

# INDUSTRIAL HEATING

The International Journal of Thermal Processing

MARCH 2019

## Mainstream Metal 3D Printing 31

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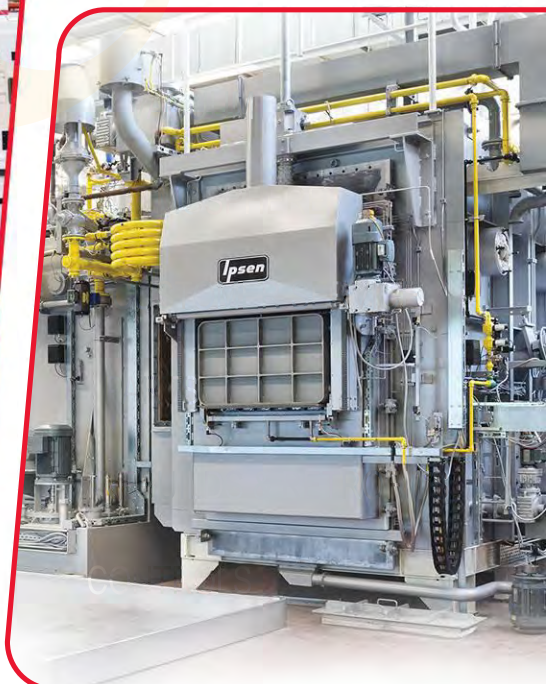
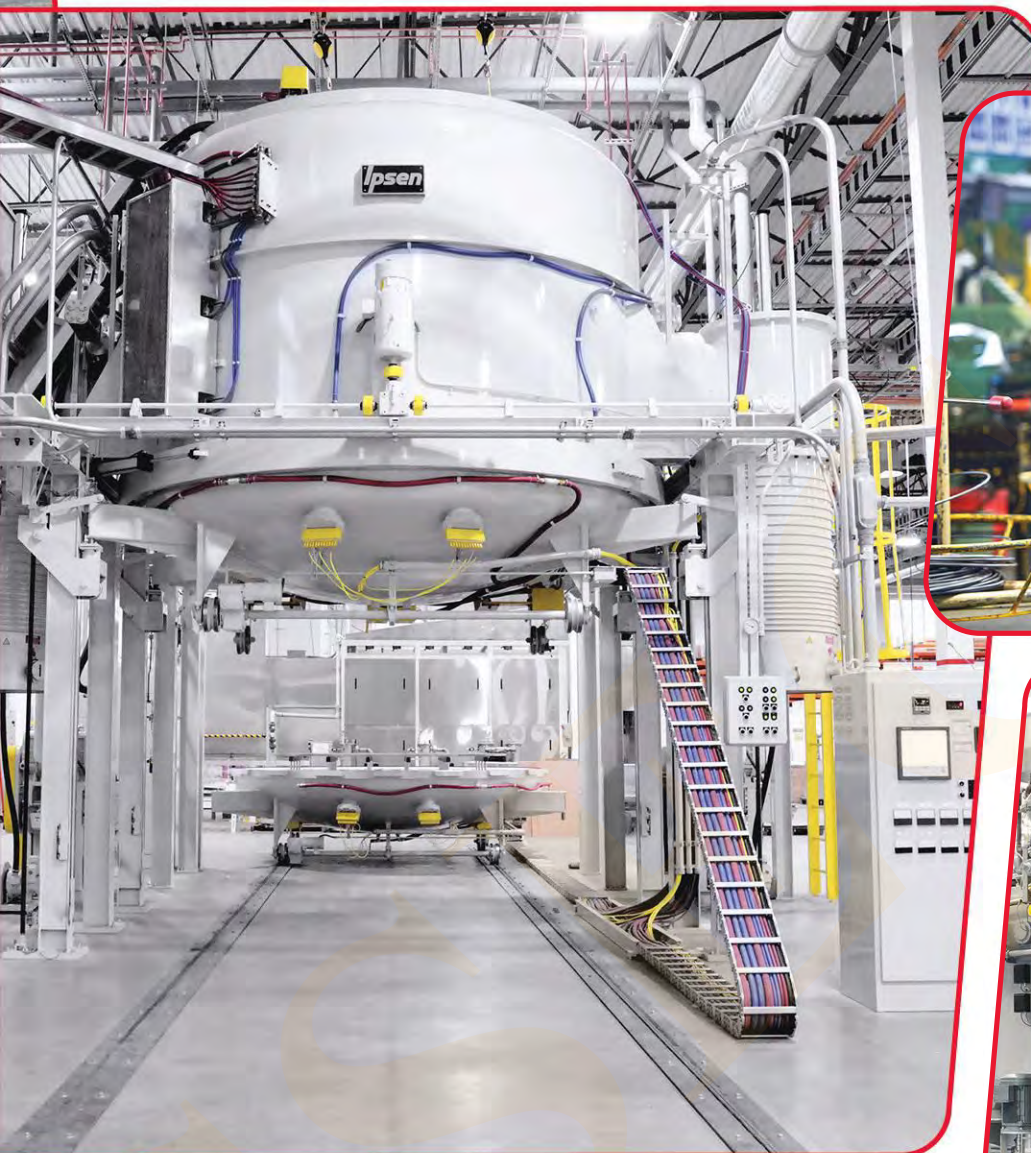
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## FEATURES

