

The



# SPOTLIGHT

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A QUARTERLY PUBLICATION BY SOLAR ATMOSPHERES

NOVEMBER 2004

## Medical Devices

Daily heat treating and brazing for the medical manufacturing industry is an important activity at Solar. Medical manufacturers highly value the clean, bright finish of the vacuum heat treating and brazing process. Yet, most critical are the numerous metallurgical requirements that vacuum processing achieves for the practitioners of medicine.



Joint implants are homogenized and solution annealed.

The cardiologist requires specified tensile strength to successfully manipulate the heart wire during catheterization. 420 stainless steel surgical knives need the correct sharpness that results from hardening and tempering. HIP (hot isostatic processing) joint implants attain the correct microstructure to increase part life with a homogenization and solution

heat treatment. Stainless steel heart stents are annealed to attain the metallurgical characteristics necessary to keep arteries open.

Other medical devices Solar heat treats include dental instruments, medical tubing, pacemaker terminals and encasements. Orthopedic rod and plate implants made from



Harden and temper stainless steel surgical instruments.

for the treatment of prostate cancer.

Solar regularly brazes critical and intricate gas chromatograph sub-assemblies for medical research and testing (seen on the lab scenes for the TV show, CSI). Solar supplies brazed assemblies that are leak tight and clean with non-corrosive joint areas that have consistent metallurgical integrity for long-term usage.

Solar services a broad spectrum of parts for the medical device industry. Even with the advancements and availability of various non-metallic materials, metal medical devices are continually in use. As alternative materials such as polymers have become available in the medical device industry, it should be noted that metallurgical developments also continue. This means that metal alloys are developed for specific and appropriate applications. Titanium usage continues to expand. Age hardened 17-4 PH stainless steel is essential for strong, non-corrosive implants. Metal instruments have a niche in the

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## Extra Safety Precaution

As in most companies, Solar's effort to improve safety is an on-going task requiring analyzing problem areas and taking actions to prevent injuries. Solar's Safety Committee, headed up by Ken Bauhof, General Manager for the Keystone Plant, meets monthly to consider suggestions by company personnel.

Solar continually evaluates our operations for places where an individual could possibly be injured. A suggestion was made to improve the safety of open doors on Solar's air tempering ovens that workers need to reach under in order to load and unload parts. What if the chain that holds the door open broke? Is there a back up so the door would not come tumbling down? Solar has several furnaces with similar doors.

Jim Hotz, Plant Foreman at Solar's Keystone plant, with fifteen years service, developed a safety system for the air-tempering furnace door. The system is an automatic doorstopper to hold the door open if the chain holding it up were to break. A spring loaded pin rod will be released under the door each time the door is raised. The safety assembly is mounted to the furnace to prevent the door from falling (see picture).



Solar is an active participant in the on-going "Safety First" industrial culture that has been developing over the past fifty years and encouraged through the OSHA requirements. In fact, Solar is in the process of qualifying for the OSHA PVV program that certifies a company as having met the requirements for a safe working environment. This program includes employee training and constant evaluation in order to exceed requirements for the safest working environment possible.

This is Solar's goal, as it should be, in order to fulfill a major point in the company's *Guiding Philosophy*, "maintaining a workplace that is environmentally friendly." Environment is not just the air and water, but the protection of those who work for Solar.

## Vacuum Carburizing

At the Furnaces North America show and exhibition, Bill Jones gave a report on Solar's progress in the development of vacuum carburizing. The process hardens the surface of parts and tooling for improved wear life. The hardened case is deep and offers extended wear life for many applications including gears and shafts. For the past six months the Solar Vacuum Carburizing Team has made significant development progress.

Solar's strategy is to construct an experimental vacuum carburizing furnace, perform actual test runs, become intimately familiar with the vacuum carburizing principle and have Solar Manufacturing design and construct a state-of-the-art carburizing vacuum furnace. A number of service companies currently offer vacuum carburizing, but with Solar's expertise in vacuum and metallurgy, we believe that a unique contribution can be made to the processing technology.

At Furnaces North America (FNA), Bill Jones' report gave specific details on Solar's technical progress in order to offer this process to our customer base. Although there are always new things to learn and ramping up to a production capability will take some time, Solar has been able to successfully vacuum carburize parts with excellent quality. The benefits include: uniform case development, ability to penetrate holes and recesses, less part distortion, reduced or elimination of final machining and clean parts.

The Solar research and development team for carburizing includes Harry Antes, Ph.D., Consultant; Bob Hill, President, Solar Atmospheres of Western PA; Trevor Jones, Project Engineer; Don Jordan, Vice President of Heat Treating; Ken Moyer, Consultant; and Nick Trivic, Research Engineer



Bill and Trevor Jones operate the experimental vacuum carburization furnace built at Solar.

