

Filter B had a unit cost of \$182, compared to \$101 for the original equipment Filter A. However, Filter B lasted for 16 months or 5,280 operating hours before needing replacement, saving on parts, labor and disposal costs over the test period. By allowing better airflow through the systems, Filter B also reduced energy consumption.

Figure 2 shows the TCO savings achieved by switching to Filter B. Based on a combination of field experience and analysis of the TCO data, the manufacturer switched all three collectors to Filter B and is now saving over \$20,000 per year in maintenance and energy costs.

By now it should be clear that the lowest-priced dust collector filter is not necessarily the most economical or the most sustainable choice. TCO provides plant and environmental engineering professionals with a useful tool



Filter B - Open pleat close-up.

for comparing the real costs of operating an existing dust and fume collector with different filters, as well as a tool for evaluating the impact of energy-saving electrical components in the design of new and refurbished dust collection systems.

Authors Tomm Frungillo is vice president of sales, Latin America and Focus Markets, for Camfil Farr Air Pollution Control (APC), Jonesboro, Arkansas. Tony Supine has held numerous positions with the company including research and development manager, technical director and currently plant manager. Camfil Farr APC is one of the leading manufacturers of dust collection equipment and a member of Camfil Farr, one of the largest air filter manufacturers in the world.

**The authors can be reached** at 800.479.6801 or 870.933.8048; via email [filterman@farrapc.com](mailto:filterman@farrapc.com); or via website [www.farrapc.com](http://www.farrapc.com); outside of the U.S. and Canada, [www.camfilfarrapc.com](http://www.camfilfarrapc.com).

Figure 2: THERMAL SPRAY DUST COLLECTORS

Total Cost of Ownership Comparison  
Dust Collector Replacement Filter A vs. Filter B  
Actual Savings over 16 months (5,280 hours)

	Dust Coll. 1 (Filter A)	Dust Coll. 2 (Filter B)	Dust Coll. 3 (Filter B)
Hours of Operation	5,280	5,280	5,280
Average pressure drop inches w.g. (Pa)	4 (1000)	2.7 (673)	2.5 (623)
Fan efficiency	0.8	0.8	0.8
Cost per kWh (\$)	0.15	0.15	0.15
Air Flow CFM (m <sup>3</sup> /h)	8,000 (13,580)	8,000 (13,580)	8,000 (13,580)
Energy Cost (U.S. \$)	\$3,926	\$2,565	\$2,352
Filter Cost	\$9,731	\$5,838	\$5,838
Labor Costs	\$790	\$395	\$395
Disposal Costs	\$973	\$486	\$486
<b>Total Cost of Ownership 5280 Hours</b>	<b>\$15,420</b>	<b>\$9,284</b>	<b>\$9,071</b>
Energy savings over 5280 hours		\$1,361	\$1,574
<b>TOTAL SAVINGS OVER 5280 hours</b>		<b>\$6,136</b>	<b>\$6,349</b>

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### Carpenter Powder Products Plans Facility Expansion in Sweden

Carpenter Technology Corporation today announced a major expansion of its Carpenter Powder Products facility in Sweden (CPP AB). Located in Torshälla, CPP AB is a joint venture operation with Sandvik Materials Technology and is one of three powder metal manufacturing sites associated with Carpenter Powder Products (CPP), a subsidiary of Carpenter Technology Corporation.

CPP is the leading global producer of gas atomized powder metal products serving a variety of industries and has additional locations in Pennsylvania and Rhode Island.

"This investment will include construction of a new building, and installation of a melting and gas atomization unit with related powder handling equipment," said Per-Anders Lundh, Managing Director of CPP AB. "The new facility will more than double current capacity levels to address our customers' increasing demand for powder metal products. The unit will also feature proprietary technological advancements to provide for improved powder metal quality and mechanical property capabilities."

At an approximate cost of \$30 million (200 MSEK), the facility expansion is scheduled for completion in early 2013. "Additional facility capacity investments are also under evaluation at our U.S. locations to support growing market demand for existing and new product offerings," according to William Kent, Vice President - CPP & Dynamet.

### Carpenter Selects Alabama as New Site for New Premium Products Facility

Carpenter Technology Corporation (NYSE: CRS) has selected Limestone County, Alabama as the location to construct its new 400,000 square foot state-of-the-art manufacturing facility that was announced last August. The facility is being built in response to strong customer demand for premium alloy products primarily in the fast-growing aerospace and energy industries. The new facility will ultimately be capable of producing approximately 27,000 tons per year of additional premium product and will be designed with modern technology and optimum product flow to meet customer requirements for reduced lead times.

The approximately 230-acre site is located near Athens, Alabama in the Huntsville Metropolitan Statistical Area. The flat, open tract of land is in an area that will allow relatively easy construction, flexibility for future growth and expansion, and access to a strong pool of skilled workers.

"The site selection process began with about 250 world-wide locations, and we narrowed it down to a dozen, including two Pennsylvania locations," said William A. Wulfsohn, President & CEO. "After further analyzing state, county and local incentives, utility costs, and labor resources, we felt Limestone County provided the best opportunity for us to expand our core business. The state of Alabama and local government entities put together a very compelling package including various tax initiatives, infrastructure grants, and training programs."