### 25 **Most-Viewed Heat- and Corrosion-Resistant Materials Articles**

Heat & Corrosion Resistant Materials/  
Composites

Bill Mayer – Managing Editor

Once again, *Industrial Heating* will focus on specific topics on our website and list the articles that are most popular amongst our readers. We hope you find this information useful, particularly if you have an interest in high-temperature materials.

Read it online at [www.industrialheating.com/HaCR](http://www.industrialheating.com/HaCR).

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Vacuum/Surface Treating

Edward Rolinski and Mikel Woods – Advanced Heat Treat Corp.; Monroe, Mich.

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Read it online at [www.industrialheating.com/EtS](http://www.industrialheating.com/EtS).

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Sintering/Additive Manufacturing

Daniel Carroll and Emily Durham – Carnegie Mellon University; Pittsburgh, Pa.

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Read it online at [www.industrialheating.com/3DML](http://www.industrialheating.com/3DML).

### 34 **Generating Hydrogen for Thermal Processing and Coatings**

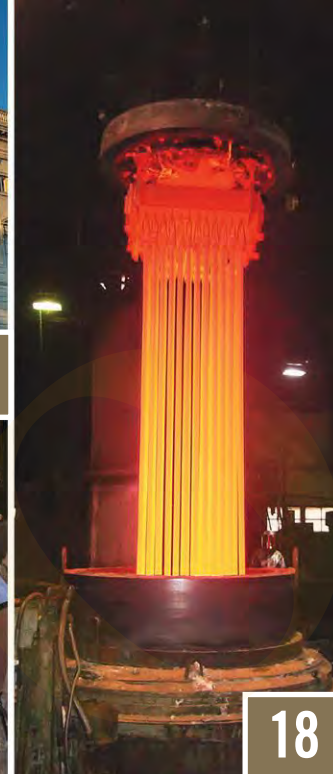
Heat Treating

David Wolff – Nel Hydrogen; Wallingford, Conn.

Atmosphere thermal processing improves the properties of fabricated metals. Operations include annealing, brazing, sintering (for powdered metals, metal injection molding and additive manufacturing) and glass or ceramic-to-metal sealing.

Read it online at [www.industrialheating.com/H2atm](http://www.industrialheating.com/H2atm).





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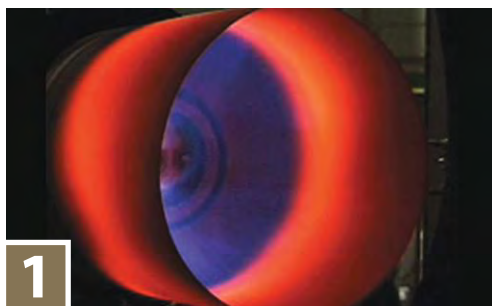
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## ONLINE

### 1 Web Exclusive

#### Meeting Increasingly Strict NOx Emissions Standards

The global industrial sector has never placed greater demands on manufacturers. This article describes the challenges involved in reducing NOx emissions and offers guidance on the selection of effective burner and control technologies in process heating applications.

