

Aerospace Industry to Qualify High Pressure Gas Quenching (HPGQ)

A recent declaration by the aerospace industry allows vacuum processors control of distortion and improved performances to alloys and cross sections. With the addition of Appendix A of AMS2759/7, High Pressure Gas Quenching (HPGQ) can now be applied to these materials, previously limited to liquid quench methods. This is a great benefit to heat treaters in the aerospace industry.

HPGQ practices have been available and successfully employed on a wide range of materials and cross sections for many years. Unfortunately, the practice has been limited in the aerospace industry due to the lack of agreement on how best to qualify vacuum gas quench methods to meet very conservative engineering standards. However, a small group of engineers and designers well acquainted with thermal processing have applied HPGQ with success, resulting in Appendix A of AMS2759/7. This amendment opens the door for heat treaters to "self-certify" the output of their particular gas quenching systems and practices. With highly controlled, industry-accepted trials, supported by examination of empirical data, heat treaters will have a record of documented HPGQ performance, crucial for successful heat treating in the aerospace industry.

Solar Atmospheres employs a wide range of HPGQ equipment to fill this growing need within the aerospace industry. Plans are underway to develop test loads and acceptance criteria (pyrometric performance, achievement of required mechanical properties,



uniformity of output, etc.) for a variety of engineering alloys. This will open up markets, and help customers satisfy growing demands for economic solutions to liquid quenching, and the problems typically associated with it.

Of course, many factors are considered in the design of a qualification scheme, and process performance will be governed by a technique sheet – the basis for how shop orders or travelers for these processes will be developed and the work controlled. This provides us with the ability to offer the customer their desired outcomes in a predictable and reliable manner, order after order, allowing Solar Atmospheres a unique market position within the aerospace industry.

New State-of-the-Art Furnaces for California and South Carolina Facilities

In a continuing effort to meet our customers' increasing capacity requirements, both Solar Atmospheres of California and Solar Atmospheres Greenville, SC have expanded their facilities to incorporate a new, state-of-the-art vacuum furnace.

Derek Dennis, President of Solar California, states, "I'm very pleased to embark on yet another facility expansion. Since opening our doors for business in January 2011, we have been fortunate enough to experience a high demand for our services. The continued growth has required SCA to continue our path of nearly non-stop expansion. We will continue to focus on processing our customers' parts in well-maintained equipment with an emphasis on quality, delivery and the highest level of customer service. Additionally, SCA is focused on reducing internal costs through continuous improvement initiatives and energy efficient practices, along with operating in a clean and green environmentally friendly manner."

Designed by Solar Manufacturing, the 12' long, car-bottom vacuum furnaces with SolarVac Polaris® furnace control systems include graphite hot zones,



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advanced dual pumping systems, dual 400HP high velocity internal gas recirculating systems, and dual furnace car loads. They are specifically designed for high performance, low maintenance costs, and energy efficient results with a reduction of CO2 emissions.

Measuring 60" x 60" x 144" deep, the furnaces are capable of processing loads up to 50,000 lbs, with a maximum temperature of 2750°F and temperature uniformity of $\pm 10^\circ\text{F}$. The pumping system can reach an ultimate vacuum of 1×10^{-6} Torr range, crucial for processing titanium and other high grade alloys. The 2 Bar (15 psig) maximum cooling pressure is suitable for Nitrogen, Argon, or Helium.

Solar Atmospheres of Greenville's Regional Sales Manager, Michael Paponetti, states, "We see the acquisition of this new furnace as key to meeting the growing needs of our customers. This provides yet another tool to lower their cost of heat treatment through economies of scale only experienced through the use of large vacuum furnaces."

The furnaces are scheduled for installation in early 2020.

Furnace Specifications include:

- Furnace Dimensions: 60" X 60" X 144"L
- Furnace Load Capacity: 50,000 lbs.
- Maximum Temperature: 2750°F
- Temperature Uniformity: $\pm 10^\circ\text{F}$
- Ultimate Vacuum: 1×10^{-6} Torr range
- Maximum Cooling Pressure: 2 Bar (15 psig) Nitrogen, Argon or Helium
- Furnace Control System: SolarVac Polaris®



Solar Atmospheres of Western PA Commissions Large Car Bottom Air Furnace

Solar Atmospheres of Western PA successfully commissioned a brand new 20 foot long car bottom furnace that has a total load capacity of up to 30,000 pounds. The Class 2 furnace, built by John Becker's Heat Treat Equipment Inc, located in Canton, Michigan, was installed and fully tested for the first time in Hermitage, PA. The 60 inch square by 240 inch hot zone envelope easily passed the stringent AMS 2750E Temperature Uniformity Survey (TUS) of $\pm 10^\circ\text{F}$ from temperatures of 300°F to 1450°F. The survey passed on the very first attempt and was put into production immediately.

