

HEAT TREAT NEWSLETTER

Everything to do with heat treating



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HEAT TREAT NEWS

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IN PARTING

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INTRODUCTION

You will find the February issue of ***“The Monty”*** to be filled with heat treating news from around the world-some good and some bad. We mention the passing of two individuals who had very close ties to the industry, you will read about plant closings, commercial heat treat acquisitions and summaries about used furnace sales. Technical articles from ***David Pye*** abound, management changes at industry suppliers, used furnace listings, thoughts about the ***“discovery”*** of the commercial heat treat industry and stories about new furnace orders will also be found. In short if it happens in the heat treating industry you will read about it in ***“The Monty”***.

Best regards,

Gord, Dale and Jordan Montgomery

HEAT TREAT NEWS

The Website of Choice for Captive and Commercial Heat Treaters Since 1999

RCR Heat Treatment Australia Sold

Feb 5, 2019

A couple of years back we at “*The Monty*” toured most of the major captive and commercial heat treaters in Australia and while it was a very interesting experience at the end of the day there is not a great deal of heat treatment in Australia (we will add that the largest commercial operation and probably the largest captive or commercial in all of Australia is Heat Treatment Australia who we have talked about many times in the past). With that out of the way we see that RCR Mining and Heat Treatment on the west coast of Australia has just been sold. RCR is the largest commercial operation in that part of the country and has three Lindberg Batch IQ furnaces along with stress relieving furnaces and Induction Hardening. *“NRW Holdings has signed an agreement with RCR Tomlinson to acquire the assets of RCR Mining and RCR Heat Treatment. NRW will finance the \$10m acquisition from the company’s existing cash reserves. RCR Mining and Heat Treatment are part of the original RCR Tomlinson business, which was established 100 years ago. RCR Mining has primary locations at Welshpool and a plant in Victoria. It includes the Mining Technologies business that owns intellectual property across various products and processes.”*



Ipsen Management Change/Geoffrey Somary

Feb 4, 2019

Ipsen Management Change/Geoffrey Somary

“Effective February 1, 2019 Ipsen Group CEO Thorsten Krüger will move to the Advisory Board of the company, handing over global operational responsibilities to Mr. Geoffrey Somary. Mr. Somary is appointed to CEO of Ipsen Group worldwide,

with the same effective date. The Advisory Board thanked Mr. Krüger for his contributions at Ipsen since 2013, and looks forward to his shift from operational responsibility to an advisory capacity, where he will support the further development of the company. Since 2005, Mr. Somary has held several senior positions within Ipsen, always closely involved with customers and with team members of the company. He has demonstrated the ability to bring together employees of different cultures in a way that delivers the best possible solutions to Ipsen customers. Ipsen Group Management will be complimented by Mr. Houman Khorram, who will continue to serve as Group CFO, a position he has held since 2013. The Board is confident this leadership team, together with Ipsen's dedicated employees, will continue advancing Ipsen's unique success story and further strengthen its position as global market leader.

About Ipsen; Ipsen designs and manufactures industrial vacuum and atmosphere heat-treating systems, supervisory control systems and predictive maintenance platforms for a wide variety of industries, including Aerospace, Automotive, Commercial Heat Treating, Energy and Medical. With production locations in Europe, North America and Asia, along with representation in 34 countries, Ipsen is committed to providing 360° support for customers worldwide. Choosing Ipsen means choosing a partner in success.”



We're more than a manufacturer.

When you partner with Ipsen, you get the support and resources of an entire team dedicated to your success.

Partner with Ipsen



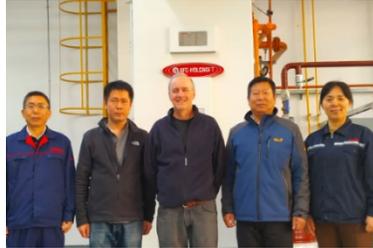
ION NITRIDING
SOLUTIONS



SKS China Installs AFC-Holcroft Endothermic Generator

Feb 5, 2019

Hydraulics manufacturer and captive heat treater “The SKS Hydraulic TECHNOLOGY Co., Ltd”, in Zhejiang Province, China just commissioned this AFC-Holcroft Endothermic generator. One look tells us that this is a 4500 CFH EZR Series unit.



involved with customers and with team members of the company. He has demonstrated the ability to bring together employees of different cultures in a way that delivers the best possible solutions to Ipsen customers. Ipsen Group Management will be complimented by Mr. Houman Khorram, who will continue to serve as Group CFO, a position he has held since 2013. The Board is confident this leadership team, together with Ipsen’s dedicated employees, will continue advancing Ipsen’s unique success story and further strengthen its position as global market leader.

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ECM, Grenoble, France

Feb 4, 2019

What you see in this photo is an ECM transfer tunnel for ICBP Flex system which we saw at ECM in Grenoble, France this past week (more information about ECM including an interview with the CEO, Mr. Laurent Pelissier later this week). This system is in the process of being prepared for shipment to a customer in Germany who will be using it for a new brazing application. This will be the first time that ECM has used an ICBP Flex system for brazing. Dale Montgomery of “The Monty” can be seen standing in the tunnel.



Gruppo T.T.N./Nervianesi, Italy

Feb 1, 2019

As a prelude to our visit to furnace builder ECM in Grenoble, France we visited the largest commercial heat treater in Italy, Gruppo T.T.N., headquartered in Nervianesi, Italy (near Milano). The family owned group consists of 9 locations, all in northern Italy with a total of 500 employees making them one of the larger commercial heat treaters in the world. Next week we have a complete write up about the company but to start off we have these photos. In the first we see part of the T.T.N Team along with part of the ECM team in front of a 6 chamber ECM vacuum carburizing system which has been running very successfully for a number of years. In the second picture we see something truly remarkable in the heat treating world-some of the largest pit gas nitriders in the world. The pit for these furnaces measures a remarkable 25 meters (75') deep and as you can see while the current furnaces are enormous the company has built for the future in constructing this pit. Next week we will tell you how the company worked closely with Boeing to heat treat components for some of the largest rockets ever produced by NASA.



How Cold is it in North America?

Feb 1, 2019

According to the news item below it is so cold in parts of North America that some auto plants and their heat treating operations are being forced to close; *“In the midst of a polar vortex that has brought record-breaking low temperatures to Michigan, Consumers Energy has called for customers to reduce their natural gas usage and DTE Energy is asking customers to reduce electricity usage. Consumers Energy sent an urgent text alert on cellphones shortly after 10:30 p.m. urging utility customers to lower thermostats and reduce energy usage or risk a dangerous gas shortage in the wake of record-breaking cold. The temperature in metro Detroit hovered at minus 11 degrees at 10:30 p.m., smashing the record for Jan. 30 of minus 4 degrees set in 1951.*

In addition to individual residential customers, General Motors has been requested by Consumers Energy to suspend operations at several manufacturing sites. GM operations are suspended at the following SE Michigan locations:

- Orion Assembly
- Pontiac Stamping
- Flint Assembly, Flint Stamping, Flint Engine and Flint Tool & Die
- Lansing Delta Township Assembly, Lansing Grand River Assembly, Lansing Regional Stamping, and Lansing Grand River Stamping
- Warren Transmission and the Warren Tech Center

Ford Motor Co. is also taking measures in response to the extreme cold. Kelli Felker, a Ford spokeswoman, said in a statement Wednesday, “Due to extreme temperatures and at the request of Consumers Energy, we are curtailing our natural gas usage in some of our plants. We lowered the temperature in Livonia Transmission Plant and Van Dyke Transmission Plant to minimum levels. We stopped heat treatment processes at Sterling Axle Plant and will stop our paint process at Michigan Assembly Plant at midnight. We will continue to work with Consumers Energy in the days ahead. All other plants are operating normally.”





Andreas Wiesemann/ ROHDE Schutzgasöfen GmbH

Jan 31, 2019

A favorite of ours in the industry Mr. Andreas Wiesemann, Engineering Manager of German furnace manufacturer Rohde will be retiring March 31/2019. Andreas has been in the heat treating industry for 42 years with 20 of these being at Rohde. We have always been impressed by his knowledge and have to say that his vast experience will be missed in the industry. In the photo below Andreas is second from the left.



Worldwide Heat Treat/Houston, Texas, USA

Jan 31, 2019

Texas with the downturn in the oil and gas industries over the past few years has gone through some hard times but things are back and starting to boom with virtually all the captive and commercial heat treaters doing well. As an example there is a new heat treater in town Worldwide Heat Treat which was started by Robert Gutierrez just a few months back. Robert has been in the industry for quite some time and these photos show some parts which his firm has been processing recently. We understand that he will be adding a number of furnaces in the very near future.



Used Vacuum Furnace Sales

Jan 31, 2019

Over the course of the past two months we have run across and listed a used, very large 2 Bar GM Enterprises vacuum furnace and two relatively new Ipsen Titan 2 bar vacuum furnaces. Beyond the fact that that each has two bar quenching what else do they have in common? The answer would be that each sold very quickly, as a matter of fact two sold within days. What this tells us that at least in the North American market there is a real shortage of good used vacuum furnaces which shows that the captive and commercial heat treating market remains very strong in 2019.



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

Jan 30, 2019

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.



For additional information, contact Tim at 724-982-0660 x2252 or timf@solaratm.com, and visit us at www.solaratm.com.

Grupo TTT in Spain Buys Seco Warwick Vacuum Furnace

Jan 30, 2019

SECO/WARWICK vacuum heat treatment and brazing system equipped with high pressure gas quench will be added by Grupo TTT, one of the leaders in heat and surface treatments, to their Bergara, Spain facility to run a variety of processes. One vacuum system for a variety of processes.

SECO/WARWICK’s signature pressure quenching systems, with their reputation for process flexibility and precision control systems was selected to enable the TTT heat treatment team to run a variety of processes in a single system. This is the fourth system purchased by with an earlier installation in Europe, and two systems currently in operation in Mexico.

“Grupo TTT is a full service technical solutions provider, serving clients in aerospace, automotive, machine tool, capital goods, paper, and the oil & gas markets, each market has specific requirements and quality standards. We continue to partner with SECO/WARWICK because we value their commitment to the highest quality precision control systems that enable us to meet and exceed customer specifications in all of our various markets along with superior service to keep our equipment online and running efficiently,” stated Oihane Larrañaga Ezeiza, Project Manager, Grupo TTT.

“SECO/WARWICK builds efficiencies into every aspect of product designs, from the very beginning of our history we have prioritized precision temperature controls for both heating and cooling as well as conserving furnace atmosphere and energy to produce optimum system performance and total value for our customers. We want each and every piece of equipment to be regarded as a high performance tool that works reliably every day, flexible enough to change within the daily needs for processes and production providing both profitable operation and satisfied customers.” according to Maciej Korecki, VP, Vacuum Heat Treatment Furnaces at SECO/WARWICK.



Mountain Rep Hires Additional Sales Rep

Jan 30, 2019

John R. Young joined Mountain Rep, a 35 year old manufacturing rep firm (www.mtnrep.net) as the Area Manager covering the northern Midwestern U.S. John has been part of the heat treat industry for 40 years and is known by many. He received his BS in Metallurgical Engineering at Michigan Technological University and his MBA at Michigan State University. John is an Adjunct Professor of Metallurgy at Macomb Community College, MI.

Along with the Mercer Group of Companies, including Midwest Vacuum Pumps, Mountain Rep sells Plasma and Gas Nitriding Systems, Plasma Coating Systems from Rubig, Fluid Cooling Systems and 3-D Temperature Uniformity Surveys. The newest addition to Mountain Rep's linecard is ILS (International Logistics Solutions). ILS provides all the services needed to transport product or equipment between the Midwestern U.S. and Mexico. John can be reached at john.young@mtnrep.net



Bodycote to Open New North American Heat Treatment Facility in North America

Jan 29, 2019

Now this is a really interesting news item, as a matter of fact we would rate it as a 9 out of 10 on the interest scale for heat treat related press releases. And why? If you read the press release and see the technologies that Bodycote will be investing in you will quickly realize that this represents an investment of many millions of dollars and that these are leading edge but expensive technologies. The reference to vacuum carburizing is certainly intriguing. While Bodycote has several VC installations in North America currently we are not aware of any additions the company did in 2018 and to take it one step further we do not know of any new VC investments in the commercial heat treating industry in all of 2018. Obviously the company feels strongly that there is a market for this process in the near future. We look forward to more details.

Bodycote Invests In New North American Heat Treatment Facility

“Bodycote, the world’s largest provider of heat treatment and specialist thermal processing services, is pleased to announce plans to open a new heat treating facility in Elgin, Illinois. The new facility will include advanced heat treating technologies such as low pressure carburizing and carbonitriding, vacuum nitriding and ferritic nitrocarburizing, Bodycote’s proprietary Corr-I-Dur® process, and traditional carburizing of large parts. The facility, scheduled to be operational by late 2019, will support the automotive, agricultural, mining, construction and various other manufacturing supply chains in the Upper Midwest region. Dan McCurdy, President Automotive & General Industrial, North America & Asia division, adds: “This investment demonstrates Bodycote’s commitment to serving the Midwest with the services our customers ask for and require.”

About Bodycote. With more than 180 accredited facilities in 23 countries, Bodycote is the world’s largest provider of heat treating and specialist thermal processing services. Through classical heat treatment and specialist technologies including Hot Isostatic Pressing (HIP), Bodycote improves the properties of metals and alloys, extending the life of vital components for a wide range of industries, including aerospace, defence, automotive, power generation, oil & gas, construction, medical and transportation. Customers in all of these industries have entrusted their products to Bodycote’s care for more than 30 years. For more information, visit www.bodycote.com. For more information, please contact: Bill Sandstrom, Vice-President, AGI North America. Email: bill.sandstrom@bodycote.com”





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An Introduction To The Carburizing Process

Jan 29, 2019

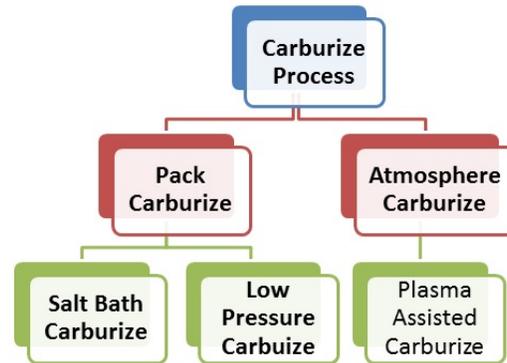
Basic Simple Principle of Carburizing. Carburizing is not a new process. Its presence has been known since mankind began to work iron, which was approximately 4500 years ago. Copper mining and the working of copper can trace its origins back some 8,000 years. Carburizing is perhaps the oldest of all the major surface treatment processes. It is a process has been around for many centuries, and will continue to be around for many more centuries. A process led the way to steel making, simply by forging iron in a fire. The fire, (made from wood and charcoal) provided the source of carbon (Carbon Monoxide) and the carbon diffused into the surface of the iron.

The forging was continued, the hammering continued. The iron was re-heated and more carbon diffused into the iron, until it eventually became steel. Then it could be heat-treated to whatever hardness was required, for fighting sword, a headman's axe or whatever weapon of war was required. Therefore, it can be said that the process of carburizing was the process that led to the development of steel.



The medieval Blacksmith

One would ask the simple question 'why carburize?' Why is it necessary to carburize? What are the advantages and disadvantages of the process? Before one can carburize many engineering issues are necessary to be discussed and determined. Once these issues have been identified and settled upon, then the selection of the method of carburizing process can begin. There are essentially 5 methods of carburizing;



Summary of Carburizing Process methods. Is one process method better than another is? Which is the best to use?

That will depend on the products use, its performance requirements and of course the environment that it will operate in. There are many reasons to carburize, versatility of the process technology of carburizing in terms of accomplished mechanical properties.

In essence however, one is creating 2 different steels out of one steel analysis, simply by diffusing carbon into the steel surface of the selected steel analysis. This then, will create a steel with different mechanical and metallurgical properties as shown below;



Summary of Mechanical Properties of Carburizing. There are many choices and considerations that one must make before finally selecting the appropriate process of carburizing:

- The steel with its analysis/chemistry.
- The process technique (The selected process method).
- Distortion considerations.

- Part performance requirements (functionality).
- Part geometry.
- Economics (the cost of equipment, the cost of the product).
- Surface metallurgy.
- Core metallurgy.
- The quench medium that is required and its availability.
- (Remember, you have created fresh un-tempered martensite which is unstable).

A process has now been established to create a component with a combination of high surface hardness and good core hardness that will now function and taking advantage of surface a hard surface that displays a compressive residual stress at the surface and with a hard surface. It is known that wood is a hydrocarbon material and when burned will produce a carbon rich gas.

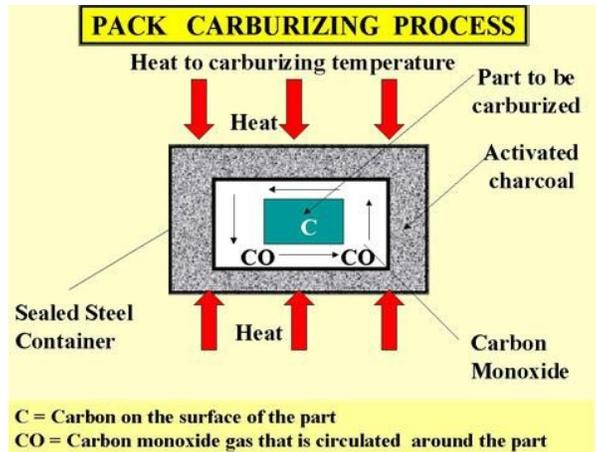
Early man created his fire to heat the iron, and without realizing what was happening was that carbon from the wood fire was beginning to enter into the surface of the iron. His continual working of the iron required heat which meant that more carbon was diffusing into the surface of the iron in an uncontrolled manner.

Early man was carburizing without realizing it. Early man had unconsciously begun the carburizing procedure. Process Methods; Pack Carburizing. In today's process technology, we know the method that early man was using, is now known as pack carburizing.

Pack carburizing began to emerge as a process technology during the latter part of the 19th Century and early 20th century. It was perhaps the first attempt to bring into the procedure, a level of surface carbon potential control made adding certain product control chemicals into the carburizing granulate.

Pack carburizing is a method of creating the conditions with the steel being treated so that carbon diffuse into the surface of the steel. Once the carbon has diffused into the surface of the steel, the whole process is allowed to cool down to room temperature and the steel remove from the container in which it was originally placed for the carburizing procedure.

The following illustration shows the cross-section of a simple steel box type constructed process furnace, which provided the heat source for the carburizing procedure. Within the interior of the furnace is placed a steel container which carries both the carburizing medium and the steel which is to be carburized. The steel container is sealed with a lid which is further sealed using either fireclay or mud.



The very simple carbon rich source that is used for the Pack carburizing procedure is that of simple charcoal.



A simple carburizing box made from Heat Resisting Stainless Steel. Typical Pack Carburizing Mediums. Wood charcoal (will produce a carbon rich atmosphere, but with no knowledge of the carbon output)

- Cast Iron chips.
- Can produce a carbon rich potential of 2.3% up to 5.0%.

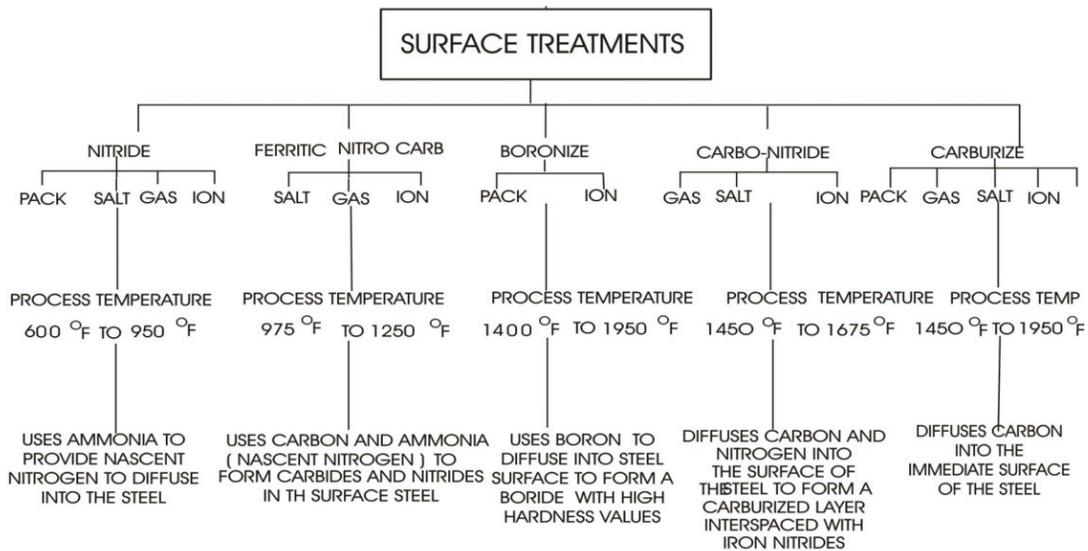
In this presentation, we are focusing our attention on the pack carburizing method. The pack carburizing method relies on the use of a carbon rich material. One can also make use ordinary charcoal, (such as barbecue charcoal). However the carbon output from the charcoal is never consistent. Companies did at one time manufacture their own brands of carburizing granulate which consisted of charcoal, and an activator known as Barium Carbonate.

The process method produces the release of carbon monoxide (CO) which is derived from a solid carbon source. This activity is initiated at the surface of the steel to be carburized. The resulting decomposition is nascent carbon and carbon dioxide. The action is to release the carbon monoxide which is caused by thermal activity (temperature/heat) on the carbon rich source material.

The activity is assisted by an Energizer such as (previously stated) Barium Carbonate ($BaCO_3$) or potassium carbonate (K_2CO_3), or sodium carbonate (Na_2CO_3). The energizers (whichever one is utilized) are present to aid the initial production of CO_2 from the carbon rich source material resulting in the formation of carbon monoxide (CO) which is the active gas at the surface of the steel being carburized.



Test coupons carburized, the dark outer ring is the carbon which has been diffused into the surface of the steel.



*A summary of the Thermal Surface treatments.
To be continued*



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Continuous furnaces



Monday Morning Briefing

Jan 28, 2019

We see that *Jim Montemagno* became President of alloy supplier *Alcon Industries* of Cleveland, Ohio, USA a few months back. Jim has been with Alcon for as long as we can remember and certainly knows his stuff. If you recall we mentioned not that long ago how the founder of the company and President, *Mr. Dick Chalet* very unfortunately passed away at a relatively young age. Alcon is one of the largest suppliers of cast and fabricated high temperature alloy components in North America. Speaking of Alcon we also see that *Mr. Stacey Harley* who was with Alcon for a number of years just joined one of their competitors, *Wirco* of Avilla, Indiana. Proving yet again the people do not leave this industry we will mention that before Alcon, Stacey was with *North American Cronite* another alloy supplier whose ad can be found on this page. While we are talking about alloy *Nickel Pricing* is staying at relatively low levels these days as you can see in the chart below. As far as we can tell (*and we certainly have no crystal ball*) it would appear that high temperature alloy component pricing should remain fairly stable for the foreseeable future.



Last week we visited a very impressive heat treating facility *Erie Steel Treating* in Toledo, Ohio, USA-let us tell you a little bit about the company. Erie was founded by *Phil Flynn* a metallurgist for Buick back in 1961 (it is worth mentioning that right beside Erie Steel is GM Propulsion Systems which maintains a very large captive heat treating department-this is the legacy of Buick). We met with a very experienced fellow, *Mr. Michael Mouilleseaux*, General Manager who gave us a tour of the facility and gave us a very good idea about the company. Michael summed up the organization by describing it as doing “precision carburizing of high volume parts which are distortion critical” with a heavy emphasis on the

transportation industry. It does this through 2 pusher furnaces, several large batch IQ furnaces but the company also has a large vacuum department and the ability to handle annealing, normalizing and stress relieving to name a few. This is all done with roughly 60 employees in a 70,000 square foot building. We all know that the heat treat industry has a heavy emphasis on family businesses well Erie is no different. The current owner and President is *Mr. Pat Flynn* the son of the founder. If there was one thing which really impressed us it was the cleanliness of the plant. Carburizing with oil quenching is inherently a dirty process, well this shop is as clean as any oil quenching facility we have ever seen. In the first photo below taken in the lab we have from the left; *Brian Flynn* (Process Engineer), *Morgan Little* (Quality Engineer), *Jamil Bolden* (Lab Supervisor) and *Michael Mouilleseaux* GM. The second photo shows one of the two pusher furnaces.



A little while back we told you how *Can-Eng* furnaces had received an order for a mesh belt line from a customer in Europe which is fairly unusual. It would appear that the line is now up and running as we can read in this press release; *“CAN-ENG Furnaces International Ltd has recently commissioned in the Piedmont Region of Italy, a state-of-the-art continuous mesh belt heat treat system for the production of high quality automotive fasteners. This Italian project was one of four installation locations for this globally recognized producer of specialty automotive fasteners that span from Europe, South America, Mexico and USA.”*



A pet peeve of ours is press releases from industry suppliers which say little or nothing about who the actual end user of their product is, what it is for or even where they are located. The Can Eng press release above doesn't tell us who the end customer is (and we understand why) but it does say that the furnace line was

just commissioned, what it is for and where it is located. An example of a very self serving press release which tells you nothing has to do with the photo below. It was issued by a Chinese furnace manufacturer by the name of *JGEF* who tells us this is a nitriding installation they have done and literally nothing else. We have had several people ask us if we knew anything about this installation-the answer is we have no idea about the end user, country, continent or even whether this is a new or old installation. I guess the company got some fee mileage out of the press release but still we are not impressed.



The Wall Colmonoy Brazing School always attracts some interest; “Wall Colmonoy Announces Spring Session of Modern Furnace Brazing School in USA, May 7-9, 2019. Preserving the tradition originated by the late Robert Peaslee, a brazing pioneer who invented the first nickel-based brazing filler metal, Wall Colmonoy offers a spring session of Modern Furnace Brazing School on May 7-9, 2019 at Wall Colmonoy’s Aerobrazing Brazing Engineering Center in Cincinnati, Ohio. Engineers, technicians, quality managers, production managers, and others will participate in “hands-on” practical applications while learning about brazing technology from the industry’s leading brazing engineers. For over 60 years, Wall Colmonoy engineers have been gaining practical experience on actual problems in brazing plants around the world.”



And that is it for our Monday Morning Briefing for January 28, 2019. Later this week we will be changing gears slightly and covering part of the heat treat industry in France and Italy.

ECM USA
Jan 28, 2019

“ECM USA is excited to announce that we have performed our 100th development engineering load in our new NANO in the new SYNERGY CENTER in Pleasant Prairie Wisconsin. This furnace has been designed with single piece and small continuous batch operations in mind. The 20 bar gas quench system has been used to quench parts to the same core hardness as oil quenched parts in some alloys. This is a breakthrough technology for quenching and loads for distortion control.