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### 3 Video

#### Taking a Second Look at Materials, From Cellphones to Clothing

Professor B. Reesha Jayan discusses her work with common everyday materials doing uncommon things. New materials are important, but Jayan suggests that we give all materials a second look.

[www.industrialheating.com/videos](http://www.industrialheating.com/videos)

## INDUSTRIAL HEATING

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# Rewards of Membership



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I know that some of you reading this column are on board with memberships in our industry associations – Metal Treating Institute (MTI) and Industrial Heating Equipment Association (IHEA). Since both associations have upcoming spring meetings, I thought I would shine the light on them, explain what each association does and provide a look at the events.

## Industrial Heating Equipment Association (IHEA)

From their website, IHEA says they are the “industry’s leading trade association representing designers and manufacturers of industrial heating equipment and related supplies and services. The organization focuses on driving its members’ success by providing the knowledge base and authoritative voice for industrial heat processing.” IHEA is celebrating their 90<sup>th</sup> anniversary in 2019.

In addition to their annual meeting in the spring, IHEA also has a fall gathering for committees to meet. They have a total of six working committees. IHEA also conducts seminars, including Combustion, Safety Standards and Codes, Induction and Infrared. Their Infrared Equipment and Induction Divisions teach end-users about these technologies, including their advantages and applications.

IHEA’s annual meeting will be held April 29-May 1 at Lido Beach Resort in Sarasota, Fla. From IHEA.org, “IHEA members will enjoy the camaraderie created by the ever-popular social events and thought-provoking presentations. The annual meeting provides plenty of opportunity to get involved with important industry-related developments while exploring new business contacts and growing relationships.” Check out the IHEA column for more information.

If you think IHEA membership might be right for you, the annual meeting is a great time to test the waters. Check out the website ([www.IHEA.org](http://www.IHEA.org)) to see the five different membership options, and contact them to see how you can get involved.

## Metal Treating Institute (MTI)

The early roots of MTI go back even further than

IHEA. You can read about their history on MTI’s website, [www.heat treat.net](http://www.heat treat.net). There’s no way I can do it justice here, but the first meeting of heat treaters happened in October 1913. Over the years, the name changed several times and became MTI in 1933.

From the website, “The membership has expanded worldwide and includes commercial heat treaters, manufacturers with in-house heat-treat operations and suppliers that provide products and services to the industry. MTI is active in government advocacy and technical standards, conducts national and regional educational networking conferences and produces the Furnaces North America business expo every-other year.”

Like IHEA, MTI has two meetings each year – spring and fall. On even-number years, the fall meeting is held in conjunction with Furnaces North America. This year’s spring meeting will be held April 25-27 at the Diplomat Beach Resort in Hollywood, Fla. MTI also has several training opportunities throughout the year, including the popular YES Management Training. They offer certificate programs in the following: Qualified Furnace Operator, Heat Treat Technical Specialist, Heat Treat Specialist and Heat Treat Management Specialist.

MTI also has four membership categories, and you can learn more about them on the website. If you think MTI might be the association for you, contact them and plan to attend the meeting in April. *Industrial Heating* will be there as well as at the IHEA meeting the following week. Hope to see you there.

The issue you are holding is our heat-treating issue and contains our Commercial Heat-Treating Directory. This print directory is a great resource for locating commercial heat treaters in your area. You can also use the directory’s search feature by accessing it in the “Directories” dropdown on [www.industrialheating.com](http://www.industrialheating.com).

This month’s cover is a look into 3D printing, which is moving into the area of ceramics. Carnegie Mellon University and others are helping to drive the technology developments in this state-of-the-art industry. Check out their article to learn more about it. ■



# What We Need is a 28th Amendment



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**"As government competence seems to be in decline, it is past time for corrective action."**

It was a year ago (March 2018) that this column addressed the need for Congressional term limits, something the public overwhelmingly endorses. In that piece and prior ones, it was cited that a Constitutional Convention seems to be the only practical way that reform matters such as limiting legislators time in office can be achieved.