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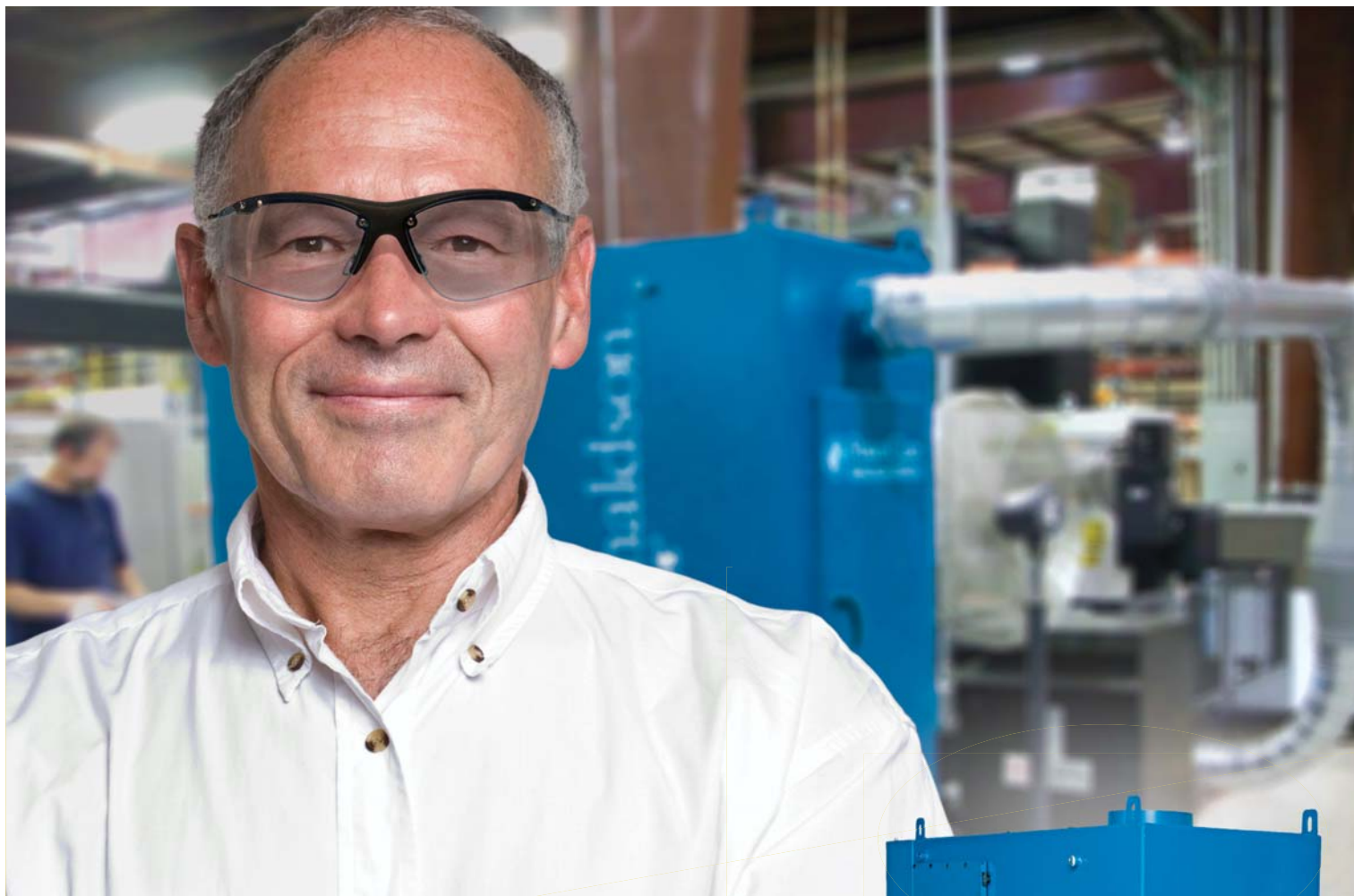
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Carpenter's core business will be strengthened with increased premium capacity to support expanded long term customer agreements. This initiative also enables Carpenter to support the increased demand related to the Latrobe (pending), Amega West, and Oilfield Alloys acquisitions. Finally, this expansion will support increased demand expected from the sales of new technologies which are planned to be commercialized over the coming years.

The acquisition of the new Alabama site is subject to various closing conditions.

**For more information** about Carpenter, visit <http://www.cartech.com>.

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

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

Bulletins. The standards/bulletin names are in German and in English.

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

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## Automated Thermal Spraying at Laguna Verde Nuclear Power Plant Veracruz, Mexico

Metallisation customer, Lainsa, based in Mexico and part of Grupo Dominguis, provides thermal spraying for corrosion protection of pipes used to exchange and transport dry water vapour in thermoelectric, conventional and nuclear power plants.

The application of thermal spraying is critical, as the circulation of dry steam at high temperatures can lead to corrosion of the carbon steel. As a consequence of this corrosion the pipes can become perforated, which can lead to an unplanned closure of the plant resulting in a costly and inconvenient loss of electricity generation. To protect against corrosion the inner walls of the pipes are protected with a coating made up of several layers of cast metal alloys. The coating is extremely hard and resistant to abrasion, protecting against corrosion and improving the tribological properties, the resistance to wear and tear by friction of the water molecules contained in the steam.



Corrosion and erosion inside the pipe.

Grupo Dominguis has developed the TIRANT 3® system, a worldwide innovative automatic system used to apply thermal spraying to the inner surfaces of steam pipes. TIRANT 3® system is operated from outside the pipe, which means the only human intervention is the operation of the robot positioning and to change the metal wire. As a robotic, automated system that is pre-programmed, the thermal spraying process is significantly extended without the need for rest periods and the only 'down time' is for robot maintenance.

The TIRANT 3® system also provides increased coating uniformity, therefore its resistance to corrosion, by keeping the selected parameters constant and consistent. In 2010, Lainsa successfully thermal sprayed the inner surfaces of Cross Under pipes at Units I and II of the Laguna Verde Nuclear Power Plant. Using the TIRANT 3® system and the Metallisation Arcspray 140/S350 system, 3300 sq ft (300m²) of steam pipes were thermal sprayed in thirty-four days. The project was commissioned by Comisión Federal de Electricidad de México, and had to be completed during a routine break in the refuelling of the units.

The inner surface of the steam pipes was blasted to a cleanliness SA 3 before being thermal sprayed to a thickness of approximately 0.0196 in. (500 µm). The coating was applied in three layers: An anchoring layer of nickel/aluminium alloy; an intermediate layer of chrome/nickel alloy and a surface layer of chrome/nickel alloy.

The manual application of thermal spraying requires a great deal of physical effort with frequent rest periods, which is mainly due to working in confined spaces, thermal stress and the need for independent and semi-independent breathing equipment and face masks.



Manual spraying inside the pipe.

The manual operator uses the gun to project the molten metal particles onto the surface, which can entail bending and kneeling in difficult and uncomfortable positions, while spraying pipes varying in size from 3.37 ft (1 m) in diameter and up to 82.02 ft (25 m) long. Due to the inaccessibility of pipes with smaller diameters, they are usually left untreated

and prone to corrosion. The flexible TIRANT 3® system is the perfect solution for thermal spraying small diameter pipes.

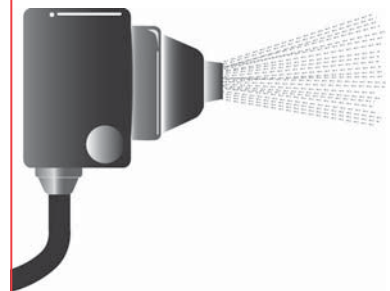
The thermal spraying process also produces a large amount of fume, sparks and particles of metal dust, which means manual operators must have appropriate protection, including fireproof clothing, masks and a supply of breathing air. In certain industries additional protection must also be put in place, such as protection against ionising radiation, if the work has to be carried out in a radiological area.

