

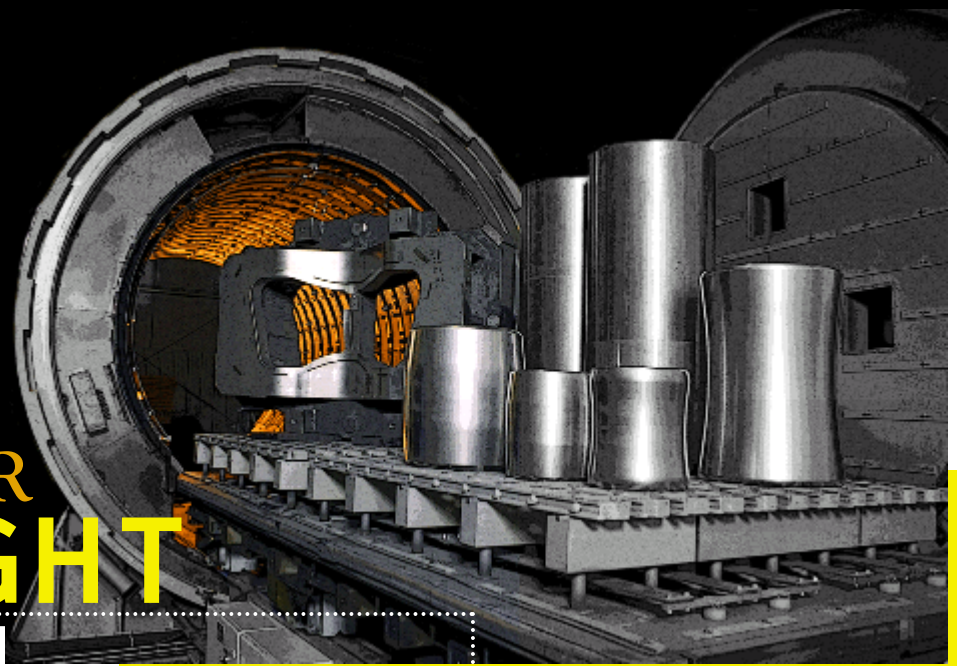
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THE SOLAR SPOTLIGHT



A QUARTERLY PUBLICATION BY SOLAR ATMOSPHERES

BOEING CHOOSES SOLAR FOR THE DREAMLINER 787

Solar Atmosphere's 24 foot vacuum furnace had caught the eye of Boeing's project managers. Boeing had a very specific need to process long titanium components for its new commercial jet, the 787 Dreamliner. After initial prototype testing, it was not only the 24 foot furnace's capacity that impressed Boeing, but the programming skill and furnace cycle controls that have made Solar a steady vendor for the new airline project. Boeing and Solar personnel have developed cycles and procedures to meet stringent quality specifications that have greatly contributed to the 787's production goal of a 2008 delivery.

The new Dreamliner is truly a revolutionary plane with the most innovative air travel engineering design changes in several decades. A major priority of the design is passenger comfort. Quieter interiors, larger win-

dows, improved on-board atmosphere and more leg room are features that will make air travel much more pleasurable in the 21st century. The comfort innovations are matched by better fuel economy from improved aerodynamics, more fuel efficient and quieter jet engines (environmentally friendly) with a lighter and stronger plane structure.

It is the lighter and stronger plane structure where Solar contributes to the Boeing project. Moving from the standard aluminum structure and skin, Boeing is using lightweight and high durable composite technology that has been used in military planes for the past decade. Compared with current airliners, the composite technology enables an increased cargo revenue capacity by 40% to 60%. Since titanium and composites form a noble bond to each other



A concept drawing of Boeing's new 787, The Dreamliner

(with zero corrosion), the plane's titanium structure forms the aerodynamic shape for the composite material that covers a high percentage of the plane.

Solar is heat treating titanium structural members in its 24 foot furnaces. Because the company invested in the development of large furnace technology and processing skills over the past fif-

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PART THREE: EFFECTIVE MANAGEMENT

Three criteria are critical for managing a business partnership: investment, communications, and trust. Investment shows commitment, communications sustain the commitment and trust is earned through consistent and responsive service. In other words, successful outsourcing is more than a contract; it is a relationship built on a mutual commitment to achieve business objectives.

The partnership enables the outsourcing company to take advantage of the investment made by the heat treater in new furnaces, equipment, personnel, quality systems and other business activities. This investment comes from a mutual commitment to attain the outsourcing company's business objectives. Investment objectives vary with each customer. Tighter quality standards, developing new cycles, quicker turnaround or other options are the goal of a heat treating company that responds to a customer objective.