These articles mentioned that this convocation of states can and should be called and only needs states' coordination of the movement to do so. Now let us look at a few other reasons that are overlooked and largely unknown but command this action. I say this because, as I tell folks, my job in Washington is to watch government and report on how they screw things up.

Being blunt, Congress is often corrupt in what it does. Prior to passage of the Affordable Care Act (ACA), members got health insurance through a Federal Employees Health Benefits Program (FEHBP). During the ACA mark-up, however, lawmakers inserted a provision (Section 1312(d)(3)(D)) that they and staffers may use a Small Business Health Option Program (SHOP). This places Congress in the position of being a small business, which means that all offices are treated as if they were private entities.

If a reader of this journal claimed to be a small business and is not, the penalty exacted by the U.S. Treasury is three times the amount of the transaction and/or 20 years in jail. This maneuver results in members of Congress getting a subsidy equivalent to 72% of FEHBP premiums. Never mind that the Office of Personnel Management has approved this fraud in spite of punishments discussed in 18 USC 1001. Look it up.


Only under recent public pressures has Congress even acknowledged exemption of themselves on numerous items. The Congressional Accountability Act of 1995 finally made both House and Senate answerable to paying social security and to civil rights, discrimination and harassment laws. I bet you never thought about what snakes in Congress have allowed for themselves and hidden from the public. Recently under way are investigations brought by Judicial Watch into collusion by State Department employees to funnel U.S. tax money to approximately 200 different groups associated with Open Society Founda-

tions and intended to destabilize specific, friendly foreign governments, all done without approval by Congress of spending tax monies. All this is being overlooked by Congress.

America is enduring an increasingly corrupt Congress, one that needs to be stopped and reset on the path of operating in citizens' interests. Business and industry has a vital interest in corrections to the Congressional distortions mentioned here. The public is disenchanted with increasing frequency. Since the mechanics of the Constitutional Convention are in place, it is time to use that avenue for a Constitutional Amendment – Number 28.

Believe it or not, the Congressional Reform Act of 2018 is several years old but has never received any vote by Congress. Three-fourths of the states must pass it in an agreed form, and it requires no Congressional actions and cannot be appealed to the Supreme Court. In various forms, here is what this amendment seeks:

- Term limits of elected members of the House of Representatives and Senate – 6 or 12 years total.
- No tenure and no pension for any member; salary only while serving.
- Members will participate in Social Security.
- Members may purchase their own retirement plans like all citizens.
- Congress may not vote itself a pay raise; pay will rise by lower of CPI or 2.5% annually.
- Congress loses its healthcare system and may participate in any citizen program.
- Members of Congress must equally abide by all laws that apply to U.S. citizens.
- All contracts with past and present members of Congress are void.

This 28th Amendment to the Constitution was formally proposed in August 2013 by then-Congressmen DeSantis (FL) and Salmon (AZ). Would you believe that Congress never brought the matter to discussion or vote? This matter is of vital importance to America and its future. As government competence seems to be in decline – and citizens' disapproval is increasing – it is past time for corrective action. The suggestion to "straighten up and fly right" has national appeal and support. Let's get on with it. 



# Testing to Determine Material and Mechanical Properties (Part One: The Tools)



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**H**aving the right tools in our toolbox or knowing who to call and rely on makes any job go easier, faster and better. In the analysis of heat-treated parts, we often must call on outside testing laboratories or universities for help. The Doctor is often asked questions such as: “What tools do these sources have?” “What tests should I have them run?” “How can they help us get the answers we need?” Let’s learn more.

## Universal Testing Machine Investigations

Universal testing machines (Fig. 1) fall within the general class of mechanical-testing devices that were traditionally used to test the tensile and compressive strength of materials. Depending on the equipment setup, however, one can examine samples after stretching, compression, bending, twisting and the like.

These types of machines are used to determine the basic strength and plasticity values of samples after various heat-treatment processes, including: tensile strength, compressive strength, flexural

strength (i.e., resistance to bending), modulus of elasticity, yield (and offset yield) strength, limit of elasticity, elongation and reduction of area.