Continued on page 12

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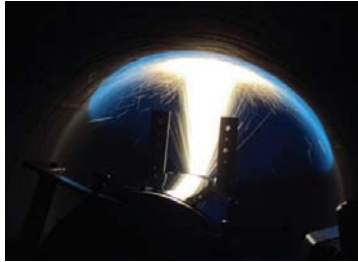


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Continued from page 11



Tirant3 automated pipe spraying.

the position of the operator inside the pipe. Movement is restricted and the visual distance or perspective of the coating application can be hampered making it more difficult to obtain a uniform layer.

While working on thermal spraying the inner surfaces of the Cross Under pipes of a Boiling Water Reactor at the Nuclear Power Plant, these conditions were exacerbated with the additional risk of exposure to radiation for a manual operator. Opting for an automated process to



Pipe inside after thermal spraying.

Another inherent problem in manual application is the task of achieving uniformity of the coating thickness, so a reduction in thickness variations will result in greater resistance and greater surface protection. The difficulties arise due to

thermal spray these pipes reduced the risk of radiation by 70%. This was achieved by adopting protection measures using three basic principles - distance shield and time.

The TIRANT 3® system has been developed in

direct response to the need for a simple, remote tool that removes manual application of a coating, while guaranteeing a uniform coating layer. The thickness applied to the surface of the pipe depends on four factors: The wire type used; the forward speed; the rotation speed and the distance of the Arcspray 140 from the wall of the pipe. The TIRANT 3® system, used in conjunction with Arcspray 140/S350 equipment, is versatile and appropriate for different pipe diameters, projected materials and desired thicknesses. The control software enables consistent and uniform forward and rotation speeds in relation to the thickness of the wall of the pipe. The TIRANT 3® system also has an automatic folding and unfolding system making it suitable for metal spraying pipes in all shapes and sizes.

The Metallisation Arcspray 140 system is a solution to today's demands for high performance arcspray equipment. The patented 'Syncrodrive' push/pull system provides constant, reliable and trouble free operation, utilising two gearboxes linked by a flexible drive. The drive system guarantees that the 'push' and 'pull' elements cannot be out of synchronisation, which ensures consistent wire feed over a long range, of up to 65.61 ft (20 m), making spraying at a distance much easier. The benefits of the Arc 140 system include a choice of coating textures, low running costs, high throughput, portable wire dispensing, safety interlocks and steel reinforced conduits.

Metallisation Ltd, based in the UK, provides anti-corrosion solutions to industries around the world and has done since 1922.

For more information on thermal spraying solutions, please contact Stuart Milton on 01384 252 464 or visit [www.metallisation.com](http://www.metallisation.com)

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Group Marketing, based in Lausanne, is looking to consolidate and expand its various coating activities around the world and is looking for an

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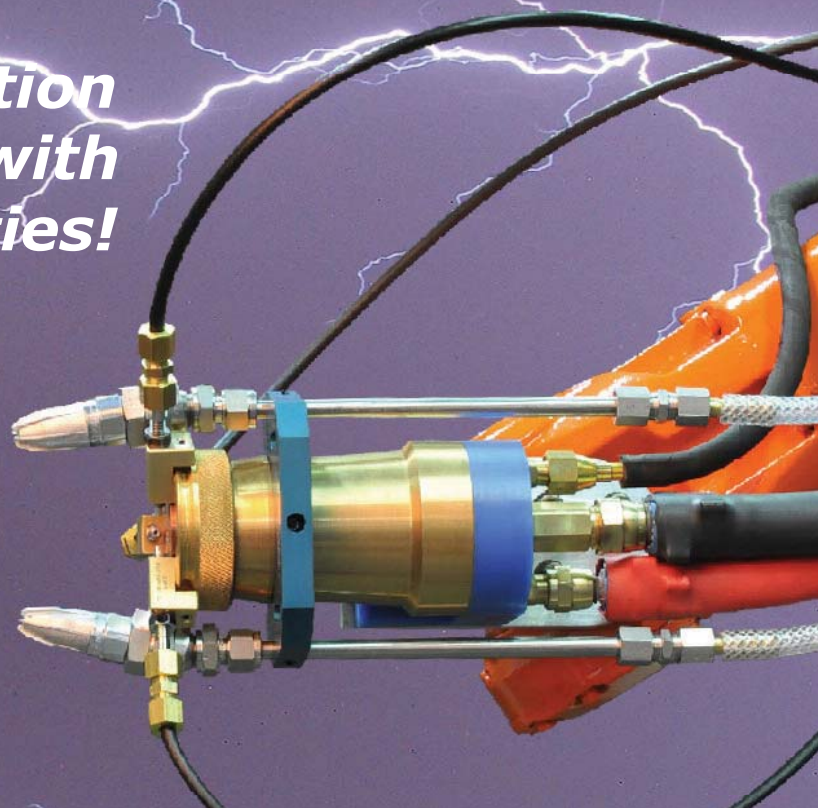
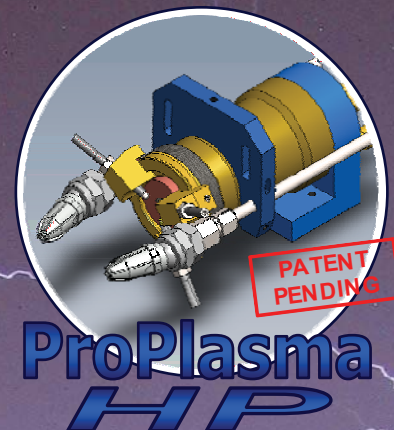