## A Race Car Story

Many people are aware of the high demands and stresses that are put on automotive parts. The precision that goes into the manufacturing for this industry is very high along with the testing that is performed before parts are put into usage. Imagine for a moment if your company only produced automotive parts for high performance engines. That's exactly what Jesel Valvetrain in Lakewood, NJ does every day.

The next time you see a NASCAR or any other high performance vehicle, chances are you will see the Jesel sticker on it. Professional auto racers and mechanics have learned that the parts from this company are the ones they trust and rely on.

Many steps are taken to assure that the final product from Jesel is of the highest quality. As with many quality items the first step is the idea. Jesel has on staff many machinists who also are very involved with the original concepts. The owner, Dan Jesel, has three machinists who work directly for him, bringing his ideas and concepts to a working part. After the idea is born, the staff metallurgist gets involved with the material selection and choosing (or writing) an appropriate thermal cycle. This step is very critical. Where many competitors would choose a material that provides the minimal quality specification necessary to perform the required task, Jesel selects material that will perform above and beyond the requirement.

After the new design, material selection and thermal cycle has been decided, the parts are produced and sent out for heat treating. Solar has enjoyed providing the vacuum heat treating service for the majority of Jesel products. The relationship has grown over the years into a partnership that is an asset to both companies. The thermal processing provided truly does add value to the parts, a perfect example of the mission statement here at Solar.

After heat treating, the parts are returned to Jesel where finish machining is performed to the highest tolerances for automotive applications. The final step is assembly. Some steps are now done

through automation, but many parts are still hand assembled by highly skilled technicians. On a recent visit, I was told there are some NASCAR drivers who personally select which of the technicians work on their parts.

After this final step, parts are packaged and delivered to drivers and mechanics all over the world. Jesel parts can be found in Formula race cars, NASCAR vehicles, street cars and motorcycles (look for the new Harley-Davidson Jesel line). Solar is proud to be a part of the highest quality automotive parts available, and appreciates having Jesel Valvetrain as a customer.

Scott Nyce, Regional Sales Manager

### Medical continued from Page 1...

medical industry and metallurgical science continues to improve their effectiveness. Additional advantages Solar provides for the medical manufacturing industry are:

- Certified charts for heat treatment cycles
- Fluxless brazed assemblies
- Full lot integrity and traceability
- White glove handling of critical parts



10 foot heart wires are regularly annealed at Solar.

At Solar the medical market has been increasing 10% per year in sales dollars as well as the number of customers serviced. In addition to servicing medical manufacturers directly, a good percentage of Solar's medical work comes from tubing manufacturers, stamping houses, titanium manufacturers and job shops who service the medical industry. Needless to say, for the advancement of medical instruments, the use of vacuum heat treating and brazing has an important role.

## Scott Nyce - "Liberty Bell" ASM President

In the past decade Solar has had the honor of providing four chairpersons to serve the local Liberty Bell ASM Chapter. This includes Roger A. Jones, Robert Hill, Don Jordan and now, Scott Nyce. Scott has been Vice Chairperson the past year and prior to that had successfully overseen the young member development program. Solar's Regional Sales Manager received the reins for leading the local chapter last May and has a vision for the advancement of ASM.

Scott sees his role in the next year as not only overseeing the chapter programs, but continuing his leadership in aggressively involving student involvement in ASM. The Philadelphia area is fertile ground for this objective with materials departments at both Drexel University and University of Pennsylvania.

To help accomplish this task there will be a joint effort with Drexel to have a week long Materials Camp the summer of 2005 for high school students. The camp, to be held at Drexel University, will introduce high school students to the materials science. In addition to this student outreach effort, the ASM Young Members Committee, along with Materials Resources International, based in Lansdale, PA, will be sponsoring an essay contest for high school students on the significance of materials science in their lives.

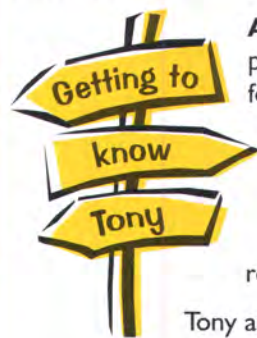
To state the obvious, this year is not a caretaker year for the Liberty Bell ASM Chapter, but a year of development focused on encouraging student involvement in materials science. Scott's past and current leadership has made the Liberty Bell Chapter a model for other chapters in the USA.



Scott Nyce receiving the gavel from Jim Waters, the 2003-2004 Chairperson.