## Impact Investigations

By far, the most-used and well-known impact test is the Charpy test, which can determine a material’s resistance to cracking under dynamic load. These tests measure the total amount of energy that a material is able to absorb. This energy absorption

is directly related to the brittleness of the material. Therefore, one can determine such things as the ductile-to-brittle transition temperature. Understanding a material’s energy-absorption properties is critical because it predicts how much plastic deformation the material will be able to withstand before catastrophic failure.

## Hardness Investigations

Hardness testing is the most common heat-treatment test performed throughout industry due in large part to its speed and simplicity. Hardness, in simplest terms, is a measure of the resistance to localized plastic deformation induced by either mechanical indentation or abrasion. It is also valuable because it reveals a relationship with certain mechanical properties, so it can be used to approximate tensile strength without conducting a tensile test.

In the laboratory, macro- and microhardness testing is typically performed for a variety of reasons, including checking the accuracy of field results. Hardness on a macro scale employs loads above 10 N (1 Kg). The most common methods include:

- **Brinell** – With a load that can be applied over a wider surface area than other test methods, it is often used to test cast irons and soft materials (e.g., to measure materials prior to heat treatment or those that have been annealed or normalized). It consists of pressing a penetrator into the material. A steel ball is used for research of soft materials and sintered carbide for the harder ones. The bead diameters may be 1, 2, 2.5, 5 and 10 mm, and loads may range from 10-3,000 N.
- **Rockwell** – This is a fast method often used to determine a successful heat treatment. The measurement consists of applying force in two stages: an initial force (preload) to set the indenter followed by the main force. Hardness is determined on the basis of the difference of impressions for individual loads. The three types of indenters include



**Fig. 1. Universal testing machine in the configuration for tensile testing of bolts**





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**Fig. 2. Scanning electron microscope (equipped with attachments for determination of chemical composition in micro-areas and phase identification via the EBSD method)**

a diamond cone with a tip angle of 120 degrees (for measurements with scale A, C, D), a steel ball with a diameter of 1.588 mm (for measurements with scale B, F, G) and a steel ball with a diameter of 3.175 mm (for measurements with scale E, H, K).

- **Vickers** – This is considered the most versatile of microhardness test methods. It can be used for virtually any material, from very soft to very hard. The test involves pressing the pyramid-shaped penetrator (with a gap angle of 136 degrees) into the material, with a given load that can vary from to 1-10 N (0.1-1 Kg).
- **Knoop** – An alternative microhardness measurement to Vickers, the only difference is the shape of the penetrator (indenter), which is an elongated diamond shape. A key advantage of Knoop testing is that the shape of the indenter enhances the ability to measure closer to the surface and measure thin layers or coatings.
- **Low-load testing** – Light loads can be used to determine hardness distributions of surface layers after surface treatments. It may be performed by either Vickers or Knoop methods and typically involves loads between 1-3 N (0.1-0.3 Kg). It is important to note that no conversion of these measurements to other scales (particularly Rockwell “C”) is allowed.

### Microstructural Investigations

The microscope is to the materials engineer what the hammer is to a carpenter. Their usefulness and versatility in metallurgical investigations is fundamental. The most common types include:

- **Stereo microscopes** – Use magnifications of 10-50X for examination of surface features/defects, fracture surfaces, braze joints and other basic macroscopic features. More sophisticated units can provide topographic (3D) mapping of surfaces.
- **Optical microscopes** – These now have extended magnification capability, up to 2000X. Metallographically prepared samples are required (i.e., properly mounted,



**Fig. 3. Optical glow-discharge atomic-emission spectrometer for studying chemical composition of metals and ceramics**

polished and etched specimens).

- **Scanning electron microscopes (SEM, TEM, STEM)** – These (Fig. 2) have magnification capability up to 250,000X. Use of higher magnification reveals features on structural components far beyond optical microscopy. They also have an additional advantage, namely that when the appropriate detectors (e.g., EDS and EELS) are installed, the chemical composition of the material can be qualitatively or quantitatively determined. Due to the very large depth of field, they are used extensively for failure analysis and forensic metallurgy work.
- **Image analysis, digital cameras** – Software and hardware packages are available for the various microscopes to perform such tasks as automatically detecting objects, layers, area fractions or optical profiles for data collection as well as display/photography of microstructures.