The Synergy Center is set up with a fully functional CMM for distortion studies before and after heat treatment to validate production loads. This system has been used to validate very tight distortion specifications for E-drive and hybrid transmission programs. We welcome you to bring your project to the Synergy Center for testing your parts. [WWW.ecm-usa.com](http://www.ecm-usa.com)”



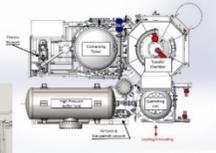
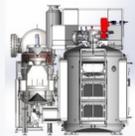
NANO FEATURES:

- ✓ Gas quenching up to 20 bar
- ✓ Distortion control with Step GQ (step Gas Quenching)
- ✓ Annealing under partial pressure
- ✓ Carburizing by INFRACARB® PROCESS
- ✓ Powder Metal Carburizing
- ✓ Vacuum Hardening
- ✓ Vacuum Brazing
- ✓ Carbonitriding
- ✓ Mechanical properties improvement with
- ✓ StopGQ (Stop Gas quenching)

Load dimensions

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- ✓ Height overall 250 mm
- ✓ Depth 500 mm
- ✓ Maximum gross load 100 kg

ICBP NANO

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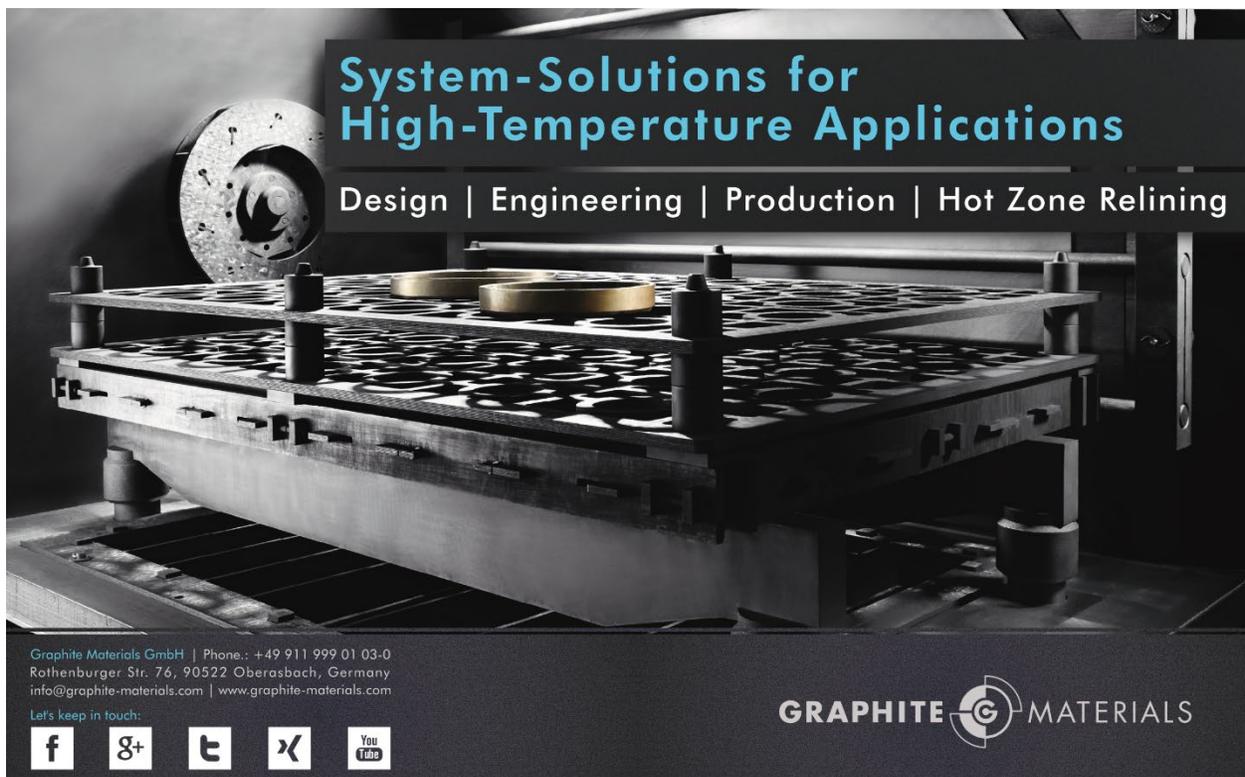
AEROSPACE TESTING & PYROMETRY

*Profit from our
knowledge because
quality is our standard.*

Michael Mouilleseaux, Erie Steel Treating, Toledo, Ohio, USA

Jan 25, 2019

We had the chance yesterday to visit a real cool commercial heat treat by the name of Erie Steel Treating in Toledo, Ohio, USA and spend some time with the General Manager Mr. Michael Mouilleseaux who is one of the most experience heat treat guys we can think of. We have this photo of Michael and Gord Montgomery in front of a control panel for one of the company's two pusher furnaces. More details on this very interesting operation on Monday.



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Kathy Peterson Obituary

Jan 25, 2019

It is with great regret that we mention the passing of Kathy Peterson. Below is a message from her husband Kary Peterson who many of you will know.

"It is with a heavy heart that I share the news that my wife, Kathy Peterson, has passed away. After a 27 year battle with Breast Cancer, she passed peacefully on January 21, 2019 at our home in Rockford, surrounded by family. I wanted to take a moment and thank all of our business friends and associates for their kind wishes and support these past few years. As many know, Kathy was very involved with the rebirth of BeaverMatic in 1986. She worked closely with myself and my father, the late Mark Peterson, with the purchase of BeaverMatic from Barbara Beavers, the widow of Jack Beavers. Below is the obituary, honoring my late wife. I can't thank you enough for the thoughts, prayers, and kindness that has been expressed.

Sincerely, Kary Peterson"

<https://www.cremation-society.com/obituary/Kathleen-A-Peterson/Rockford-Illinois/1832138>



Mesh Belt Tempers

Jan 24, 2019

We are searching for 6 used mesh belt tempers, gas fired, capable of 1,000F with a belt width of 36" to 48" and a heated length of 10-16' (except for temperature and gas heating dimensions are flexible). This is an immediate requirement. If you have something surplus we would appreciate hearing about it jordan@themonty.com



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Chromalloy, Middletown, NY, USA Closed
Jan 24, 2019

The Chromalloy gas turbine repair facility in Middletown, NY just closed down. Chromalloy is a worldwide company which designs, manufactures and repairs parts that extend the lives of gas turbine engines. Because of the nature of their business many of their locations have really impressive heat treating departments typically featuring vacuum furnaces. In the case of the Middletown location it is now closed and the furnaces already spoken for and in the process of being moved.



Meapforni Shipping Mesh Belt Furnace Line
Jan 24, 2019

In Italy we are being told that furnace builder Meapforni is starting to ship the first part of a complete mesh belt furnace line. The furnace is capable of 1000 kg/hour production capacity and is completely automated from loading to unloading. The end customer is a manufacturer of special fasteners. These photos show the furnace wrapped and in the process of shipping.



Ipsen Installs New 6 Bar Vacuum Furnace

Jan 23, 2019

Furnace builder Ipsen of Rockford, Illinois, USA is in the process of installing this brand new 6 Bar quenching vacuum furnace at Thermetco in Montreal. Thermetco recently moved into a brand new facility on the South Shore of the St. Lawrence river in Quebec and the company has made very substantial investments in new equipment including a new Batch IQ furnace, a new nitriding system and this new vacuum furnace.



The eFlo line of Flow Meters



custom-electric.com

Transfer of Practical Knowledge to the New Generation of Heat Treater's

Jan 23, 2019

As each day goes by, the older generation of heat treater's becomes another day older, and closer to the day when they will want to retire and live comfortably. Our age is not a thing that we can hide from.



So the question is asked, will the input (or volume) of the new young generation of heat treater's keep pace in the numbers of new entrants into the heat treatment of metals world. I do not have any access to the number of new entrants in relation to the those who leave the industry (simply because they don't like it), or they relocate in relation to the older generation who either retire or pass away).

We have the graduates coming out of college, but (without sounding disrespectful to those people who have been able spend at least 4 years of college studies of metallurgy), many unfortunately lack the practical experience). The only way they will get the experience is by working in the industry (for either captive heat treatment shops, or commercial heat treatment shops). Some can be fortunate enough to work alongside a seasoned and experienced mentor.

But let us step back for a moment!! What about the furnace operators? It is the operator heat treater, who literally can 'make or break' the product that is being heat treated. It is that person who has to deal with;

- *Distortion*
- *Loading the furnace in such a manner so as to reduce the risk of distortion at the quench operation and understanding what can contribute to the occurrence of distortion*
- *Understanding the quenching practice*
- *Furnace atmosphere control*
- *Process temperature setting (not too high and not too low)*
- *Pre-heating to reduce thermal shock*
- *Ensuring that the initial hardness is as expected for the particular metal being treated*
- *Understanding safety in the heat treatment shop*
- *When operating salt baths, the 'do's and don'ts (I have seen and acted as expert witness in a number of accident's that out not to have occurred, but did, with very serious results*
- *Understanding why the material being treated did not respond as expected (possibly mixed or incorrect material)*

- Understanding the principles of the first line of establish successful heat treatment by the hardness test
- Having the ability to trouble shoot the non-response of the metal being treated
- Having a basic understanding of the principle of phase diagrams (for example: the Iron Carbon Equilibrium (or ICE diagram) of the phase diagrams for heat-treatable aluminum diagrams
- A basic understanding of the action of alloying elements on the material being treated



Some years ago, I approached Mr Lance Miller (the then Metal Treating Institute President) regarding an idea that I had for the person on the shop floor. It had to be an affordable idea, because the industry felt it could not justify high priced educational courses for the heat treater, and later the employee leaved for another position. (A genuine fear) (but it was a fear!!). I proposed low priced on line heat treating courses for the shop floor operator on numerous subject relating to the Heat Treatment of Metals.

I left USA in 2010 for international assignments of teaching and consulting. I worked on numerous projects internationally embracing low pressure carburizing installation and the training of the operator's and staff, as well as assisting in the preparation for audits. I worked also in both Central America (Mexico and El Salvador on heat treat training as well as Chile, and Brazil. I have worked extensively in and around India on heat treatment training and consulting projects. Saudi Arabia on oil and as well drilling (as well as the United States and South Africa), I have also worked on nitriding projects and training in UAE. I worked also with a large international forging who have the most amazing technical research and development centre. The centre specializing in gaining an full

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understanding of a particular metal, its application, forging, machining, thermal processing, to studying the performance of that metal and the product application. Yet they still wanted further education for its graduate and Ph.D. employees. It is an absolutely amazing facility. A metallurgist and a heat treater's 'toy shop to die for!!!



Wootz Steel from India

What a foresight and forward thinking company that is!! I would like to make a visual introduction, that takes a new hire on a walk about in that particular heat treat shop that might specialize in;

- Steel heat Treatment*
- Surface treatment such as carburizing in IQ furnaces*
- Aluminum heat treatment*
- Brazing technology*
- Induction heat treatment and its metallurgy*
- Vacuum heat treatment*
- Cryogenic heat treatment and why it is utilized*
- Materials testing and met lab developments*

This to show the potential employee/ operator, that they are not simply working on 'Fire Breathing Dragons'.



I am often asked why I don't slow down!! My response is 'if I slow down I will stop'!! I simply do not want to stop. I have too much to give back to the industry which has been good to me. It is not mine to hold onto!!

*Ride a wild horse
against the sky-
hold tight to his wings
before you die
whatever else you leave undone
once ride a wild horse*

into the sun.

~ Anonymous

I have numerous Heat Treatment courses, that I have developed (too numerous to list here) and tailored for the student the new hire, the graduate person and can be conducted on site with the companies furnace and supportive equipment. I am continuing to write for The Monty on at least a weekly basis. I have gained a great deal of knowledge and experience over the years of international heat treatment, and one thing that I am certain of, is that;

- *We need continuing research and development*
- *We need heat treat education, (each and every one of us in the industry)*
- *We need, (not to be afraid of sharing the basic knowledge) while preserving and keeping confidential of how we do things for each of our customers*
- *Each of use (no matter who we are) still need to continue to learn and develop or science*
- *We should never be afraid to ask why*
- *Ours is a complex industry that has embraced change and gained understanding form simple procedures to the use of IT technology, robotics, plasma, 3D manufacturing, electronics, physics, chemistry, thermal engineering, keeping the furnaces functional and well maintained to bring back the financial return on investment.*
- *Not everyone understands how heat treatment affects the very fibre of our lives.*
- *Heat treatment has entered the realm of medical metallurgy, the development of enhancing the strength of material and application's.*



McLaughlin Services Installs Furnace Line in Viet Nam

Jan 22, 2019

Furnace builder/rebuilder Jeff McLaughlin of McLaughlin Services in Avilla, Indiana, USA just completed installation of a large batch IQ line in Viet Nam. The line consists of 2 Ipsen "Atlas" batch IQ furnaces 36" X 48" X 36", 4 tempers, charge car and all necessary ancillary equipment. Originally the equipment was purchased by a Norwegian company Dokka Fasteners in 2012 for a facility in Michigan, USA. The plant was shut down 3 years later and the equipment has been in storage before being bought by a US pump manufacturer for their location in Viet Nam. McLaughlin Services also installed a McLaughlin Furnace Group True-Mix 4000 Endo Generator. Two of the photos below show the equipment installed in Viet Nam while the third shows the original installation in the US. In the pictures we see Jeff McLaughlin and Stephen Christopher of SSI who has been looking for new opportunities in Viet Nam.



American Heat Treating Upgrades Controls

Jan 22, 2019

Super Systems, Inc. recently completed two upgrade projects at American Heat Treating in Dayton, OH. Controls were upgraded on a Beavermatic integral quench furnace that included a Series 9205 with a 12.1" HMI for atmosphere and temperature control and datalogging, a Series 804 for oil quench temperature control (heating and cooling), and other ancillary items. A second project included a controls retrofit of a Lindberg 3000 SCFH endothermic generator with an SSI AutoGen control system.

Van Hatcher, Instrument Technician and project leader at American Heat Treating said, "Our long-range plan was to upgrade the controls on the Beavermatic, but when the old controller failed without notice, Super Systems jumped into action and did the complete upgrade project quickly. Our endothermic generator has been operating with the new SSI AutoGen controls with no issues since commissioning. We look forward to the operating cost savings that come with the automated turndown features."

Super Systems Inc., based in Cincinnati, Ohio, has been developing and manufacturing products for the thermal processing industry since 1995. SSI's

products include probes, analyzers, flow meters, controllers, software solutions and engineered systems. With over 100 years of combined experience, SSI continues to satisfy industry demands with innovative technology, enabling customers to be more efficient and to produce higher quality products. For more information on SSI's capabilities, visit www.supersystems.com.

American Heat Treating, located in Dayton, Ohio is a full service commercial heat treating company with atmosphere, vacuum, flame hardening, cryogenics, straightening and sand/shot blasting. ISO 9001:2015 certified. For more about American Heat Treating visit www.ahtdayton.com.



Monday Morning Briefing

Jan 21, 2019

Machining company **Blue Chips Manufacturing** in Caseville, Michigan, USA who does a small amount of heat treating in house managed to set one of their ovens on fire not once but twice last week resulting in the local fire department making two visits to the company. Damage was minimal it sounds like. A large player in the worldwide captive/commercial heat treating market is Austria based **Voestalpine, Inc.**, a steel supplier who offers heat treating as one of their core competencies. Over the years we have had the chance to see a number of their locations including South Africa and Canada-all are impressive and typically feature state of the art vacuum heat treating and nitriding capacity. For the past couple of years Voestalpine Thermo-Tech, Inc., in Canada has had a really top notch Operations Manager a fellow by the name of **Mr. Carlos Sartori** who we actually know from his home country, Brazil. It looks like Carlos will shortly be returning to Brazil with his family for personal reasons. We wish him the very best. In this photo Carlos is on the left, **Jerry Barvinek**, Business Development Manager on the right.



We recently ran across an article by the **“Furnace Doctor, Mr. Dan Herring”** a heat treat consultant who we happen to have a very high opinion of. Dan was estimating the size of the worldwide heat treating market and came to the conclusion that the current size of the market is \$90-100 billion USD per year of which \$18 to 18.5 Billion USD is in North America. There is a bunch of studies out there each purporting to know the size of the market and in most cases we are not impressed. Having said that if anybody in the world knows the size of the market we would expect it to be Dan and consequently we would expect these numbers to be as close as anybody will ever get. Speaking of the size of the heat treating market we would suggest checking out our list of the **Largest Captive Heat Treaters in North America** Perhaps we don't have Dan's knowledge however in our conceit we feel our summary is pretty accurate.

10 Largest North American Captive Heat Treaters

Last year fastener manufacturer **Kamax** announced plans to build a new plant in Mexico (press release below). As part of this plan the company is bringing a continuous mesh belt furnace from one of their locations in Europe *“German manufacturer Kamax announced plans to invest US\$ 45 million in the municipality of Leon, Guanajuato to build a plant dedicated to the production of high strength fasteners for the automotive market. The facility, Kamax first manufacturing site in Latin America, will be located in the Colinas de Leon industrial park. The company plans to open 215 job positions in order to star operations by March 2019. Kamax has already orders in Mexico for US\$ 25 million, company officials said during the ceremony to unveil the investment plan, which took place at the Hannover Messe 2018 industrial fair in Germany. The company employs 3,300 workers at facilities in Germany, Spain, Czech Republic, United States and China.”*

Commercial heat treater **Hauck** in Letchworth, UK recently fully commissioned their new Aerospace vacuum furnace. The furnace has working dimensions of 1000 X 1000 by 1200 deep and is capable of temperatures up to 1200C. Hauck is part of the Aalberts Industries Group of companies based in the Netherlands and is one of the largest commercial heat treaters in Europe.



Again in the UK we see that **ATL Turbine Services** is adding another vacuum furnace; “ATL has just received the latest addition to increase our processing capacity – a brand new vacuum furnace. This is the single largest CAPEX investment in ATL over the last 10 years and adds 50% to our heat treatment capacity. Commenting on the delivery, operations manager, David Henderson said, “This furnace will add significant additional capacity to our heat treatment capability and will help ATL expand and grow our component repair services. The furnace also encompasses a hydrogen cleaning facility which will deliver additional capability for taking on new work and new material types.” The furnace is currently being commissioned and will be available for use by the end of January”.



What's Upcoming? This week we are going to visit commercial heat treater **Erie Steel Treating** in Erie, PA, USA and provide a few photos. The week after we are going to profile furnace builder **ECM** in Grenoble, France along with commercial heat treater **TTN** in Milano, Italy. Also upcoming are interviews with **Laurent Pelissier**, President of ECM and also the President of **Quintus Technologies, LLC**-Quintus is the company which is selling all the Hipping systems in the USA these days, and we will tell you about a captive heat treater who suffered a very serious fire the day after Christmas which is not a good way to start off the year.

A green advertisement for Eurotherm by Schneider Electric. It features the text "Life Is On | Eurotherm by Schneider Electric" and "Control. Data. Visualization." Below this, there are images of a PLC rack, a laptop displaying a software interface, and a tablet displaying another interface. The text "Enhanced E+PLC Range" and a "Learn more" button are at the bottom.

A red advertisement for predictive maintenance. It features a cartoon scientist character in a white lab coat and glasses. The text reads "Minimize unplanned downtime of your heat treatment equipment" and "Check the power of predictive maintenance. Check SECO/PREDICTIVE". A "FIND OUT MORE" button is at the bottom.

Low Pressure Carburizing Trivia

Jan 17, 2019

Now here is some useless trivia for you. The first vacuum carburizing load was run almost exactly 50 years ago at John Deere in Iowa, USA. The year was 1969 and the load was processed in a 10 bar furnace and methane was the carburizing medium. Vacuum carburizing has come a long way since that time and in certain industries such as automotive gearing it has become the predominant form of heat treating. To mark the occasion we at “The Monty” are going to be visiting one of the pioneers in the vacuum carburizing industry and one of the largest manufacturers- ECM in Grenoble, France. We will take the opportunity to interview the President of the company Mr. Laurent Pelissier, get his thoughts on the future of the technology and provide you with some photos of ECM. In the attached photo taken just 3 months ago at ECM in Wisconsin, USA Laurent is shown on the left.



Good People Are Hard to Find (But Desperately Needed)

Jan 17, 2019

We would venture to say that there has never been a time in the heat treating industry when good, experienced people were so desperately needed and the situation is only getting worse as retirements accelerate. A sign of the times can be found in our “Positions Open” section <https://themonty.com/employment-opportunities/> where just today we added 3 open positions. **Bodycote** is looking for two Production Managers in the US North East, and **Premier Thermal** requires a Plant General Manager in Michigan. Over the next few days we will also have openings for **Service Technicians** and a **Plant Manger Position** in Canada.



Gasbarre Products Inc., Changes

Jan 17, 2019

Furnace manufacturing group Gasbarre is making a number of changes which include the organizational structure and some brand name changes; “DuBois, Pa – Gasbarre Products, Inc. (Gasbarre) is pleased to announce the launch of its new website, www.gasbarre.com, with updated branding. As part of the rebranding initiative, and to more closely align with the end users of its products, Gasbarre has categorized its diverse product offering into three business units: Powder Compaction Solutions, Thermal Processing Systems and Manufacturing Technologies.

Powder Compaction Solutions consists of all things related to compaction presses, press automation, precision tooling and other related powder feeding solutions. Gasbarre’s diverse press offering includes uniaxial Mechanical (Gasbarre & PTX-Pentronix), Hydraulic, Electric, and Cold Isostatic Presses (Simac).

Thermal Processing Systems, Gasbarre’s largest product group, offers Belt and Pusher Sintering Furnaces (**Sinterite**), Continuous and Batch Vacuum Furnaces (**C.I. Hayes**), and Industrial Furnace Systems (**Gasbarre Industrial Furnace Systems**). As part of their rebranding effort, Gasbarre is announcing that it will no longer be using the brand name J.L. Becker and has moved to **Gasbarre Industrial Furnace Systems (Gasbarre IFS)**. This change is representative of the significant enhancements made by Gasbarre as well as its focus on reliable equipment and great service.

Manufacturing Technologies provides Manufacturing and Fabrication, Mechanical and Electrical Assembly, and Design Services to a wide range of industries. With 200,000 sq./ft. of manufacturing space and state-of-the-art equipment, Gasbarre can leverage its knowledge to provide high quality manufacturing expertise to industries seeking an OEM to manufacture their equipment.

Other Developments. In the coming months, Gasbarre will be launching its Field Service Cloud and InSight Equipment Networking Software. These systems provide Gasbarre customers anywhere/anytime access to cloud-based asset management and service scheduling as well as OEE, alerts, and status tracking to optimize their operations. Stay tuned for updates on these developments and more on LinkedIn, Facebook, and Twitter, and on the Web: www.gasbarre.com.

For more information, contact: Donna Spillane, Marketing Coordinator, Gasbarre Products, Inc., 814.371.3015 ext. 260, dspillane@gasbarre.com



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Rod Pressey

Jan 17, 2019

We mentioned the passing of long time heat treater Rod Pressey, who passed away earlier this week. *“Rod Pressey Passed away on January 14, 2019 at his home in the presence of his loving family after a valiant battle with cancer at the age of 61. Beloved husband of Beth (McElwain). Loving dad of Jennifer and husband Craig Steptoe, Alison and former spouse of Lynn. Stepdad to Jesse Brown (Bea), Mandy Brown, Jeremy Brown (Sandy) and Chris Brown. Loving Poe to Mitchel, Madison, Grayson, Ellody and Harvey. Cherished son of Dorothy and the late Donald Pressey of Alymer, Ontario. Dear brother of Rhonda (Wayne), Joel (Denise), Sheldon (Donna), and Darcy (Jennifer). Brother-in-law to John (Janet), and Bob (Pam). Special uncle to many nieces and nephews. Rod will be remembered for his love of life and by many close friends. He retired from a successful career managing a local heat treatment facility. Rod will also be remembered for his musical talent and for being a member of several London area bands. His hobbies included home renovation, playing his guitar, tending his garden and spending time with his beloved dog Ziggy. As per Rod’s wishes, memorial donations to the Hospice of*



Windsor would be appreciated in lieu of flowers. Visitation Friday from 3-5 and 7-9 p.m. Funeral will be held on Saturday, January 19, 2019 at 11:30 a.m. at FAMILIES FIRST 1065 Lauzon Rd., East Windsor, 519-969-5841.”

The Heat Treatment of Aluminum Alloys

Jan 16, 2019

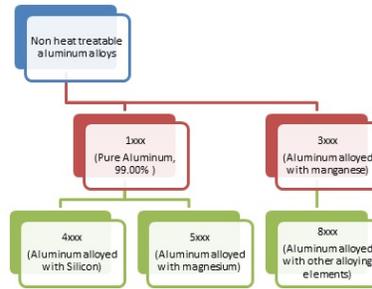
From International heat treat consultant David Pye, of Pye Metallurgical pye_d@ymail.com we have these thoughts about the heat treatment of Aluminum; *“The heat treatment of heat treatable aluminum alloys is a very sensitive and specialized subject. The strengthening of the heat treatable alloys necessitates what would appear to be a very simple procedure known as solutionizing. However, the solution treatment of the heat treatable aluminum alloys is conducted extremely close to the liquidus temperature of the aluminum alloy, and can very easily be subjected to surface grain boundary melting. So residence and temperature selection are critically important to the thermal processing of the heat treatable aluminum alloys.”*

The heat treatment of heat treatable aluminum alloys is a very sensitive and specialized subject. The strengthening of the heat treatable alloys necessitates what would appear to be a very simple procedure known as solutionizing. However, the solution treatment of the heat treatable aluminum alloys is conducted extremely close to the liquidus temperature of the aluminum alloy, and can very easily be subjected to surface grain boundary melting. So residence and temperature selection are critically important to the thermal processing of the heat treatable aluminum alloys.

This short presentation will deal with the categorization of the heat treatable alloys and followed by the introduction of the thermal strengthening procedures of heat treatable aluminum alloys. Although there are many alloying elements that can be added to the basic aluminum, there are generally only 5(five) major alloying elements. The alloying elements for aluminum are seen in the illustration below;

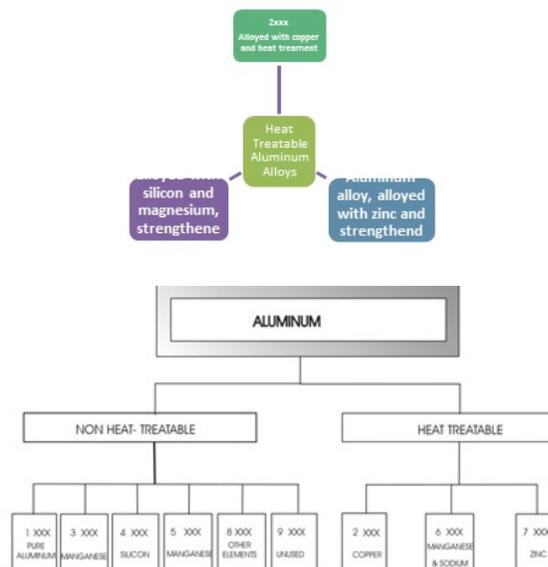


Categorization of Non Heat Treatable Aluminum Alloys



The only thermal treatment that can be given to the non-heat treatable aluminum alloys are those thermal treatments that will; Anneal, Stress Relieve. There are no other thermal strengthening treatments that can be applied to the non-heat treatable aluminum alloys.

Categorization of Heat Treatable Aluminum Alloys



Solutionizing Treatment. (sometimes known as solution anneal)

Precipitation treatment. (age hardening/naturally/artificially. The net result of the solutionize treatment (in terms of hardness is, that the particular alloy is in its softest condition). The precipitation treatment is the process that will develop both the appropriate metallurgy and the mechanical properties of the particular grade being treated.

Solutionize Treatment. There is a very specific reason for the **solutionizing** procedure which is to take into solution (dissolve) all of the principle alloying elements contained in the analysis of the aluminum alloy. The alloying elements are known as the **solute** elements. The solute elements are generally;

- Magnesium

- Zinc
- Copper
- Silicon

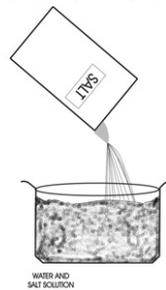
Other elements that are not in solution, such as;

- Antimony
- Strontium
- Sodium
- Phosphorous

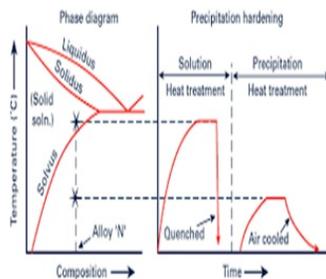
Will strongly affect the aluminum alloy microstructure accomplishment.

So what does it mean to solutionize or solutionize anneal?

The process of aluminium solutionizing treatment is slightly different to that of steel heat treatment. It is different in so much as the solutionizing treatment which involves heating the aluminium alloy up to its appropriate solution temperature followed by quenching rapidly, this makes the alloy extremely soft. This procedure is done simply to make sure that all of the solute alloy elements go into solution. (Hence the name solutionizing.) (Think now of the saturated solution of salt in water, the method of making the salt go into solution is to raise its temperature);



The next illustration shows a typical solutionize procedure, followed by a precipitation hardening procedure:



The process temperature is such, that the aluminum alloy is very close to the aluminum alloys lowest melting temperature, which necessitates the need for;

- Temperature accuracy
- Temperature uniformity

In addition to this requirement, it further necessitates the ramp up to the solutionize temperature as uniformly as is possible to reduce the risk of creating low

temperature grain boundary melting and for the possible cause of segregated structures. The time at the solutionize temperature will be determined if the heat treatable aluminum alloy will be;

- Forging
- Casting
- Extrusion

This because at the primary alloy manufacture, differential cooling rates will occur from the surface to the core, thus producing different grain sizes and potentially different phase structures. An excellent guide to time at solutionize temperature is to refer to the ASM publication known as 'The Heat Treater's Guide, Practices and Procedures for Nonferrous Alloys'. (This publication is a very valuable publication and a great addition to the heat treater's library.

Solution Quenching for the heat treatable aluminum alloys

It is of PARAMOUNT importance that the transfer of the aluminum alloy being solution treated, be transferred in a most timely manner to ensure complete solutionizing of the alloying elements. The process temperature selected (depending on the heat treatable alloy and its maximum cross sectional thickness) and the transfer time begins at the commencement of the furnace access door beginning to open and is complete at the point of total submergence of the alloy into the selected quench medium.

Should the time of transfer exceeds the appropriate transfer time (based on cross sectional thickness) will not achieve full solutionizing. This means that the both the required metallurgical and mechanical properties will not be accomplished. It is further recommended that for the heat treatment audit for NADCAP and the heat treatment of aluminum alloys, the heat treat company is in possession of a certified and certificated stop watch be used to verify the transfer time from furnace to quench medium. The maximum transfer time for aerospace aluminum heat treat alloys, is as follows;

Cross sectional thickness of 0.016" Max = 5 Seconds, from commencement of door opening to total quench medium submersion.

