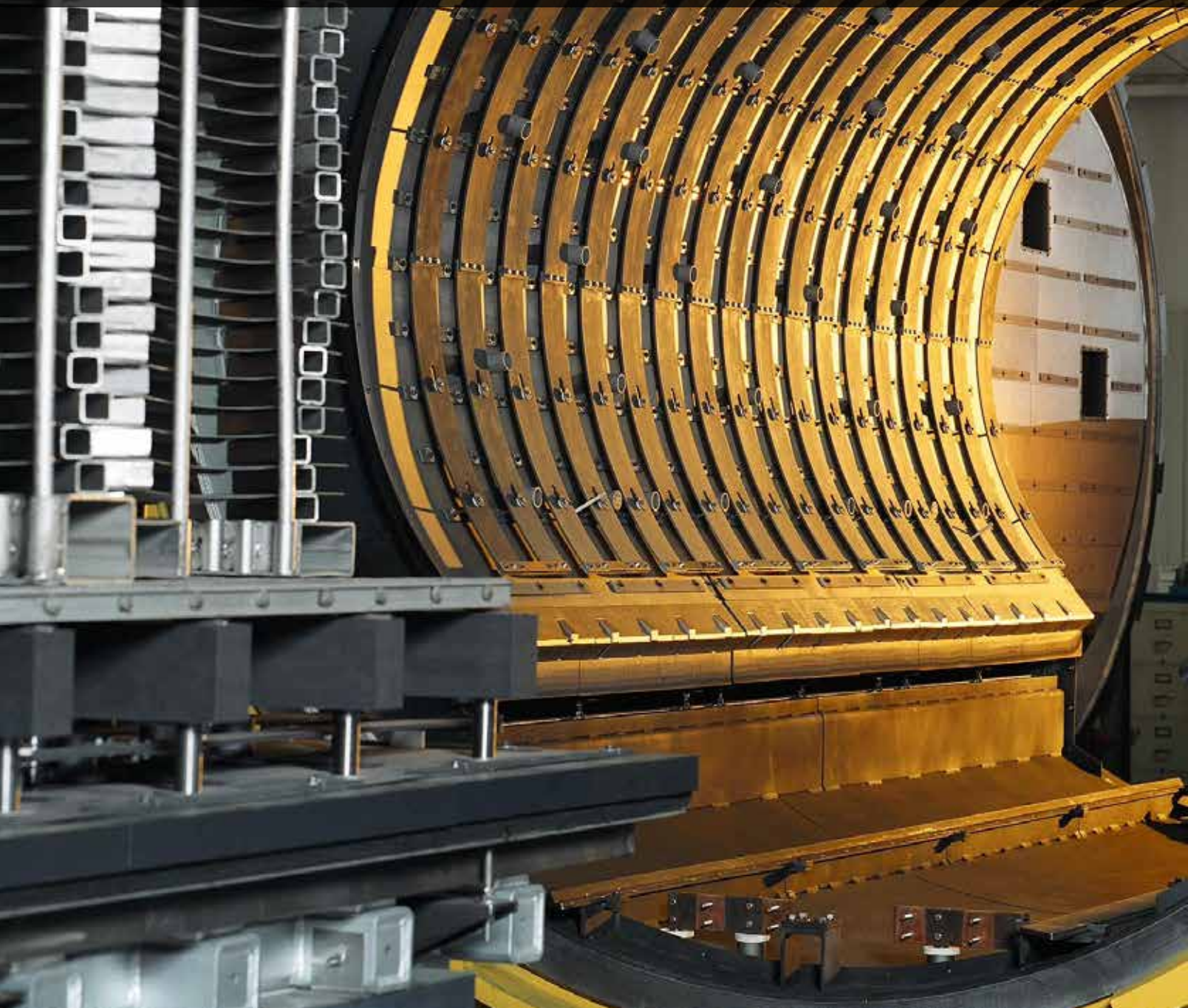




Solar Atmospheres

One of the largest heat treaters and heat treat equipment manufacturers in the country explains capabilities for gear manufacturing.