To reach objectives, investment to innovate is critical. Joseph Schumpeter, an economist from the early 20th century, made the point that innovation, not price, is the primary stimulus to the growth in the free market economy. Appreciation of his analysis has grown in today's market economy. This means that outsourcing companies need to carefully consider just shopping price. What is most critical is to find an innovative company that invests in helping attain business objectives. By shopping price, actual costs, because of poor quality or the lack of a resourceful partner, may result in the loss of market positions in a competitive environment.

This is an important evaluation point on establishing an on-going relationship. It distinguishes the heat treating partner who invests to provide better and more efficient services. The heat treating partner invests to provide advantages through "leveraging best practices, knowledge, reducing costs by getting access to technology" [Jay Whitehead]. All of these factors should be motivators in

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SOLAR TAKES ON THE LASER ENERGETICS CHALLENGE

The Laboratory for Laser Energetics (LLE), University of Rochester, is an important customer of Solar Atmospheres brazing division. Projects take on a special importance for a number of reasons. A case in point is the brazing of large, stainless tables to position optics for the world's largest laser. Specifically, this work is critical for scientific research to develop fusion capabilities that may alleviate the world's energy crisis. Needless to say, as with most new projects, there is an assortment of challenges.

Sales Director Mike Drakeley has overseen Solar's brazing of the laser optic tables. As a totally new type of work, the very large assembly (11.3 feet long x 5.5 feet wide x 2 feet high), required unique fixturing and many procedural developments dur-



ing production.

The components are two large 300 series stainless plates, the length and width of the assembly, with a 2 foot high diamond shaped, honeycomb type structure sandwiched between the two plates. Since the diamond shaped internal structure is too small an area to weld, with two plates limiting access, vacuum

(CONTINUED ON PAGE FOUR)

SOLAR BUYS TWO CAR BOTTOM FURNACES

As Solar Atmospheres continues to expand its heat treating business, new furnaces must be built to keep up with the demand. Increased production loads from titanium, petro-chemical, aerospace, and industrial customers have led Solar to purchase a third 50,000 lb. capacity, 24' deep, car bottom vacuum furnace that will be installed in Solar's Western PA plant.

Designed and built by Solar Manufacturing, the furnace is high vacuum, pumped with dual 48" high vacuum valves and 35" Varian high vacuum diffusion pumps. With a combined pumping capacity of 100,000 Li/sec, the specialized furnace has the ability to fully degas materials like Ti6-

AL-4V into the low ppm range. High vacuum performance is in the low 10^{-5} Torr range at process temperature.

Roger A Jones, Corporate President, also announced the order of a fourth car bottom vacuum furnace, with the same specs as previously mentioned. According to William R. Jones, CEO, "Solar is currently looking for a plant site in southern California as a home for this fourth furnace, specifically to service the aerospace and related markets." This market placement will undoubtedly see the need for more furnaces in the future and the growth of the largest independently owned vacuum heat treater in the USA. ☀️

CUSTOMER CONFIDENTIALITY AGREEMENTS

By Ken Bauhof, Vice President of Special Projects

An often quoted phrase from the difficult days of World War II is, “loose lips sink ships”. The implied message analogy is just as true today regarding confidentiality in doing business between companies. Companies that Solar Atmospheres does business with have spent substantial sums of investment dollars to research, develop and put into production new products in a very competitive marketplace. These companies do business with Solar Atmospheres with the expectation that confidential information regarding their products, plus the thermal processes that Solar Atmospheres provides, will remain confidential.

The concept is similar to what you would expect of your doctor or from an attorney who knows your detailed medical or legal situation. This does not mean that your doctor or attorney will not draw upon his general overall experience with other patients or clients to be able to better help you, but in doing so they do

not share with you the specific confidential information pertaining to actual patients or clients.

Solar Atmospheres often formalizes its basic policy of customer confidentiality by entering into an agreement with its customers, whereby our respective companies sign a written agreement. These agreements are typically referred to as “Confidentiality Agreements” or simply “Non-Disclosure Agreements” (NDAs). When a customer approaches Solar Atmospheres regarding the feasibility of developing a thermal process to be utilized in the production of their product, the customer needs assurances that we will not share the customer’s confidential information with any third party.

As an example, a customer’s confidential information may consist of marketing plans, technical trade secrets, production capacity or financial status. The prospective customer feels more comfortable sharing confidential com-

pany information with Solar Atmospheres once the NDA is signed.

Because Solar Atmospheres shares its own thermal process trade secrets, which are a value in our effort to help our customers with processes for their own products, we prefer to sign mutual NDAs that protect the confidential information of both parties equally. This mutual approach to confidentiality between two different companies is a good confidence-builder at the front end of any business relationship. It’s a good indicator of the mutual trust that is required for any truly successful and enduring business relationship between companies.