Cross sectional thickness of 0.500" and greater = 15 Seconds, from commencement of door opening to total quench medium submersion





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Advanced Heat Treat Corp. Adds Three New Gas Nitride Units

Jan 16, 2019

Advanced Heat Treat Corp. (AHT), a recognized leader in heat treat services and metallurgical solutions, announced today the arrival of three new gas nitride units at their corporate headquarters located in Waterloo, Iowa. The investment doubles their gas nitriding capacity at this location and allows the company to expand its UltraGlow® gas nitriding and UltraOx® surface treatment solutions. The three new gas nitride units vary in size, allowing for the accommodation of various industries and applications including, but not limited to: agriculture, construction, aerospace, firearms and oil and energy. One nitride unit will be operational this month, and the additional two units will be running in February. AHT also has plans to design/build an additional unit later in 2019.

AHT President, Mikel Woods commented, "I'm excited on many accounts. One, we're adding capacity/back-up to an already growing agriculture/construction market. Two, we have plans to add a new Nadcap process in order to expand further into the aerospace market and meet our customer requirements/requests. And three, we're gearing up to go even bigger in 2019 with additional equipment." The new units will house AHT's UltraGlow Gas Nitriding and UltraOx services, commonly used in manufacturing to prevent corrosion and improve wear resistance.

Woods commented, "UltraOx is rapidly replacing processes like QPQ/salt bath, chrome plating and nickel plating; therefore, it was pivotal for us to invest in more equipment so that we can accommodate the growing demand and continue to provide our customers with the quality and service they have come to expect from AHT." AHT is currently Nadcap accredited for ion nitriding at their corporate location, but with the additional capacity, AHT plans to gain accreditation in gas nitriding by this summer as well. The additional Nadcap accreditation will help AHT

to accommodate additional aerospace needs and grow their UltraGlow gas nitriding service. www.ahtcorp.com”



Rod Pressey, Shmoltz & Bickenbach

Jan 16, 2019

We regret to mention the passing of Rod Pressey this past week. Rod was the General Manager of Captive/Commercial heat treater Shmoltz & Bickenbach in Windsor, Canada for a number of years before the plant shut down with much of the equipment moving to another Shmoltz location in Carol Stream, IL, USA. We say that much of the equipment was moved to Carol Stream-this is only partly correct. The very large 10 bar Ipsen vacuum furnaces seen in the background in this picture had holes drilled in the shells, were then cut in half and the scrap sent to different scrap dealers such was the paranoia that another user would blow the furnaces up with Shmoltz being liable for any damages. In this photo Rod is on the left and Gunter Braus of Dibalog in Germany is on the right. Rod was a good man and he will be missed.



Calvert Street Capital Partners and Thermal Process Holdings, Inc.

Jan 15, 2019

Thermal Process Holdings, Inc. (“TPH”) is pleased to announce Mr. Todd McDonald as President and Chief Executive Officer. McDonald will oversee TPH’s five current commercial heat treat operating locations, and work closely with the TPH leadership team to grow the organization and create a positive experience for TPH customers and employees.

“Having Todd in a leadership role is a game changer for us. He is an accomplished executive with a strong track record of delivering operational excellence and growth. Todd shares our passion for the heat treating industry and embodies our entrepreneurial spirit, and we are very excited to have him on our team,” commented John Hubbard, Chairman of the Board at Thermal Process Holdings. Mr. McDonald previously served as President and Chief Executive Officer of Signicast, a global leader in commercial investment castings, which was previously owned by investment affiliates of the Pritzker Group. During his time at Signicast, the company experienced significant growth and improvement in operating metrics. In addition, he led the successful launch of a new state-of-the-art facility which, combined with Signicast’s seven other plants, created just under one million square feet of manufacturing space for their extensive captive heat treating operations. Signicast was sold in 2017 to Dynacast.

“I am delighted to join John Hubbard and the Thermal Process Holdings team, and I’m looking forward to the growth opportunities ahead of us,” commented McDonald. “Through my prior experience in the thermal processing industry, I’ve had a chance to work with some of the TPH companies, and am excited to partner with all of our employees to build upon the excellent businesses they’ve created. Mr. McDonald earned his B.S. in Business Economics from South Dakota State, where he was also an All-American football quarterback. He currently lives in Hartland, Wisconsin with his wife and two children.

ABOUT THERMAL PROCESS HOLDINGS, INC. Thermal Process Holdings was formed by Calvert Street Capital Partners and John Hubbard (former CEO of Bodycote, PLC) to pursue a buy-and-build strategy in the thermal processing industry. The team has a stated goal to build a diversified, professionally-managed thermal processing business generating over \$100 million of revenue. TPH currently owns and operates four businesses: Diamond Heat Treat, based in Rockford, IL; Certified Heat Treating, based in Springfield, OH; Hudapack Metal Treating, based in Elkhorn and Franklin, WI; and P&L Heat Treating, based in Youngstown, OH. TPH is actively seeking other add-on acquisition opportunities.

ABOUT CALVERT STREET. Calvert Street Capital Partners is a Baltimore, Maryland-based private equity firm with a focus on investing in industrial service businesses in the lower middle-market. Since its inception in 1995, Calvert Street has partnered with skilled management teams of privately held businesses to drive profitable growth and organizational transformation. TPH builds upon Calvert Street’s experience in other high-value add industrial sectors, including testing and inspection and precision machining.

For more information, please go to www.cscp.com. Contacts, Julie Padgett, CompleteSpectrum, (813) 907-2150, JP@completespec.com



Where Are They Now? Marco Moser

Jan 14, 2019

The alloy industry consists of all those companies around the world who supply either fabricated or cast high temperature alloy components such as base trays, baskets, radiant tubes etc. And if you are involved with the alloy industry we can almost guarantee that you know Marco Moser either from his days as President of North American Cronite or as VP Business Development for Alcon Industries of Cleveland, Ohio, USA. Well after 3 years and 4 months Marco has abruptly left Alcon and is looking for new opportunities-and with his experience we would assume he will find a new opportunity pretty quickly. We went through our file photos and came up with this one of Marco-he is on the right. This photo was taken at a Heat Treat Show in Germany back in 2016 where Marco was presenting Alcon to the European market, something which we never understood. For logistical reasons it is almost unheard of for a European alloy supplier to supply the North American market and visa-versa-since we have not seen Alcon exhibiting at any European shows since then we have to assume they learned this lesson.



Inductoheat Webinar

Jan 14, 2019

In this webinar, attendees will learn about:

- *Induction hardening of powertrain transmission and engine components*
- *Failure analysis*
- *How to avoid cracking in induction hardening*
- *Subtleties of heating parts with holes, fillets, and other geometrical irregularities*

- Re-hardening (re-austenitization) of previously hardened parts
- Novel inverters that allow instant and independent adjustment of both frequency and power
- Selected challenges when applying induction tempering
- Reducing process sensitivity and improving robustness and flexibility of induction systems.

To Sign Up For The Webinar Please: [Click Here](#)

Dr. Valery Rudnev Biography. Dr. Valery Rudnev is the director of science and technology at Inductoheat Inc., an Inductotherm Group Company. He is considered one of the leading global figures in the induction heating and heat treating industry. Valery has more than 40 years of experience and is known within ASM International and among induction heating professionals worldwide as Professor Induction. In 2006, he was elected as a Fellow of ASM in recognition of distinguished contributions to the



field of materials science and engineering. In 2017, the International Federation for Heat Treatment and Surface Engineering (IFHTSE) elected Valery as a Fellow in recognition of significant contributions to the development of heat treatment and surface engineering. He has authored and co-authored numerous chapters for nine handbooks devoted to various aspects of induction heating, heat treating, materials science, computer modeling, and innovative process development. His credits include a great deal of know-how, more than 50 patents and inventions (both U.S. and International), and more than 250 engineering publications. He has also served as a keynote speaker at many international conferences.

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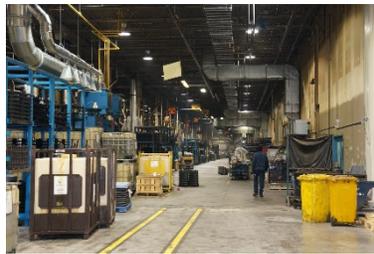
SOLAR MANUFACTURING

Don't let **one part** keep you down

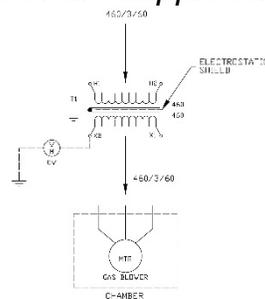
Monday Morning Briefing

Jan 14, 2019

Now the beginning to this Monday Morning Briefing has little to do directly with heat treating but we just had to mention it since it has to do with **Linamar**. This international auto parts maker is one of the larger captive heat treaters in North America and as such we have mentioned them many times on this site (the photo below shows part of their heat treating department at Linamar Gear in Canada). *“Well a group of workers at the company just won a \$60 million dollar jackpot as you can see below; “Today, a group of nine co-workers from southern Ontario picked up a \$60 million cheque. The auto parts production line workers won the Dec. 21, 2018 Lotto Max jackpot. “We’re a very close line – closer than any of the other lines,” shared group leader Ala Hirmiz. “We always talk and joke and celebrate each others’ birthdays. And now we get to celebrate this unbelievable win together!” The co-workers work the same line and the same shift at Comtech, a Linamar company.”*



Solar Atmospheres Files Patent for 600 HP blower motor in Argon Gas; *“Solar Atmospheres, Inc. has filed a Patent Application with the US Patent Office, application number 15/999,873 for a high pressure, rapid gas quenching vacuum furnace utilizing an isolation transformer in the blower motor power system. The gas quench with a 600 HP motor operates at 460 volts in Argon gas, utilizing a double wound, Magnetic Specialties, Inc. electrical isolation transformer, primary winding 1:1 to the secondary winding, with a Variable Speed Drive and solid state electrical spike protection for motor arc suppression.”*



Heat Treating of Aircraft Landing Gear. A lifetime spent in the heat treating industry has shown us that there are many types of heat treating which can provide the same results-take aircraft landing gear as an example. Commercial heat treater

and vacuum furnace manufacturer **Vac Aero** is the largest commercial heat treater of aerospace landing gear in North America. Their very impressive facilities utilize vertical vacuum furnaces with oil quenching manufactured by the company themselves-an example can be seen below. Landing gear manufacturer **Safran** one of the world's largest chooses a different approach, pit furnaces with endo atmosphere and separate quench oil tanks-a photo is below. Both companies achieve excellent metallurgical results although the type of furnaces utilized are quite different.



John Principi, General Manager of **Bodycote, Burlington, Canada** retired as of December 31st, 2018. John has been GM of this facility for as long as we can remember- at this point no long term replacement has been named. This Bodycote location was formerly **Nitrex Metals Technologies** before it was acquired by Bodycote a few years back. Since that time the company has made very substantial investments in the plant including a number of new batch IQ furnaces. Remember the **GM Enterprises**, very large 2 bar vacuum furnace we listed shortly before Christmas (if not the photo below should jog your memory). As predicted it did not last long on the used market and is now destined to move from the aerospace rebuild facility where it was located to a commercial heat treater in North America.



GE India has now finished installing their brand new Ipsen bottom load vacuum brazing furnace. We mentioned this sometime back during installation and at the time commented on the color. While this is a very nice looking install the color hurts our eyes.



French vacuum furnace builder **BMI** has been having some success recently selling vacuum furnaces into Russia. During the last two months of 2018 the company shipped 4 new vacuum furnaces to Russia including an oil quenching furnace, a vacuum brazing furnace, an LPC furnace and a vacuum nitridier. While we know little about the Russian heat treating market we at “The Monty” will be attending the upcoming Exhibition “**Heat Treatment 2019**” and **IFHTSE** event September 17-19 in Moscow, Russia to learn more.

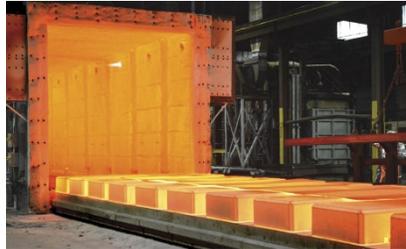


Commercial Heat Treating Discovered?

Jan 11, 2019

Our news item of earlier this week about California Brazing being acquired by an equity firm shows a trend which we have been seeing for some time now and which appears to be accelerating-namely equity firms investing in the commercial heat treating industry (*this is the original news item; “Trive Capital Partners Acquires California Brazing. Well we now have our first acquisition in the North American commercial heat treating industry for 2019. An equity firm by the name of Trive Capital just announced that they have acquired California Brazing with two locations, California Brazing in Newark, CA and Nevada Heat Treating, located in Carson City Nevada.”*). Going back about 5 years we at “The Monty” found that with increased regularity we were being approached (and undoubtedly many others) by private equity firms looking for information about the commercial heat treating industry in North America and for that matter the world. The reasons are obvious, commercial heat treating can be a very profitable business if done correctly and equity firms over the past few years have become more and more aggressive about improved returns. The result is that over the past few years a number of commercial heat treaters have either been outright acquired or accepted investments from equity firms. A few names that come to mind are Nitrex Inc.,

Premier Thermal, Bluewater Thermal, California Brazing, Alfe Heat Treating Inc., Diamond Heat Treat, P&L, Certified Heat Treat, Hudapack, Commercial Steel Treating Corp., and Applied Process. Is this trend good bad or indifferent-it really depends upon the equity firm and their objectives. Will this continue-we would say yes but it is becoming more difficult as there becomes fewer and fewer good profitable companies interested in selling. Our conclusion? We wish we had a heat treat for sale. (by the way for a list of the largest commercial heat treaters in North America <https://themonty.com/largest-commercial-heat-treaters-in-north-america-october-2018/>)



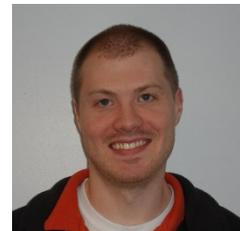
Paulo Cleveland Management Changes

Jan 9, 2019

Paulo is the second largest commercial heat treater in North America and we are always pleased to mention what they are up to. This press release caught our attention because Andy Muto (who is mentioned) has just been promoted to Operations Manager. Andy is the son of long time Paulo employee Bob Muto. Bob is famous in the industry as a male model-in the picture below he is third from the right-perhaps his smiling face looks familiar as for years he has been associated with advertising for one of the vacuum furnace builders.



“Paulo is excited to announce changes within the Cleveland Plant leadership. Both promotions are internal; developing leaders from within is a focus of our Human Resource team. Andy Muto has been promoted from Production manager to Operations Manager, and Keith Blackford has been promoted to 1st Shift Manager from 3rd Shift Manager. Andy is replacing Tom Buckeye, who is retiring in Spring 2019. Andy has a BSBA in Operations Management from The Ohio State University and worked in logistics prior to joining Paulo in 2014. He began as an Area Manager, and was promoted to Production



Manager in January 2017. Plant Manager Bob Muto commented, "Andy's interpersonal skills have been beneficial both in helping to develop the Cleveland Team and in building stronger relationships with our customers. He has been instrumental in training Team Members and improving information flow down." Andy added, "I'm excited for the opportunity. This allows me to be at the forefront of driving us to continually progress and improve as a team. I will strive to increase the value we add for our customers and for Paulo as a whole."

"Keith Blackford joined Paulo in 2008 as a 3rd Shift Supervisor in the Vacuum Department. Keith was promoted to Off Shift Manager on 3rd Shift in February 2017. In his new role as Shift Manager on 1st Shift he will be responsible for the Vacuum Department, which consists of over 30 Vacuum Furnaces, and the Thermocouple Wire Department. Andy Muto commented, "There are specific adversities and challenges that one can face during the overnight shifts. One must be self-sufficient and accountable to be effective at the role. Keith has proven himself here and thus he has proven himself to be a great fit for the 1st Shift Manager role. We are looking forward to this transition with great excitement as we know Keith is as well."

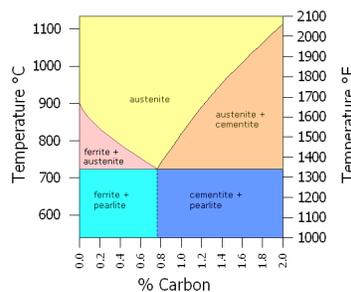


Nitriding, Process Methods and Metallurgy

Jan 9, 2019

From international heat treat consultant David Pye pye_d@gmail.com we have an article about Nitriding.

The process Nitriding is a diffusion process and not a deposition process. It is a diffusion procedure that is reliant on a nitrogen source, and a low thermal process temperature (which, by looking at the Iron Carbon Equilibrium diagram is in the ferrite/cementite region of that diagram) just as the process of carburizing and carbo-nitriding processes are.



However, there are significant differences in the two surface hardening process techniques;

- A lower process temperature (determined for steel by selecting a process temperature below the steels prior tempering temperature by some 50°F to say 70°F, and of course making considerations for the possible potential for distortion).
- Surface metallurgy and mechanical properties (different surface phases and diffusion zone metallurgy)

Machlet of Elizabeth, New Jersey was granted a process patent granted in 1908. The German metallurgist (Dr. Adolph Fry of Krupp Steel) was granted a European process patent in 1923. This led Krupp Steel to develop and market selected steels which were then known as Special Nitriding Steels or better known as the Nitralloy steels by Thomas Firth and John Brown Steels in the United Kingdom.

The process principle is based on the simple premise of the limits of solubility of nitrogen in iron. In other words, nitrogen will diffuse in the iron or steel very easily with the application of heat and will interact with the some of the alloying elements. (This also includes Iron)

The chemistry of the process is extremely simple and uncomplicated. The source of nitrogen is ammonia for gaseous nitriding. The surface reaction and the decomposition are as follows:

- $2\text{NH}_3 + \text{heat} \rightarrow 2\text{N} + 3\text{H}_2$ (Equation 1)
- $2\text{N} + 3\text{H}_2 \rightarrow \text{N}_2 + 3\text{H}_2$ (Equation 2)
- $K_n = \frac{p_{\text{NH}_3}}{p_{\text{H}_2}^{3/2}}$ (Equation 3)

The initial decomposition is to separate the nitrogen from the hydrogen of the ammonia (nitrogen source). For a fraction of a second, the nitrogen is atomic, which will react with the steel being treated which then diffuses into the steel surface. The hydrogen acts as a dilutant gas and also a reducing gas to assist in reducing surface oxide contaminants. The steel surface acts as the catalyst to assist in the gas decomposition.

The ratio of nitrogen to hydrogen in the ammonia decomposes to a ratio of 1 part nitrogen to 3 parts of hydrogen. This is a very important observation to note when defining what type of formed immediate surface metallurgy is required for the application of the part being nitride.

From the decomposition of the gas, atomic nitrogen will react the steel surface and begin to diffuse into the steel. The nitride forming elements that will react with the atomic nitrogen and form stable nitrides are as follows:

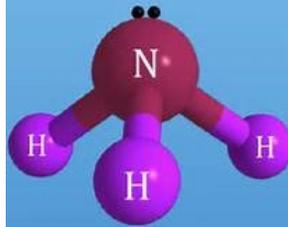


It should not be forgotten that Iron is also considered as a nitride former. However the resulting nitrides do not exhibit high hardness values, but assist in the improvement of the steels resistance to corrosion.

Nitriding methods.

At least 4 different, yet basic different methods of applying the nitride process to steel and are:

- *Gaseous nitriding (using ammonia as the nitrogen source)*

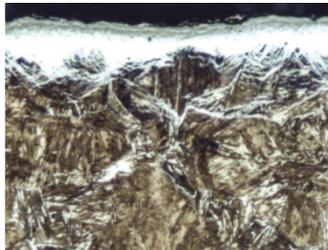


Ammonia gas molecule

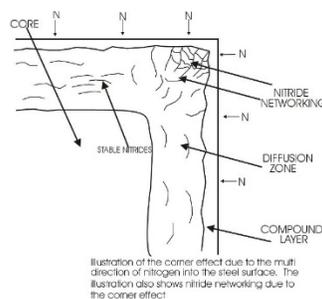
- Salt bath nitriding (using a cyanide based salt such as KCN and NaCN) (Potassium Cyanide and Sodium cyanide)
- Plasma nitriding process techniques can also be known also as Glow discharge nitriding, or Plasma nitriding Continuous DC nitriding, Pulsed Plasma nitriding.

The decomposition of the ammonia to release both nitrogen and hydrogen diffusion is very similar with each of the above methods except with the Plasma nitriding. Time, temperature and material chemistry will also influence the;

- Surface metallurgy
- Surface hardness
- Core hardness
- Diffusion zone enrichment
- Nitride networks



Severe Nitride Networks

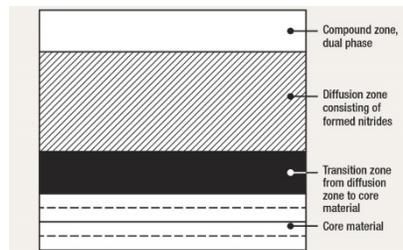


Metallurgy

The final metallurgy (As seen in the Illustration below and by the gaseous process methods or salt bath methods) will be formed as seen in the lower illustration) comprise of the following results in the order of observation (microscopically)

- Compound layer (also known as the white layer), because the immediate surface etches out white with a cross sectional examination of the formed case) The compound layer comprises of two phases known as Gamma Prime (γ') and Epsilon nitride (ϵ) The compound zone formation can be controlled by adjustment of the process gas flows(or salt bath chemistry)
- Diffusion zone. This is where the nitrogen has reacted with the alloying elements to form stable nitrides with the appropriate alloying elements.
- The transition zone. (this is the area from the diffusion zone to the core material)
- This is the original core metallurgy of the steel being nitrided.

The exception to the above will be nitriding by plasma techniques and nitriding by dilution techniques.



General nitride surface metallurgy of the formed case

Plasma

What do we understand as “plasma”? There are many forms of natural plasma, such as;

- Lightning
- Aurora Borealis (Northern Lights!)

A simple generated fluorescent light is a plasma light source with can be colored by various internal gases.



Plasma Ball



Ball Studs under Pulsed Plasma Assisted Nitriding Conditions

The thermal process requirement can be accomplished by Continuous DC generated Plasma, or be a combination of variable pulsed plasma, in conjunction with an electrical external heat source

Plasma nitriding has the distinct advantage of being able to control the ratio of nitrogen to hydrogen in order to control the resulting surface metallurgy of the nitriding process. The formed compound zone can be constructed of:

- Dual phase (γ and ϵ)
- Single (Mono) phase (γ or ϵ)
- No compound layer

It can be said that “fixed process chemistry = fixed resulting surface metallurgy, but variable process chemistry = variable surface metallurgy”

This can simply be accomplished, by control and adjustments of the ratios of molecular nitrogen to hydrogen.

Steels for Nitriding

Any steel will nitride, simply because of the presence of iron. However they will not produce the same hardness values because of the steel chemistry's. The iron will assist in the surface corrosion resistance by the formation of Iron Nitrides.

Below is a general group of steels that will nitride. The list is by no means complete:

- **Cast Irons.** Cast iron grades will nitride without any significant difficulty. The problem then arises because of the cast iron density and The ability of the nitriding to nitride cast iron has been known for many years and is not new. A new use has been developed for cast irons, which is the nitriding of cast iron forming dies for the surface hardening of large auto bodies (such as the tractor in tractor/trailer. This has been pioneered by European and USA die manufacturers with commercial heattreaters.
- **Alloy steels.** Most alloy steels will nitride. However care needs to be taken when considering the choice of steel for nitriding and in particular with the carbon content. It is not generally necessary to have a high carbon percentage in the steel to give high core hardness in order to support the formed case. A carbon content of approximately 0.45% maximum is considered acceptable. Once again, please be aware that the carbon content of the steel will affect the ratio of gamma prime to epsilon phases in the compound layer.
- **Tool steels.** The typical tool steels for nitriding will be the Hot Work series of tool steels. The High Speed Steels will nitride very satisfactorily, as will

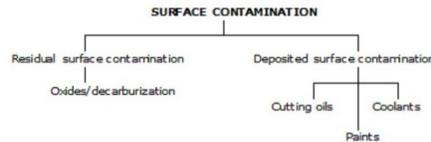
the Air Hardening tool steels. There are some applications where the D series are nitrided, but care should be exercised when selecting the D series for nitriding.

- **Stainless steels.** All of the stainless steels will nitride. This is because of the ability of chromium to form high surface hardness values. However some will nitride easier than others. The martensitic stainless steels are perhaps the easiest to nitride. All of the other stainless steels require some form of surface de-passivation to remove the chrome oxide layer on the immediate surface of the stainless steels. Once the chrome oxide surface layer, then the stainless steel has lost its corrosion resistance.

A general note for accomplishing a good and sound nitrided structure.

It is a mandatory requirement that the surface is free from surface contamination such as is seen below

Illustration of possible surface contaminations



Sincerely David,
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Very Large Plasma Nitrider Installed in China

Jan 9, 2019

Shortly before Christmas we posted a photo of the largest Plasma nitrider RÜBIG Industrial Furnaces had ever built-we now have a few more details. The unit will shortly be in operation at a gear manufacturer in China who is providing ring gears to the wind industry. With an effective diameter of 2,2 m it is the largest cross section plasma nitriding equipment produced to date by RÜBIG. The application of nitriding increases especially in drive systems fabrication because the low level of distortion makes the follow-up procedures, such as re-grinding and shot blasting, obsolete and thus significantly reduces costs. Coupled with the fact that as opposed to traditional heat treatment no toxic gases are used and no open flame is needed it would appear to be a good fit. In this photo we see Leon Zhao a service engineer with RUBIG China along with Manuel Frei, Markus Saxinger and Philipp Humer of RÜBIG, Austria.



Wisconsin Oven – 2018 Year In Review

Jan 9, 2019

Interesting the number of ovens Wisconsin Oven built in 2018-a quick calculation shows that Wisconsin shipped on average a new piece of equipment every 1.6 days or 4.3 per week which is pretty cool. *“2018 was another strong year of growth for Wisconsin Oven. During the year they shipped an impressive 224 pieces of equipment to companies in industries such as composites, aerospace, technology, and automotive. This equipment included a mix of custom and standard batch and conveyor ovens that were used for curing composites, treating aluminum castings, post curing refractory material, and stress relieving automotive springs. This year the Wisconsin Oven team installed the world’s largest composite cure oven. This oven is a significant accomplishment in their drive to be the leading supplier of composite curing ovens in the world. The continued growth led to many new employment opportunities. As many companies have experienced, with a strong economy comes the challenge of acquiring and maintaining quality employees. Another challenge in the manufacturing sector is the increasing skilled trades gap. Dave Strand, President, and CEO, had been noticing for years the need for more skilled trades workers in the job market and in 2018 made his dream*

of [Wisconsin Oven Universal Training Center \(WOC-U\)](#) a reality. At the new WOC-U center, experienced Wisconsin Oven production personnel and engineers provide specialized training to help prepare the workforce of the future. The students are paid during their training and many are hired to full time upon graduation.”



Trive Capital Partners Acquires California Brazing

Jan 8, 2019

Well we now have our first acquisition in the North American commercial heat treating industry for 2019. An equity firm by the name of Trive Capital just announced that they have acquired California Brazing with two locations, California Brazing in Newark, CA and Nevada Heat Treating, located in Carson City Nevada. Both locations were owned by Rich Penrose, a very well known individual in the North American heat treating community. It has been pretty common knowledge for some time that the company was for sale with rumors suggesting that the buyer was an equity firm but this is the first definite news. Sales for the two locations are estimated to be between \$25 million and \$30 million USD per year. The first picture below shows Rich Penrose along with Pat McKenna who is now the President of Ipsen, USA and the second photos shows Nevada Heat Treating.

“Trive Capital (“Trive”), the Dallas-based private equity firm, is pleased to announce it has partnered with [California Brazing](#) (“Cal Braze” or the “Company”). Founded in 2002 and headquartered in Newark, California, the Company is a leading manufacturer of complex, high tolerance components for space, aircraft connectivity, specialty electronic and various defense applications. Cal Braze specializes in CNC machining, metallic and ceramic vacuum brazing, and heat-treating services for both OEM and Tier 1 defense and communication customers. The Company operates out of two facilities in the San Francisco Bay Area and Carson City, NV, delivering turnkey manufacturing of mission critical parts that include satellite waveguides, antenna sub-systems, cold plates and other thermal management devices.

“We are excited to partner with California Brazing management in support of the next phase of the Company’s innovation and expansion,” commented [David Stinnett](#), Partner at Trive Capital. “We believe the California Brazing team has built a differentiated capability and reputation for supporting highly engineered

components that will benefit from increased funding into satellite, aircraft connectivity and defense electronic sectors. Trive looks forward to providing capital and resources to help the business achieve continued growth and value to its customers.”

California Brazing President & CEO, Rich Penrose stated, “California Brazing’s unique value proposition and recent investment in new capacity and capability has resulted in tremendous growth. We look forward to continuing this momentum and chose to partner with Trive based on their knowledge in the sector, operational approach and shared vision for the future. Our mission is to deliver best-in-class services and support to our customers, which we believe will be further enhanced with the Trive partnership.”



