

## State-of-the-art Vacuum Furnace for Hydriding and De-Hydriding Joins Lineup at Solar Atmospheres Eastern PA

At Solar Atmospheres Eastern PA, we process a wide array of materials, mostly to improve properties for a particular service application. That isn't the case, however, for a significant portion of our business: hydriding and de-hydriding.

Hydrogen is atomic number 1 on the periodic table of elements. It has the lowest density of all known elements. In nature it occurs as a diatomic molecule of two hydrogen atoms...H<sub>2</sub>. It is colorless, odorless, non-toxic, and highly combustible. When burned, there is no visible flame.

One of the interesting properties of hydrogen is that it may embrittle certain materials if permitted to diffuse into those materials. Further, the hydrogen may also be effectively degassed from some materials. Two such materials are Tantalum and Titanium. These two materials are valuable and extremely useful in today's world. When manufactured into their relative forms, scrap is generated. The scrap is also valuable, however it must be reduced to be effectively recycled into the desired new metal

forms. This is where Solar comes into the picture. Solar embrittles the materials, returns them to the customer, they use that brittle condition to convert the material into powder, then Solar degasses the hydrogen from the powder to return the metals to a ductile form.

Decades ago, Solar's technical team developed hydriding and de-hydriding processes that could be performed in a standard vacuum furnace. We have long-established customers for this process and perform it on a daily basis. In 2019, the demand for these processes increased such that a new furnace was required. As a part of the purchasing process for the new furnace, the opportunity was taken to add state-of-the-art design features for both safety and performance. This new furnace, HT-150, now affords Solar the capacity and performance needed to meet our customers' growing volumes while meeting their quality and on-time delivery metrics.



# Cleaner, Safer and Greener Vacuum Oil Quench Processing

A newly designed vacuum oil quench furnace will be commissioned in April 2022, at the Solar Atmospheres facility in Hermitage PA. This Solar Manufacturing built furnace has multiple advantages versus the traditional endothermic atmosphere gas-fired integral quench furnaces that are in operation worldwide.

First, since all work is being processed under a vacuum atmosphere, different alloys (consisting of varying carbon percentages) with similar austenitizing temperatures may be combined into similar loads. The utilization of a vacuum atmosphere eliminates detrimental intergranular oxidation (IGO), carburized and/or decarburized surfaces.

Another unique feature of this vacuum oil quench furnace will be the use of up to twelve work thermocouples.

This feature allows Solar to accurately record real internal work piece temperatures on every load processed before it transfers to the oil quench. Eventually this procedure will become the gold standard for the operation of all oil quench furnaces.

Finally, the number one advantage of this



new furnace is **SAFETY**. A tightly sealed vacuum chamber with a fully purged nitrogen vestibule eliminates the need for traditional burn off ports or flame curtains because endothermic protective atmospheres are no longer needed. Additionally, detrimental CO2 gas emissions

to our atmosphere will be reduced dramatically. These features alone will provide a safety culture boost to our often-maligned heat treating industry.

Contact Mike Johnson at [mikej@solaratm.com](mailto:mikej@solaratm.com) for additional information.



## Solar Atmospheres of South Carolina Receives Nadcap 24-Month Merit Status

Solar Atmospheres of South Carolina has been awarded Nadcap 24-month merit status for heat treating, brazing and carburizing. We are extremely pleased PRI has recognized Solar's adherence to strict specification requirements, flawless process execution, and a daily commitment to quality processing which is evident among all employees at Solar Atmospheres.

All Solar Atmospheres facilities, Souderton, PA; Hermitage, PA; Fontana, CA and Greenville, SC have now earned Nadcap 24-month merit status demonstrating Solar's corporate commitment to quality.

"This is the goal that all Nadcap suppliers strive for, and it's not an easy task," states Steve Prout, President of the Solar Atmospheres Greenville, SC facility. "It truly is a team effort from the employees handling our customers' products while conducting the thermal processes and testing, to the post process compliance and review. Everything must be in order and completed without issue. Our team in Greenville, as well as all our other locations, are committed to top-tier heat treating services. This 24-month Nadcap accreditation award is evidence of our unwavering commitment."



## Solar Atmospheres of California Adds Small Furnace Capacity

To support R&D and additive manufacturing projects, Solar Atmospheres of California (SCA) has added some much-needed small vacuum furnace capacity to their expansive equipment offerings. The new vacuum furnace was procured from SCA's furnace manufacturing sister facility, Solar Manufacturing (SAMI) located in Sellersville, PA, and was specifically designed to process a variety of materials between 600°F – 2400°F (+/-10°F) in both vacuum and/or partial pressure environments. Precise cooling capability up to 2-Bar in argon, nitrogen or helium is available with a maximum operating temperature up to 2650°F. The furnace is also equipped with the SAMI's state-of-the-art SolarVac® Polaris Control System for optimum performance and precise cycle control.

SCA President Derek Dennis states, "We are pleased to add this needed piece of vacuum furnace equipment to service our valuable customers. The additive manufacturing industry continues to grow, and this new furnace will allow SCA to respond to small builds and R&D projects quickly and precisely. SCA has become the go-to source for additive heat treating on the west coast and we want to make sure we are making the necessary investments to support our customers immediate needs and requirements. SCA will continue to focus on the best quality and on-time delivery with a focus on providing the best customer service in the industry. SCA has plans to add additional equipment in the future to ensure that we have the capacity available to handle the rebounding industry post-COVID."

## UPCOMING TRADE SHOWS



**Rapid+TCT**  
May 17-19, 2022  
Detroit, MI



**Power-Gen International**  
May 23-25, 2022  
Dallas, TX



**Space Tech Expo**  
May 23-25, 2022  
Long Beach, CA



**MD&M South**  
June 14-16, 2022  
Charlotte, NC



**Farnborough Int. Airshow**  
July 18-22, 2022  
Farnborough, UK



Our sales team is looking forward to seeing you at one of our upcoming trade shows. Be sure to stop by and say hello.

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

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# THE Spotlight

Spring 2022



The 12ft. furnace at Solar Atmospheres California is specifically designed to process a variety of materials that require optimum performance during controlled heating.

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