By Sherri Mabry



When William R. Jones founded Solar Atmospheres in 1983, he brought decades of experience in vacuum furnace equipment and heat-treating to the manufacturing industry. Jones realized there was a need for manufacturers and job shops to outsource the thermal processing of their metal parts and raw materials and his vision ultimately resulted in the creation of one of the largest independently owned commercial heat treat companies in the United States.

With plants in Souderton and Hatfield, Pennsylvania, and a new plant in Fontana, California, Solar Atmospheres' group of manufacturing and heat-treating companies remains a family-owned business with unrivaled sales and growth.

"My father was the founder and he remains an integral part of the company. He is my mentor," said Roger Jones, corporate president of Solar Atmospheres and its sister companies. "He started out with Abar Corporation in 1965 as a chief engineer and was promoted to vice president of operations and eventually president. Abar manufactured vacuum heat-treat furnaces. When Abar was sold my father saw a need for bringing commercial heat-treating to the industry for processing parts for OEMs. He started Vacuum Furnace Systems (VFS) and then later sold that company before starting Solar Atmospheres to expand into commercial vacuum heat-treating. In 2002, he founded Solar Manufacturing to produce vacuum furnaces specifically for the manufacturing industry and heat treaters, so we

basically came full circle in heat treating and vacuum heat treat equipment manufacturing."

With the elder Jones as CEO, Jones says the company has the potential to continue operating as a family-owned business for generations. "My two sons are also employed with Solar Atmospheres and will continue the family name."

In 1992, the company expanded into a new 24,000-square-foot facility built specifically for vacuum heat treating and brazing. Additional space was soon needed, and another 10,000-square-foot plants opened in Hatfield, Pennsylvania, to handle the company's need for brazing and ion-nitriding. Solar atmospheres Eastern Pennsylvania is located in Souderton. The heat-treat facility in Souderton consists of about 75,000-square-feet of space and is situated next door to the 85,000-square-foot plant furnace manufacturing facility.

As the customer base continued to expand, a third location was opened in Hermitage, Pennsylvania. Solar Atmospheres Western





Pennsylvania (SAWPA) was born in 2001. SAWPA is located at the center for the large vacuum furnace processing and technology market. The 125,000-square-foot facility serves customers in the aerospace, titanium, electrical power generation, and oil and gas markets.

As growth continued, SAWPA installed its second and third 24-foot car bottom furnaces, and worked with Solar Atmospheres of Eastern, PA, and Solar Manufacturing to design and install an advanced vacuum carburizing furnace, which provides repeatable carburizing results.

Together they also designed and installed a vacuum gas nitriding furnace to reduce cycle times in nitriding. Over the years the SAWPA plant has increased capacity several times and is now one of the world's largest commercial vacuum furnace facilities housing a 36-foot-long car bottom furnace with a load capacity of 150,000 pounds. SAWPA also recently received the 2012 Master Craftsman Commercial Heat Treater of the Year Award by the Metal Treating Institute.

The company's fourth location in Southern California, is a 25,000-square-foot facility in Fontana, California, and includes several furnaces including a 24-foot car bottom furnace. The Fontana plant is about 40 miles East of Los Angeles and serves many industries, including aerospace customers along the West Coast.

Solar currently employs 225 workers at four locations, and Jones anticipates that more employees will be added in the next couple years as a new facility opens in the Southeast.

"If the manufacturing industry continues to grow, we expect continued growth of 10 percent or greater at each of our facilities," Jones said. "We are now one of the top 10 heat treaters in the country. Our growth far exceeds the general heat-treating industry and our sales have more

than tripled in the past 10 years. We expect that to continue. In the next year-and-a-half we will open a new facility in the Southeast, probably in the Carolinas to meet the needs of that region."