David Pye on Tempering

Jan 8, 2019

International heat treat consultant David Pye gives us these thoughts on tempering;

“The need for tempering to temper after the austenitize and quench procedure

A favorite television program for me (and I suspect many other heat treater’s) called ‘Forged in Fire’ shows and demonstrates the early forging techniques that were used to make knives, swords, axes and so on. It further demonstrates the importance of good heat treatment in order for the weapon to be functional. However I have observed quite a few omissions in the heat treat procedure.

- *When the implement is quenched after austenitizing, there is very little agitation of the blade to break up the initial vapor blanket. This means t(in my opinion) that the blade is not being effectively quenched for the first stage of the quench procedure.*
- *The second omission (and perhaps the most important), there has yet to be a broadcast that demonstrates the most important thermal treatment to make the implement functional which is tempering!! If the implement is not tempered correctly, it can be too soft (and bend, or not hold its edge) or too hard (and the implement chips or breaks!!). Good heat treatment makes the*

product; bad heat treatment breaks the product. (This particularly applies to the tempering procedure)

Hardness; *The as quenched hardness is the first noticeable event and if the implement has responded to its given thermal treatment. Check the hardness simply with a 6" fine cut file. The file is usually heat treated to 62HRC to 64 HRC. If the file bites into the as quenched steel, than it has not been fully transformed into martensite, and is below 62HRC. If the file skids off the as quenched steel, it means that the appropriate transformation to martensite has occurred. It is a simple and quick test to observe if the appropriate transformation has occurred. This should be conducted prior to tempering the implement.*

Tempering; *The purpose of tempering is to develop both the toughness and ductility of the austenitized and quenched steel implement. Tempering can also be considered as a stress relieving procedure to relieve the brittle nature resulting for the austenitizing and quenching procedure. Depending on response of the steel to the austenitizing temperature, we must now select the appropriate tempering temperature to ensure functionality of the as quenched implement. It is that tempering temperature and the time at that particular temperature, that will determine the final hardness. Generally, there is usually no noticeable change in hardness to the steel (through hardened or surface treated by carburizing) at a temperature of say 300 °F. The final and functional tempered hardness will depend on;*

- *Selection of the tempering temperature*
- *Residence time of the steel at the tempering temperature*
- *Material chemistry (carbon and alloys content present in the treated steel implement)*
- *Type of martensite present in the microstructure*
- *Retained austenite (if present after quenching)*

The type of martensite that is present in the steel will be determined by the carbon content of the steel. As stated previously in the first article the two types of martensite are;

- *Lath martensite (steels with low carbon content present)*
- *Plate martensite (steels with carbon content above 0.60%)*

You will find that most tempering data related to hardness will display a decrease in hardness in hardness and an increase in toughness. This will apply to the plain carbon steels as well as the alloy steels and some of the tool steels.

Steel Response during tempering; *The high alloy tool steels such as;*

- *A Series*
- *D Series*
- *H Series*
- *HSS Series*

Some of the above steels will require a double temper, whereas the AISI alloy steels will only require a single tempering treatment. The above steels will begin to exhibit an increase in hardness at tempering temperatures from approximately

800°F up to approximately 1100°F. The temperature will depend of course on the hardness required in relation to the material chemistry and mechanical and metallurgical properties required. The tempering data graphs that are published by steel making companies are based on a 1" maximum cross section. The study of the Jominy End Quench hardenability tests for that particular steel analysis will give a good indication as to the as quenched hardness value for cross sections that are greater than 1". However, you can make up your own tempering diagrams simply by keeping an as quenched/as tempered log to keep a record of;

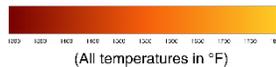
- The material being tempered
- The material maximum cross section
- The temperature selected for the tempering procedure
- The material as quenched hardness
- The time into the furnace
- The time up to the tempering temperature
- The time out of the furnace
- The tempered hardness results

From the above data, you will be able to make up reasonably accurate tempered hardness data for any of the steels that you deal with in your facility. **By David Pye, Pye Metallurgical International Consulting, Hampton Virginia www.heat-treatment-metallurgy.com**"

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Stack Metallurgical Group to Enter Hot Isostatic Press (HIP) Market

Jan 7, 2019

Stack Metallurgical Group (SMG) will be entering the Hot Isostatic Press (HIP) market in 2019 with the addition of a QIH 286 “Mega-HIP” manufactured by Quintus Technologies. Based in Västerås, Sweden, Quintus is widely-regarded as the global leader in high-pressure equipment and solutions. The addition of HIP will further expand the service offerings of SMG to key customers in the aerospace, medical implant, additive manufacturing, and power generation industries.

The equipment being constructed for Stack will offer some of the largest capacity available not only in the Northwest United States, but around the globe. It will be equipped with Quintus’ proprietary uniform rapid cooling and features a large-capacity work zone of 63 inches (1,600 mm) in diameter and 102 inches (2,591 mm) in height, allowing densification of large batches at 29,000 psi (2,000 bar) and a maximum operating temperature of 2280°F (1,250°C).

“We are truly delighted to bring large-scale HIP capacity to the Northwest U.S. market,” according to Doug Puerta, CEO. “HIP is a complimentary service to our existing portfolio of offerings. Stack has always worked closely with its clients to make smart investments in support of their metal processing needs. By expanding into HIP, we’ll be in a position to offer a really outstanding value proposition of capability, capacity, quality, and service.” Dave Ederer, Chairman of SMG adds “This is an important extension of Stack’s business philosophy of providing new technology to its established customer base.”

“Stack HIP” will be based in a brand-new 25,000 sq. ft. facility in Albany, OR. This will be the fourth location for SMG, and will complement existing heat treat and metal processing facilities in Portland, OR, Spokane, WA, and Salt Lake City, UT. Construction of the new HIP facility is underway and will be completed in mid-2019, with equipment installation to immediately follow.



Monday Morning Briefing

Jan 7, 2019

2019 marks a very special anniversary for “**WG Montgomery Ltd.**”, and “**The Monty**”. Way back in 1969 WG Montgomery Ltd. was founded by the writer’s father **William Gordon Montgomery** as a manufacturers representative firm selling new heat treating equipment-2019 marks our 50th year in business. 2019 also marks the 20th anniversary of “**The Monty**”, the worldwide heat treating publication. While William passed away in 2017 at the age of 82 we know he would be very pleased to see that his business lives on and continues to serve the worldwide heat treating industry.



Auto parts supplier and captive heat treater **Dana Corp.**, in Glasgow closed down some time ago (as we mentioned) and the surplus equipment was put on the used market. This included 3 Surface Combustion 3 row pusher furnaces which were in use up until December 2017. The lines were complete and in various conditions ranging from mediocre to pretty good but our prediction was that they were unlikely to find a buyer due to low demand these days for pusher furnaces. As it turns out our prediction was correct and the lines are being scrapped. Heat treaters can rejoice in the **Nickel Pricing** these days as you can see in the chart below. To cut a long story short there appears little likelihood of alloy pricing changing substantially in the near future.



Back in September of 2017 commercial heat treat **New Britain Heat Treating** in CT, USA suffered a devastating fire (the original story will be in our archives). Unfortunately fires are not an uncommon occurrence in our industry but what is always frustrating is that it is usually impossible to find out what caused the fire-it is important that our industry as a whole learns from our mistakes. In this case the fire would appear to have been caused by a malfunctioning motor.

“NEW BRITAIN – A malfunctioning motor that caused a machine to overheat started the spectacular blaze at New Britain Heat Treating Corporation Sept. 17 that roared for hours, officials said. Employees inside the building were changing a motor to a machine that cools the equipment that heats up during the metal treatment process when the equipment overheated causing oil to turn to vapors, said fire inspector Ryan Stewart, the lead investigator in the case. “The vapors created a fireball,” Stewart said. The cause of the fire has been determined to be accidental, Stewart said. The employees were not injured and were able to get out of the building at 126 Whiting St. before the heat treating business burst into flames. Firefighters arrived within minutes to find flames shooting out of all of the front windows of the building. Black smoke could be seen for miles. It took about 90 minutes to get the blaze under control with firefighters pouring foam, not water, on the flames from a ladder truck due to the chemicals inside the building. The fire roared back up about 30 minutes later forcing city firefighters to call in foam units from Hartford and Waterbury. In all firefighters spent about eight hours battling the blaze and putting out hotspots. Two firefighters who came in contact with chemicals while fighting the fire were treated and released from a local hospital. Due to the damage from the fire and the chemicals inside the building has been condemned by the city.”



It has now become “old news” about **Thermal Process Holdings** buying commercial heat treater **P&L Heat Treating** in Youngstown, Ohio, USA, however we ran across this interesting little summary in the local Youngstown newspaper; “**YOUNGSTOWN, Ohio (WYTV) – A Youngstown company closed 2018 with a major change and is ready for another one in a few months. P&L Heat Treating on Wood Street was sold in December to Thermal Process Holdings. The company was started in 1978 by Bill Pociask. It has grown from two employees to 16. P&L does heat treating of various dyes in vacuum furnaces, which heat up to over 2000 degrees. Today, it does more work in two weeks, handling millions of pounds, than it did in an entire year when the company was started. P&L has two dozen furnaces and offers a wide variety of heat treatment services, all done in**

Youngstown. *“The sale was important because the company will grow here, stay here, and our people will have good jobs and a potential to grow their own positions here, and our customers are extremely important because there is no way I would want this company just to end and leave everybody in limbo,”* said Pociask. *P&L Heat Treating will start an expansion project in the spring and plans to reach out to the Cleveland area for more work.”* In **Germany** we hear that furnace builder **KGO** has landed an order from a German commercial heat treater for a brand new vacuum nitriding furnace. We visited KGO just a few months back and took this picture of the KGO team.



Roger A. Jones, FASM, Honored as CEO Emeritus

Jan 4, 2019

“Souderton, PA, January 4 – Solar Atmospheres recently awarded the title of CEO Emeritus to Roger A. Jones, FASM. The honorary title was conferred by the company, and announces his semi-retirement as Solar Atmospheres’ CEO, the culmination of 45 years of leadership and service to the vacuum heat treating industry.

A 1974 graduate of Hocking Technical College (Nelsonville, Ohio), Roger began his professional career in the heat treating industry at ABAR Corporation. Jones left ABAR in 1978 to join the newly formed Vacuum Furnace Systems Corporation (VFS), working with his father and VFS founder, William R. Jones FASM. In 1983, Roger assisted the founding of Solar Atmospheres, Inc., serving as Vice President until 1993. Jones was promoted to President in 2001, and eventually to CEO in June 2017, overseeing operations of all four heat treating facilities.



As a member of several professional societies, Jones has provided leadership and has received numerous industry awards, primarily from the American Society of Materials (ASM) and the Metal Treating Institute (MTI). Jones has been recognized time and again for his outstanding commitment and service to the vacuum heat treating industry.”

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Thermal-Vac Technology, California, USA

Jan 4, 2019

Out in the western USA, Steve Driscoll has created a very nice commercial heat treating operation by the name of Thermal-Vac Technology. Over the years we have mentioned the company several times; a couple of recent mentions include when they announced a very large investment in the facility in June of 2018 and also back in 2014 when they acquired City Steel Treating. Be that as it may the company is giving us this update; “I have attached some breaking news from Thermal-Vac Technology! To summarize:

- Thermal-Vac Technology Inc., located in Orange, CA has been named a Top Workplace by the Orange County Register for 2018. (Press release and photo attached.)
- Thermal-Vac Technology Inc., located in Orange, CA **has received merit status** for NADCAP AC7102 Heat Treating accreditation.
- Thermal-Vac Technology Inc. dba City Steel Heat Treating, located in Santa Fe Springs, CA has been awarded NADCAP accreditation in AC7102 Heat Treating. This is **the initial accreditation award** after our 2016 acquisition of this location.”



High Pressure Gas Quenching In Vacuum Furnaces

Jan 3, 2019

David Pye is known around the world as one of the heat treat industry’s most knowledgeable consultants. Today he offers his thoughts on high pressure gas quenching in vacuum furnaces.

“Work has been conducted on this quench technology for many years now. In fact as far back as the early 1960’s with Reynoldson and Dawes in UK when they presented their work on using 2 bar over pressure with nitrogen and helium as the quench medium gases. Work progressed on the development of blended gas mixtures to substitute the liquid quench insulating vapor phase with a thermally efficient and effective cooling gas. The two most thermally effective cooling gases are:

- *Hydrogen*
- *Helium*

The writer has seen the use of 6 bar over pressure using 20% Hydrogen and 80% Nitrogen in vacuum work very effectively on tool steel heat treatments such as the D series, the High Speed Steels, and H series for example. Generally the pressure used today is a maximum of 20 bar over pressure (maximum) using blended mixtures of helium and nitrogen. The blend ratio can be blended according to the steel that is being treated. Thus one can now create the quench medium that best suites the type of steel being treated. The reason for the blend of nitrogen as the dilutant gas is one derived purely because of process economics. There are three perquisites for high pressure gas quenching which are:

- *Pressure*
- *Volume*
- *Velocity*

Because of the expense of helium, the focus of gas quenching (under partial pressure conditions) has been with nitrogen. The pressures being used today are generally in the region of 10 bar to 20 bar (Max) over pressure. The nitrogen is simply blown off to atmosphere and not usually recycled. The important factor about high pressure gas quenching, is that the completed work does not require any post cleaning whatsoever. The parts are almost as bright as when they went into the process vacuum furnace. A word of caution is necessary at this juncture. Do not exceed the rated over pressure quench capabilities of the vacuum furnace. This can result in serious damage to the furnace with the potential for serious injury. Sincerely David pye_d@ymail.com”



East Carolina Metal Treating/Raleigh, NC, USA

Jan 2, 2019

Commercial heat treater East Carolina with two locations in the US, Raleigh, NC and Virginia Metal Treating in Lynchburg, Virginia recently ordered another batch IQ furnace. The furnace to be provided by Surface Combustion is a 36" X 48" X 36" size unit capable of 4,000 pound loads. This system will fit in line with another Surface unit the company already has in place.



People News

Jan 2, 2019

We ran across two recent “people changes” which we would consider worth mentioning. It looks like **Joshua Farrell** very recently became Plant Manager of commercial heat treater **Mid South Metallurgical** in Murfreesboro, Tennessee, USA. Previous to this Joshua had spent 26 years as Production Manager at **Century Sun Heat Treat** in Michigan. Mid South is a long established commercial heat treater owned and run by **Mr. Clif Coleman** which has batch IQ furnaces, Vacuum furnaces and Ion Nitriding systems. In this photo we see Clif and his Quality Manager **Jay Hendershot**.



It would appear that **Mike Nappi** left **Feintool** in Cincinnati, Ohio, USA mid December of this year. Mike worked at **Cincinnati Steel Treating** for many years before joining Feintool. Feintool is an interesting company which offers fineblanking which required a great deal of heat treating-some of which is done in-house although most is outsourced to local commercial heat treaters. We’re not sure where Mike has ended up but we assume it will be in another heat treating capacity.

Beijing Huahai Zhongyi Industrial Furnaces Co Ltd , (HHZY)

Jan 2, 2019

Going back a number of years there was a very colorful individual by the name of **Tom Guler** in Australia who had made a real name for himself designing and building new furnaces over the course of a 60 year career in the industry (Tom passed away back in 2012 at the ripe old age of 90). Like many in the industry his

son, **Byron Stewart** followed in his footsteps and ended up starting up a new furnace building company in Beijing quite a few years back by the name of Beijing Huahai Zhongyi Industrial Furnaces Co Ltd , (or HHZY). We have mentioned Byron and his company a couple of times over the years and today we have this update for you. *“I hope all is well, here in China it is getting to be a real madhouse in the heat treating industry as the furnaces keep getting larger, the orders keep coming and China requires more and more heat treating processes. To give you an example we did over 150 furnaces last year including the Guler design and a new vacuum carburizing oil quench furnace line. This year I have to put in a new pressure vacuum temper furnace plus a complete vertical vacuum heat treatment line including 2 vacuum hardening furnaces and 4 vacuum tempers-all completely automated. My prediction is that 2019 is going to be a very big year in China. Best regards, Byron”*



Happy New Year!
Jan 1, 2019



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BATCH IQ FURNACES

See something you need, click on the link or scroll through all the items for sale. Searching for something we don't have listed, let us know.

Item#IQ464 Ipsen T-4 Batch IQ Furnace

Ipsen Model: T-4 Batch IQ Furnace, Serial # 52506

Type: Straight Through Atmosphere Integral Quench Furnace

Processes: Carburizing, Neutral Hardening and Carbonitriding

Heat Input: Natural Gas-Fired (8 ceramic radiant tubes)

Work Zone: 24"W x 36"D x 18"H

Max. Temp: 1850°F (Typically operated at 1750°F)

Max. Load Wt.: 850 lb at 1550F

Quenchant Heating and Cooling: Yes (SBS Oil Cooler)

Loading/Unloading: Ipsen Powered Front-end Loader and Roller Unload Table

Pit Required: None

Carbon Control: SSI Gold Probe

Controls: Super Systems, Inc. 9120 touch screen, with SSI Series 3 & 7 controllers, Digital data logging (currently tied into plant-wide SSI Super Data system), SSI eFlo Electronic Flowmeters for natural gas and air.

Insulation Type: Brick-lined

Included: Any available spare parts, Ammonia Tank.

Footprint: 5'5" Wide x 17'-10" Long x 13'-2" High per literature (We measure 93"W x 21'L x 14'H)

Alloy: Grids and baskets may be available

Asking Price \$39,000 USD

<https://themonty.com/project/itemb464-ipsen-t-4-batch-iq-furnace/>

Item#IQ463 Ipsen T-7 Batch IQ Furnace

Ipsen Model: T7-1000-DGM Batch IQ Furnace. Serial #52044. Type: Straight Through Atmosphere Integral Quench Furnace

Processes: Carburizing, Neutral Hardening and Carbonitriding

Heat Input: Natural Gas-Fired (12 Silicon Carbide Radiant Tubes)

Work Zone: 30"W x 48"D x 20"H

Max. Temp: 1850°F (Typically operated at 1750°F)

Max. Load Wt.: 1350 lb at 1550F

Quenchant Heating and Cooling: Yes (SBS Oil Cooler)

Loading/Unloading: Ipsen "T7 Trans. Loader" powered Front-end Loader and Roller Unload Table

Pit Required: None

Carbon Control: SSI Gold Probe

Controls: Super Systems, Inc. 9120 touch screen, with SSI Series 7 & 7SL controllers, Digital data logging (currently tied into plant-wide SSI Super Data system)

Insulation Type: Brick-lined

Condition: Refurbished by Unitherm, Converted to Eclipse Recuperative Burners (still under warranty)

Included: Any available spare parts, Ammonia Tank.

Footprint: 8'-6" Wide x 27' Long x ~14-1/2' High

Alloy: Grids and baskets may be available

Asking Price \$59,000 USD

<https://themonty.com/project/itemvf350-ipsen-t-7-batch-iq-furnace/>

Item#IQ462 Beavermatic Batch IQ Furnace

Beavermatic Batch IQ Furnace. Standard "Beavermatic" Integral Quench Furnace which includes top cool chamber, dunk & spray wash, 1400°F atmosphere temper, charge car and air to oil heat exchanger. This furnace has a

total of eight (8) single ended radiant tubes with recuperators, four (4) on each sidewall. Quench tank is heated. Natural gas fired with a max temperature of 1950°F. Model # 46-26-I.G.LQ.F and Serial # 1192-50-1. Voltage 460/3/60. Working dimensions of 24"W x 24"H x 36"L and external dimensions of 100"W x 12'5"H x 18'L. Controls Mounted & wired in a free standing panel includes a Honeywell UDC 3000 digital controllers for control and high-limit, Honeywell UDC 5000 for carbon control and Honeywell digital round chart recorder. Very good condition and available immediately.

Asking Price \$55,000 USD

<https://themonty.com/project/itemb462-beavermatic-batch-iq-furnace/>

Item#IQB461 Surface Combustion Batch IQ

Surface Combustion Batch IQ Furnace. Standard Surface Combustion Integral Quench Furnace with single quench cylinder and rear handler. This furnace has "Trident" type radiant tubes with Eclipse burners and Eclipse recuperation. Natural gas fired 1,000,000 BTU's. Serial Number BX-35790-1. Max operating temperature 1750°F with a voltage of 460/3/60. Working dimensions of 30"W x 20"H x 48"L. Approximate external dimensions 10'w x 10'h x 15'l. Controls: Mounted and wired in a free standing panel includes a current SSi control system with PLC and computer. Very good condition and available immediately.

Asking Price \$65,000 USD

<https://themonty.com/project/itemb461-surface-combustion-batch-iq/>

Item#IQ460 Surface Combustion Batch IQ

Surface Combustion "Super 30" Allcase Batch IQ furnace. Working dimensions of 30" x 48" x 30". Serial number BX 37769. Early 1970's vintage. Alloy in good condition and comes with a new spare trident tube. 2,000 F operating

temperature, gas fired. Updated SSI controls. Currently installed and in good condition.

Asking Price \$45,000 USD

<https://themonty.com/project/super-30-batch-iq-30-x-48-x-30/>

Item#IQ459 Surface Combustion Batch IQ

Surface Combustion batch IQ furnace. Serial number BX 36347-1. Gas fired, 1750 operating temperature. Endo atmosphere. 800 pound capacity. Does not require a pit. Complete and installed. Updated SSI controls with oxygen probe. Alloy and brickwork in fair condition. Working dimensions of 24"W x 36" deep X 20" high. Some cast fixturing is also included.

Asking Price \$25,000 USD

<https://themonty.com/project/472/>

Item#IQ453 Williams Batch IQ's

Williams Industrial Batch, high temperature, electric, Internal Quench furnaces. 24" W X 36" deep X 24" high load size. Mid 1990s built. 2 identical units available. Currently used for solution heat treat, water and Polymer quench. Max temp. 2100F, very tight +/-10F or better uniformity. Set up for Nitrogen atmosphere. Waukee meters for air and N2 with solenoids tied to recipes. SSI Oxygen probe with panel/display. Sand Lion PLC touch screen controls for recipes, charting, temp, agitator, atmosphere control etc. Horizontal SiCarbide glow bars for heating. SiCarbide rails make up the hearth for tray support and transfer. Chain guide and roller rails over the quench vestibule. Air operated inner and outer doors. Units are in use but ready to take out for the floor space. Transfer car not included.

Asking Price \$25,000 USD Each

<https://themonty.com/project/itemb453-williams-batch-iqs/>

Item#IQ451 Surface Combustion Batch IQ

Manufactured by Surface Combustion this is a batch IQ furnace. Working dimensions of 30" wide X 48" deep X 24" high. Gas fired. Nitrogen/Methanol with updated controls and an Atmosphere Engineering SmartMeth panel. Included datalogging and trending. SSi oxygen probe. Honeywell overtemp. Currently installed, complete and in good condition. Ready to go and available immediately.

Asking Price \$30,000 USD

<https://themonty.com/project/itemb451-surface-combustion-batch-iq/>

Item#IQB445 Surface Combustion Batch IQ's (3 Available)

Surface combustion gas fired batch IQ furnaces model "Super 36". Working dimensions of 36" wide X 48" deep X 32" high. Late 1980's vintage. Casemate controls, SBS quench oil filter. Set up for endo atmosphere with ammonia addition. Furnaces were in operation until February 27th 2018, now in indoor storage in the Detroit, Michigan area. Complete and in good operating condition. Alloy and brickwork in reasonably good condition.

Asking Price \$99,000 USD Each Loaded On A Truck

<https://themonty.com/project/itemb445-surface-combustion-batch-iqs-3-available/>

Item#IQ442 SOLO Quenching Machine

SOLO Quenching Machine 209-30/30 6981 – 1150 °C. Built by Solo of Switzerland this is a SOLO 209-30/30 model. This furnace was manufactured in 1991. Quenching machine for self-hardening and oil quenching. Composition: quenching Bell Furnace, nitrogen quenching unit, tempering furnace, oil quenching unit, controller / programmer, operator panel, temperature controller, hydraulic control. Dedicated for austenitizing, annealing, tempering, oil quenching, quenching under nitrogen. Max. temperature: 1150°C. Main voltage:

3 x 400 V – 50 Hz. Power input: 10 kW. Effective load dimensions: Diameter 300 mm*Height 300 mm. Max. loading weight: 20 kg. Protective gas: N2 or mixture N2 to max. 5 % H2. Overall dimensions: Height 2200mm, width 2070mm, depth 2250m. Possibility of mounting and commissioning by the manufacturer (SOLO). Located in France. Good condition. All manuals included.

For Pricing Please Contact Jordan@themonty.com
<https://themonty.com/project/itemb442-solo-quenching-machine/>

Item#IQ441 GM Batch IQ Furnace

GM Batch IQ with Top Cool. Manufacturer: GM. Type: Integral Quench Furnace with Top Cool. Heated: Natural Gas – 1.2 M BTU's/Hour. Max. Temperature: 1450-1875 deg. Voltage: 460/3/60. Work Area: 36"W x 36"H x 48"L. Controls: All mounted in two freestanding panels next to the furnace Includes motor starters relays, pushbuttons, signal lights etc. Honeywell indicating controller and overtemp. Honeywell circular chart recorder for recording temperature. Carbon control system.

Description: Furnace has (4) "U" shaped radiant tubes mounted vertically, (2) on each side wall. Heated by recuperated burners. Alloy roller rail hearth, alloy circulating fan, dual quench cylinders, top cool chamber and heated quench tank. Brick lined with fiber roof. Rear handler system, 1998 vintage. Installed, complete and operational. Condition: Very Good. Availability: Immediate.

Asking Price \$150,000 USD

<https://themonty.com/project/itemb441-gm-batch-iq-furnace/>

Item#IQ439 Surface Combustion Batch IQ Furnace

Surface Combustion "Allcase" batch IQ furnace with working dimensions of 36" X 48" X 30" high. Natural gas heating, 1 MBTU's/Hour. Maximum operating temperature of 1750F, voltage 460/3/60. External Dimensions: 10'W x 12'H x

15'L. Controls: All mounted in a panel attached to the furnace includes motor starters relays, pushbuttons, signal lights etc. Honeywell digital strip chart recorder for recording temperature, indicating controller and overtemp. Partlow controls for oil heating/cooling. Description: Surface Combustion Allcase Furnace with (6) "U" shaped radiant tubes mounted vertically 3 on each side wall. Fiber lined. Alloy roller rail hearth, alloy circulating fan, dual quench cylinders, top cool chamber and heated quench tank. Furnace has some missing components (temperature controls, pressure switches, ignition transformers, regulator) which will be replaced prior to shipment. Condition: Very Good.

Asking Price \$80,000 USD

<https://themonty.com/project/itemb439-surface-combustion-batch-iq-furnace/>

Item#IQ438 Holcroft Batch IQ Furnace Line

Holcroft Batch IQ Furnace Line. Model GP2500. Serial Number S/N #CJ-4233. Installed new in 1980. Gas fired, working dimensions of 30" X 48" X 30" and a capacity of 2500 pounds. Furnace was operational until shut down on 11/30/17 when plant closed. Also included is a double ended charge car (Holcroft) to handle loads of 30" X 48" and a Holcroft Spray/Dunk washer with heating system 30" X 48" X 30". Complete, in very good condition and ready to go.

Asking Price \$85,000 USD

<https://themonty.com/project/itemb438-holcroft-batch-iq-furnace-line/>

Item#IQ398 Sauder Batch IQ Line

Sauder Batch IQ Line. Serial Number 881978-83. Electrically heated 480/3/60/150kW total load. Maximum operating temperature of 1850F. Working dimensions of 24" Wide X 24" high X 36" long. Controls; Mounted and wired in an enclosure attached to the right hand side of the furnace includes a Marathon 10 Pro digital temperature controller, Marathon Carbpro digital carbon controller, Barber Colman analog high limit and a Honeywell digital strip chart recorder.

Three power meters are face mounted to the same enclosure which monitor power in each zone of the furnace. A Halmar "SCR" power controller controls power to the heating elements. Two (2) Allen Bradley PLC controllers are mounted in the same enclosure. Standard In/Out Integral Quench Furnace w/Top Cool. This line consists of IQ furnace with top cool, heated quench tank, charge car, dunk & spray washer, temper furnace, SBS oil cooler, scissors table, atmosphere flow panel and several spare parts. Very good condition. Asking \$125,000 USD for the complete line. Shipping Dimensions:

Temper Oven: 72"W x 11'H x 72"L

Washer: 80"W x 10'3"H x 120"L

Furnace: 109"W x 11'H x 96"L

Quench: 106" x 10'H x 72"

Top Cool: Skid – 5' x 5' x 6'H

Charge Car: 78"W x 60"H x 86"L

Misc. skids, flow panel, SBS, spare parts

Asking Price \$125,000 USD

<https://themonty.com/project/itemb398-sauder-batch-iq-line/>

BATCH FURNACES

See something you need, click on the link or scroll through all the items for sale. Searching for something we don't have listed, let us know.