### Getting to Know

The growing Solar family has two new employees that have already made significant contributions to the daily servicing for our customers.

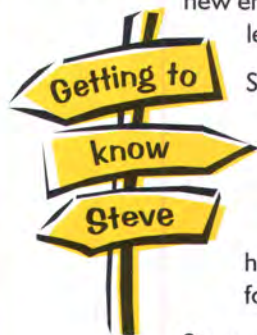


**Anthony Wolf**, "Tony", a new furnace operator started in April working on the third shift at the Souderton plant. You might call this shift the "clean-up crew" since many of the previous day's orders are completed for the Solar trucks that will head out to make deliveries in the morning.

Dan Barszcz, his group leader, and Don Jordan, VP of Heat Treating, have described Tony as a very hard worker and appreciate his efforts to finalize many of the heat treat jobs. "Cleaning up" is not a new role for Tony. Having come from Servicemaster of Bux-mont, Tony has been trained to supervise cleaning, in particular, commercial carpet maintenance and installation. His training also includes water and fire restoration.

Tony and Denise live in Green Lane and are rearing a four year old son, Austin. They are expecting a girl, due October 31<sup>st</sup>. Tony's favorite activities include swimming, martial arts and to relax he enjoys video games. Tony grew up in both Bucks and Montgomery counties.

**Steve Schmitt** and Tony work together as furnace operators on the third shift at Souderton. We might say Steve is no longer a new employee since he started work in April of '03. However, he knows that there is always something new to learn when heat treating metal parts and assemblies.



Steve and his new bride, Peggy, live in Allentown although his roots are in Kentucky. Actually Steve and Peggy were married about the time Steve came to Solar, but Steve still considers them newlyweds. Steve married the girl next door since they both lived in the same neighborhood in Allentown.

The "newlyweds" have a couple of activities that make their life interesting. First is the 1982 "Harley" Sportster on which they enjoy cruising to visit the local sites. Recently they toured the Harley Davidson headquarters in York, PA, but Steve was disappointed that the heat treating area was closed off. Another focus of their relationship is caring for two Dobermans that they enjoy, most of the time.

Steve spent 10 years in the Navy, traveling up and down the Atlantic Coast on a frigate. He misses his "Olde" Kentucky home, but after 10 plus years of traveling he is glad to finally put some roots down with Peggy in Allentown and at Solar.

## *The Object of Thanks*

Throughout our nation's history, time has been set aside to give thanks, quite often in the midst of adversity. The Pilgrims set the standard and our Founding Fathers called for times of thanks during the revolutionary period. Abraham Lincoln established the last Thursday of November to give thanks to God. These men understood that thanksgiving marks our existence as more than just passing events, but a recognition that there is providential governance of the nation and our lives. The importance of thanksgiving marks our relational dependence upon the Creator and opens our eyes to see the good that surrounds us, even in difficult circumstances. It could be said thanksgiving enables hope to exist in our lives.

Lincoln makes this point in his Thanksgiving Proclamation amidst the great and terrible Civil War, which included these words:

The year that is drawing towards its close, has been filled with the blessings of fruitful fields and healthful skies. To these bounties, which are so constantly enjoyed that we are prone to forget the source from which they come, others have been added, which are of so extraordinary a nature, that they cannot fail to penetrate and soften even the heart which is habitually insensible to the ever watchful providence of Almighty God ...

No human counsel hath devised nor hath any mortal hand worked out these great things. They are the gracious gifts of the Most High God, who, while dealing with us in anger for our sins, hath nevertheless remembered mercy. It has seemed to me fit and proper that they should be solemnly, reverently and gratefully acknowledged as with one heart and voice by the whole American People.

I do therefore invite my fellow citizens in every part of the United States ... to set apart and observe the last Thursday of November next, as a day of Thanksgiving and Praise to our beneficent Father who dwelleth in the Heavens. And I recommend to them that while offering up the ascriptions justly due to Him for such singular deliverances and blessings, they do also, with humble penitence for our national perverseness and disobedience, commend to his tender care all those who have become widows, orphans, mourners or sufferers in the lamentable civil strife in which we are unavoidably engaged, and fervently implore the interposition of the Almighty Hand to heal the wounds of the nation and to restore it as soon as may be consistent with the Divine purposes to the full enjoyment of peace, harmony, tranquillity and Union.

The object of Lincoln's thanksgiving is the "Most High God", "our beneficent Father" for his "great gifts and mercy". His providence the source of all that is good, is the reason we direct thanks to him.