For additional information on customer confidentiality at Solar Atmospheres, or a sample of a mutual non-disclosure agreement, please contact Ken Bauhof at jkb@solaratm.com or 215-721-1502, ext 354. ☀

A PUBLIC SERVICE: “MIKE, THE BOAR SLAYER”

With his rapid fire quips, even long meetings with Mike Drakeley present will always have a good laugh or two. However, it was another kind of boredom that Mike stopped in its tracks to perform a unique public service.

Boars (wild pigs) are environmental problems for up-state Pennsylvania farmers. According to an AP report, “Wild boars continue to wreak havoc on residential property and game . . . The game commission officials want their populations to be limited because of the personal property destruction left in their trail.”

Well, it is not as valiant as slaying dragons, but “Mike the Boar Slayer” did his act of public service by downing a 325 pound boar after Thanksgiving. With a hide as tough as they come, the prickly haired beast will no longer bring destruction to the forests and farmland of Tioga County. Mike thought the animal was a bear at first sight, but it was a boar, so he had the last laugh, again.

BOEING DREAMLINER (con’t from page one)

teen years it made Solar the right supplier, in the right place, at the right time for Boeing. The Western PA crew is continuously working with Boeing engineers to develop the cycles needed to achieve demanding part specifications. Using the 24



foot furnaces with extensions up to 36 feet long is the evidence of the part size. So the heat treating

process not only had to achieve metallurgical specifications, but dimensional stability over the length of the parts. The knowledge and understanding of the Boe-

ing engineers, coupled with Solar’s furnace capability and processing expertise, have helped to make possible

this massive undertaking that advances American aerospace engineering. ☀

SCHOOL GROUP VISITS AND TOURS

(con't from page two)



Thirty-five students visited Solar from Williamson's Trade School, Media, PA. Don Jordan gave them an overview of vacuum heat treating, brazing and carburizing technology and processes. Plant tours followed Don's talk. ✨

brazing is the best alternative for joining.

The 5000 pound tables need to be level and stable to provide absolute accuracy for the optics that will simultaneously aim several laser beams at a single target. If all this sounds very hi-tech, the irony is that the targets are held in place by spider webs. For their gauge size the webs have outstanding strength. A news film on the project claims that a spider web strand, the diameter of a pencil lead, could stop a 747 commercial airliner.

The size of the brazed assembly is only one of the challenges for this job. The stainless plates will be 2.5 inches longer at brazing temperature! Consequently, when Solar's newest 12 foot furnace is heating up, all 8 part thermocouples must be reading no more than 125° F difference. Assembly temperature uniformity is critical to prevent distortion.

There are several reasons why Solar took up the LLE challenges. First, an important attribute of any service company is to assist customers in accomplishing their goals. Solar is the first to admit we cannot do everything and will refer work to other companies when necessary. However, even if a job takes a little sweat and we can see our way to the end, Solar will "accept the challenge."

A second reason for tackling difficult work is to push our knowledge and processing capabilities to a new level. Solar is always learning and developing its heat treating, brazing, nitriding and carburizing skills. This kind of work is a great stimulus to Solar's research and development department. A unique job tests Solar's metallurgical, furnace, processing and engineering skills.

It is a credit to Mike Drakeley's understanding of brazing and the shop heat treating / brazing team that have brought this project to a successful conclusion.

Challenging projects come from numerous university and national R&D laboratories as well as our customer base. On the Solar web site, www.solaratm.com, under "About Us" is a link to the R&D efforts, government and university. In many ways this page symbolizes the pain and wisdom that Solar gains by "accepting the challenge." ✨

COMPANY SERVICE AWARDS

Service awards are a staple for the annual company banquet. Their significance can be debated, but they are at the very least a tribute for showing up for work. However, years of perseverance in that effort signifies a number of things. First it says something about a person's commitment and ability to contribute to a company. At Solar, as in most growing companies, perseverance requires an ongoing contribution.

Secondly, service awards are a statement on the company's commitment to the worker. In an era of low unemployment, having people stay means that the company is investing in their skills as well as treating them well. Service awards symbolize the biblical statement, "do unto others as you would have them do to you," which is a fundamental value for success in today's free market economy.

Congratulations to all who have received awards.