Item#B473 Pit Carburizing Furnace “Like New”

Unitherm Industries Pit Carburizing furnace with working dimensions of 36" diameter X 72" deep. Model GP3672. Installed in 2015 and in operation until December 2018 when the plant was closed down. Maximum operating temperature of 1850F, maximum load 2,000 pounds. Gas-Fired with Eclipse Thermjet TJSR55.0060 Self-Recuperative Burners (3 each) designed for a maximum temperature of 2200F. Corrugated Alloy Retort with cast support grid and alloy fan located in the bottom of the furnace. Controls; Super Systems, Inc. 9120, Series 7, Series 7SL, Digital Data Recording. Floor Space Requirement as Installed Now: 30'W x 15'D x 15'6"H. Pit Required: 136"W x 20'L x 7'-10"Deep. Also included is a 2015 Unitherm Endothermic generator Model: EG2000, S/N: 102113-13-2, CFH: 2000 CFH. Gas fired. Other extras included; Gas collection hood, Overhead Crane, Quench Oil tank, Alloy baskets and work carriers. Excellent condition! Available immediately.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemb473-pit-carburizing-furnace-like-new/>

Item#B472 Ionitech's Plasma Nitriding Cold-Wall furnace

Ionitech's Plasma nitriding Cold-Wall furnace ION-75CWI, with 2 Chambers and one control. The furnace is capable of Plasma Nitriding, Plasma nitrocarburising, and Post-oxidation, processing big and small parts and tools. The furnace has been used for 4 years at Ionitech's facility and has been taken care of perfectly – it is good as new. It still works daily. It has been retrofitted to work with our absolutely user-friendly touchscreen control panel. The process is really easy to

control. Ionitech gives full time support as maintenance and technology after purchase. Working dimensions of Chamber 1 are Ø 1000 mm x 1100 mm and max weight of tool for processing 1500 kg. Chamber 2 – Ø 750 mm x 2000 mm and and max weight of tool for processing 1500 kg. Purchase can be done with only one chamber. Located in Europe.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemb472-ionitechs-plasma-nitriding-cold-wall-furnace/>

Item#B471 Lindberg Pit Nitrider

Lindberg Pit Nitrider. Lindberg Cyclone “Pit Nitriding” furnace with removable fan assembly & retort. There are twelve (12) bolt locks which seal the fan assembly to the gasket on the retort. Fan assembly sets on a steel stand when not in use. Alloy retort sets in a steel support when not in use. Electrically heated with a voltage of 230/3/60/105 kW. Model # 3896-E12 and serial # 14030. Max operating temperature is 1250°F. Working dimensions of 36” diameter x 84” deep with external dimensions of 5’w x 9’4”H x 7’l – Furnace Only. Controls mounted and wired in a free standing panel includes all necessary controls for proper operation.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemb471-lindberg-pit-nitrider/>

Item#B468 Leeds & Northrup Pit Furnace

Leeds & Northrup Pit Furnace. Standard vertical steam pit furnace with manual operated cover. The coiled heating elements are mounted to a cylindrical rack that surrounds the work area. The circulating fan is located below the work support and circulates across the elements and down through the work load. A

steam inlet port is located on the bottom and a pressure relief flapper on the cover. A cooling blower is mounted to the side for accelerated cooling. Electrically heated with a voltage of 230/6/60/49 kW. Model # 09522-261CX and serial # 77-48912-1-1. Max temperature is 1250°F. Working dimensions of 22" Diameter x 26" Deep and external dimensions of 6'6" x 8'2"H. The controls are mounted in a free standing panel with main disconnect switch. There is a Honeywell digital controller, L&N analog high limit, strip chart recorder, and a process timer. Also control switches for the motors and control power. The motor starters and element contactors are mounted on the sub panel inside along with the necessary relays and fuses.

For Pricing Please Contact Jordan@themonty.com
<https://themonty.com/project/itemb468-leeds-northrup-pit-furnace/>

Item#B467 Lindberg Carbottom Furnace

Lindberg Carbottom Furnace. 20,000 pound car capacity, 460V, 437 kW, 400°F to 1700°F temperature range. Fans, grid and refractory on car are new. Furnace has forced air cooling. Powered car has a VFD to control car speed. Electrically heated with a voltage of 460/6/60/437 kW. Model # 41-MT-8106-ECB-17 and serial # 868533 (1986). Max temperature 1700°F with working dimensions of 8'W x 6'H x 10'L (will handle 12'L part) and external dimensions of 15'W x 25'H x 36"L with car. Complete controls.

For Pricing Please Contact Jordan@themonty.com
<https://themonty.com/project/itemb467/>

Item#B466 Wild Barfield Carbottom Furnace

Wild Barfield Carbottom Furnace. Electrically heated with voltage of 480/3/60/110 kW. Max operating temperature is 1250°F and the serial # is AP 4074 M. Working dimensions are 60'W x 60"H x 120'L. Controls mounted and wired in a free standing control panel includes SCR for heating elements, digital temperature controllers for control and high limit, strip chart recorder etc.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemb466-wild-barfield-carbottom-furnace/>

Item#B452 AHT Fluidized Bed Furnace

Applied Heat Technologies (AHT) fluidized bed furnace. Treatment chamber is 300 mm diameter x 900 mm deep (roughly 12 in diameter x 36 in deep.) Maximum temperature is 1050 °C (1922°F). Maximum load is rated at 50 kg at 1000 °C (110 lb at 1832 °F) and 90 kg at 570 °C (198 lb at 1058 °F.) Mark® fluid bed furnace controller software. Silicon carbide heating elements, 25 kW, configured in delta. Piping is set to accept nitrogen, argon, hydrogen chloride (HCl), and hydrogen gasses. Inert material is P120 grit aluminum oxide (Al₂O₃) powder. The fluidized bed is designed to deposit vanadium carbide (and other carbides with correct chemistry) onto steel. The fluidized bed system comes with a propane burner, HCl detection system, and scrubber system. The system also has a hood and quench bed that came with it but these have not been used and it cannot be verified that they work. The fluidized bed system with scrubber is currently operational but is not being used. Almost new heating elements with one spare included.

Asking Price \$99,000 USD

<https://themonty.com/project/itemb452-aht-fluidized-bed-furnace/>

Item#B448 Kleenair Products Tip Up Style Furnaces

Tip Up Furnaces (3 available). Manufactured by Kleenair Products these “Tip Up” style furnaces have working dimensions of 60” wide X 60” high X 72” long. Natural gas heating-1200CFH. Maximum temperature 1500F & 2000F. 460/6/60 electrical. External dimensions of 8’W x 10’6”H (closed) x 14’L Each, 13’6”H when open. Controls: Temperature controls are missing. There is one (1) control cabinet which houses the flame relay modules, motor starters etc. and is common to all three (3) furnaces. Description: Currently available are two (2) 1500°F furnaces and one (1) 2000°F furnace. There is also one (1) loader and one (1) quench tank. Furnaces are ceramic fiber lined with Eclipse “TJ” direct

fired burners. Burners fire from top rear and bottom front under the refractory piers. Dual hydraulic cylinders open/close the furnace cover. One (1) common hydraulic power unit for all three (3) furnaces. We will separate the line to sell individually or as a whole. We can provide hydraulic power units for each furnace. Very good condition.

Asking Price \$55,000 USD Each

or

\$150,000 USD For All Three

<https://themonty.com/project/itemb448-kleenair-products-tip-up-style-furnaces/>

Item#B442 SOLO Quenching Machine

SOLO Quenching Machine 209-30/30 6981 – 1150 °C. Built by Solo of Switzerland this is a SOLO 209-30/30 model. This furnace was manufactured in 1991. Quenching machine for self-hardening and oil quenching. Composition: quenching Bell Furnace, nitrogen quenching unit, tempering furnace, oil quenching unit, controller / programmer, operator panel, temperature controller, hydraulic control. Dedicated for austenitizing, annealing, tempering, oil quenching, quenching under nitrogen. Max. temperature: 1150°C. Main voltage: 3 x 400 V – 50 Hz. Power input: 10 kW. Effective load dimensions: Diameter 300 mm*Height 300 mm. Max. loading weight: 20 kg. Protective gas: N2 or mixture N2 to max. 5 % H2. Overall dimensions: Height 2200mm, width 2070mm, depth 2250m. Possibility of mounting and commissioning by the manufacturer (SOLO). Located in France. Good condition. All manuals included.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemb442-solo-quenching-machine/>

Item#B436 Lindberg Pit Gas Nitrider

36" x 60" pit gas nitrider (Lindberg Homo Nitrider – electric) built in late '70's, c/w with Super Systems Gas Nitriding Control system built in 2012. System was

operational up until decommissioning last year, when it was replaced with new equipment. Price includes fixtures shown in pictures.

Asking Price \$50,000 USD

<https://themonty.com/project/itemb436-lindberg-pit-gas-nitrider/>

Item#B426 Plateg Plasma Nitriding Unit

Manufactured by Plateg this is a Plateg Puls Plasma Nitriding unit. Type; Hot Wall Plasma Nitriding Furnace (Tandem). Built in 1997, the programmer was replaced in 2017. Working dimensions of 1000 mm diameter X 1250 mm high. Load capacity 1000 kg. Installed power 95 kW, 400 V, 50 Hz, 160 A. Located in Turkey.

Asking Price \$98,000 Euro

<https://themonty.com/project/itemb426-plateg-plasma-nitriding-unit/>

Item#B415 J.L.Becker Car Bottom

J.L. Becker Car Bottom. Working Dimensions are 96" wide x 180" Long x 66"High with a Maximum Temperature of 1,800 Deg. F. Natural Gas fired with 4.3 Million Btu's. Serial Number: J 2060. Double Ended Car Bottom with Air Operated Doors to accommodate Dual – Full Length Motorized Cars. Each Car is 108" wide x 200" long with Castable Refractory Floor Insulation – Sand Sealed. The Furnace is Fiber/Refractory Lined with 8 Tempest Burners (4) per side wall, firing opposite and opposed. The Exhaust Flues are floor level mounted for excellent temperature uniformity. Temperature Controls : Free Standing Panel Honeywell Digital Controls and Honeywell Tru-line Circular Chart Recorder.

Asking Price \$95,000 USD

<https://themonty.com/project/itemb415-j-l-becker-car-bottom/>

Box Furnaces

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Item#BOX465 Electra Box Furnace

Electra Box Furnace. Floor model high temperature box style furnace with a manually operated vertical lift door with counterweight for easy operation. A door limit switch cuts power to the elements when the door is opened. The furnace is refractory lined and has a silicon carbide hearth plate supported on brick piers. Twenty four silicon carbide elements mounted horizontally across the furnace chamber, 12 elements over the top and 12 under the hearth for good uniform heating. Electrically heated with a max operating temperature of 3000°F. Model # 6724 and serial # 1184. Voltage of 460/3/60/16 kW. Working dimensions of 8"W x 6"H x 30"L and external dimensions of 44"W x 90"H x 70"L. Controls are located on the right hand side at the rear of the furnace. There is a Barber Colman model 560 digital controller, a Barber Colman 560 high limit and a Barber Colman strip chart recorder. Also on the rear of the unit in a protected area is a Robicon SCR to control the elements and a high limit contactor. A voltage reduction transformer is mounted on the framework under the furnace chamber.

For Pricing Please Contact Jordan@themonty.com
<https://themonty.com/project/itemb465-electra-box-furnace/>

Item#BOX464 Lindberg Box Furnace

Lindberg Box Furnace. Pneumatically operated vertical lift door with convenient foot pedal operator. The door slides up and down on the sloped front breast plate. A flame curtain is mounted directly under the door. A limit switch activates

a solenoid to start the flame curtain to burn off any escaping atmosphere. The interior is refractory lined. Heavy gauge rod style heating elements are located on both side walls, and on the floor under the alloy hearth plate for excellent temperature uniformity. The alloy hearth pan has 2" high sides to prevent product from falling off the pan. Flow meters attached to the side of the furnace regulate the flow of atmosphere into the furnace. There is an Endothermic gas flow meter and a Natural Gas flow meter. Electrically heated with a max temperature of 2000°F. Model # RO 122410-A and serial # 19229. Voltage is 480V/3/60/15 kW, 67V. Working dimensions of 12"W x 10"H x 24"L with external dimensions of 54" wide x 64" long x 85" high. Controls are mounted and wired in a separate enclosure. There is a Leeds & Northrup digital temperature controller with display screen and a Leeds & Northrup model 2077 high limit safety. Control switches are flush mounted on the front of the panel. The panel has a Square D flange mounted fused disconnect switch. Honeywell flame safety relay, purge timer relays and control transformer are mounted inside the enclosure A second enclosure with circuit breaker disconnect switch houses the Halmar SCR power controller. A step down transformer is supplied to provide low voltage to the elements.

For Pricing Please Contact Jordan@themonty.com
<https://themonty.com/project/itemb464-lindberg-box-furnace/>

Item#BOX463 Lindberg Box Furnace

Lindberg Box Furnace. This furnace has an air operated vertical lift door with foot pedal control. "Rod Overbend" heating elements are located in the hearth and both sidewalls. An Alloy hearth with brick piers supports the work load. The atmosphere system consists of a "Waukee" Nitrogen flowmeter and flame curtain. Atmosphere enter the furnace chamber through the rear wall. Manuals and drawings are included with this furnace. Electrically heated with a max temperature of 2000°F. Model # 11-ROMT243618-20A and serial # 859266. Voltage is 460/3/60/40 kW, 92V Secondary. Working dimensions of 24"W x 18"H

x 36"L with external dimensions of 6'W x 9'H x 8'L. Controls Mounted in a free standing panel includes a Honeywell UDC digital temperature controller, Honeywell Dial-a-Trol high limit and a Honeywell strip chart recorder. The step down transformer for the heating elements is mounted in the same enclosure. Power to the heating elements is controlled through a "Halmar" SCR. This electrical enclosure is air conditioned to prevent overheating of the SCR.

For Pricing Please Contact Jordan@themonty.com
<https://themonty.com/project/itemb463-lindberg-box-furnace/>

Item#BOX458 Noble Furnaces Box Furnace

Manufactured by Noble Furnaces this is a gas fired box furnace capable of 2,000F. Furnace has a vertical lift front door with a charge car and retort. Furnace has working dimensions of 8' X 8' X 6" high (approximate). 330SS retort has working dimensions of 70" diameter X 42" high. Vendor has been processing aerospace parts in an argon atmosphere in the retort, however furnace can be used without the retort. Excellent condition, currently installed and in operation.

Asking Price \$80,000 USD

<https://themonty.com/project/itemb458-noble-furnaces-box-furnace/>

Item#BOX454 Lindberg Box Furnace

Model #11-MT-489336-14. Serial #888809-L (9/1989). Electrically heated. Operating temperature of 1400F. Voltage: 480/3/60/164 kW. Working dimensions of 48" wide X 36" high X 96" deep. Controls: Mounted and wired in a free standing control panel includes SCR for heating elements, digital temperature controllers for control and high limit, strip chart recorder etc. Description: Standard Lindberg design box furnace with "Moldatherm" heating elements, vertical lift door, roller rail hearth, cast alloy tray, alloy air plenum for air

distribution, roof mounted fan and stationary powered loader/unloader. Very good condition.

Asking Price \$70,000 USD

<https://themonty.com/project/itemb454-lindberg-box-furnace/>

Item#BOX449 Lindberg Atmosphere Box Furnace

Lindberg/MPH air atmosphere box. Model Number: 11-ROMT-243624-20, Job Number: 224745. Chamber Dimensions: 24" W x 36" D x 24" H. Electrically heated 40KW. Max Temp: 2,000°F. Capacity: 1,200 lbs. @ 2,000°F. Elect. Input: 480/3/60. SCCR Rating: 65 KW. F.L.A.: 5 AMPs. Elect. Drawing: 7315-1134-OOA. Largest Motor/Load: 40 KW. Control Panel is included. Manufactured Date: September 2016. Never used this unit is available for immediate delivery with a full warranty.

Asking Price \$60,000 USD

<https://themonty.com/project/itemb449-lindberg-atmosphere-box-furnace/>

Item#BOX437 Ipsen Recirculating Box Furnace

Ipsen Recirculating Box Furnace 38" high x 43" wide x 48" deep. Gas fired, 1,000,000 BTU/hr with a max temperature: 1400 deg.F. Model Number: DL-3036. Serial Number: 60458. Updated controls, Honeywell indicating controller and overtemp. High temperature tempering furnace. Vertical lift air operated door with overhead air cylinder. Fiber board insulation. Alloy roller rail hearth. Direct fired furnace, but the heating chamber is separate from the work chamber and has a high velocity roof mounted circulating fan. Top mounted package burner. Complete combustion controls and safeties. 460/3/60 power. Test fired prior to shipment.

Asking Price \$39,500 USD

<https://themonty.com/project/itemb437-ipsen-recirculating-box-furnace/>

Item#BOX425 Lindberg Box Furnace

Manufactured by Lindberg. Working dimensions of 42" high x 48" wide x 14'-0" long. Electrically heated 480/3/60, 160 KW. Operating temperature of 2000F. Temperature Controls: Free standing enclosed panel with updated Honeywell controls, including circular chart recorder, SCR controls, back up contactors and step down transformers for the heating elements. Description & Features: Fiber lined. Heated by Nichrome ribbon heating elements on both side walls. Two zones of control. Air cylinder operated door. Includes motor driven load/unload system. 8000 pound capacity. Originally installed at Boeing. Condition: Good. Vendor will repair the back wall, replace all broken element hanger modules and provide and install serviceable heating elements.

Asking Price \$85,000 USD

<https://themonty.com/project/itemb425-lindberg-box-furnace/>

Item#BOX397 Drever Atmosphere Box Furnaces

"Lift-Off" Atmosphere Box Furnaces (2 available). Manufactured by Drever. Effective working dimensions of 10'6" Wide x 35' Long x 6' High. Gas fired- 12,000,000 BTU/Hr. Max. Operating temperature of 1450F. Description; Ceramic Fiber Lined, Vertical Rising Atmosphere "Lift-Off" Furnace complete with (26) U-Shaped Radiant Tubes, North American Burner System, (4) Top-Mounted Alloy Circulating Fans, (4) Zones of Control, Stationary Hearth, "Knife-Edge" Atmosphere Seal, and Hydraulic Lifting Cylinders on each end of furnace. Furnace is capable of 100,000 lb. loads. Instrumentation; Free-Standing Control Panel with Honeywell PLC Digital Temperature Controller, and Honeywell Flame Safety System. Very good condition. Overall dimensions of 15'11" Wide x 41' Long x 13'6" High. Approximate weight 70,000 pounds. Units each can hold up to 100,000# loads and were used prior for tempering/normalizing wire rod and bar stock. Both of these have top mounted recirculating fans and are "atmosphere capable", good for FNC work.

Asking Price \$325,000 USD Each

<https://themonty.com/project/itemb397-drever-atmosphere-box-furnaces/>

Item#BOX374 R&G Services Atmosphere Box Furnace

Atmosphere Box Furnace. Manufacturer: R&G Services, Inc. Inside Dimensions: 18" high x 32" wide x 36" deep. Heated: Electric, 230/3/60, 60 KW. Temperature: 2100 deg. F Model Number: EB-183236 Serial Number: 77021 Temperature Controls: Updated indicating controller and overtemp. Description & Features: Air operated vertical rising door. Slanted face plate. Brick lined with silicon carbide hearth. Heated by heavy Nichrome ribbon heating elements. Atmosphere inlet and burn-off. Flame curtain with controls and safeties. Condition: Very good. Furnace will be cleaned & painted, repaired as necessary, checked out & test fired prior to shipment.

Asking Price \$18,000 USD

<https://themonty.com/project/itemb374-rg-services-atmosphere-box-furnace/>

Item#BOX352 Pacific Scientific Box Furnace

Working dimensions of 72" wide X 120" long X 48" high, Gas fired radiant tube, maximum operating temperature of 2050F. Air operated vertical lift door, fiber lines, new refractory piers (12), hi-temp horizontal radiant tubes (6 above, 6 below), full safeties, side exhaust guard. Free standing control panel-prewired panel with Honeywell Tru-Trend circular chart and Honeywell digital controllers and overtemp. Atmosphere capable. Comes with spare radiant tubes. Very good condition.

Asking Price \$70,000 USD

<https://themonty.com/project/itemb352-pacific-scientific-box-furnace/>

CONTINUOUS FURNACES

See something you need, click on the link or scroll through all the items for sale. Searching for something we don't have listed, let us know.

Item#C338 Can Eng 1,000 Pound/Hour Mesh Belt Line

Complete Can Eng mesh belt furnace line capable of 1,000 pounds per hour. Automated loading system, pre wash, gas fired high heat with an operating temperature of 1700F, 44" wide belt, oil quench and 1200F mesh belt temper furnace. SSI AC 20 carbon controllers, SSI probes and complete SCADA system. Built in 1997. Complete, installed and currently in production. Line must be removed by mid February 2019. Good condition.

Asking \$25,000 USD

<https://themonty.com/project/itemc338-can-eng-1000-pound-hour-mesh-belt-line/>

Item# C337 Mesh Belt Furnace Line, 4,000 Pounds/Hour

Manufactured by Atmosphere Furnace Company in 1995 this is a complete mesh belt furnace line designed for hardening of fasteners. Gas fired. 4,000 pounds per hour capacity. Line included Metro Scale loading system, hydraulic bin dumper, vibratory shaker and scale, belt width 60". Oil quench and temper. Line is complete, installed but has not been run recently. Very good condition. More details and photos to come.

Asking Price \$250,000 USD

<https://themonty.com/project/item-c338-mesh-belt-furnace-line-4000-pounds-hour/>

Item#C336 BTU-TCA Series Mesh Belt Conveyor Furnace

Manufactured by BTU this is an electrically heated mesh belt furnace capable of 1100C. Heated length is 120" with a 18" wide belt and 4" clearance over belt. Metallic muffle, 10 zones of temperature control. 24" long load/unload table at each end. Overall length 29'. Microprocessor controls. 76 KW, 440/3/60. Overtemp. Protection. Water cooling sections. N2 curtains front and back with burn-offs. Protective atmosphere: DA with N2 purge.

Asking Price \$50,000 USD

<https://themonty.com/project/itemc336-btu-tca-series-mesh-belt-conveyor-furnace/>

Item#C335 SOLO Compact Belt Furnace

Compact belt furnace 321-7-90 6677 1000°C. Built by Solo of Switzerland this is a SOLO 321-7-90 model. This furnace was manufactured in 1990. Composition: Loading frame, heating part with frame, cooling part with frame, unloading frame, driving system, conveyor belt, NH3 cracker 3m3/h, distribution for treatment and cabinet gas, operator panel. Dedicated for annealing under cracked ammonia, brazing and hardening. Max. temperature of 1000 °C Heated length: 900 mm, cooled length: 1500 mm, channel section: 80 x 40 mm, Main voltage: 3 x 380 V – 50 Hz / TN, power input: 10,5 kW, gas generated: 75% H2 and 25% N2 (NH3), effective height with belt: 30 mm, conveyor belt width: 70 mm, external dimensions: L 5300 mm x I 800 mm x H 1250 mm. Perfect condition, 11 manuals included. Located in France.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemc335-solo-compact-belt-furnace/>

Item#C330 Lobo Hornos Mesh Belt Furnace Line

Lobo Hornos built this mesh belt furnace line with all the engineering coming from Sunbeam. The line consists of a loader, high heat furnace, quench tank,

wash, temper, and post wash. It has Honeywell, Shinha, and Siemens controls that are approximately 12 years old. The furnace has a heated length of 6 meters and a tempering length of 11.09 meters. Both the high heat and tempering lines can handle 500 KG/Hour each. The high heat furnace has an opening of 7" high by 40" wide. The tempering line has an opening of 6" high and 47" wide. Max temperature is 930 C. This mesh belt line is capable of either controlled atmosphere or Nitrogen gas. The alloy (AISI I-330, AISI I-310) and brickwork (T23& ceramic fiber) are in good condition. The quench oil is Equimsa 770 and there is a washer included. The furnace is complete in good condition and currently installed in Mexico.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemc330-lobo-hornos-mesh-belt-furnace-line/>

Item#C324 C.I. Hayes Mesh Belt Furnace

LAC Type. Work Zone: 12" Wide Belt, 12" High work area, 12' heat, 12' cool with 3 zones of temperature control. 1120C maximum temperature (2000F operating temperature). Power: 220V, 75KW, 212Amp, 60Hz , 3Ph. "Air Products" Gas Mixing Panel (N2, H2). Footprint: 9'W x 54'L (90'L Belt), 10'H + ductwork. Extra set of cooling muffles.

Asking Price \$49,500 USD

<https://themonty.com/project/itemc324-c-i-hayes-mesh-belt-furnace/>

Item#C323 Aichelin Cast Link Furnace Line

The line consists of a loading table, cast link belt hardening furnace, oil quench, cross conveyor, post wash and two continuous tempering furnaces. High belt is 24" wide X 300" long with a capacity of 336 Kg/h. Nitrogen/Methanol atmosphere. Electrically heated 300 kW. Operating temperature of 1650F. Quench oil tank holds 7,000 litres. Air/oil quench oil cooler. Post wash has oil

skimmer. Both tempering furnaces are electrically heated, 57 kW each. Belt widths 20" X 250" long. Maximum operating temperature of 575F. Installed in 2005 and used for processing automotive bearings. Recently removed from operation and now in indoor storage. Excellent condition.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemc323-aichelin-cast-link-furnace-line/>

Item#C321 Ipsen Austempering System

Ipsen Model SG500, S/N52822. Shaker hearth style hardening furnace is capable of 500 pounds/hour, 1850F operating temperature, gas fired 800,000 BTU's/hour with an 18" wide tray. Temper has an operating temperature of 800F and a heat input of 300,000 BTU's. Controls on both are Honeywell UDC units. Entire system consists of a magnetic conveyor loading system, Ipsen shaker-feeder-hopper. Mitsubishi variable speed AC drive on salt conveyors, 900 gallon wash tank with 30" conveyor and 280 gallon rust inhibitor tank with 32" conveyor. Currently installed but not in production. System is in reasonable condition but has not been used for some time.

Asking Price \$20,000 USD

<https://themonty.com/project/itemc321-ipsen-austempering-system/>

Item#C314 Wellman Roller Hearth Furnace

Manufactured by Wellman in 1982. Model #AL-81-180 RH, S/N 180. Working dimensions of 60" Wide x 42' Long x 14" High – 4800#/HR. Electric – 480/3/60 – 469 KW (over (4) Zones of Control). Operating temperature of 1650° F. Brick Lined Atmosphere Capable Roller Hearth Furnace complete with (4) Zones of Control, Heating Elements above and below Rolls, Transformers, 25' Slow Cool Chamber (Air Cooled with Fans), and Variable Speed Drive. Free Standing Control Panels with Watlow Digital Controllers ((1) Per Zone), Watlow High

Limits, and SCR Power Controls. Overall dimensions; Entrance Chamber: 12' Wide x 14' Long x 10' 6" High. High Heat Chamber: 10' 6" Wide x 30' Long x 10' 6" High. Cooling Zone: 12' Wide x 27' Long x 10' 6" High. Approximate weight 80,000 pounds. Very good condition.

Asking Price \$225,000 USD

<https://themonty.com/project/itemc314-wellman-roller-hearth-furnace/>

Item#C308 AFC Mesh Belt Hardening Furnace

Manufactured by Atmosphere Furnace Company this furnace has working dimensions of 6" high x 54" wide x 12' long (heated section). Gas fired with radiant tubes. Operating temperature of 1800F. S/N 6948. Temperature Controls: Free standing enclosed panel. Honeywell solid state digital readout indicating controllers, L&N overtemps. L&N strip chart temperature & carbon recorder. Marathon Monitors Carb-Pro carbon control. Description & Features: Fiber lined. Heated by (9)North American 4724-2-E burners firing into recuperated U-tubes. Two zones of control. Rear zone has a roof mounted recirculating fan. Cold belt return. Furnace has a flame curtain and complete combustion controls and safeties. Includes quench tank and conveyer.

Asking Price \$75,000 USD

<https://themonty.com/project/itemc308-afc-mesh-belt-hardening-furnace/>

Item#C301 Rogers Engineering Cast Link Furnace Line

Manufactured by Rogers Engineering 4,000 pounds/hour cast link belt furnace line consisting of a 1750F high heat furnace and 1700F temper furnace. Serial # CC-3977-0 (1997). High Heat Furnace: 48"W Omega Cast Link Belt, 4" pitch, 3" sides. Furnace has a 30'L heating section. Four (4) zones of control with three (3) roof mounted in the last three (3) zones. Maximum operating temperature of the hardening furnace is 1750°F. Furnace is radiant tube heated with recuperators. Furnace is currently set up for Endothermic w/Enriching Natural

Gas & Air. Total BTU's for hardening furnace is 3,180,000 BTU/HR. Controls; All mounted in a free standing panel includes Allen Bradley PLC w/HMI Touchscreen, Honeywell UDC Digital Temperature Controls, SSi Carbon Controls. Voltage 480/3/60/200kW.