This new piece of equipment will serve to compliment Solar's lower temperature work – especially where surface oxidation is of little concern. It will also be used to economically process many "downstream" processes, including multiple tempering operations, which typically follow vacuum austenitizing treatments. Pictured is the inaugural run of six 4140 rolls that weigh a total of 12,000 pounds. The rolls are used for a variety of steel making industries from forming angles to rolling rebar. The uniqueness of these rolls is that the working circumferences of the major diameters are made from Crucible Powdered Metal (CPM 9V). The consolidated powdered metal on the major diameters is Hot Isostatically Pressed (HIP'ed) and thus must be hardened. Following the vacuum austenitizing treatment at 2075°F, the rolls are quickly nitrogen quenched. It is necessary to immediately temper the resultant HRC 60 surface hardness on the major diameters. Instead of reloading back into Solar's large vacuum furnaces, the rolls are now transferred to this newly acquired air furnace for triple tempering operations ranging from 1000°F to 1150°F – thus saving valuable vacuum furnace time.

Bob Hill, President of Solar Atmospheres of Western PA states, "Today we have acquired an excellent piece of equipment that will keep metal flowing in and out of our state of the art facility. Every employee remains laser focused to achieve our ultimate goal – 100% On Time Delivery (OTD) to all of our customers. This furnace will enable us to get there."



Solar Atmospheres Promotes Mike Paponetti to Southeast Sales Manager

Solar Atmospheres South Carolina facility proudly announces that Mike Paponetti has accepted the position of Sales Manager. Prior to accepting this position, Mike was the Regional Sales Manager at our Hermitage, PA facility. Mike will lead the sales efforts to maintain and promote sales for Solar Atmospheres in the Southeastern United States and we are confident Mike will provide our customers with exceptional support.

Solar Atmospheres Southeast President, Steve Prout says, "We are excited to have Mike as a part of the Solar Atmospheres Southeast team. With over 20 years of thermal processing experience, his heat treating and brazing expertise will be a tremendous resource for our customers."

A Season of Giving!

Solar Atmospheres of Souderton PA Provides Food and Toys to Local Charities

It was a season of giving in November and December for employees of the Solar Nation in Souderton, PA. Along with Solar Atmospheres donations were collected from employees of sister companies Solar Manufacturing, MSI and VPS.

The generosity began in November with a Thanksgiving food/supply drive to benefit the Keystone Opportunity Center in Souderton, PA. The donation consisted of 800 lbs. of food, paper products and personal care items which helped supply 247 households who needed a helping hand.

The generosity continued into December with a Christmas toy drive to benefit children in need through the Pennridge FISH organization. More than 10 bags and boxes of toys as well as gift card donations were collected and delivered in time for Santa's arrival!



Solar employees Jon Schweitzer, Kim Harrison and Kristin Twardowski with the assistance of Tom Smith (not pictured) delivered the food and supplies.

Solar Atmospheres of Western PA Provides Special Christmas for Local Family

This Christmas season, Solar Atmospheres of Western PA employees once again wanted to do something special for their local community. A family was selected, on their behalf, by the West Middlesex School District. Immediately the Solar employees went to work. Their goal was to provide Dad, Mom and three beautiful girls with an extra special Christmas this year.

The sponsored family, along with the school guidance counselor, were invited to attend Solar's Christmas luncheon. At this gathering, the family was presented with new clothing, arts and crafts supplies, toys, and dolls. Additionally, the parents were bestowed with cash donations to help with the purchase of food and necessities for their family this holiday season. Finally, after experiencing a morning full of smiles and excitement, the family joined all of the Solar employees to break bread and enjoy the comradery of the holiday season.

The principal of West Middlesex High School was truly amazed at the outpouring of generosity. She stated, "Thank you thank you! I cannot express how thankful we are at WMHS for what you all did for this family. Please express my sincere appreciation to all Solar employees."

It was truly a wonderful day for all involved!



Solar Atmospheres of Western PA Appoints Tim Fish as Regional Sales Manager

Solar Atmospheres is pleased to announce the addition of Timothy C. Fish to our sales team, as Regional Sales Manager at Solar Atmospheres of Western PA.

As an Integrated Marketing Communications graduate of Duquesne University, Tim has honed his sales and marketing skills during the course of his diverse career in the metals industry. Tim brings a wealth of forging and materials knowledge while most recently serving as a Strategic Account Manager at Ellwood City Forge.

Bob Hill, President of Solar West, says, "We feel extremely fortunate to be adding Tim Fish and his talents to our sales team. Tim's prior sales experience within the power generation and aerospace arenas brings a wealth of knowledge to Solar Atmospheres of Western PA. Tim's professionalism will cultivate new and exciting opportunities for our company today and in the future."

Joining Solar as Regional Sales Manager, Tim will utilize his experience and leadership skills to maintain and promote sales for Solar in the Midwest region. We are confident Tim will provide our customers with exceptional support with their thermal processing challenges.

UPCOMING TRADE SHOWS



Easttec

May 14-16, 2019
West Springfield, MA



Rapid-TCT

May 21-23, 2019
Detroit, MI



Space Tech Expo

May 22-24, 2019
Pasadena, CA



MD&M East

June 11-13, 2019
New York, NY



Paris Air Show

June 19-25, 2019
Paris, France

This newsletter is published by Solar Atmospheres, a leader in world-class vacuum heat treating services.

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THE Spotlight

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Souderton, PA