Solar Atmospheres – Eastern PA

Jim Hotz – 20 years
Al Barndt – 15 years
Bob Lacock – 15 years
Glenn Slotter – 10 years
Mike Moffit – 10 years
Melissa Delgado – 5 years
Don Jordan – 5 years
Harry Ortwein – 5 years
Richard Yu – 5 years
Kim Brown – 5 years

Solar Atmospheres – Western PA

David Kapsewich – 5 years
James Reinhart – 5 years
Rod Schilling – 5 years
Michael Johnson – 5 years

Solar Manufacturing (includes years of service at VFS)

Rick Jones – 25 years
Bob Daley – 10 years

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SUCCESSFUL OUTSOURCING *(con't from page two)*

competition. You could say that investment in quality, office, management, production procedures and equipment systems is critical to effectively provide the service of heat treating and associated processes.

As discussed under *Partnering for Successful Outsourcing*, communications between outsourcing companies and a heat treater must occur, continuously, on several levels. However, in the heat treating industry, the primary line of communication must be sales and customer service. Through the expertise of sales engineer's consultation and guidance, from the RFQ response through cycle development or processing practices, this is critical to make the best decisions.

New work will always have challenges. Tim Steber, Regional Sales Manager at Solar Atmospheres, stated that "every job has its own personality," and working through the "getting to know you phase" requires personal attention from the salesperson. Once the best heat treating and quality practices have been established, processing improvements can be explored through cycle changes, new furnace capabilities, fixturing modifications, and all require on-going communications. In the heat treating business, the sale is just the start of a salespersons job.

Communication is perhaps the greatest chal-

lenge in any relationship, but the advent of electronic data collection systems greatly assists in the effort to acquire and share processing information. Digital charts, which are much more readable, can provide information in a much more timely and convenient manner. However dedicated customer service people, including the quality team, is central to develop the next phase of managing the outsourcing partnership - trust.

A requirement, in response to the "losing control" of the parts by outsourcing companies, is for heat treaters to not only provide consistent performance, but communicate the progress and results of the work. If handled well, the heat treaters response to processing and turnaround questions builds trust. The key is to provide a timely, frank and honest response. Joseph Schumpter, in his analysis of a free market economy indirectly contends that honesty is the critical element.

Not all marriages work and the outsourcing company may have to settle for just having a service provider or pull the work in-house. In essence, the outsourcer and heat treater will need to have similar values. That is, matching the heat treaters practices with the business objectives of the outsourcer. ✨

The Mission of Solar Atmospheres is to add significant value to our customer's operations by thermally treating parts, principally in a vacuum environment, with an unwavering commitment to honesty in all relationships.

Guiding Philosophy

We will strive to fulfill this mission while

- ◆ *performing our work with an emphasis on quality and responsiveness*
- ◆ *Operating with an awareness and appreciation of the value of our customer's parts while in our care*
- ◆ *Forever looking "forward" in the area of technical capabilities*
- ◆ *Demonstrating a willingness to "accept the challenge"*
- ◆ *Providing and maintaining a work environment that is safe, clean and reflects our respect for human dignity.*
- ◆ *Providing our employees with an opportunity for personal growth, challenge and reward*
- ◆ *Maintaining a workplace that is environmentally friendly*
- ◆ *Sustaining long-term growth and profitability*

ALUMINUM PROCESSING

According to a report in *Forbes*, Dec., 06, the use of aluminum will triple from current levels by 2020. This metal is definitely a growth market. For years Solar has regularly heat treated 6061 aluminum tubing and small cross section parts to a T6 condition. The aluminum is solution treated in a vacuum furnace then pressure quenched in helium gas (in place of water) followed by aging to attain T6 or near T6 properties. The pressure quenching process offers the advantage of minimized distortion. This is very helpful for manufacturers that have spent a great deal of time

straightening or scraping parts that are distorted beyond use.

Solar is now marrying its heat treating experience with brazing of aluminum components. This is a new and developing process. Sales Director Mike Drakeley is motivated to pursue this new service by the weekly phone calls from those looking to minimize distortion by vacuum brazing.

Brazing aluminum components changes the 6061 aluminum to condition O. One of the challenges is to return the whole as-

sembly to the T6 condition in the brazing cycle while minimizing distortion. With controlled quenching experience when heat treating aluminum, Solar has the confidence to braze aluminum components.

After initial success, Mike is hopeful of expanding the applications of this technology at Solar. If you would like to discuss vacuum brazing aluminum components, give Mike a call (extension 203) or email him at mjd@solaratm.com. ✨



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"He that gives good advice, builds with one hand; he that gives good counsel and example, builds with both; but he that gives good admonition and bad example, builds with one hand and pulls down with the other."

- FRANCIS BACON

Upcoming Trade Shows...



Medical Device
Puerto Rico Feb 1&2
Booth # 1610



Anaheim, CA February 13-15
Booth # 3734



Design 2 Part
King of Prussia, PA
Booth # D14



Springfield, MA May 22-24
Booth # 2100