### Summary

The key to using any outside resources lies in clearly understanding what tests will help answer the question(s) you have or reveal the root cause of a problem you are investigating. As a result, good communication of the intended end-use component application (including the material and design requirements), its heat treatment and/or the specific problem you are trying to investigate or understand is at the heart of working with outside laboratories or universities.

The reason this is so important is that you want to obtain test results you know are both accurate and representative and ones you can interpret to make informed decisions. Data alone or conclusions without supporting facts are most often useless.

Next time: We present several case studies to illustrate how these tools are used in solving heat-treat problems. 🇺🇸

Too much good material to fit into two pages. Read the rest at [www.industrialheating.com/htdr](http://www.industrialheating.com/htdr).

### References available online





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# Serving the Customer



**JEFF JUDD**

Wisconsin Oven Corporation  
Sales Engineer  
jjudd@wisoven.com  
262-642-6009

After spending two years as a retail sales associate and five years handling industrial equipment telephone support calls, it became abundantly clear that the experience one creates for their customer can be even more important than having the fast/easy solution. Active listening and finding the true “pain” a customer is experiencing are of the utmost importance.

For instance, a photographer looking for a new computer may be out searching in order to replace an existing computer that cannot run the necessary photo-editing software they require. Without conversation on this topic, or consideration to their needs, it is very easy to quickly sell the photographer on a more inexpensive computer. Ultimately, however, this would leave the customer dissatisfied and less likely to return the next time they have a related need.

Similar to the capital-equipment world, this “pain” could be something as simple as small, sporadic annoyances cropping up on aging equipment to exorbitant fees and scheduling difficulties due to relying on contracting out work to severe, line-down failures causing loss-of-production scenarios. Now that I am in

a capital-equipment sales role, much more time is required to root out these concerns and understand application needs in order to ensure that they are addressed during the equipment design process.

In my current sales engineer role, my focus is to spend more time with customers speaking about their application to determine what design considerations


are best made to suit their specific process. One of the most critical decisions to make during the pre-design process of a convection-heated oven is to determine the type (direction) of air flow used throughout the chamber.

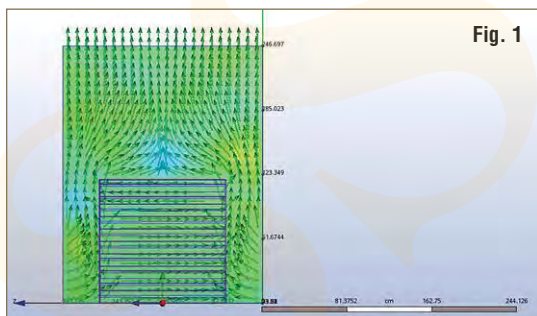
Oven companies often have several standard airflow patterns, but misapplying the path of airflow could lead to a piece of equipment that is, at best, not efficient in its heating and, at worst, not at all useful for the application. Inquiring about how the equipment will be loaded, the orientation of the parts and the size/shape of the parts all play a role in determining optimal airflow.

We recently had a customer that contacted us with concerns that their ovens were taking a very long time to heat their load of aluminum extrusions. Upon investigation, we found that the ovens were ordered several years ago with combination airflow (where air is provided from both sides of the chamber and returned vertically through the ceiling of the chamber) for a different application (Fig. 1).

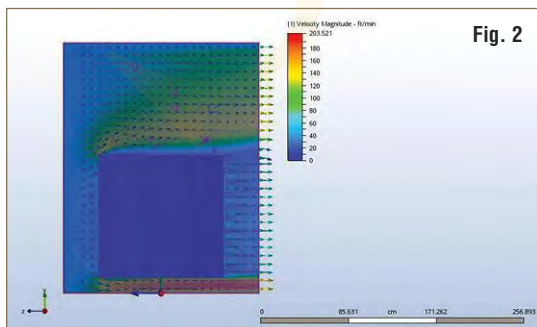
This new aging application had extruded aluminum tubes that were stacked front to back on a load car and one on top of the next, thus allowing no path for the heated air through the load. Rather than being effectively heated, the material was almost entirely dependent on conduction from one part to the next because only the outside edges of the tubes were directly heated by the air.