Thanksgiving is a core value of the American experience. Why? Thanks to God is the root and foundation for how we treat others, particularly in the midst of adversity. This is what we observe from the Pilgrims, our Founding Fathers and the eloquent call of Lincoln's proclamation. Thanksgiving gives a persevering quality and depth to our service as we draw on the goodness that comes from "our beneficent Father". Thanksgiving enables the heart to move past the "prid quo pro" and as Lincoln states, "commend to his tender care" those who are suffering.

Consequently, for industry, more than commerce can be accomplished. Accountability to the "Most High God" motivates practicing good for all, i.e., employees and customers. Through the act of thanksgiving, "earning a buck" is not the only goal, but encouragement of the soul takes on importance. Thanksgiving is a force that moves individuals, companies and a nation to, "implore the interposition of the Almighty Hand to ... the Divine purposes ... the full enjoyment of peace, harmony, tranquillity and Union."

### ***New Eight-Foot Furnace at Souderton***

Solar Manufacturing's Tom Smith works on the installation of a new Solar Furnace at the Keystone Plant. Ken Bauhof, GM for the facility, expects the furnace to be up and running in November.



## Another Race Car Story

At Solar's (Western PA) plant, titanium anti-roll bar torsion pins were vacuum heat treated for an Indycar racing team. Solar's customer is Rayco Machine Company, Indianapolis. This adjustable suspension component gives the driver the capability to change the rate of chassis roll on the suspension, thereby, changing the handling of the racecar.

Titanium race car pins in process.



In the past, this component was manufactured using 4340. However, the engineering group of an Indycar race team looked into the titanium pin for its weight reduction properties, but has discovered that it flexes much more in each setting giving the driver a wider range of adjustment. These modifications are within the rules that govern racecar modifications.

Originally the titanium torsion pins' heat treatment was assigned for water quenching, but Robert Perez, Motorsports Manager for Rayco, discussed the advantage of high pressure gas quenching for minimized distortion. The titanium pins were successfully vacuum heat treated and were metallurgically tested by LTI, Hatfield, PA for tensile strength.

Michael F. Johnson, Quality Manager Western PA

## Solar Goes "PAPERLESS"

Solar Atmospheres in Souderton, PA has placed an order for twelve (12) Eurotherm/Chessell Model 5100V Paperless Data Recorders. These recorders replace existing Chessell strip chart recorders on selected tempering and deep freeze equipment. According to Mike Moyer, Corporate Quality Manager for Solar, the decision was made to allow data storage via computer, ease of copy via computer software printout, e-mail of data or chart to our customer base, and the elimination of chart paper retention.

The single order value to Neal Systems, Inc., Newtown, PA is approximately \$30,000 and is one of the larger single orders received for multiple recorders of this model according to Shane Filer, the area Technical Representative for Eurotherm/Chessell.

### Mission

The Mission of Solar Atmospheres is to add significant value to our customers' 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.



*"Research is the process of going up alleys to see if they are blind."*

Marston Bates Site Links

### Milestones and Thanks

It was reported that Solar's order entry system, Visual Shop (VS), had just recorded its 100,000 order a milestone. VS was only installed five years ago, but seeing the 100,000th order or any other milestone causes something in our psyche take note. Milestones in life and business mark our progress.

As part of the American economy, Solar is thankful for 20 plus years of service with a growing customer base. In 2004, for the first time, Solar will service 1000 customers within a year another milestone. As one accomplishes new goals, thanksgiving helps to avoid the pitfall of pride and reinforces how dependent we are on the goodwill of those we serve.

One of the nation's Founding Fathers, Samuel Adams, expressed this sentiment with these words, "Go on, then, in your generous enterprise with gratitude to Heaven for past success, and confidence of it in the future." Therefore, "with gratitude to Heaven", Solar says thanks to all who we have been able to serve this year. Have a thankful Thanksgiving.

As is our tradition, current customers will be sent a calendar. If you would like a calendar and do not receive one, please contact Bob Lacock, [rdl@solaratm.com](mailto:rdl@solaratm.com). 800.347.3236 x 213

*"A man who wants to lead the orchestra must turn his back on the crowd."*

James Crook Site Links



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**"You make a living by what you get. You make a life by what you give."**

*Winston Churchill Site Links*

## **Power Gen Show**

Heat treating or brazing services for turbine blades, rotors and stators has become regular work for Solar, so an annual trip to the Power Gen show has been a regular part of our show itinerary. This year's exhibition will be in Orlando, FL, November 30<sup>th</sup> through December 2, at the Orange County Convention Center. Solar will be at booth #2158. If you would like more details, call Bob Lacock, 800.347.3236 x 213



## **The Solar Spotlight is a quarterly publication of Solar Atmospheres**

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