Members of the National Association of Manufacturing (NAM) and the Metal Treating Institute (MTI), the Society of Manufacturing Engineers (SME), SAE International, and the Precision Metalforming Association (PMA), among others, Solar Atmospheres is dedicated to providing the highest standards of commercial heat treating for the manufacturing industry.

Jones said the company serves a diverse customer base which includes aerospace, automotive, power generation, medical implants and instruments, defense, electronic, fabricators and power generation with heat treating services and equipment for any size job.

"Our biggest market is the manufacturing industry," he said. "As more and more manufacturing downsizes or goes offshore, it hurts the country and the entire industry, so we are committed to supporting manufacturing in the United States. Our primary customers are automotive parts, aerospace, raw materials, metals joining and brazing and other auxiliary areas," he said. "On the furnace building side we build furnaces for companies like GE for aerospace and aircraft parts or Pratt Whitney. We also supply equipment to companies who perform captive heat-treating internally. We do heat treating for numerous customers. Our furnaces are used to perform thermal processes on micro-surgical instruments, aircraft components and many other products, in addition to vacuum heat treating, vacuum brazing, vacuum carburizing, vacuum nitriding, diffusion bonding, annealing and stress relieving."

Jones said the company works closely, particularly with helicopter manufacturers and others who need gears manufactured and thermally processed to high tolerances.

"Specifically for gearing we offer vacuum carburizing, traditional heat-treating and vacuum gas nitriding," Jones said. "The Souderton facility is the largest for heat treating of gearing and materials. Here, there are four units for vacuum carburizing of gearing material, one furnace for vacuum nitriding and four furnaces for ion-nitriding for gears and gearing. For this (Souderton) facility is the largest for heat-treating, of gearing and materials. The facilities in Hermitage and Fontana both have furnaces for vacuum carburizing used particularly by gearing manufacturers. We also conduct a lot of R&D for processing gears."

Solar Manufacturing, an affiliate company of Solar Atmospheres, offers a line of furnaces for manufacturers who have captive in-house heat-treating needs and commercial heat treaters who process parts for manufacturers without heat-treating equipment. Solar Manufacturing's line includes the HFL-EQ series of horizontal front loading external quench furnaces, the HFL-IQ series of horizontal front loading internal quench furnaces, the HCB-2EQ series of horizontal car bottom furnaces, the VBL-EQ series of vertical bottom loading furnaces, the HFL-VC series of horizontal front loading vacuum carburizing furnaces, the HVN series of horizontal front loading vacuum gas nitriding furnaces, and the VTL series of vertical top loading vacuum furnaces.

A successful history of heat treating paired with experienced engineers, metallurgists and others allow its affiliate companies of Solar Manufacturing to produce the most technically advanced and highest performing furnaces available.

"With over 40 different vacuum furnaces operating 24/7 at Solar Atmospheres, our employees at each location are constantly providing feedback to Solar Manufacturing and the companies work together to improve performance and processes," Jones said. "Together, along with customer collaboration, we have developed new designs for graphite insulation, curved graphite heating elements, tapered gas nozzles, high velocity gas quench system and energy management procedures."

The HFL-IQ model is a horizontal front-loading internal quench, vacuum heat-treating and brazing furnace designed for high production commercial and captive heat-treating shops. It offers electric resistance heating elements and energy efficient graphite insulation for high temperature applications up to 2650° F and quench pressure to 20 Bar.

The HFL-EQ series is a horizontal front loading, external quench, vacuum heat-treating and brazing furnace for high production commercial and captive heat-treating shops. With a variety of work zone sizes and external gas quenching for rapid cooling at positive pressures up to 10 Bar 134 PSIG, the model is fully automated with programmable industrial controls.