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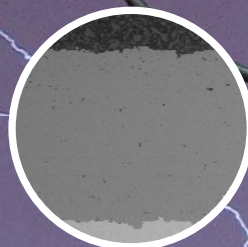
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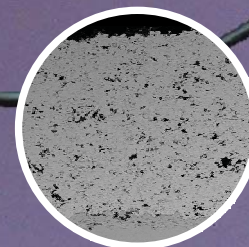
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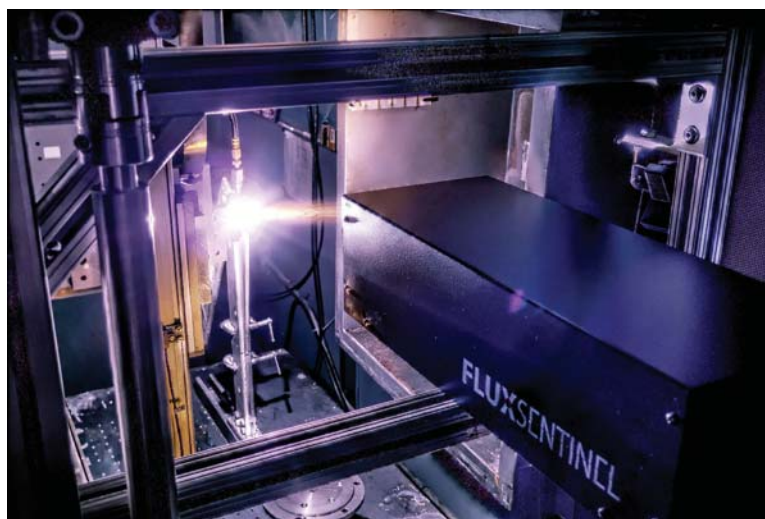
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## New Full-Plume Individual Particle Sensor for Plasma Spray

Cyber Materials, LLC is pleased to introduce a unique particle sensor for plasma spray, the Flux Sentinel. The novel architecture of the Flux Sentinel combines the large measurement volume and ease-of-use of bulk average sensors with the detailed measurements of individual particle sensors, in order to deliver the following measurement capabilities:

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- Accurate particle state measurement as demonstrated by proper detection of feedstock melting point, and sensor-to-sensor consistency without user calibration ensured by the sensor architecture and factory calibration
- Allows the user to quickly compute any desired particle metric such as kinetic energy, molten particle superheat, splashing index, and splat ratio to provide insight into process physics.



These advanced capabilities allow the Flux Sentinel to be used for a wide range of applications including production monitoring and control, process development, and research.

Cyber Materials (CM), founded in 2004, focuses on developing technologies that enhance material process capabilities for high value applications. CM's mission is to provide significant operational advantage to its customers through development of advanced materials process control strategies and sensing systems. CM has performed manufacturing studies and commercialized products in multiple industries including thermal spray, thin film optical coatings, and electrospinning of nanofibers.

The development and commercialization of the Flux Sentinel was made possible through research in collaboration with Boston University and with support from the NSF (ENG IIP SBIR/STTR).

**For more information**, visit website [www.cyber-materials.com](http://www.cyber-materials.com) or phone 857.263.7198.

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## Element Materials Technology Acquires Detroit Testing Laboratory

Michigan product qualification laboratory adds 100 experts to testing network

Element Materials Technology has acquired Detroit Testing Laboratory (DTL) headquartered in Warren, Michigan. Given DTL's reputation as a leading product qualification testing provider, the announcement underlines Element's commitment to industry-leading service of the aerospace and defense and transportation sectors.

"I'm proud to welcome over 100 experts into the Element fold," said Charles Noall, CEO of Element. "DTL's rock-solid reputation and impressive facilities are a fitting addition to our capabilities and global network of laboratories."

The acquisition increases Element's footprint in the United States, adding DTL's two original facilities in Michigan, one facility in Florida completed in 2009, and a 10,000 square-foot high-tech facility in Washington state that opened in 2011.

"I'm proud of our team joining Element. We have a long history as a leading product qualification laboratory, and with Element we will become a critical part of a leading global materials testing provider," said Alfredo Apolloni, Chairman and CTO of DTL. "We'll continue the same high level of service and integrity our customers have counted on for over 100 years."



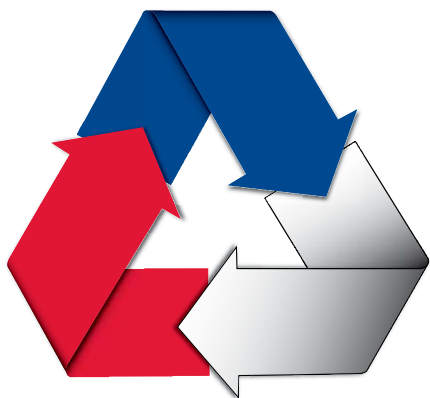
In 2007, DTL opened the first hybrid and electric vehicle battery testing lab in Detroit, Michigan, once again establishing itself as a pioneer in the automotive sector. Today, they continue to focus on emerging technologies that benefit United States industries, businesses and consumers.

"Our core values—relentless commitment to industry-leading customer service, a passionate and dedicated team, investing in technological innovation—are as important to us today as they were upon our founding in 1903," said Earl L. Smith, President and CEO of DTL. "It was critical to us that the company we join share these same values, and we are convinced we have found that in Element."

**About Element:** Element is a global network of laboratories with experts specializing in materials testing, product qualification testing and failure analysis for the aerospace and defense, oil and gas, power generation, and transportation sectors. Their team of 1000 scientists, engineers and technicians work in laboratories located throughout the United States and Europe.

**For more information** and complete accreditations and approvals, please visit [www.Element.com](http://www.Element.com).

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Corporate offices are located in Shaker Heights, OH. Facilities are located in Augusta, GA; Cleveland, OH; Houston, TX; and Phoenix, AZ



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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  
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

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



**Chairman Wright**

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 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, 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 industrial organization dedicated to expanding the use of thermal spray technologies for the benefit of industry and society.*

#### **Officers**

Chairman: **David Wright**, Accuwright Industries, Inc.  
 Vice-Chairman: **Jason Falzon**, FW Gartner Thermal Spraying  
 Treasurer: **Bill Mosier**, Polymet Corporation  
 Corporate Secretary: **Kathy Dusa**  
**Executive Committee** (above officers plus the following)  
**Dan Hayden**, Hayden Corporation  
**John Read**, Cadorath Plating Ltd.  
**Joseph Stricker**, St. Louis Metallizing Company

#### **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.

[itsa@thermalspray.org](mailto:itsa@thermalspray.org)      [www.thermalspray.org](http://www.thermalspray.org)

#### **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.

**See page one for the newest ITSA benefit - All ITSA company members are now also Supporting Members of the American Welding Society.**

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, Weldmex Mexico, PowerGen, Society of Vacuum Coaters 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 our headquarters office or visit the membership section of our [www.thermalspray.org](http://www.thermalspray.org) website.



## European Thermal Spray Association

The European Thermal Spray Association (ETSA) is managed by a Board of Delegates composed of twelve member representatives of the European countries (one representative per country being active in thermal spraying). The ETSA goal is "organizing the exchange of information on thermal spraying at the European level".

The Board of Delegates represent key European universities, research centers and companies involved in thermal spraying, performing research and producing feedstock, equipments and coatings on European and international level. The institutions represented by the delegates gather together hundreds of scientists and engineers dedicated to R&D activities dedicated to base research, applied research, equipment and application development, problem solving in the field of thermal spraying, materials science and engineering.