After consulting with our customer, we were able to recommend use of horizontal airflow, where air is supplied from one side of the chamber, passes through the tubes and returns through the other (Fig. 2). This recommendation was made by identifying the part orientation within the oven and working with the customer to obtain a 3-D model of the load.

We were able to use CFD (computational fluid dynamics) software to show a change in airflow from combination to horizontal would provide a roughly 50% reduction in heat-up time. Time savings like this can be used to increase the throughput of the oven, thus sending more product out the door and leading to a quicker payoff on the capital investment. 



**Fig. 1**



**Fig. 2**





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# Metlab

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**M**etlab isn't your typical commercial heat treater. Founded in 1928 as a manufacturer of aluminum spars for biplanes, the company is credited with the patent for the first drop-bottom gantry furnace.

But today, the Wyndmoor, Pa.-based company is known for its huge pit furnaces and its ability to heat treat parts weighing anywhere from a few ounces to 50,000 pounds. In fact, Metlab has more than 30 furnaces on-site – including pit furnaces as big as 15 feet x 12 feet deep, which are believed to be the largest in North America.

The company also has vertical pit furnaces measuring 4 feet in outside diameter x 16 feet deep with the ability to extend to 18 feet deep for heat treating long, slender parts used in oil drilling, mill pinion shafts, bar stock and tubing. A pit nitriding furnace and a car-bottom tempering furnace (6 feet x 9 feet x 16 feet) complement the large-parts department, and the company has several integral-quench batch furnaces and support tempering equipment for heat treating small parts.

Metlab acquired the John V. Potero Company in 2001, allowing it to process small parts and provide a wide range of heat-treatment services. These include: case hardening, nitriding, protective atmosphere annealing, hardening, quenching, tempering, stress relieving, solution annealing and age hardening. What's more, the recent investment in vacuum furnaces has further expanded the company's offerings into bright hardening of tool steels and stainless steel.

Deep-case carburizing and hardening, as well as nitriding of large and small gears and shafts, are core competencies of Metlab. The ability to heat treat these parts to precise and accurate case depths and hardness

while maintaining geometric integrity makes the company unique in the field of commercial heat treatment. What really sets the company apart from its competition, however, is its ability to process parts in large, atmosphere-controlled equipment specifically designed for processing gears, pinion shafts, bearing races and other large industrial components.

This longtime MTI member offers more than thermal processes. With three full-time metallurgists on staff and an in-house metallurgical laboratory, Metlab has the ability to analyze microstructure and case depth to ensure all parts are processed accurately and on time. The company also offers black oxide finishing, failure analysis and metallurgical consulting.

As for recent developments, a recirculating water system funded in part by a grant from the Department of energy coupled with rebuilds of the two large pit furnaces has made Metlab more competitive from a cost-savings and water-recycling standpoint.

As for the future, Metlab intends on acquiring new equipment and adding new processes to complement its core offerings. Recent projects involving the heat treatment of nose cone and rocket exhaust gas nozzles as well as long, slender down-hole tooling indicate the need for more capacity to process large parts. In addition, capacity to nitride gears, axles, shafts and large industrial valves calls for equipment upgrades.

*Visit [www.metlabheattreat.com](http://www.metlabheattreat.com) for more information on Metlab.*



Load of modified H-11 steel rods, 2 feet in diameter x 16 feet long, being prepared for air quenching.



Fabricated gear weighing 40,000 pounds being removed from Metlab's largest pit furnace.



# IHEA to Celebrate 90th Anniversary at Annual Meeting



**T**he Industrial Heating Equipment Association (IHEA) will celebrate its 90th anniversary at the 2019 Annual Meeting April 29-May 1 at Lido Beach Resort in Sarasota, Fla. IHEA members will enjoy the camaraderie created by the ever-popular social events and thought-provoking presentations. The annual meeting provides plenty of opportunity to get involved with important industry-related developments while exploring new business contacts and growing relationships.