Tempering/Anneal Furnace: 60"W mesh belt with support rollers. Furnace has a 35'L heating section. Four (4) zones of control with four (4) roof mounted fans. Maximum operating temperature is 1700°F. Total BTU's for the tempering/annealing furnace 3,790,000 BTU/HR. Please note that this furnace has two (2) different modes of operation. Click on 'PDF" below for more information on the different modes of operation.

The sequence of this furnace is as follows:

- Load parts into pre-wash dump loader
- Pre-Wash, 190°F, Gas Heat
- Parts vibrate onto mesh (soft load) then onto cast link belt.
- High heat cycle
- Quench cycle, 200°F, Gas Heat, 8000 Gallon
- Wash cycle, 190°F, Gas Heat
- Temper cycle
- Oil blackening cycle

Includes:

- 5600 CFH Air Cooled Endothermic Gas Generator
 - SBS Air to Oil Heat Exchanger which consists of three (3) 5 H.P. fans.-
- Manuals & Drawings

Very good condition, available immediately.

Asking Price \$650,000 USD

<https://themonty.com/project/itemc301-rogers-engineering-cast-link-furnace-line/>

Item#C283 Denton Thermal Rotary Hearth

Denton Thermal Systems (O'Brien & Gere) 2150°F Rotary Hearth Furnace System. Includes high temperature furnace, Nitrogen-Methanol Panel and

Quench Press. Working Zone: 6 ft Diameter Hearth, Door Opening is 14"W x 13"H Overall Size: 9ft-8in Diameter x 10ft-10"Tall. Heating: Electric, 125 kW, 1 Zone, Globar Heating Elements. Power Requirement: 200 Amps, 480V/3Ph/60Hz. Temperature Rating: 2150°F. Water Requirement: 3 GPM. Air Requirement: 100 PSI. Controls: GE90 PLC. Honeywell Temperature Controller and Overtemp (missing but will be replaced). Marathon Monitors Carbon Control System. Includes Quench Press that was handling up to 5" Diameter bearings. Prior user reference available upon request.

Asking Price \$29,000 USD

<https://themonty.com/project/itemc283-denton-thermal-rotary-hearth/>

Item#C269 C.I. Hayes Mesh Belt Furnace

Working dimensions of 5" over belt, 12" wide X 120" of heated length. Electrically heated 230/3/60, operating temperature of 2100F. Model LAC. Temperature controls are new state of the art, control panel with Honeywell solid state digital readout controller and overtemp for each of three zones, includes volt and amp meters. Full alloy muffle in hot zone. 20' long sealed water jacketed cooling. Globar heating elements over and under the belt. (3) zones of control. (4) argon flowmeters. Dayton AC inverter provides adjustable belt speed. Updated SCR controls. Muffle and belt are new. Very good condition.

Asking Price \$29,000 USD

<https://themonty.com/project/itemc269-c-i-hayes-mesh-belt-furnace/>

Item#C265 Sunbeam Pusher Carburizer

This is a very unusual style of furnace and perfect for carburizing of large gears, bearings or races. Working dimensions of 50" X 50" X 34" high. Operating temperature of 1750F. 3,000 pound capacity. Gas fired 12 Honeywell composite

single ended recuperated tubes (recently replaced). Surface Casemate controls. 1800 gallon quench tank. System does not need a pit. Comes with a spray washer, temper and an oversized IHRE air cooled quench oil cooler. System is installed but not currently in use. Very good condition.

Asking Price \$40,000 USD

<https://themonty.com/project/item265-sunbeam-pusher-carburizer/>

DRAW/TEMPER OVENS

See something you need, click on the link or scroll through all the items for sale. Searching for something we don't have listed, let us know.

Item#T360 Wisconsin Oven

Model SBH-222, 650F, inside dimensions 2'W x 2'D x 2'H, horizontal airflow, Allen Bradley Panel View Plus 600, hi-limit, door switch, audible/visual alarm, 240/3 with 12 KW heater, Honeywell chart recorder, 2 shelves.

Asking Price \$7,900 USD

<https://themonty.com/project/itemt360-wisconsin-oven/>

Item#T359 Seco Warwick Vacuum Temper Furnace

Model VTR-5050/48. Serial Number 586/2005. Purchased 3/21/2006. Work Zone Dimensions, 36W X 48D X 24H. Originally qualified for 900°F to 1260°F with +/- 10°F uniformity. Vacuum pump is Stokes Model 212-11, Blower is Stokes Model 310-41. The operating system is Wonderware Intouch. Internal circulation fan. 460 VAC 3 phase. The buyer will be responsible for removal. The furnace will be available for removal in April 2019. It is currently still in operation.

Asking Price \$50,000 USD Or Best Offer!

<https://themonty.com/project/itemt359-seco-warwick-temper-furnace/>

Item#T358 Wisconsin Oven Like New (2 Available)

Wisconsin Oven Model EWN-55-5G8, 800F, 5'W x 50'D x 6'H, overall 9'6" W x 11'D x 11'H, 10HP/7000CFM recirculating fan, combination airflow, adjustable louvers, airflow switch, 600 CFM exhaust, Eclipse 450,000BTU burner, UL listed control panel, Honeywell recorder, Honeywell programmer, digital hi-limit, disconnect switch, vertical rise doors on both ends, insulated floor, exhaust hood. Excellent Condition.

Asking Price \$29,500 USD Each

<https://themonty.com/project/itemt358-wisconsin-oven-like-new-2-available/>

Item#T357 Surface Combustion Electric Tempering Furnaces (3 available)

Surface Combustion Electric Tempering Furnaces (3 available). Bricked Lined Box Tempering Furnace complete with Alloy Roller Rail Hearth, Stainless Steel Air Baffles, Top-Mounted Recirculating Fan, and Vertical Rising Pneumatic Door. Model # BX41758-1. Serial # BX41758-1. Working dimensions of 30" Wide x 48" Deep x 30" High. Electric – 460/3/60 – 81 KW. Max operating temperature of 1400° F. Controls consist of Side-Mounted Control Panel complete with Love Series 2500 Digital Temperature Controller, Love Series 16 Digital High Limit Controller, and Honeywell Truline 12" Round Chart Recorder. Overall dimensions of 8' Wide x 7' Deep x 11'8" High. Approximate weight of 8,000 lbs.

Asking Price \$39,500 USD Each

<https://themonty.com/project/itemt357-surface-combustion-electric-tempering-furnaces-3-available/>

Item#T356 Wisconsin Oven Temper Furnace

Wisconsin Oven Temper Furnace. Recirculating gas fired batch temper with air operated vertical lift doors on each end. Eclipse package burner with roof mounted recirculating fan distributes heated air in a combination air flow pattern. Roller rail hearth with chain guide. Furnace includes two (2) scissor lift tables. Manuals & drawings are included with this furnace. Natural Gas – 1 MBTU's/Hour. Model # SDB-6616-10G and serial # 033899307. Max operating temperature is 1000°F with a voltage of 480/3/60/16 Amps. Working dimensions of 36"W x 36"H x 96"L with external dimensions of 96"W x 13'4"H assembled (10'6"H shipping) x 11'L. Controls mounted and wired in an enclosure with fused disconnect attached to the side of the furnace. Temperature controllers consist of a digital Barber Colman 560 digital for temperature and a Barber Colman digital "Limitrol" 75L high limit. ATC process timer to control heating cycle and Barber Colman digital round chart recorder. Allen Bradley switches for control power, circulation fan, ignition and gas valve reset. Signal lights for control power, air flow, high/low gas pressure, purge, etc. Eclipse package burner with Honeywell flame safety, UV scanner and spark ignition.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemt356-wisconsin-oven-temper-furnace/>

Item#T355 Wisconsin Oven Temper Furnace

Wisconsin Oven Model EWN-610-6G, 500F, 6'W x 10'D x 6'H, overall 9'6" W x 11'D x 9'9"H, 5HP/4,500CFM recirculating fan, combination airflow, adjustable louvers, airflow switch, 900 CFM exhaust with motorized dampers, Eclipse 500,000BTU Winnox Low NOx burner, UL listed control panel, Eurotherm Nanodac digital recorder/programmer, digital hi-limit, disconnect switch, 8 position T/C jack panel, 3" port.

Asking Price \$19,000 USD

<https://themonty.com/project/itemt355-wisconsin-oven-temper-furnace/>

Item#T354 Surface Combustion Temper

Surface Combustion "Super 30" temper. Model HFC 36-54, Serial number BX 37159-7. Gas fired, maximum operating temperature of 1400F. The unit needs some minor brick work and the circulation fan reinstalled to be ready to run. The fan was removed from service, has a new shaft which has been balanced. Footprint; 9' 7" Deep x 6' Wide x 141" High (door frame only). Weight capacity is 2000 lbs. Installed and overall in good condition.

Asking Price \$15,000 USD

<https://themonty.com/project/itemt354-surface-combustion-temper/>

Item#T352 Pyradia Tempering Oven

Pyradia Oven 48" X 48" X 48". Electrically heated oven manufactured by Pyradia. Model P06P048048048HMTGV, Serial Number 2002-12-15977-1. Working dimensions of 48" X 48" X 48". Operating temperature of 1200F. Recirculating fan. 600 volts, 3 phases, 54KW. Vertical lift Door with double pivots. Convection style, 32,000 CFM. Built in 2004 this oven has been used for a total of 40 hours and should be considered like new.

Asking Price \$39,000 USD

<https://themonty.com/project/itemt352-pyradia-tempering-oven/>

Item#T349 Eclipse Recirculating Box Furnace

Recirculating Box Type Draw Furnace. Manufacturer: Eclipse. Inside Dimensions: 30"high x 42"wide x 96"deep. Heated: Gas fired. Temperature: 1250 deg.F. Model Number: Box Draw. Serial Number: 3424-00773. Temperature

Controls: Updated controls, Honeywell indicating controller and overtemp, circular chart recorder. Description & Features: Vertical lift air operated door. Brick lined. Alloy roller rail hearth. Seven adjustable roof baffles. Rear combustion chamber with atmospheric burner and high velocity recirculating fan. Complete combustion controls and safeties. Includes manual load table. Condition: Very Good, Operational.

Asking Price \$39,500 USD

<https://themonty.com/project/itemt349-eclipse-recirculating-box-furnace/>

Item#T343 Wisconsin Temper Oven

Batch Temper 36"W X 36"H X 96"L. Manufactured by Wisconsin Oven, Model SDB-6616-10G, S/N 033899307. Natural gas fired, 1 MBTU's/hour. Maximum temperature rating 1000F. Voltage 480/3/60/16 amps. External dimensions of 96" wide X 13' 4" high assembled (10'6"H shipping) x 11'L. Controls; Mounted and wired in an enclosure with fused disconnect attached to the side of the furnace. Temperature controls consist of a digital Barber Colman 560 digital for temperature and a Barber Colman digital "Limitrol" 75L high limit. ATC process timer to control heating cycle. Allen Bradley switches for control power, circulation fan, ignition and gas valve reset. Signal lights for control power, air flow, high/low gas pressure, purge, etc. Eclipse package burner with Honeywell flame safety, UV scanner and spark ignition. General Description; Recirculating gas fired batch temper with air operated vertical lift doors on each end. Eclipse package burner with roof mounted recirculating fan distributes heated air in a combination air flow pattern. Roller rail hearth with chain guide. Furnace includes two (2) scissor lift tables. Manual and drawings are included with this furnace. Very good condition.

Asking Price \$49,900 USD

<https://themonty.com/project/itemt343-wisconsin-temper-oven/>

Item#T342 Precision Quincy Recirculating Walk In Oven

Recirculating Walk In Oven. Manufactured by Precision Quincy. Working dimensions of 72"high x 48"wide x 120"deep. Gas heated, 300,000 BTU's per hour. Operating temperature of 450F. Model EC-410, S/N 25766.

Temperature Controls: Partlow indicating controller and overtemp. Side mounted control cabinet. Double swing open doors, horizontal air flow. Powered exhaust blower, rear mounted combustion and fan chamber. Atmospheric type burner system. Complete combustion controls and safeties. Air flow switch. Oven will be checked out and test fired prior to shipment. Approximate shipping weight 4,310 lbs.

Asking Price \$16,500 USD

<https://themonty.com/project/itemt352-precision-quincy-recirculating-walk-in-oven/>

Item#T341 McLaughlin Services Temper Furnace

Temper Furnace 36" X 48" X 36". Made by McLaughlin Services. Working dimensions of 36" X 48" X 36", 5,000 pound capacity. Gas fired 750 cfh @ 2-5 PSI, 750,000 BTUH. Operating temperature 250F to 1400F, +-10F. Electricity; 40 Amps, 480V/3Ph. Compressed Air; 100 psi, Intermittent. Temperature Controls; Super Systems 9130 Temperature Controller with 12" Touchscreen, Super System 7SL 1/16 DIN Limit Controller. Logic Controls; Allen Bradley Micrologix PLC is included for alarming and sequencing.

Asking Price \$91,000 USD

<https://themonty.com/project/itemt341-mclaughlin-services-temper-furnace/>

Item#T340 Safed/Borel Annealing Furnace

Safed/Borel Annealing Furnace built in 1991. The working dimensions consist of: Diameter 400 mm, Height 500 mm. External Dimensions: 1800 mm x 1767 mm x 2412 mm. Maximum Temperature: 650 C with a maximum load capacity of 100

kg (not including baskets). Main voltage is 3 x 400V / 50 Hz, Control voltage is 230V / 24V. This setup includes a Eurotherm programmer, threshold controller, recorder, programmable clock, timing relay, control for water flow, vacuum pump, pressure reducer, and fire engine. Located in France.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemt340-safed-borel-annealing-furnace/>

Item#T335 Despatch Temper

Batch Oven 37"H X 37"W X 25"D. Batch type recirculating oven manufactured by Despatch, Model V-29-STD. Inside dimensions of 37" high X 37" wide X 25" deep. Electrically heated 480/3/60, 12 KW. Operating temperature of 500F. Serial number 126552. Temperature Controls: Partlow indicating controller and Honeywell overtemp, timer. Double swing open doors. Side mounted recirculating fan. Adjustable horizontal air flow. Provisions for 12 shelves, 4 shelves included. Powered exhaust blower. Oven has been checked out and test fired and is ready for immediate shipment. Excellent condition.

Asking Price \$5,500 USD

<https://themonty.com/project/itemt335-despatch-temper/>

Item#T325 Despatch 3-Station Temper Furnace

Manufactured in 1980 by Despatch Industries, Inc. 3 Independently loaded and operated furnace stations with shared panel. Tops elevate off bases for loading and unloading. Work Zone: 22"W x 40"L x 25"H Each. Hearth Height: Estimated at 36-40" (Can measure for you). Max. Temperature: 850°F with a Uniformity of +/- 25°F (Center area of 12"W x 20"L x 10"H meets +/-10°F). Electrically heated with a power of 490V/3Ph/60Hz. 3 West 4400 Temperature Contrl. & West 6700 Hi-Limit. (We can quote upgrade to new Super Systems, Inc. controls, if

desired.). Just rebuilt. New heating elements, new hearth ceramics, New stainless steel side panels, new paint.

Asking Price \$39,500 USD

<https://themonty.com/project/itemt325-despatch-3-station-temper-furnace/>

Item#T320 Pifco Conveyor Oven

Electrically heated 2 zone conveyor oven 480/3/60/144 kW. Maximum operating temperature of 600F. Work area; 72"W x 12"H x 25'L heated length. External dimensions 9'W x 10'H x 40'L – approx.. Controls; Mounted and wired in a free standing panel includes an Allen Bradley PLC with PanelView Plus 1000 touchscreen interface. Power to the heating elements are controlled through two (2) Allen Bradley "SCR" power controllers, one (1) for each zone. An Allen Bradley PowerFlex "VFD" controls oven conveyor belt speed. Standard two (2) zone electrically heated conveyor oven with a wire on edge belt. This oven has a 10'L load end and 8'L unload end with cooling. Access doors with "Brixon" door latches on both sides of oven and one in each heating chamber. Very good condition.

Asking Price \$59,000 USD

<https://themonty.com/project/itemt320-pifco-conveyor-oven/>

Item#T318 Eisenmann Box Tempers (4 Available)

Large Box Tempering Ovens (4 available). Built by Eisenmann in 2002, Model # HN-FNC-002. Working dimensions of 108" Wide x 96" Deep x 64" High. Natural gas fired, 3.2 million BTU's per hour. Operating temperature of 1200F.

Description; Stainless Steel Lined Recirculating Box Tempering Oven complete with Top-Mounted Alloy Recirculating Fan (20 HP – 13,000 CFM), Rear-Mounted Heater Box with Eclipse Burner System, Alloy Skid Hearth, Forced Cool Down

Fan System (7,333 CFM), Vertical Rising Motor Driven Front Door, and Stationary Loading Table.

Instrumentation; Free Standing Control Panel with Eurotherm Digital Set Point Programmable Temperature Controller, High Limit, Chessel Strip Chart Recorder, and Honeywell Flame Safety System.

OVERALL DIMENSIONS: Oven: 13' Wide x 20' Long x 17'8" High (includes Door Structure. (Shipping Dimensions: 12'6" Wide x 20' Long x 10'8" High). Loader: 9'6" Wide x 12" Long x 4' High. Approximate weight 20,000 pounds. Excellent condition, operational.

Asking Price \$72,500 USD

<https://themonty.com/project/itemt318-eisenmann-box-tempers-4-available/>

Item#T303 Pifco Temper Furnace

S/N 8177 built in 1988. Working dimensions of 126" long x 60" wide x 40" high. Overall dimensions of 13' x 11' x 11' high. Comes with load and unload discharge tables and combustion fan. Maximum operating temperature 950 deg. F. Rated for 250 pound net weight x 37.4in long tray loaded every 15 minutes. Furnace holds three (3) trays. Approximate nineteen (19) minutes to operating temperature. Forty-five minutes in furnace @ 15 minute load cycle. Heated by one gas burner approximate rating 600,000 BTU/hour. Utilities required: 1000 BTU natural gas @ 5PSI, 480v 3Ph 60Hz. Water 80 deg. F maximum @ 20PSI. Compressed air 60PSIG minimum. Adequate drain for water. Good condition.

Asking Price \$30,000 USD

<https://themonty.com/project/itemt303-pifco-temper-furnace/>

Item#T290 Tempering Ovens (2 Available)

Working dimensions of 36"W x 48"D x 36"H. Shells have just been completed and buyer has the option of Gas-Fired or Electric, Hearth Height, Burner Locations (Left or Right) and Panel Location. These can be completed, fully tested and ready to ship to your facility in 8-9 weeks at a very attractive price.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemt290-tempering-ovens-2-available/>

Item#T286 Lindberg Box Temper

Model 11-7212048-G14, S/N 24947. Working dimensions of 72" wide X 120" long X 48" high. Gas fired with a maximum operating temperature of 1200F. Vertical lift-air operated door, brick lined, 5 course refractory hearth, alloy roof baffles, alloy side wall ducts, dual zone burners-roof mounted combustion chambers with dual belt driven fans. Free standing prewired control panel. Good condition.

Asking Price \$65,000 USD

<https://themonty.com/project/itemt286-lindberg-box-temper/>

GENERATORS

See something you need, click on the link or scroll through all the items for sale. Searching for something we don't have listed, let us know.

Item#G202 AFC Endo Generator

AFC-Holcroft EZ-4500 CFH Endothermic Generator. New in 2006. SSi 9200 controller. This stand-alone unit can be integrated into an array of up to 3 generators. Currently in operation. Manuals and drawing are included. Very good condition. Includes a spare retort (\$4000). Features:

- Recuperative type combustion system, providing 18% to 20% fuel savings
- High efficiency air-cooled heat exchanger
- 5:1 Automatic Turndown to produce only the gas required
- Ease access swing door for horizontal retort access
- SSi E-Z dew point analyzer
- Atmosphere Engineering endo injector

Asking Price \$55,000 USD

<https://themonty.com/project/itemg202-afc-endo-generator/>

Item#G198 Sunbeam Endothermic Generator

3,000 CFH Endothermic Generator. Manufactured by Sunbeam, model # ENG-30, S/N F-377-79. Gas fired, operating temperature of 1900F. Temperature Controls: Upgraded controls. Honeywell digital indicating controller and overtemp. Single alloy retort. Selas compressor. Waukee flowmeters. Air cooled. Package burner. Complete combustion controls and safeties. Good condition.

Asking Price \$22,500 USD

<https://themonty.com/project/itemg198-sunbeam-endothermic-generator/>

Item#G197 Lindberg Ammonia Dissociator

Manufactured by Lindberg. 1,000 CFH. Model Number: 16-1000-HYAM. Serial number 26004. Electrically heated, 460/3/60, 30 KW, 37.6 amps. Operating Temperature: 2000 deg.F. Temperature Controls: Honeywell indicating controller and overtemp. Standard Lindberg design with vertical sealed catalyst chamber. Ceramic fiber insulation. Nichrome heating elements. Air cooled heat exchanger. Includes pressure gauges, SSOV, Waukee DA flowmeter. Includes operating manual and drawings. Very good condition. Unit is complete and guaranteed operational.

Asking Price \$11,500 USD

<https://themonty.com/project/itemg197-lindberg-ammonia-dissociator/>

Item#G196 Surface Combustion Endo Generator

Surface Combustion 5000 CFH Endo Generator. Serial number AC 42332-1A. Maximum temperature 1950F. Barber-Coleman controls with digital recorder and over temp. Air cooled. Shipping dimensions of 8'5" W X 10'1" high X 8'11" long. Very good condition. Included is a new pump.

Asking Price \$31,500 USD

<https://themonty.com/project/itemg196-surface-combustion-endo-generator/>

Item#G178 Sargeant & Wilbur Ammonia Dissociators (4 Available)

Built by Sargeant & Wilbur, 4 electrically heated Ammonia Dissociators. Model GAD3000E. 3,000 CFH capacity. Maximum temperature 1759F. Voltage 480/3/60/60 kW. External dimensions of 5'W x 6'H x 8'L. **Controls:** Mounted and wired in a free standing panel includes the following:

- Yokogawa UT 350 digital control for dissociator undertemp.
- Yokogawa UT 350 digital control for dissociator overtemp.

- Yokogawa UT 350 digital control for dissociator temperature control.
- Two(2)Yokogawa UT 350 digital controls for vaporizer lower/upper zone.
- Yokogawa UT 350 digital control for vaporizer overtemp.
- All necessary signal lights, timers etc.

Mounted in the same control cabinet are three (3) SCR's. Two (2) "Halmar Robicon" and one (1). "Ametek". One is for dissociator heating elements and the other two are for vaporizer lower/upper zone heaters.

Description: Electrically heated Ammonia Dissociator suitable for supplying up to 3000 CFH of atmosphere with a composition of 75% Hydrogen and 25% Nitrogen. This atmosphere is obtained by cracking anhydrous ammonia vapor in a catalyst filled vessel maintained at a temperature of 1700°F to 1850°F.

Incoming ammonia pressure is reduced before retort entry. At the outlet of the retort the hot dissociated ammonia passes through a dry cooler where the gas is cooled to near room temperature. It then passes through a flowmeter and on to the consuming device. This dissociator includes a Sargeant & Wilbur Ammonia vaporizer. This dissociator is provided with two (2)catalyst filled heat resisting alloy retorts. The retorts are mounted within the insulated dissociator heating chamber. The heating chamber consists of heavy Mullite T-Slot tiles. Retorts are heated with Sinuous-wound Nichrome Ribbon Heating elements which are mounted in the tile slots. The element tails and studs extend through the rear wall of the dissociator. Elements can be removed through the rear wall without having to unpack furnace insulation etc. A step-down transformer (480V to 240V 112.5 KVA) is included. Manuals and drawings are also included. Very good condition.

Asking Price \$29,500 USD

<https://themonty.com/project/itemg178-sargeant-wilbur-ammonia-dissociators-4-available/>

Item#G176 Surface Combustion Endo Generator

Manufactured by Surface Combustion. Natural gas heated 675 CFH/HR. Model # RX 35-75-3V. Maximum temperature 1950F. 7500 CFH capacity. Controls are complete, water cooled. SSi atmosphere controls and Atmosphere Engineering "Endo Injector". Very good condition, ready to go.

Asking Price \$75,000 USD

<https://themonty.com/project/itemg176-surface-combustion-endo-generator/>

Item#G173 Lindberg Endo Generator

4500 CFH, gas fired. Retorts and brickwork are in excellent condition however it requires temperature controls and an air cooler (vendor has partially completed changing from water cooling to air).

Asking Price \$17,500 USD

<https://themonty.com/project/item173-lindberg-endo-generator/>

Item#G169 Gasbarre / Sinterite Endo Generator

3000 CFH, electrically heated 460/3/60/63 Amps/50kW. New in 2006. External dimensions of 106" wide x 75" deep x 116" high. Controls are enclosed in a panel attached to the side of the generator. Honeywell UDC 3200 digital temperature controller and Honeywell UDC 2500 digital high limit safety. Control switches with indicating lights are flush mounted in the enclosure. Flange mounted fused disconnect switch for control power. Separate non fused disconnect for the main power. Waukee flow meters are manifold mounted for incoming and outgoing gases. Flow meters include: Natural Gas 0-1000 CFH, Air 0- 2500 CFH, (3) Mixed Gas 0-1500 CFH and Endo 0- 3500 CFH. Step down transformer for reduced voltage to the heating elements. Electrically heated 3 retort generator. Refractory lined shell with vertically mounted retorts. Total of twelve (12) silicon carbide heating elements, 6 on each side are mounted through the chamber for

good uniform heating of the alloy retorts. The natural gas and air pass through a Waukee “mixor” valve then into the Waukee gas pump. Mixed gas enters the 3 “mixed gas” flow meters, through the Selas fire checks and enters the top of the retorts. The gas travels through the catalyst filled heated retorts and exits at the bottom. The exiting Endothermic gas passes through water cooled chambers then finned cooled air heat exchangers then through the Endothermic flow meter. A pressure regulator is supplied on the exiting gas piping. Good condition.

Asking Price \$29,500 USD

<https://themonty.com/project/itemg169-gasbarre-sinterite-endo-generator/>

INDUCTION HEATING SYSTEMS

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Item#I178 Inductoheat Pick & Place Induction System

Used Inductoheat Automated 100kW, 400 khz pick and place heat treating machine. This machine has been taken out of production due to completion of a contract. It is in good working condition and is still connected to power. It can be run for the buyer prior to shipping. It was used to harden a gear part 45" in dia. Could possibly be retooled for different part processing within the limits of the machine capabilities. This machine includes a SOLID STATE TRANSISTOR (Thermatool) power supply. These are very heavy-duty power supplies which are generally made by Thermatool for tube welding operations that usually run 24/7. This machine includes:

- Input conveyor with gating and part pickoff locator.
- Three arm Pick and Place mechanism that picks one part from the infeed position, one part from the heating position and one part from the cooldown station. All are transferred at the same time.
- Head Position includes placement into the heating coil, air operated part hold down, rotation, heating and quenching. Quick Change Coil Adapter is also included.
- Cooldown/Exit Idle position includes cooling quench flow.
- Exit position with push off onto exit conveyor with reject station
- Auto Lube System • Quench cooling and recirculating system with bag filter
- Water cooling and recirculating system.
- PLC Control with Panelmate interface
- Most Drawings and DVD Manual Included.
- Optional 6 Ton Chiller available.

Asking Price \$85,000 USD

<https://themonty.com/project/item178-inductoheat-pick-place-induction-system/>

Item#I177 Ajax 2 Station Spindle Scanners

This is an integrated Ajax 2 Station (single spindle per station) 150 kW, 10 kHz Scanner System. It has a single SCR type power supply with a transfer switch to send power to station A or B. It has a single shared Quench Recirculating System with bag filter, single shared Water Recirculating System. Each station has a PLC Control and servo control. PLC is A/B SLC 5/03, Pacific Scientific Servos, and Nematron MMI. Also has Quick Change Coild Adapters (would cost about 4-5k today). This was built in 1998 but appears to have been well maintained and contains currently serviceable components.

Asking Price \$89,500 USD

<https://themonty.com/project/item177-ajax-2-station-spindle-scanners/>

Item#I175 Inductoheat/LepeI Induction Power Supply

This is a LepeI/ Inductoheat SP5-40 kW, 3/10 kHz SCR type induction heating power supply with a separate Heat Station (I believe this could be operated at 3 kHz but the heat station is currently arranged for 10 kHz). This is an "HS-3" Heat Station with 3 capacitors and a Jackson Transformer with ratios of 5-3 to 17-3. The Inductoheat SP5 has been a proven reliable power supply for heating and heat treating for many years. It can be used for short heat times as it has fast and consistent ramp up to set power. There is no warranty but it is sold with the assurance it is in good working order. It has recently been connected and tested in our facility. I can supply a video of the unit in operation. Start up and Training service is available at extra cost by an experienced induction heating service engineer. Excellent condition.