Last June, ETSA held a Cold Gas Spray Summer School. It was held in Barcelona the first summer school about the innovative technology of cold gas spray. Attendees enjoyed interesting lectures given by notable professors about the basic knowledge, practical methodology and potential applications of the technology. The attendees came from 12 different countries around the world (China, Colombia, France, Finland, Germany, Italy, Japan, India, Portugal, Russia, Spain and USA).

The opening ceremony was given by Prof. Pawlowski, president of the European Thermal Spray Association (ETSA) and Prof. Guilemany, director of the Summer School.

The course was sponsored by Carbueros Metalicos (Air Product Group) and organized by the Thermal Spray Centre of the Barcelona University (CPT). Diplomas were awarded by the University of Barcelona Vice-Chancellor for Innovation and Knowledge Transfer, Prof. Silvia Atrian.

Another meeting - the 5RIPT meeting - was held in Limoges in December with 154 participants from 26 countries. There were 3 plenary lectures including one about the life of Max Ulrich Schoop the inventor of thermal spraying, which was given by Dr. Stephan Siegmann. 16 invited talks and 62 oral ones were presented in the following sessions: (i) Application of coatings; (ii) Biomaterials; (iii) Coatings properties; (iv) Cold spray; (v) Laser processes; (vi) Mechanical properties; (vii) Modeling; (viii) Nanotechnologies; (ix) Pre- and post-spray processes; and; (x) Spray process.

**For more information**, contact ETSA President Professor Lech Pawlowski via website <http://etsa-thermal-spray.org>

## New Company - SprayWerx Technologies Inc.

### **SprayWerx** Technologies Inc

SprayWerx Technologies Inc. is a surface engineering and thermal spray supply company started by former Northwest Mettech founder and President, **Alan Burgess**. SprayWerx has established a collaboration network of well established partner companies located around the globe. This collaboration network includes companies who specialize in equipment, technology, materials and service. This Network enables SprayWerx to offer a broad range of commercially proven, state of the art products aimed at providing customers cost effective surface engineering solutions. Equipment partners include: GTV GmbH (Germany), Plasma Powders and Supplies Inc. (USA), Langqiao (China) and MEC (India).

A selection of products that SprayWerx supports includes:

- K2 Liquid Fuel HVOF system with a unique patented fuel injection system to facilitate higher velocity and cooler in-flight powders.
- NIR Sensor that measures particle temperature and velocity within discrete slices of the particle jet. Able to measure the velocity of cold spray particles and optimise spray distance.
- COAX Laser Cladding System to provide high quality, high feedrate laser clad surfaces.
- PTWA Rotating Wire Arc System for ID coatings in non-automotive applications
- Spray lathes, turntables, robots and other peripheral devices specifically designed for the thermal spray environment.
- Delta 3 Anode Plasma Spray System for high quality ceramic coatings with low heat input into substrate. Utilizes fixed arc stabilization technology developed in Germany.
- Wire HVOF System that provides smooth, high quality coatings with high bond strength. Specifically useful for moly and cored wire spraying.

SprayWerx also provides expertise and consulting services. Companies who are looking to adopt thermal spray into their manufacturing process or have a novel surface engineering technology and are looking for commercialization or market assistance, can benefit from SprayWerx's expertise.

**For more information** please contact Alan Burgess via email [aburgess@spraywerx.com](mailto:aburgess@spraywerx.com) or visit website [www.spraywerx.com](http://www.spraywerx.com).

### Scholarship Opportunities

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

**Applications are accepted  
April 15 through June 30 ONLY.**

Please visit [www.thermalspray.org](http://www.thermalspray.org) scholarship area for details and a printable application form.

### NEW "Supporting Societies" Membership

The International Thermal Spray Association is pleased to announce a new "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 17.**

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)



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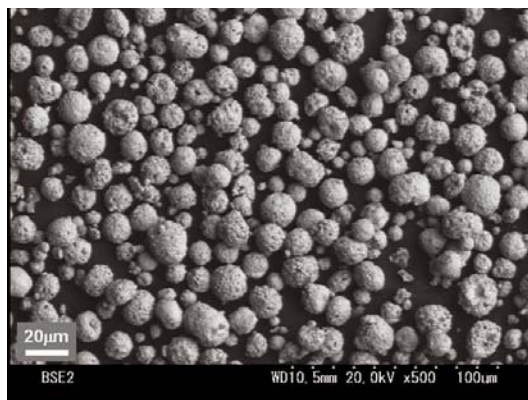


## Fujimi Incorporated Announces NEW Cermet Based Fine Powders for Thermal Spraying



Fujimi Incorporated, Manufacturer of Thermal Spray powders in Japan, announces a NEW fine agglomerated and sintered powder. The new powder is applicable to many cermet materials, such as WC/Co, WC/Co/Cr, WC/CrC/Ni, WC/Fe alloy, CrC/NiCr, MoB/CoCr, etc. The standard particle size distribution of new fine powders are  $-20+5\text{ }\mu\text{m}$  and  $-7+2\text{ }\mu\text{m}$ , but special particle size distributions can be arranged upon request. The fine powder features are spherical shape and a homogeneous morphology. The spherical shape leads to good flow-ability, and the homogeneous particle leads to high performance coating with excellent uniformity.

The new fine powders are advantageous in various spray processes. The WC/Co/Cr fine powder can produce a harder coating with high deposition efficiency via HVOF versus HVOF. The WC/Co fine powder by warm spray can generate a super hard coating with a very smooth surface. The WC/Fe alloy and WC/CrC/Ni fine powders can deposit thick and hard coatings in order to avoid thermal degradation by cold spray. The new cermet fine powders can be used in many more industrial applications due to the above advantages. Fujimi Incorporated is a leading manufacturer of polishing powders and slurries used in the semiconductor and optic applications for the past 50 years. Fujimi Inc. also started



manufacturing cermet and oxide ceramics powders for thermal spray 10 years ago. The primary products include WC/Co, WC/CoCr, WC/CrC/Ni, CrC/NiCr, MoB/CoCr, and high purity ceramics of  $\text{Al}_2\text{O}_3$ ,  $\text{TiO}_2$ ,  $\text{Y}_2\text{O}_3$ , etc.