The HCB-2EQ model is a horizontal, car bottom, vacuum furnace for large, heavy loads. It is a high-temperature, high-vacuum batch furnace with electric resistance heating elements both in the circular hot zone and a full length of the car bottoms with front and rear hinged autoclave-type doors for loading and unloading from both ends of the furnace. This dual high performance external gas quenching system provides high velocity, 2 bar cooling of large workloads.

Carburizing furnaces in the HVC-3872-101Q model is a horizontal front loading, internal quench, vacuum carburizing unit that is designed for high production commercial and captive heating shops, while the HFL-3648-LT is a horizontal front loading vacuum gas nitriding furnace with electrical resistance heating elements for commercial and captive shops.

All Solar Manufacturing's vacuum furnaces are designed for high production commercial and captive heat-treating shops. They offer electric resistance heating elements and energy efficient graphite insulation for high temperature applications up to 2500° F. Each series of furnace models offer a wide variety of work zone sizes and two gas-quenching configurations (external or internal) for rapid cooling at positive pressures up to 285 PSIG (20-bar). Vacuum pumping systems are geared to provide the vacuum levels required by the customer and designed in the configuration to suit their facility space.

All Solar furnaces are provided with fully automated programmable logic control systems. Customers can select from three platforms of the SolarVac™ interactive control systems allowing furnace operators to control and monitor all furnace functions through an industrial-grade, color LCD touchscreen operator interface with custom displays. Whether the customer chooses the base SolarVac 3000™, the SolarVac 4000™ or the PC-based SolarVac 5000™, all control systems provide recipe storage, alarm management, data acquisition and reporting functions.

All production vacuum furnaces offer high-temperature, high -vacuum performance with circular hot zones and a hinged front door for easy loading and unloading (some models include a rear hinged door).



Laboratory furnaces are designed for research and development applications in laboratory or university settings. They are high temperature, high vacuum, and batch-type furnaces with hanging heating elements of graphite or molybdenum for rapid, uniform radiant heating and available forced gas cooling. The entire furnace is mounted on a compact, heavy-duty steel platform for restricted space.

Other Solar Manufacturing products include replacement hot zones, a full line of aftermarket spare parts to keep furnaces running, and on-site technical service to maintain and troubleshoot furnaces when needed.


According to Jones, Load trucks from 7,500 pounds to 20,000 pounds and Conservac Microprocessor Controls are also available, in addition to aftermarket and spare parts.

"We also have a large R&D department where we work with our customers to develop processes and models," he said. "Having a R&D metallurgical engineering services department is unusual for a commercial heat treating company, and it is a great value for us and for our customers. We have an onsite metallurgical laboratory for complete evaluations of any heat treated materials and the lab is staffed by our project engineer and a dedicated technician and metallurgical and chemical consultants to provide the highest standard of the treatment and behavior of metals under thermal processing. With our experience and knowledge, we can optimize heat treatment processes to obtain the desired material properties for individual heat treating requirements."

Jones said the company's R&D department also does the work for its customers in a production area or the customer might buy a piece of equipment and do the work themselves.

"As members of the Metal Treating Institute, the Souderton facility is number one in sales in its district and has been number one for the last 10 years," he said. "As commercial heat treaters you look at critical levels of success in relation to everyone else. Nationally this facility is in the top 10. Our facility in Hermitage is number two in its district in the Midwest and the California facility is still in its infancy, but has a good share of the market for the West Coast."

Part of the company's commitment to excellence includes continuous updates to processes and system in accordance with ISO9001 AS9100. Solar is Nadcap accredited for aerospace component heat treating, and complies with industry standards and specifications for AMS, AWS and International Traffic in Arms Regulations (ITAR).

"Our mission is to add value to our customer's operations in thermally treating parts in a vacuum environment," Jones said. "Our customers come to us because they trust that the company has the capabilities and expertise to meet their specific needs, even when the customer isn't exactly sure what they need." 

FOR MORE INFORMATION: visit www.solaratm.com, call 1-800-347-3236 or email info@solaratm.com.