Asking Price \$17,500 USD

<https://themonty.com/project/item175-inductoheat-lepel-induction-power-supply/>

Item#I174 Ajax Tocco Induction Power Supply & Heat Station

Manufactured by Ajax/Tocco in August 2005. 480V three phase input is rated to be 1.2MW (1200KW). 660V three phase input is rated to be 2.2MW (2200KW). Unit requires three phase input of 480V, 2500A. System is deigned to work at 2.5 kHz in frequency. Requires 65 GPM of cooling. Buyer must have a dedicated transformer at the three phase input for this machine. Buyer must provide their own coils, bus, and water-cooled cables to attach power supply to heat station and heat station to coils. Limited warranty available. Note: Currently set up to work at 480V input voltage. In order to switch to 660V, buyer needs to change the input breaker. Excellent condition.

Asking Price \$120,000 USD

<https://themonty.com/project/item174-ajax-tocco-induction-power-supply-heat-station/>

LAB EQUIPMENT

See something you need, click on the link or scroll through all the items for sale. Searching for something we don't have listed, let us know.

Item#L12 Leco MicroHardness Tester

LECO Hardness Tester Model M400. "As is/where is"

Asking Price \$7,500 USD

<https://themonty.com/project/iteml12-leco-microhardness-tester/>

Item#L11 Leco Metallagraph

Leco Metallagraph.

Asking Price \$8,500 USD

<https://themonty.com/project/iteml11-metallagraph/>

Item#L10 Mitutoyo Rockwell Hardness Tester

Mitutoyo HR-521 Series 810 Rockwell Type Hardness Testing Machine (2 Available) – Two hardness testers. Model #810-202-03A. Calibrated and in good working order. May require new calibration upon installation at a new location.

Asking Price \$8,500 USD Each

<https://themonty.com/project/iteml10-mitutoyo-rockwell-hardness-tester/>

Item#L9 Wilson Rockwell Hardness Tester

Wilson Rockwell Series 2000. Capacity of 150 Kg. Power Requirements 100/120/220/240 Volts with a 3 Amp slow blow. Max power 370 VA. Frequency 47/63HZ.

Asking Price \$4,200 Euro

<https://themonty.com/project/iteml9-wilson-rockwell-hardness-tester/>

Item#L7 Leco Micro Hardness Tester

Model M400. Complete and in good condition. Unit has become surplus to the vendors organization.

Asking Price \$7,000 USD

<https://themonty.com/project/iteml7-leco-micro-hardness-tester/>

Item#L3 Microtrac Laser Diffraction Particle Size Analyzer

Manufactured by Microtrac, Model S3500. Measurement capability from 0.02 to 2800 microns. Wet and dry measurements. Complete and in very good shape.

Asking Price \$5,000 USD

<https://themonty.com/project/iteml3-microtrac-laser-diffraction-particle-size-analyzer/>

Item#L1 Spectra-Tech Infrared Microscope

Model WHK 10X 201, Reflected & Transmitted light, multiple objectives, Polaroid 4×5 attachment.

Asking Price \$6,500 USD

<https://themonty.com/project/iteml1-spectra-tech-infrared-microscope/>

MISCELLANEOUS HEAT TREAT EQUIPMENT

See something you need, click on the link or scroll through all the items for sale. Searching for something we don't have listed, let us know.

Item#M424 AFC-Holcroft Transfer Car

Built in 2007 this is a double ended AFC-Holcroft Charge car suitable for a 36" X 48" batch IQ furnace. Currently in indoor heated storage, complete and in excellent condition.

Asking \$27,000 USD.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemm424-afc-holcroft-transfer-car/>

Item#M421 Berg Chiller

Brand: Sterling. Model: GPAC-20 (2014 mfg. year). Capacity: 5 ton. Voltage: 460V/3/60. In good condition.

Asking Price \$8,000 USD

<https://themonty.com/project/itemm421-berg-chiller/>

Item#M420 SBS Quench Oil Coolers

SBS "Quench Airs", (9 available). We have available 9 SBS air to oil quench oil coolers "Quench Air". These are all in good condition and range in size from 2' long up to 10' long with a total of 5 different models. All are 460V. Asking from \$1,000 USD for the 2' units up to \$5,000 USD for the 10' long model.

Asking Price \$1,000-\$5,000 USD

<https://themonty.com/project/itemm420-sbs-quench-oil-coolers/>

Item#M417 Soluble Oil Dunk Tank

Working dimensions of 30" X 48" X 30". Tank has a capacity of 2500 pounds. Includes chart recorder, cooler, recirculation pump, and controls. This could easily be modified or used to water quench aluminum. Good condition.

Asking Price \$8,000 USD

<https://themonty.com/project/itemm417-soluble-oil-dunk-tank/>

Item#M416 Wheelabrator

Wheelabrator 6' Diameter. 6" Diameter table blast wheelabrator. 30 HP belt drive. Installed and in use until March 2018. Recently reconditioned with rebuilt auger. Brand New wheel and wheel housing. Good controls with pneumatic operated control and timer to shut down wheel and notify operator when cycle is complete. Very reliable machine in excellent condition. Table is mounted on the door with full access for overhead crane.

Asking Price \$75,000 USD

<https://themonty.com/project/itemm416-wheelabrator/>

Item#M414 Vacuum Residual Gas Analyzer (3 Available)

Pfeiffer Vacuum PrismaPlus QMG220 Compact Mass Spectrometer, Mass Range 1-200 amu, Catalog # PT M06 211 111, Residual Gas Analyzer. Unused these were new in Dec. 2015 and are still in original factory packaging. Warranty expired, but still factory supported. Each set consists of the following;

1. 1 Each, Quadrupole electronics QME220, P/N PTM28612
2. 1 Each, Quadrupole analyzer QMA200, P/N PTM25253
3. 1 Set, QMS220, Accessories & Spare Parts

4. 1 Each, SP 220, (033-0038 43202) Power Supply 90-264VAC, 2.1mm R/A (24 V Output)
5. 1 Each, 45-0007 43024 UTP-Patch-Cable, 3m, Crossed, Red
6. 1 Each, B4564309YX Inficon Mains Cable (USA) LNPE, AWG 18, 2.5m
7. 1 Each, 45-0006 UTP-Patch-Cable, 3m, 1:1, grey 43024
8. 1 Each, PT882400-T Quadera-software, Version 4.61 12/10/2015 for Windows 7 or XP (32-bit Pro)
9. 2 Each, PrismaPlus QMG220 Operating Instructions (1-English & 1-German)
10. 1 Each, Test Reports and Configuration
11. 1 Each, PT R 26 002 Compact Full Range Vacuum Gauge PKR 251, DN 40 CF F
12. 1 Each, PT 448 250-T Sensor Cable

Asking Price \$8,800 USD Shipping Included

<https://themonty.com/project/itemm414-vacuum-residual-gas-analyzer-3-available/>

Item#M411 SBS Quench Oil Coolers (2 Available)

Air to oil quench oil coolers manufactured by SBS Corporation. 480V/6/60. External dimensions of 6' wide X 5' high X 21' long. This unit has three (3) NEMA type disconnect switches mounted on side of unit. Standard "SBS Quench Air" air cooled heat exchanger with removable tube manifold, propeller fans for moving air across the tube bundle, flanged inlet & outlets, three (3) NEMA type disconnect switches mounted on the side of the heat exchanger. This unit has a removable top that has louvers for directing the air horizontally instead of vertically. Good condition.

Asking Price \$13,500 USD Each

<https://themonty.com/project/itemm411-sbs-quench-oil-coolers-2-available/>

Item#M380 Bronco Wheelabrator

Model# SLC500. 36" Mesh Belt –VFD drive. 8 – 20hp Blasting Wheels – VFD drive. Media separator, Torrit dust collector. Some spare parts are also included. Well maintained and works well. Footprint – 30' long, 16' high, aprox. 12' wide. (Includes loading at the facility)

Asking Price \$20,000 USD

<https://themonty.com/project/itemm380-bronco-wheelabrator/>

Item#M366 Wheelabrator Rubber Belt Tumblast

Model # TBR-12, Serial # A142403, Voltage 480/3/60, 12 cubic feet, Controls – complete. Available Immediately, very good condition.

Asking Price \$55,000 USD

<https://themonty.com/project/itemm366-wheelabrator-rubber-belt-tumblast/>

Item#M363 SBS Quench Oil Cooler

Specs: S/N: 4926. Year: 2007. Three (3) Fans with side mounted disconnects. Overall Size: 6'w x 6'h x 21'l. W-RES, MAWP 75 psi @ 450°F, MBMT -20°F, 75 psi.

Asking Price \$15,500 USD

<https://themonty.com/project/itemm363-sbs-quench-oil-cooler/>

Item#M346 SBS Quench Oil Cooler

SBS "QuenchAir". SBS Corporation air/oil quench oil cooler. Single fan unit model 5084-Q4. Serial number: 2365, 230/460 voltage, overall size: 74"wide X 104"long X 55"high. Comes with disconnects. Very good condition.

Asking Price \$5,500 USD

<https://themonty.com/project/itemm346-sbs-quench-oil-cooler/>

Item#M341 AFC Charge Car

Drawing # MT-237014. Voltage 480/3/60. Suited for a 36" wide X 48" tray. External dimensions of 100" wide X 84" deep X 84" high. Side mounted control panel with Allen Bradley SLC 500 PLC Logic Control. Double ended chain driven powered charge car with roller rail top. Excellent condition.

Asking Price \$28,500 USD

<https://themonty.com/project/itemm341-afc-charge-car/>

VACUUMS FURNACES

See something you need, click on the link or scroll through all the items for sale. Searching for something we don't have listed, let us know.

Item#VF351 GCA/Vacuum Industries Vacuum Furnaces (3 Available)

MANUFACTURER: AVS/VACUUM INDUSTRIES

TYPE: VACUUM FURNACE

I.D.: 12"W X 36"D X 12"H

SERIAL#: 42093

MODEL: WORK HOUSE 3040

MAX. TEMP: 3000 F

ELECTRICS: 460V/77KW/3PHASE

CONTROLS: HONEYWELL DCP 700 DIGITAL PROGRAM CONTROLLER, HONEYWELL OVER TEMP CONTROL, HONEYWELL CHART RECORDER MOUNTED IN AN ENCLOSED PANEL.

GENERAL: HORIZONTAL DOUBLE WALL WATER COOLED VESSEL WITH SIDE SWING DOOR, FAN IN REAR, METALLIC HOT ZONE, AND STAINLESS INNER WALL. OUMPING SYSTEM INCLUDES A WELSCH MECHANICAL PUMP AND A 6" DIFFUSION PUMP.

Asking Price \$22,500 USD

<https://themonty.com/project/itemvf351-gca-vacuum-industries-vacuum-furnaces-3-available/>

Item#VF350 Ipsen Bottom Load Vacuum Furnace

Model VVFC, Serial number #57411. Working dimensions of 48" X 48". Max. temp 2300F. 225KW heating power. 2 speed 25 HP cooling fan. Increased internal heat exchanger coils. Insulated hot zone with moly hot face. Stokes 412 mechanical pump with ROOTS CONNERSVILLE 1016 booster. New SSI programmer/controller. Built 2/6/78. Graphite heating elements and graphite hearth. Installed but not in use. Good condition.

Asking Price \$99,000 USD

<https://themonty.com/project/itemvf350-ipsen-bottom-load-vacuum-furnace/>

Item#VF317 Seco Warwick Vacuum & Sintering Furnaces

High Temperature Vacuum HT & Sintering Furnace. Seco/Warwick Model V40-35/48 Vacuum Furnace, 1500C (2732 F) Max. operating temperature, 1600C (2912F) burn-out temperature, Work Zone: 600mm x 650mm x 1200mm (23.6" x 25.6" x 47.2"), Design uniformity +/- 10C, but with elements on all 6 sides we would expect much better uniformity. All-Metal Hot Zone (Layers: 1 Tungsten, 7 Moly, 1 Stainless Steel), Low voltage Tungsten Heating Elements, Moly hearth, Load Rating: 2850 lb. (1300 Kg), Power: 480V/3Ph/60Hz, 390 kW SCR Heating Input with 3-zone control, 420 kVA total power, Stainless steel chamber, water jacket and hot zone plenum, Controls are CompactLogix PLC with computer, touch screen and SCADA software, Leybold TTR91 pirani vacuum sensor, Edwards (Stokes) 212J mechanical pump with Edwards 607 booster pump, Gases set up for Argon cooling and hydrogen purge, Hydrogen mass flow controller, Gas quench pressure rating is 1.05 Bar absolute. Mezzanine-mounted power supplies for minimal floor space requirement. Disassembly and Loading: Buyer's responsibility. Built in 2010 this furnace was only used for 1 year. Excellent condition!

Asking Price \$145,000 USD

<https://themonty.com/project/itemvf317-seco-warwick-twin-vacuum-sintering-furnaces/>

Item#VF348 C.I. Hayes Vacuum Furnace

C.I. Hayes Vacuum Furnace. The front door is mounted on an I-Beam trolley and slides to the side for access to the interior. Quench section is located directly in front of the heat chamber with a hydraulically operated door separating the chambers. Hot zone is lined with graphite felt backed up with ceramic fiber blanket. Six graphite rod elements are mounted horizontally across the chamber, 3 over and 3 under the work area. Hearth rails support the work load. Hydraulic cylinder transfers the load between the chambers. Hydraulic pumping system lowers and raises the work load into the tank. There is a Kinney vacuum. Electrically heated with a voltage of 480/3/60/20 kW. Model # VCQME and serial # 16482 (1987). Max operating temperature is 2400°F. Working dimensions of 8"W x 6"H x 14"L with external dimensions of 5' wide x 9' 6" long x 8' 5" high Furnace only – not including pumps, transformer. Controls are mounted and wired in a separate enclosure. There is a Honeywell DCP 511 programmable controller and a Honeywell round chart recorder / high limit with digital readout. MKS vacuum gauge indicates vacuum level in the quench area and the heat chamber. Control switches for all functions of the furnace including temperature, vacuum, nitrogen backfill, gas fan and oil agitator are flush mounted in the enclosure. Controls for transferring the load and elevator controls are located next to the furnace door. Voltage reduction transformers with DC power drivers are mounted in a NEMA 12 enclosure.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemvf348-c-i-hayes-vacuum-furnace/>

Item#VF347 Vacuum Furnaces Available

We have available 6 very large, lower temperature Ipsen, Abar/Ipsen and Lindberg vacuum furnaces. Vendor would like to sell them as a package for \$500,000 USD but will consider selling individual items. Furnaces are located in California, USA and are installed but not in operation.

1. Lindberg Vacuum Furnace. Working dimensions of 42" W x 59" L x 35" H. Stokes vacuum pumps and Varian diffusion pump. Single zone of control. Operating temperature/uniformity 900F +-25, 1000F-1400F +-15F, 1400F-1600F+-25F. All Metal Hot Zone. Honeywell Controls with Honeywell Paper Chart Recorder. Thermocouples; Controls type K, Load type K, SAT type N. MKS Vacuum Controller.
2. Abar/Ipsen Vacuum Furnace. Working dimensions of 51" W x 120" L x 42" H. Stokes vacuum pumps and Varian diffusion pump. 2 zones of control. Operating temperature/uniformity 900F +-25, 1000F-1400F +-15F, 1400F-1600F +-25F. All Metal Hot Zone. Honeywell Controls with Honeywell Paper Chart Recorder. Thermocouples; Controls type K, Load type K, SAT type N. Inficon Vacuum Controller.
3. Ipsen Vacuum Furnaces (2 available). Working dimensions of 84" W x 120" L x 58" H. Stokes vacuum pumps and Varian diffusion pump. 2 zones of control. Operating temperature/uniformity 900-1000F +-25F, 1000-1400F +-25F, 1400 -1750 +-25. All Metal Hot Zone. Honeywell Controls with Honeywell Paper Chart Recorder. Thermocouples; Controls type K, Load type K, SAT type N. Inficon Vacuum Controller.
4. Ipsen Vacuum Furnace. Working dimensions of 83" W x 143" L x 65" H. Stokes vacuum pumps and Varian diffusion pump. 3 zones of control. Operating temperature/uniformity 900-1000F +-25F, 1000-1400F +-15F, 1400 -1750 +-25. All Metal Hot Zone. Honeywell Controls with Honeywell Paper Chart Recorder. MKS Vacuum Controller.
5. Ipsen Vacuum Furnace; Working Dimensions of 60" W x 119" L x 59" H. 480 Volts. Stokes vacuum pumps and Varian diffusion pump. 2 zones of control. Operating temperature/uniformity 900-1000F +-25F, 1000-1400F +-15F, 1400 -

1800 +/-20. All Metal Hot Zone. Honeywell Controls with Honeywell Paper Chart Recorder. Inficon Vacuum Controller.

Asking Price 500,000 USD

<https://themonty.com/project/itemvf347-vacuum-furnaces-available/>

Item#VF344 C.I. Hayes Vacuum Furnace

Built by C.I. Hayes this is a VCH-202436 Single Chamber Vacuum Furnace. Work dimensions of 20”h x 24”w x 36”d. Max. Temp.: 2450 deg.F. Connected Load: 125 KW, 440/3/60. All Graphite Heating Chamber. Vacuum Components: Mechanical Pump/Blower Combo (16” Port For Addition Of Diffusion Pump). High Volume Recirculating Gas Cooling System. Programmer Controller, OT Protection, Two Recorders. Previously used for sintering of stainless steel magnetic material and the quench is capable of hardening alloy materials. Hot zone in good condition. Furnace is presently in storage.

Asking Price \$90,000 USD

<https://themonty.com/project/itemvf344-c-i-hayes-vacuum-furnace/>

Item#VF342 Ipsen Bottom Load Vacuum Furnace

Ipsen Bottom Load Vacuum Furnace 48” X 54”. Completely Re-Manufactured IPSEN 48” Dia x 54” High Vertical Bottom Loading Vacuum Furnace for your Heat Treating and Brazing requirements. This furnace complies and meets the SAE Aerospace Material Specification AMS2750 Latest Revision E (AMS2750E) and NADCAP. Operating temperature from 800°F (427°C) to 2400°F (1315°C). Temperature uniformity ±10°F (±6°C) between 1004°F (540°C) to 2400°F (1315°C). Equivalent to Class 2 Furnace in AMS2750E standards. Circular one-piece gas plenum/hot zone support structure provides strong, uniformly expanding support for elements Work Zone Dimensions are 48” (1219 mm)

Diameter x 54" (1372 mm) High. Hot Zone Insulation is composed of the following layers:

Hot Face

First Layer

Second Layer

– 0.060" Thick Graphite Foil with CFC Sheet at ends

– 1.00" Thick High Purity Graphite Felt

– 1.00" Thick High Purity Graphite Felt

Hearth gross load weight capacity of 3000 lbs (1361 kilograms) at 2400°F (1316°C). Ultimate Vacuum (nominal) 10-5 Torr Range. Re-manufactured Stokes 412H-11, 300 C.F.M. (8,500 litres per minute) mechanical roughing pump. Re-manufactured Stokes 900-615, 2,000 C.F.M. (56,600 litres per minute) as blower pump. Re-manufactured Varian NHS-35" Diffusion pump, pumping speed 50,000 litres per second. Comes with Safety Guard against hot body surfaces. New Leybold Trivac 8B, 5.7 C.F.M.(161 litres per minute) Rotary Vane Vacuum pump as holding pump. New Oil Mist Filter System for pumping system exhaust. One (1) Re-manufactured External 4400 CFM 50HP Spencer Turbine Co. Gas Fan Cooling Motor and heat exchanger system. One (1) Re-manufactured step-up transformer for Gas Fan Motor. One (1) Backfill Reservoir Gas Tank @ 120 p.s.i.g of 5,000 litres capacity. Argon Quenching To Maximum 2 Bar. Consider this basically a new furnace with a 12 month warrantee. Asking \$525,000 USD with start up and training included. Half the price of new.

Asking Price \$525,000 USD

<https://themonty.com/project/itemvf342-ipsen-bottom-load-vacuum-furnace/>

Item#VF340 Vac Aero Vacuum Furnace

Vac Aero Model VAH 4848 HV-2. Working dimensions of 48" X 48" X 48". Furnace includes controls, vacuum pumps (Stokes 412 roughing, 615booster, 20" diffusion, holding), furnace quench system (gas blower, heat

exchanger, gas accumulator), water cooling system (cooling tower, similar to EVAPCO LRWB).

Asking Price \$220,000 USD

<https://themonty.com/project/itemvf340-vac-aero-vacuum-furnace/>

Item#VF335 ALD Vacuum Carburizing Furnace

Loading Dimensions : Width 400 x Length 400 x Height 400 mm. Loading Capacity : 80 kg max. Cooling Fan Motor : 75 kW, 3000 rpm for 10 bar N₂. Vacuum System : Leybold SV100 Mechanical Pump. Leybold WA501 Roots Pump. Leybold E250 Mechanical Pump. Leybold WA1001 Roots Pump. Vacuum Level : $<5 \times 10^{-2}$ mbar. Leak Rate : $<5 \times 10^{-3}$ mbar l/s. Heating Zone : 120 kW, 2 zones. Plasma Chamber : 60 kW, 1 zone. Diffusion Zone : 180 kW, 3 zones. Max. Temperature : 1250 °C (Heating chamber). Operating Temperature : 800-1100°C. Process Gases : Nitrogen, Methan, Argon, Hydrogen. Installed Power : 700 kVA, 3x400V 50 Hz. Manufacturing Year : 2002.

Asking Price \$75,000 Euro

<https://themonty.com/project/itemvf335-ald-vacuum-carburizing-furnace/>

Item#VF334 Degussa Vacuum Hardening Furnace

Year of construction 1990. The furnace name is VKSQ 80/80/120. The maximum temperature is 1350 ° C, the max. The load is 1500Kg gross, the heating capacity is 250kW, the working space is 800x1200x800mm, the permissible pressure of the system is 6bar absolute and the furnace has the possibility of convective heating. The furnace control was renewed a few years ago (Demig). Located in Germany.

Asking Price \$60,000 Euro

<https://themonty.com/project/itemvf334-degussa-vacuum-hardening-furnace/>

Item#VF331 Elnik Vacuum Furnace

High Temperature Vacuum Furnace 2300. Manufactured by Elnik this is a MODEL T-3000 unit, built in 1993. The vacuum furnace consists of a watercooled cylindrical chamber, a molybdenum hot zone with tungsten heaters, a roughing pump, a holding pump, a diffusion pump, a heat exchanger assembly, and all associated valving.

- The furnace runs on 480 volts
- Working dimensions of 18" X 18" X 18"
- External dimensions of furnace 6' X 6', water tank 5' X 5'
- Ultimate vacuum 10⁻⁵
- Stokes roughing pump Model 148 H-9
- Holding pump (Walsh) 1402
- Varian diffusion pump – VHS-6
- Water system – Model WCS 305-ET with a 300 gallon stainless steel recirculating tower model 1CT4-64
- 2300F operating temperature
- Ut35 temperature controller controls the temperature of the furnace as programmed by the operator via the computer's profiler utilities
- Complete and in Good Condition

Asking Price \$19,950 USD

<https://themonty.com/project/itemvf331-elnic-vacuum-furnace/>

Item#VF330 Surface Combustion Vacuum Furnace

Surface 2-Bar Quench Vacuum Furnace. Model# HVPI 484824. Maximum Temperature: 2400F. Power requirements: 460/3/60, 275 KW. Hot Zone Dimensions: 48" Wide x 48" Deep x 24" High. External Dimensions: 12' Wide x 12' Deep x 11'High. Features: Horizontally Loaded Vacuum Furnace complete with 412 Stokes Vacuum Pump, Roots 615 Booster Pump, 2 Bar Quenching, Graphite Heating Elements, "Autoclave" Style Swing-Out Front Door, and

Powered Big Joe Loader. Also Included is (1) Crate of New Spare Heating Elements and Connectors. Controls: Free-Standing Control Panel complete with Marathon Monitors Digital Temperature Controller, Honeywell Digital High Limit, and Honeywell Round Chart Recorder. Condition: Very good – Operational. Approx. Weight: 25,000 lbs

Asking Price \$119,000 USD

<https://themonty.com/project/itemvf330-surface-combustion-vacuum-furnace/>

Item#VF328 Ipsen Vacuum Furnace

Abar Ipsen Model HS-26 Vacuum Furnace. Model HS-26 Abar Ipsen vacuum furnace. Working dimensions of 24" wide X 18" high X 36" deep. Working capacity of 750 pounds. Varian HS-16 Diffusion pump and Spencer GH 3025 gas booster. All metallic hot zone. Single zone temperature control. Components included from control panel: Honeywell controllers, Honeywell paper chart recorder, and MKS vacuum instruments. Operating temperature of 2400F. 480 volts. Was used in an aerospace facility before it was very recently removed.

Asking Price \$15,000 USD

<https://themonty.com/project/itemvf328-ipsen-vacuum-furnace/>

Item#VF327 Surface Combustion Vacuum Temper Furnace

Working dimensions of 36" x 48" x 24" and is approximately 23 years old. The equipment is in good condition with Honeywell HC900 Controls, Telvac Vacuum Control & Sensors, Honeywell UDC 2000 overtemp control, Stokes 412 Vacuum Pump, Controls Concepts SCR, McLeen Cabinet Cooler. Brand New Heating Elements ready to be installed. Internal Fan Circulation. This unit was pulled from service to make room for a new Vacuum furnace just recently. Max Temp 1500° F, 480 Volt / Three Phase.

Asking Price \$50,000 USD

<https://themonty.com/project/itemvf327-surface-combustion-vacuum-temper-furnace/>

Item#VF326 Ipsen Vacuum Furnace

Ipsen 924 Vacuum Furnace. Ipsen Model: VFC-924-R Vacuum Furnace S/N: 58699. Working dimensions of 32" wide X 53" deep X 26" high. Maximum operating temperature of 2400F, recently surveyed from 1400-2000F at +-25F. Molybdenum faced hot zone. Stokes 412 roughing pump, Stokes 615 booster pump, and Varian HS-20 diffusion pump. 40 HP fan. Water cooled. One zone of control. Honeywell controllers and chart recorder. MKS 937B Vacuum Gauge Controller. Good operating condition. 480 Volts. Was used in an aerospace facility before it was very recently removed.

Asking Price \$80,000 USD

<https://themonty.com/project/itemvf326-ipsen-vacuum-furnace/>

Item#VF320 Thermal Technologies Vacuum Furnace

High Temperature Vacuum Furnace. Manufactured by Thermal Technologies LLC, Model 121224G. Working dimensions of 12" wide X 12" high X 24" deep. Maximum load weight of 200 pounds. Operating temperature of 1565C, maximum temperature of 2000C. Operating vacuum level 10-2 torr range. Ultimate vacuum level 10-3 torr. Process gas argon. Front and rear doors. Graphite heating elements with rigid fibrous graphite insulation panels (hot zone is NOT installed but virtually all the components are included) 125jVA power supply. Rotary vane pump, Trivac B Leybold Model D65B (53CFM). Eurotherm Model 2704 high performance controller/programmer with SpecView software. Furnace comes complete with parts washer.

Asking Price \$75,000 USD

<https://themonty.com/project/itemvf320-thermal-technologies-vacuum-furnace/>

Item#VF319 Vacuum Induction melting System

Manufactured by Ionex, Model 260 LB VIM, S/N 93978. Electrically heated 480/3/60/200 KVA. Work area 150 kW, 3 kHz, 260 Pound. External dimensions of 10' wide X 10' high X 15' long. Controls; Complete with PLC and touchscreen HMI interface. 260 pound horizontal front loading VIM with water cooled stainless steel vacuum chamber. Pumping system includes a BOC/Edwards 1722 package with mechanical pump/booster and a stainless steel 20" T-M Vacuum diffusion pump. Induction power supply consists of a Pillar 150 kW, 3 kHz and includes water cooled power leads. This furnace has automatic tilt and includes two (2) crucibles. Also included with this VIM is a rotating load table that moves up and down for accurate pouring. Lot of misc. spare parts and molds are included. Excellent condition.

Asking Price \$285,000 USD

<https://themonty.com/project/itemvf319-vacuum-induction-melting-system/>

Item#VF316 AVS Vacuum Furnace

Manufacturer: Advanced Vacuum Systems (AVS). Model: HMF-24-24-48-1100, S/N 4-1284-0683 Approx. 1990. Chamber: Cylindrical, Horizontal, Stainless Steel with front & rear access doors for ease of maintenance. Hot Zone: Used, All-Metal Moly/SS Shielded Hot Zone with Moly Elements and Moly Hearth Ass'y. Vacuum System: Stokes Mechanical Pumps and Varian Diffusion Pump (Typ. 10⁻⁴ to 10⁻⁶ Torr ultimate) Pumps: Varian HS-20 warranty rebuilt Diffusion Pump. Stokes 310 warranty rebuilt mechanical blower pump (booster). Stokes 212 warranty rebuilt Mechanical Roughing Pump. Holding Pump for diffusion pump. Power: 480V/3Ph/60Hz, 300 Amp, 250 KVA Heating. Floorspace Requirement: Approx. 15' x 15' x 11'H. Work Zone: 24"W x 48"D x 24"H. Max. Temperature Rating: 1100°C (2012°F) Max. Load Rating: > 1500 lb. Upgraded

Controls: SSI 9220 Controller with 12.1" Advantech Touch Screen HMI and built in digital data acquisition, SSI Series 804L Hi-Limit, SR12 Remote Input Satellite Recorder, New Allen-Bradley Micrologix 1400 PLC, Televac vacuum instrument & gauges. Gas Cooling: External VFD Drive Blower and Heat Exchanger, 1 Atmosphere Pressure. Other: Included – 24" x 48" used 2-Tier Molybdenum Grid Fixture. Both front and rear doors have ports for adding end heating elements, if desired (not included). Rear door also has a port for a circulation fan, if desired (not included).