**For more information**, contact Kazuto Sato, engineer via email [satouk@fujimiinc.co.jp](mailto:satouk@fujimiinc.co.jp), website [www.fujimico.com](http://www.fujimico.com)

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### Plasma Giken Introduces PCS 1000

Plasma Giken, Tokyo-based manufacturer of one of the most advanced industrial cold spray equipment in the world, has expanded its lineup.

The PCS-1000 sets a new standard of reliability and production value in cold spray. Operating at up to 1000°C and 5MPa, the PCS-1000 is unrivaled in its ability to produce dense coatings with a broad spectrum of materials, including Inconel, MCrAlY, and Ti6Al4V.

In another pioneering step for the world of cold spray, Plasma Giken's PCS-1000 can achieve feed rates of 99.20 lb/hr (45 Kg/hr) and higher, opening new doors in the field of spray forming and near net shaping.

Plasma Giken has been on the cutting edge of thermal spray technologies since its inception in 1980. An intensive background in the effective use of powders, and extensive experience with mass production has facilitated the development of the world's most advanced industrial cold spray equipment.

**For more information**, visit [www.plasma.co.jp/en](http://www.plasma.co.jp/en), or call (508) 506-1487.

See advertisements pages 10 and 26.

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

## STICK WITH THE BEST DeWAL Thermal Spray Tapes

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### Society of Vacuum Coaters Engages Vacuum Coating Community with E-Newsletter

The Society of Vacuum Coaters' SVConnections is a monthly e-newsletter, dedicated to informing its readership about the latest in vacuum technology and industry news, and recent R&D discoveries affecting the economic and technological landscape of the future.



Deployed the first Wednesday of each month, SVConnections is distributed to the entire SVC database of vacuum coating professionals and experts. The entire library of past SVConnections issues is found on the SVC web site, [www.svc.org](http://www.svc.org), under the Publications button. This is a free subscription.

Article suggestions for future SVConnections issues are welcome from the community. **To subscribe to this free electronic newsletter**, or to send a link for an on-line article to be considered for inclusion in future issues of SVConnections, e-mail [publications@svc.org](mailto:publications@svc.org).

SVC is a non-profit organization promoting technical excellence by providing a global forum to inform, educate, and engage the members, the technical community, and the public on all aspects of vacuum coating, surface engineering and related technologies. In addition to hosting the Annual Technical Conference, SVC provides year-round offerings of On-Location Tutorial Courses, instructional webinars, printed and digital publications, and on-line resources for those involved in vacuum coating.

**For complete information** on the Society of Vacuum Coaters and the 55th Annual Technical Conference, visit the SVC website [www.svc.org](http://www.svc.org) or call 505.856.7188. E-mail all inquiries to [svcinfo@svc.org](mailto:svcinfo@svc.org). See advertisement page 28.

### ITSA On Facebook

Dear Thermal Spray Colleague,

The International Thermal Spray Association now has a very basic Facebook Page. If you are a Facebook user, you can simply type in thermal spray in the top search engine. At that point, select "like" and you will be connected to the ITSA page. Right now, we have our ITSA promotion video on the page, plus a few recent messages. We are not sure how and to what extent this will be used, but it was apparent by some recent and continuing requests that we be there. If you are a Facebook visitor, enjoy.

### LinkedIn Has Thermal Spray Group

The business social network "LinkedIn" has a group titled "Thermal Spray Coating" **currently with 431 members** and some discussions.

If you are interested, please visit [www.linkedin.com](http://www.linkedin.com) and join the network and then join the group.





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## CALENDAR OF EVENTS 2012

### FEBRUARY 2012

**1-4 Jeddah, Saudi Arabia** *Metal & Steel 2012* - visit website <http://www.metalsteeleg.com/metal>, email [jed-dah@arabiangerman.com](mailto:jed-dah@arabiangerman.com)

**29FEB-1MAR Houston, TX USA** *LAM 2012 Laser Additive Manufacturing* - visit Laser Institute of America [www.lia.org](http://www.lia.org)



### MARCH 2012

**11-15 Salt Lake City, UT USA** *Corrosion 2012* - visit [www.nace.org](http://www.nace.org)

**20-22 Toronto Canada** *Fabtech Canada Fabricating, Metal Forming and Welding* - visit [www.fabtechcanada.com](http://www.fabtechcanada.com)

**27-29 Los Angeles, CA USA** *Westec 2012* - visit [www.westeconline.com/2012](http://www.westeconline.com/2012)

### APRIL 2012

**9-13 San Francisco, CA USA** *2012 MRS Spring Meeting* - contact Materials Research Society, [info@mrs.org](mailto:info@mrs.org), [www.mrs.org/spring2012](http://www.mrs.org/spring2012)

**11-14 Osaka, Japan** *Japan Int'l Welding Show* - visit [www.weldingshow.jp/english](http://www.weldingshow.jp/english)

**22-25 Las Vegas, NV USA** *IBSC 2012 5th Int'l Brazing and Soldering Conference* - visit website [www.asminternational.org/content/Events/ibsc](http://www.asminternational.org/content/Events/ibsc)

**28APR-3MAY Santa Clara, CA USA** *55th SVC Annual Technical Conference* - visit [www.svc.org](http://www.svc.org)

### MAY 2012

**2-4 Mexico City, Mexico** *Weldmex Expo Industrial Mexico 2012* - visit [www.expoindustrialmexico.com.mx](http://www.expoindustrialmexico.com.mx)

**7-10 Atlanta, GA USA** *AISTech 2012 Association for Iron and Steel Technology* - visit [www.aist.org](http://www.aist.org)

**8-10 Hartford, CT USA** *Manufacturing 4 The Future* - Mfg4 visit [mfg4event.com](http://mfg4event.com)

**19-20 Galveston, TX USA** *International Thermal Spray Association Annual Membership Meeting* - email [itsa@thermalspray.org](mailto:itsa@thermalspray.org)

**International Thermal Spray  
Conference 2012  
Houston, Texas, USA  
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visit [www.asminternational.org/itsc](http://www.asminternational.org/itsc)

**23-26 St. Petersburg, Russia** *Essen Welding Pavilion* - visit [www.schweissen-schneiden.com](http://www.schweissen-schneiden.com)

### JUNE 2012

**10-13 Nashville, TN USA** *PowderMet 2012 Int'l Conference on Powder Metallurgy* - visit [www.mpif.org](http://www.mpif.org)



**11-15 Copenhagen Denmark** *ASME TurboExpo 2012* - visit [www.turboexpo.org](http://www.turboexpo.org), [igti@asme.org](mailto:igti@asme.org)