Asking Price \$170,000 USD

<https://themonty.com/project/itemvf316-avs-vacuum-furnace/>

Item#VF315 AVS Vacuum Furnace (Rebuilt)

Manufactured by Advanced Vacuum Systems (AVS) this furnace has a Model Number HMF-24-24-48-1100, S/N 4-1284-0490. Built approximately 1990. Chamber: Cylindrical, Horizontal, Stainless Steel with front & rear access doors. Hot Zone: New in 2015, All-metal, shielded (Moly and Stainless Steel), Moly Hearth, Moly Elements. Hot Zone rated for 2400F. Vacuum System: Currently 10⁻⁹ Torr, Cryogenic and Turbomolecular Dry Pumps. Pumps: CTI Cryogenics 10" Cryo Ultra High Vacuum Pump; MAGintegra 10" High Vacuum Turbomolecular Pump (New in 2015); Pfeifer Balzers Duo 120 2-stage Rotary Vane Roughing Pump; Agilent Technologies SH-110 Dry Scroll Holding Pump for Cryo. Power: 480V/3Ph/60Hz, 300 Amp, 250 KVA Heating, Hunterdon VRT with Halmar Power Control. Floorspace Requirement: Approx. 15' x 15' x 11'H. Work Zone: 24"W x 48"D x 24"H. Max. Load Rating: > 1500 lb. Controls: ProVac computer based control system. New in 2015. Gas Cooling: External VFD Drive Blower and Heat Exchanger, 1 Atmosphere Pressure. Loader: Included. Cooling Water: 90 GPM @ 25-40 PSIG (40 Max.), Open Drain. Air: 1 cu. ft./hr @ 80-100 PSIG. Inert Gas: 35 cu. ft./Load @ 6-8 PSIG. Other: Includes 24" x 48" 2-Tier Molybdenum Grid Fixture, Has blanked off 20" port for easy change to diffusion pumping, if desired. Both front and rear doors have

ports for adding end heating elements, if desired. Rear door also has a port for a circulation fan, if desired.

Asking Price \$195,000 USD

<https://themonty.com/project/itemvf315-avs-vacuum-furnace-rebuilt/>

Item#VF314 Ipsen Bottom Load Vacuum Furnace

Work Zone: 60" Diameter x 96" Tall with a Temperature of 2400F. Diffusion pump: 35" diffusion pump, with port and right angle valve. Manufactured in the 1980's with a Power of 480V/3Ph/60Hz; 600kW. Hot Zone: 2008 reline, graphite elements. Cooling Gas: Was running Argon; capable of 1-Bar cooling. Top mounted cooling fan. Water Cooling: Includes Dry Cooler closed-loop AquaVent water cooling system; 2005, 200 GPM, Plate & Frame Heat Exchanger with Thermacare fiberglass Tower.

Asking Price \$325,000 USD

<https://themonty.com/project/itemvf314-ipsen-bottom-load-vacuum-furnace/>

Item#VF313 GT Technologies Top Loading Vacuum Furnaces

Top Loading Vacuum Furnaces (2 available). Manufactured by GT Technologies, Model # AMPF-4836HP – 2015. Working dimensions of 1200mm diameter x 900mm High. Operating temperature of 2100C. Controls by Loy Instruments (Honeywell graphic touchscreen). This unique ultra high temperature furnace is high vacuum, has resistance heating with all graphite hot zone and graphite felt insulation for high efficiency operation. 480 volt 3PH 50/60 HZ, 160 KVA. Maximum load 1,000 KG. Double Wall Stainless Steel Vessel construction. Platform with Stairs included. Halogen Gas Purge equipped, Dry Vacuum Pumping System with Blower. Graphite Purity levels to less than 5ppm. Cycle time 72 – 84 hours. 10 – 3 Torr vacuum level achievable. Options: Exhaust Scrubber System, Overhead Crane. Very good condition.

Asking Price \$175,000 USD Each

<https://themonty.com/project/itemvf313-gt-technologies-top-loading-vacuum-furnaces/>

Item#VF312 Vacuum Furnace

2400C Vacuum Furnace. Capable of 2400C (4320F). Working dimensions of 10" high x 22" wide x 36" deep element-to-element. External dimensions of 86" high x 76" wide x 85" deep. 480 volts, 3 phase, 225 kw. This unit is capable of both vacuum and atmosphere operation. Graphite rigid board insulations, graphite heating elements on all 4 sides, graphite hearth plate, 6 channel digital chart recorder, Yokogawa UP 550 digital programmable controller. High accuracy Raytek digital optical pyrometer. All New Vacuum Chamber – Tested and Certified and new graphite hot zone. Very good condition.

Asking Price \$149,000 USD

<https://themonty.com/project/itemvf312-vacuum-furnace/>

Item#VF299 Sunbeam Vacuum Furnace

Model # 40236, Serial Number F-170-82. Working dimensions of 36" wide X 120" long X 36" high. Maximum operating temperature of 2552F (1400C). 460 volts, 400Kw, 3 phase. Honeywell digital program control, Honeywell digital overtemperature control, Honeywell strip chart (inoperative) and Granville-Phillips 375 Convectron vacuum controller in enclosed panel. Double walled water cooled horizontal load vessel. Interior has a molybdenum liner with graphite heating elements on both walls, roof and floor. 20 HP cooling fan mounted in rear. Pumping system consists of a Stokes 412-11 mechanical pump with Roots booster. Power to the heating elements is through VRT's. A battery powered loader is included. Some of the heating elements were damaged during shipment and will need to be replaced by buyer.

Asking Price \$95,000 USD

<https://themonty.com/project/itemvf299-sunbeam-vacuum-furnace/>

Item#VF282 AVS Vacuum Debinding/Sintering Furnace

This is a horizontal graphite vacuum debinding sintering furnace for steel MIM parts completely rebuilt from top to bottom by AVS in 2010. Working volume – approximately 18 cubic feet, 28” wide x 26” high x 42” long graphite retort, 1500# capacity. Temperature – rated for continuous operation at 1400°C ±10°C in vacuum, 1450°C burn-out. 50μ ultimate vacuum; leak rate <10μ / hour, CEDORT (Clean, Empty, Dry, Outgassed, Room Temperature). De-bind system – nitrogen or argon sweep gas, 0 – 100 torr differential pressure controlled by PLC and automatic I-to-P modulating vacuum valve, binder trap, condenser assembly; options available for hydrogen gas and burn-off. De-bind lines heated to keep vapor from condensing in vacuum lines. Fast cooling with circulation fan and automatic gas re-circulation ports. Control system – AVS ACE™ control/data acquisition system. Estimated cold-to-cold cycle time of 16 to 20 hours with AVS “Fast Cool” option. Horizontal jacketed chamber – 60” dia. x 80” long, nominal dimensions, flanged, on legs. SA-516-70 mild steel construction on water jackets and door + body flanges. Stainless Steel inner jacket & dished head plus all power ports Front-loading chamber with 2 doors – both doors on adjustable hinges, with buna o-rings, manual clamps, for operation from 50 millitorr vacuum to 3 psig positive pressure; rear door opens for service. Ports – rough line on side of chamber, delube line from bottom, fan housing flange on rear door Additional PORTS added to the system to accommodate future system modifications for processing ‘sinter-hard’ P/M materials – a total of up to 7 additional ports ranging from 18” in diameter down to 1” in diameter will be added. Further details available upon request. Currently installed and in excellent condition.

Asking Price \$169,000 USD

<https://themonty.com/project/itemvf282-avs-vacuum-debinding-sintering-furnace/>

Item#VF266 Vacuum Pump

Kinney 75 CFM Vacuum Pump. Warranty Rebuilt Kinney Model KTC-75, Part No. 804982-D, S/N 1105-Y 7710-5 mechanical vacuum pump. 12 Month warranty on rebuild. Will be repainted at rebuilders shop. Running without problems when removed from service.

Asking Price \$5,700 USD

<https://themonty.com/project/itemvf266-vacuum-pump/>

Item#VF243 Diffusion Pump

35" Diffusion Pump. CVC Model PMC-32C, 35" Diffusion Pumps (Today this is the Varian HS-35. Varian purchased CVC rights to this pump.) Rebuilt condition with a 12 Month warranty. 35" Throat Diameter. Bolt Circle is approx. 38-3/4" with 14 Holes on approx. 8-9/16" Centers. Flange O.D. is 41-3/4". O-Ring Center Diameter is 36-1/8". Approx. 72-3/4" Overall Height (79" on 48" x 48" shipping pallet). Note: Mating 35" Cryo-Baffle is also available for improved low-range vacuum and elimination of backstreaming (See Item# 3161 Below). 6" Foreline with approx. 9-1/2" Bolt Circle with 8 Holes on approx. 3-5/8" Centers. 1/4" dia. O-ring is approx. 8-7/8" diameter to center. Shipping Wt. with pallet approx. 2050 lb. Price in Warranty Rebuilt Condition, Painted: (with existing working elements. Add \$6,000 if you want brand new elements.)

Asking Price \$12,250 USD

<https://themonty.com/project/itemvf243-diffusion-pump/>

Item#VF242 Diffusion Pump

35" Diffusion Pump. CVC Model PMC-32C, 35" Diffusion Pumps (Today this is the Varian HS-35. Varian purchased CVC rights to this pump.) Can be purchased

either in As-Is condition or in Rebuilt condition with a warranty. 35" Throat Diameter. Bolt Circle is approx. 38-3/4" with 14 Holes on approx. 8-9/16" Centers. Flange O.D. is 41-3/4". O-Ring Center Diameter is 36-1/8". Approx. 72-3/4" Overall Height (79" on 48" x 48" shipping pallet). Note: Mating 35" Cryo-Baffle is also available for improved low-range vacuum and elimination of backstreaming (See Item# 3161 Below). 6" Foreline with approx. 9-1/2" Bolt Circle with 8 Holes on approx. 3-5/8" Centers. 1/4" dia. O-ring is approx. 8-7/8" diameter to center. Shipping Wt. with pallet approx. 2050 lb. Price in Warranty Rebuilt Condition, Painted: \$ 12,250.00 (with existing working elements. Add \$4,500 if you want brand new elements.)

Asking Price \$6,400 USD

<https://themonty.com/project/itemvf242-diffusion-pump/>

WASHERS

See something you need, click on the link or scroll through all the items for sale. Searching for something we don't have listed, let us know.

Item#W427 Detrex Continuous Belt Washer

Continuous Belt Washer. Natural gas fired 2500 CFH. Model # SAB-131-GG and Serial # 73769. Max temperature 160°F Wash, 200°F Dry-Off and voltage of 480/3/60. Working dimensions of 48"W x 15"H and external dimensions of 9'10"W x 10'H x 50'L. Controls Mounted and wired in free standing panel with fused disconnect. All functions of this washer in controlled through an Allen Bradley SLC PLC with touchscreen interface.

Stainless steel conveyor type belt washer with the following sequence: 3'l load end x 3'l vestibule x 9'l wash x 3'l air knife x 2'l transition x 5'l 1st rinse x 2'l transition x 5'l 2nd rinse x 3'l D.I. rinse x 3'l air knife x 10'l dry-off x 3'l unload.

Zone 1: WASH ZONE 9' 160 Deg. F

Wash zone is equipped with a 15 HP Stainless Vertical Pump 335 GPM @ 80 PSI

Stainless Steel Bag Filter Housing with 100 Micron Bag

Liquid Level Control

Pump Temperature Alarms

Inlet and outlet plumbing connections

Quick Access Marine Type Clean-Out Door

Lift-off viewing door with window

Viewing lights

Eclipse Gas Burner and heat system with stainless steel burner tube and necessary gas controls

Digital Temperature Read Out

800 Gallon Sump

Intermittent Zone 2' with Air Knife

A 20 HP pressure blower is mounted at the end of the wash zone with one air knife each above and below the conveyor belt. The volume air in each air knife is controlled with individual adjustable dampers. The blower inlet is complete with an air filter to protect the blower and remove particulate from the air stream. The filter also serves as a silencer by reducing the noise level of the moving air.

20 HP Pressure Blower rated at 1000 CFM@ 65" w.c.

Stainless Steel Air Knives

Air inlet filter with silencer

Zone 3: Rinse

First rinse with RO Reverse Osmosis

5 HP Stainless Vertical Pump 200 GPM

CPVC Spray Headers

Removable Spray nozzles

Liquid level control

Pump temperature alarm controls MAX 160 Deg. F

Inlet and outlet plumbing connections

Lift-off viewing door with window

Viewing lights

Zone 4: Rinse

Second rinse

5 HP Stainless Vertical Pump 200 GPM

CPVC Spray Headers

Removable Spray nozzles

Liquid level control

Pump temperature alarm controls MAX 160 Deg. F

Inlet and outlet plumbing connections

Lift-off viewing door with window

Viewing lights

Gas heat system with stainless steel burner tube, Eclipse Burner

420 Gallon Capacity

Zone 5: Rinse

1 HP Stainless Vertical Pump 60 GPM

CPVC Spray Headers

Removable Spray nozzles

Liquid level control

Pump temperature alarm controls MAX 160 Deg. F

Inlet and outlet plumbing connections

Lift-off viewing door with window

Viewing lights

Gas heat system with stainless steel burner tube, Eclipse Burner

100 Gallon Capacity

Zone 6: FINAL RINSE

After the product travels through the last rinse zone, it receives a spray of pure DI water flush. This DI flush consists of one spray header above and one spray header below the conveyor belt. Water to this section is provided by a remote located Deionized (DI) Water System

ZONE 6: Air Knife

A 20 HP pressure blower is mounted at the end of the final rinse zone with three air knives above and one below the conveyor belt.

20 HP Pressure blower rated at 1000 CFM

Stainless Steel Air Knives

Air inlet filter with silencer

Zone 7: Dry Zone

As the product enters the dry zone it is subjected to heated air for drying of the water. The air is pulled from the bottom of the dry chamber and travels through stainless steel air ducts through a filter, gas heated burner assembly, through the blower, and through stainless steel ducting to the zone distribution headers. In essence, the product will be baked dry. An exhaust duct has been provided to allow the removal of the high humidity air and place the module under a slight negative pressure.

20 HP pressure blower 4700 CFM

Indirect gas fired duct heater

High temperature control
Air inlet plenum
Ten upper air knives
Nine lower fixed air knives
Blower and temperature controls
Chamber exhaust
High Temperature 2 inch insulation
Blower and temperature controls
Specifications: Belt: 48" Wide x 15" Part Height Capacity

Asking Price \$125,000 USD

<https://themonty.com/project/itemm427-detrex-continuous-belt-washer/>

Item#W426 Mart Corporation Table Washer

Mart Corporation Table Washer. Equipped with: Thermal Insulated Skins, Rinse Pump for Hand Wand, Wash-Rinse, Gas Heat, Oil Skimmer, Variable Pressure Switch Low-High, Rinse Pump Off-Auto, Turntable Off-On, Turntable Jog, 24 Vee-Jet Wash Nozzles, Oscillating Manifold 4 Revolutions Per Minute, 30 Minute Cycle Timer, 55 HP Duplex Pumps 399 GP, Reservoir Capacity 967 Gallons 260 Gallon Sludge Capacity, Table Load Capacity 20,000 lbs. Initial Heat Up Time 45-60 Minutes. Note: Unit is in very good condition. Table Bearings are good all maintenance up to date, recent items include, turntable drive replaced, as well as pump rebuild. Heated with natural gas. Model # Hurricane 84 and Serial # H3013. Max temperature 140°F – 180°F with a voltage of 480 3 Phase 60 HZ, 71 FLA. Working dimensions of 84" Diameter x 75"H and external dimensions of 143" W x 139"H x 125"L – 16,000 pounds. Controls Mounted and wired in an enclosure attached to the left hand side of the washer includes.

Asking Price \$49,000 USD

<https://themonty.com/project/itemm426-mart-corporation-table-washer/>

Item#W425 Proceco Rotary Table Washer

Proceco Rotary Table Washer. Standard Proceco "Typhoon" stainless steel rotary table washer with 2000 pound table capacity. This washer has a wash stage, rinse stage and electrically heated blow-off stage. Wash tank is 600 gallons, rinse tank is 295 gallons. 25 HP wash pump, 360 GPM, 40 psi. 7-1/2 HP rinse pump, 115 GPM, 60 psi. Manual and drawings are included with this washer. Washer options include the following: Center Nozzle Pipe (CNP), Full Flow Filtration, Exhaust Blower, Oil Skimmer, Fresh Water Rinse, Oil Coalescer, PLC Controls, Stainless Steel Construction. Electrically heated with voltage 460/3/60/39 Amps. Model # HD 62-60-S-2000-CO-2-R-BO-SS and Serial # 96-224. Working dimensions of 62" Diameter x 60" High with external dimensions of 8'W x 16'H (11'H shipping) x 13'L. Controls Mounted and wired in a free standing panel includes an Allen Bradley SLC 500 PLC control with operator interface flush mounted to the door. There are three (3) digital temperature controllers, 1 for 1st stage, 1 for 2nd stage and 1 for blow-off stage. Excellent condition and available immediately.

Asking Price \$55,000 USD

<https://themonty.com/project/itemm425-proceco-rotary-table-washer/>

Item#W422 Surface Combustion Dunk/Spray Washer

Dunk/Spray Washer 36" X 48" X 36". Manufactured by Surface Combustion this is a Dunk/Spray batch IQ washer with working dimensions of 36" X 48" X 36". Electrically heated.

Asking Price \$22,500 USD

<https://themonty.com/project/itemm422-surface-combustion-dunk-spray-washer/>

Item#W415 Surface Combustion Parts Washer

Manufactured by Surface Combustion of Ohio this is a spray washer with working dimensions of 30" X 48" X 30" high. Radiant tube gas heat and rotary drum oil skimmer and separate skim tank located on back of wash. This is partially reconditioned . It is in overall good condition. BEST OFFER.

For Pricing Please Contact Jordan@themonty.com

<https://themonty.com/project/itemm415-surface-combustion-parts-washer/>

Item#W406 Surface Combustion Spray Washer

Manufactured by Surface Combustion this is a Spray washer with working dimensions of 30" wide X 48" deep X 30" high. Gas fired with an operating temperature of 200F. Good overall condition.

Asking Price \$12,500 USD

<https://themonty.com/project/itemm406-surface-combustion-spray-washer/>

Item#W348 Ipsen Automatic Dunk/Spray Washer

Model #WRD-11, Serial Number 57690. Working dimensions of 36" wide X 48" deep X 24"+ high, 2200 pound capacity. Electrically heated, 72KW. Companion washer-In/Out or straight through design. Door each end, Cal Rod element bundle. 12" wide belt oil skimmer, air operated-full width elevator rack for submerged oscillation, overhead spray rinse. Overall dimensions of 7' 5" wide X 5' 4" long X 11' 8" high.

Asking Price \$35,000 USD

<https://themonty.com/project/itemm348-ipsen-automatic-dunk-spray-washer/>

Item#W314 Holcroft Dunk/Spray Washer

Model GPWS 24-36-24. Electrically heated, 480/3/60/50 amps. Working dimensions of 24" wide X 24" high X 36" deep. External dimensions of 96"W X 143" high X 124" long (91" without skimmer attached). This is a standard dunk/spray washer with 4 Warren Electric immersion heaters. Spray nozzles are arranged over and all sides of the wash area. Load height is 51" from floor to top of rollers. Wheel centres are 14-1/2". Controls are mounted and wired on the right hand side of the washer and includes all necessary pushbuttons and signal lights. There is a dunk cycle timer and spray cycle timer. A Honeywell UDC 2000 digital temperature controller controls wash temperature. Good condition.

Asking Price \$18,500 USD

<https://themonty.com/washers/>

EMPLOYMENT OPPORTUNITIES ADVERTISING

The cost is \$150.00 USD per month for a minimum of two months. Payment can be made by Visa or Check. Opportunities should be in the form of a “Word” document and e-mailed to jordan@themonty.com All “Employment Opportunity” ads can include your company logo and will automatically appear both on the website and in the monthly newsletter “The Monty”.

Item#O363 General Manager

Thermal Process Holdings is seeking General Manager candidates who are eager to grow and enjoy the personal success of leading their business’ success.

In our style of running Thermal Process Holdings team of businesses a General Manager is THE leader of their business. You must be technically competent in heat treating, safety, quality systems, Human Resources, customer relations, sales, maintenance of equipment and facilities, administrative duties, community relations, compliance with all laws and regulations, strategic planning, annual budgeting, monthly performance review and anything, you will be accountable for every aspect of your company’s performance.

The ideal candidate will be an engineer with 5+ experience in commercial / captive heat treat. Have a burning desire to make positive things happen. Be committed to growing and developing team members and customers. High personal / business ethics. We offer very competitive pay and benefits package plus an annual performance bonus up to 30% of base pay as well as the opportunity for equity. We are an equal opportunity employer.

If you have the desire to step up contact us at: JHubbard@heattreating.com

John D. Hubbard, P.E., Chairman, Thermal Process Holdings, Inc

Item#0362 Seeking Plant Manager Lansing, Michigan

About Premier Thermal. Premier Thermal is a manufacturing company providing products and services primarily to the automotive, heavy truck, energy and agriculture industries. PT's customers include OEMs, distributors, forgers and foundries. PT services its customers through multiple facilities located throughout the Midwestern United States operating 24 hours per day.

Nature and Scope. Responsible for growth strategies, planning, technical sales, pricing, organizing and controlling all processing, equipment installation and support activities of the plant, quality assurance, purchasing, scheduling, production scheduling, shipping and receiving, human resources, training, safety and environmental, maintenance, and customer service to maximize profit and return on investment while serving or customers on a timely basis.

Principal Accountabilities:

- Direct, layout, plan, determine and implement the necessary organization structure to achieve optimum schedules based on employee hours(wages as a % of Sales), workforce, machine and materials availability (Equipment Uptime), tooling requirements and manufacturing space to achieve plant objectives and meet customer quality and delivery requirements. (Product Quality)
- Develop and maintain a culture that emphasizes safety for all employees and is reflected in the employee behaviors and locations statistical reporting of safety.
- Provide an environment for all employees that promotes open positive communication, transparency, mutual respect, and fair treatment for all.
- Furnish heat treated parts to customers consistent with cost, quality and service requirements. (Customer Survey)

- Provide opportunities for employees to achieve personal development growth, and career goals commensurate with their capabilities.
- Prepare capital expenditure budgets both short and long range to provide processing capacity and skills to achieve growth opportunities in existing and new markets and adhere to successfully executing the plan.
- Establish annual operation budgets including manpower and equipment requirements and capital expenditures. Budgets and realize desired profit levels.
- Maintain and provide objective product cost data to insure intelligent market pricing decisions.
- Establish and implement necessary controls, including reports, to continually monitor production quality, trucking, maintenance, and other operations in regard to productivity, costs, profitability, inventories, waste, etc.
- Continually evaluate methods and means for cost reductions and productivity improvements. (Continuous Improvement)
- Support Sales and Marketing Department in developing processing skills and technology in penetrating new markets or processing of new products.
- Achieve housekeeping requirements of an exceptionally high standard to provide favorable customer impressions. (5 S Goal, Customer Survey)
- Establish management and supervisory objectives to focus on specific productivity needs, waste reduction and cost improvement programs.
- Evaluate and appraise personnel effectiveness and achieve improved levels of performance where necessary.
- Determine long-range personnel skill requirements and implement programs to fill these needs.

- Keep current and informed of new developments in manufacturing and heat treating and make recommendations regarding desirable changes. (Continuous Improvement)
- Familiarity with OSHA, Hazard Communication Standards and the general safe work practices in the department.
- Other duties and responsibilities as assigned.

Candidate Requirements:

- A Bachelor Degree in Metallurgy or Material Science preferred
- A minimum of seven to ten years of manufacturing experience
- An extensive knowledge of metallurgical processing techniques
- Additional experience and/or training in Sales & Marketing, Statistical Process Control, Quality Assurance, Human Resources, Safety and Environmental, Purchasing, Customer Service, Computers and general business knowledge
- Must have proficient computer skills.
- The ability to use higher mathematics involving engineering principles.
- Ability to plan, determine, formulate, develop a “team” concept and establish and manage a complete heat treating production operation.
- Through adherence to company policies and procedures, maintain high quality standards and achieve quantity goals to maximize profit and return on investment.
- Be familiar with and adhere to state and federal employee, safety, environmental and other requirements.

Compensation:

- Base salary plus incentive bonus
- Eligible for healthcare plan (medical, dental and vision)
- 401(k) with company match
- Life, STD, LTD, Tuition Reimbursement

Interested candidates may apply

at: <https://www.premierthermal.com/careers/lan-gm/>



Item#0361 Seeking Production Manager Connecticut

Seeking Production Manager for two separate facilities in Connecticut (Berlin and South Windsor). Our people are the heart of our business. As the world's largest provider of thermal processing services, Bodycote employs thousands of highly skilled staff around the globe, some of the best engineers, scientists and technicians in the industry. Our staff are encouraged to develop their skills through professional career development and our in-house training resources.

At Bodycote what we do matters and as a member of our team, what you do matters too. Are you seeking a leadership role? Do you have a knack for training and demonstrating to others department goals on your shift? As the supervisor or lead person you will direct and guide other employees in a heavy industrial plant environment processing metal components for manufactures in the aerospace, automotive, general industrial or oil & gas industries.

This position will direct activities of production and maintain appropriate production staffing as needed to meet company goals. Responsible for shop production schedules and conduct production meetings including supervisors' meetings. Ensures customers' needs are appropriately met by shipping to schedule with minimum turnaround time and a high degree of quality. We are looking for someone with knowledge of heat treating, operations management, metallurgy, inspection and customer needs through technical and advanced training, seminars, and/or equivalent work experience. Minimum of five years' experience in a supervisory role with proven ability to manage multi-level employees and functions. This position must satisfy ITAR compliance requirements, therefore candidates must be U.S. Citizens or Permanent Resident Card Holder.

Interested candidates may send their resumes

to: Meagan.Boyer@Bodycote.com



Item#O357 Regional Sales Manager

Solar Atmospheres of Western PA – Hermitage, PA.

Solar Atmospheres is an industry leader in vacuum heat treating, brazing, carburizing and nitriding, as well as, thermal processing research and development. The primary target market for our services are the aerospace, defense, power generation and medical markets. We are a family run business that partners with each of our customers to provide services that meet or exceed their expectations.

We are looking for an Outside Sales Manager for our Hermitage PA facility, which will be responsible for the maintenance and growth of an assigned sales

territory. Candidate must have previous sales experience in the metals industry or heat treating environment. Also, individuals need not live geographically close to the facility.

Some of the main responsibilities of the position will include, but are not limited to:

- Management of Sales Staff and Processes
- New Business Development
- Development of Sales Plans
- Management of Sales Cycle
- Maintenance of CRM systems
- Development and Reporting of Sales Metrics
- Customer Relationship Management
- Development and Presentation of Proposals / Quotations
- Contract Review (Commercial & Technical)

Qualifications:

- 4-year degree preferred but not required.
- Previous sales experience in the metals, metal working and/or heat treating environment a must.
- Demonstrated aptitude for problem solving and logical approach to solutions.
- Result oriented and ability to work both independently and in a team environment.
- Must possess excellent written and verbal communication skills in English.
- Ability to prioritize work and complete task both efficiently and effectively with little supervision.
- Strong technical and analytical skills.
- Prior experience with CRM systems.
- Proficiency in Microsoft applications: Word, Excel, Outlook, PowerPoint etc.
- Must possess a valid driver's license.

We offer a friendly work environment, plus good compensation and benefits.

Some of our benefits include but are not limited to Medical, Dental, Vision, Short and Long Term Disability, 401K with Company Match, Employee Incentive Plan, Company Car and paid time off.

Please send resumes to Chris Schubert at chriss@solaratm.com.

Item#O345 Multiple Positions Available

Vesco-McLaughlin located in East Windsor, CT and McLaughlin Services located in Avilla, IN are looking to expand and hire people in the industry with any of the following experience:

- Hot Zone Design
- Vacuum and Atmosphere Furnace Design
- Vacuum and Atmosphere Furnace Service Experience
- Vacuum and Atmosphere Furnace Manufacturing Experience
- Electrical and Controls Experience

Please send all resumes and questions regarding positions to Ben Tackett, btackett@vacuumengineering.com, Main: (860) 627-7015, Fax: (860) 627-9964.

In Parting

We always enjoy comments, feedback and constructive criticism. Thanks for your feedback and don't hesitate to let us know your thoughts. Don't forget to visit us daily at www.themonty.com.

Gord Montgomery,
William G. Montgomery Limited
Phone: 905 271-0033
Email: gord@themonty.com