**11 JUN - 4 JUL Munich, Germany** *European Thermal Spraying Specialist (ETSS) Course* - email [slv@slv-muenchen.de](mailto:slv@slv-muenchen.de), visit [www.slv-muenchen.de](http://www.slv-muenchen.de)

**12-14 San Diego, CA USA** *Mega Rust 2012: U.S. Navy Corrosion Conference* - Teresa Denchfield [tdenchfield@navalengineers.org](mailto:tdenchfield@navalengineers.org)

**18-21 Charlotte, NC USA** *AeroMat 2012* - visit [www.asminternational.org](http://www.asminternational.org)  
**24-29 Bologna, Italy** *12th European Plasma Conference HTPP-12* - visit [www.htpp12.com](http://www.htpp12.com)

### JULY 2012

**8-14 Denver, CO USA** *65th Annual Assembly IIW International Conference* - Contact-IIW General Secretariat, email [l.durand@iiwelding.org](mailto:l.durand@iiwelding.org)

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10-11 Lumpur, Malaysia 8th Int'l Materials Conference and Exhibition IMTCE 2012 - visit [www.imtce2012.com](http://www.imtce2012.com)

### SEPTEMBER 2012

24-27 Houston, TX USA 41st Turbomachinery Users Symposium and 27th Pump Users Symposium - visit <http://turbolab.tamu.edu>

### OCTOBER 2012

9-12 Vienna, Austria Vienna-Tec - International Fair for Industry and Trade - visit [www.vienna-tec.at](http://www.vienna-tec.at)

23-27 Hanover, Germany EuroBLECH 2012 22nd Int'l Sheet Metal Working Technology - visit [www.euroblech.com](http://www.euroblech.com)

29-31 India Essen Welding Cutting Surfacing with Metallurgy India and Tube India - visit [www.schweissen-schneiden.com](http://www.schweissen-schneiden.com)

### NOVEMBER 2012

12-14 Las Vegas, NV USA FABTECH with a Thermal Spray Pavilion and Conference - visit [www.fabtechexpo.com](http://www.fabtechexpo.com)



8-9 Munich, Germany 9th HVOF Colloquium High Velocity Oxy-Fuel Flame Spraying - contact GTS [hvof@gts-ev.de](mailto:hvof@gts-ev.de), web [www.hvof.gts-ev.de](http://www.hvof.gts-ev.de)



### 2013

#### MARCH 2013

17-21 Orlando, FL USA Corrosion 2013 - visit [www.nace.org](http://www.nace.org)

#### MAY 2013

TBD Salt Lake City, UT USA Int'l Thermal Spray Association Annual Membership Meeting and Technical Program - contact [itsa@thermalspray.org](mailto:itsa@thermalspray.org)



### SEPTEMBER 2013

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

### 2014

#### MARCH 2014

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

### Scholarship Opportunities

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

**Applications are accepted  
April 15 through June 30 ONLY.**

Please visit [www.thermalspray.org](http://www.thermalspray.org) scholarship area for details and a printable application form.

### Journal of Thermal Spray Technology®

A publication of the *ASM Thermal Spray Society*  
**Enhanced Characteristics of HVOF-sprayed MCrAlY Bond Coats for TBC Applications**

**B. Rajasekaran, G. Mauer, and R. VaBen**

In this study, high velocity oxy-fuel (HVOF) and vacuum plasma spraying (VPS) coatings were sprayed using a Praxair (CO-210-24) CoNiCrAlY powder. Free-standing coatings underwent vacuum annealing at different temperatures for times of up to 840 h. Feedstock powder, and as-sprayed and annealed coatings, were characterized by scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS), and x-ray diffraction (XRD). The hardness and Young's modulus of the as-sprayed and the annealed HVOF and VPS coatings were measured, including the determination of Young's moduli of the individual phases via nanoindentation and measurements of Young's moduli of coatings at temperatures up to 500°C. The Eshelby inclusion model was employed to investigate the effect of microstructure on the coatings' mechanical properties. The sensitivity of the mechanical properties to microstructural details was confirmed. Young's modulus was constant up to ~200°C, and then decreased with increasing measurement temperature. The annealing process increased Young's modulus because of a combination of decreased porosity and  $\beta$  volume fraction. Oxide stringers in the HVOF coating maintained its higher hardness than the VPS coating, even after annealing.

**Read the entire article in the December 2011 Issue**

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

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The website "Finishing Online" ([www.finishingonline.com](http://www.finishingonline.com)) now includes "thermal spray" in an "industries" area. Everyone is eligible for a basic free listing for one year. Go to their website to register and get your free listing.

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### Scholarship Opportunities

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

**Applications are accepted  
April 15 through June 30 ONLY.**

Please visit [www.thermalspray.org](http://www.thermalspray.org) scholarship area for details and a printable application form.

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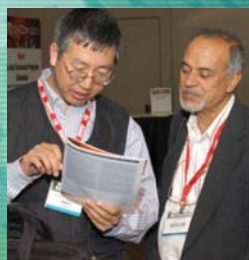
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Join the Society of Vacuum Coaters in the heart of the Silicon Valley – the economic center of American high-tech business, academia, innovation and development.

The 2012 SVC TechCon explores the latest in vacuum coating and related technologies and their role in high-tech applications. This international conference features a Technical Program with two Symposia, twelve Traditional Sessions, a two-day Technology Exhibit, a comprehensive Education Program with 26 Tutorial Courses, and a variety of networking events – linking innovation with business.



**Technical Program:** April 30–May 3 | **Exhibit:** May 1–2 | **Tutorial Courses:** April 28–May 3  
Santa Clara Convention Center, Santa Clara, California

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## FABTECH 2011 Breaks Records

The 2011 Fabtech event culminated with a total of 1,360 exhibiting companies covering an astounding 523,740 net square feet of floor space. Over 35,000 attendees made this the largest FABTECH to date!

Repeatedly, exhibitors invest in FABTECH to generate sales leads and 2011 was no different. In fact, 29% of exhibitors reported FABTECH exceeded their lead generation expectations.

Attendees came to see, evaluate and talk about new products and technologies. When buyers think about new technology, FABTECH is the place they come to see the latest and greatest available to the world.

### Audience Facts:

- 52% were first time attendees and 61% attend no other show
- 29% had job titles of corporate executive/top-level management or job shop owner
- 11% of attendees came from outside the U.S.
- 82% of visitors are involved in some way in their company's purchasing plans
- 44% indicated budgets of \$200,000 or more to spend on products and services
- 52% of attendees plan to make a purchase in the next 6-9 months.

**To reserve your booth space**, contact Joe Krall, Exposition Sales, 800.443.9353, [jkrall@aws.org](mailto:jkrall@aws.org)



## Thermal Spray Pavilion

Join the International Thermal Spray Association at the Fabtech Thermal Spray Pavilion this year in Las Vegas, NV November 12-14, 2012.



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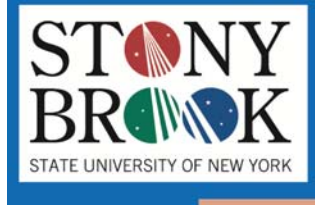


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## Focus on Center for Thermal Spray Research Students and Postdocs

The State University of New York at Stony Brook Center for Thermal Spray Research (CTSR) students continue to be sought after by the thermal spray community for internship and employment.



Over the last year, there have been many requests from member companies to hire students with exposure and experience in thermal spray technology and materials engineering. In response to this, we have taken an aggressive approach to the recruiting and involvement of undergraduate students in the laboratory enabling both hands-on learning and fundamental insights.

The Engineering Systems Laboratory undergraduate class ESM 450 developed by Professor Sanjay Sampath introduces the gas turbine system as a platform to study materials. Over the last four years more than 150 students have participated in the class which also includes a hands-on thermal spray coating and materials testing component.

In addition to the students from Engineering Science/Materials Science programs, Professor Sampath, through his joint affiliation with Mechanical Engineering,

has been involving undergraduates and graduates from mechanical engineering as well.

**Riston Rocchio** and **Sal Marino**, recent graduates of the Engineering Science program and long time interns within the Center have both received employment offers to work at GE Energy at Greenville, SC. GE Energy's recruitment team visited campus earlier this year with a specific goal to develop a strategic partnership with the Center for human resource development. Riston and Sal spent last summer as interns and will be starting full employment early next year. We wish them well in their careers and are proud of their accomplishments.

**Dr. Yang Tan**, CTSR post-doctoral associate, recently joined Alcoa Technical Center in Pittsburgh as a coatings development engineer. He received his Ph.D. in Mechanical Engineering in 2005 and worked as a post-doctoral fellow afterwards. Yang has contributed significantly to consortium efforts. We expect he will continue to be involved with the CTSR Consortium through Alcoa.

**Dr. Arash Ghabchi**, recent CTSR graduate (Sept. 2011) has joined the Boeing Company as an engineer in the thermal spray group. Arash conducted his PhD work jointly with VTT Research Center in Finland (co- advised by Dr. Turunen and Dr. Holmberg) in the area of coatings Tribology. He will work closely with Marc Froning (CTSR Consortium colleague-formerly of BASF) in furthering thermal spray applications at Boeing. Best of luck to both Arash and Marc.


**Ari Sagiv** (MS 2011) and **Adel Djam** (BS 2011) both have joined Sulzer Metco in Westbury as process engineers. Ari completed his MS thesis working with Professor Weyant in the area of Environmental Barrier Coatings, while Adel was an undergraduate intern at CTSR.

**Vaishak Vishwanathan**, a PhD student in the group was selected to received the 2011 International Thermal Spray Association graduate student fellowship.

*We wish our graduates the best for the future and are gratified by their interest in thermal spray.*


(Reprinted from CTSR Newsletter Volume 2, Issue 1)

**For more information**, visit [www.ctsr-sunysb.org](http://www.ctsr-sunysb.org)



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PEOPLE IN THE NEWS

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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.



## Christopher Pilgrim and Stéphane Berthier Receive Whittle Prize

The Aerospace Division of the Institute of Mechanical Engineers has awarded the Whittle Reactionaries Prize 2011 to two members of staff at Southside Thermal Sciences (STS): **Christopher Pilgrim** and **Stéphane Berthier**. The aim of the award is to stimulate innovative solutions to aerospace propulsion problems – to help uncover the engineers who are contributing to the next great leap.

The two award winners receive the prize for the paper entitled "Non-destructive evaluation of thermal barrier coating erosion using photoluminescence". The technology - developed and commercialised by STS - combines the advances observed in the development of today's high temperature protective coatings as they are found in gas turbines with the luminescence properties of ceramics used in TV screens or in energy efficient light bulbs. When illuminating the novel coating with UV light the coating starts phosphorescing and this phosphorescence can be used both to read temperature, detect evidence of ageing in the coating or to evaluate erosion of the coatings.

In certain operating regimes of gas turbines, particularly in environments with contaminated intake air, degradation of the coating can occur by gradual thinning from the surface leading to complete failure. Current inspection routines cannot identify these gradual degradation mechanisms. The paper describes a method based on luminescent thermal barrier coatings for the in-situ detection of gradual erosion of coatings through smart imaging technology using off-the-shelf equipment.

Dr Jörg Feist, Managing Director at STS says: 'The entire team is extremely pleased by the success of Chris and Stéphane. This prestigious award recognises the truly innovative and cutting edge technology we are working on here at STS, but furthermore shows the high quality research to which our staff is committed'.

More recently STS discovered the phenomenon that past temperature exposure can be read out when the coated component is back to room temperature. The new 'Thermal History Coating' is now the subject of an international development programme and development partners are currently being gathered.

**For more information** please go to [www.stscience.com](http://www.stscience.com) and click on 'Thermal History Coating User Club'.

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

### LinkedIn Has Thermal Spray Group

The business social network "LinkedIn" has a group titled "Thermal Spray Coating" **currently with 431 members** and some discussions.

If you are interested, please visit [www.linkedin.com](http://www.linkedin.com) and join the network and then join the group.

## Promotions at Curtiss-Wright Surface Technologies

In August Curtiss-Wright Surface Technologies announced the promotion of **Peter Ruggiero** to Regional Manager of its three thermal spray facilities located in East Windsor, CT; Wilmington, MA and Duncan, SC. Peter recently achieved his 30-year anniversary with the company, having worked for the predecessor companies (General Plasma, Engelhard and BASF ST) in a number of different marketing and operational capacities of increasing responsibility during that period. Most recently, Peter was commercial manager of the three facilities, overseeing all of the sales and marketing aspects of the business.



**Harolton Alexander** was concurrently promoted to the position of Commercial Manager, overseeing the sales and marketing activities of the organization. Harolton has extensive thermal spray coatings application expertise and market knowledge with more than 38 years in the industry. Harolton started his career in operations and has held various managerial roles throughout his career in operations, and more recently, in sales and marketing. His experiences have prepared him well for assuming the commercial manager role; and provide leadership to the operations and sales teams in developing new applications and capturing of new business for Curtiss-Wright Surface Technologies.

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

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



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