This event is filled with pertinent presentations and social activities that allow plenty of time to network with business associates while enjoying the beautiful resort, sandy beach and sunshine.

This year's program will feature a dynamic presentation by Bob Sherlock, CMO of Chief Outsiders. Sherlock's presentation, "The Power of Value," will highlight why members should be paid for the value of their products and services. All too often today, customers are pressuring our members for lower prices. But Sherlock believes there are better alternatives than simply cutting your price. His presentation will help you uncover strengths so you can value sell.

Attendees will also hear IHEA economist Chris Kuehl's lively update on the economy and a report from Omar Nashashibi of The Franklin Partnership. Nashashibi, who lobbies in Washington, D.C. on behalf of manufacturing

trade associations, will share insights into the government shutdown and the latest developments on critical policy and what it all means for your business. His presentation will attempt to help you plan for the unpredictable future.

Chris Della Mora of HUB International Risk Services and James Moore of Goyer Management International team up to provide a critical session for anyone who uses the Internet. IHEA members will gain valuable knowledge on cybersecurity and how to delay the inevitability of being hacked. Della Mora and Moore will share "true stories" and provide ways to make your information less valuable to hackers.

The program also includes a presentation from IHEA member Scott Bishop of Alabama Power on the benefits of partnering with utility companies. Your business and your customers will value the process improvements and cost savings that ultimately affect the bottom line. Learn about the opportunities available to you through this presentation.

IHEA's committees will also meet in Sarasota as they continue to work on issues of importance to the membership and the industry at large. Of course, the annual golf outing and beach games provide the perfect social experience to round out the meeting agenda. Review the complete program and event details at [www.ihea.org/event/AM19](http://www.ihea.org/event/AM19).

## Registration Open for IHEA Online Learning Course

Registration is open for IHEA's Fundamentals of Industrial Process Heating online learning course, which begins on April 15. The course is ideal for students who wish to further their studies at home or work in a flexible web-based, distance-learning format. It's an affordable alternative to campus-based classes and allows students to go at their own pace.

For a complete listing of the topics covered and/or to register, visit [www.ihea.org](http://www.ihea.org), click the Training and Events tab and then scroll to Online Course.



The presentations at IHEA's annual meeting address timely topics and provide thought-provoking information.



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## Equipment & Business News

### EQUIPMENT NEWS

#### Gas Nitriding, Tempering Furnaces

JGEF Furnace installed a series of gas nitriding and tempering furnaces at a commercial heat-treatment company specializing in mold and die steel heat treatment. The horizontal gas nitriding furnace can produce a hard, clean substrate onto which a duplex layer with high hardness values is deposited. The working size of the furnace is 35.5 inches wide x 35.5 inches high x 47 inches long.



The charge support design is suitable for a 3,307-pound maximum load. The tempering furnace will help the heat treater achieve a pre-vacuum protective atmosphere for tempering, and the atmosphere in the furnace chamber will reduce the oxidative decarburization reaction of the heat-treated workpiece. The work zone measures approximately 47.5 inches wide x 47.5 inches high x 79 inches long. The furnace has a load capacity of 11,023 pounds and an operating temperature range of 302-1202°F.

[www.jgeffurnace.com](http://www.jgeffurnace.com)

#### Gas Nitriding Units

Advanced Heat Treat Corp. (AHT) installed three new gas nitriding units at its corporate headquarters 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 units vary in size,





allowing for the accommodation of industries and applications including agriculture, automotive, construction, aerospace, firearms and oil and energy. One unit will be operational this month, and the additional two units will begin operation in February. The units will house AHT's UltraGlow gas nitriding and UltraOx services, which are commonly used in manufacturing to prevent corrosion and improve wear resistance. [www.ahtcorp.com](http://www.ahtcorp.com)

## Single-Chamber Vacuum Furnace

SECO/WARWICK received an order for a vacuum heat-treatment and brazing system with high-pressure gas quench from Grupo TTT. The company, a provider of heat and surface treatments, will install the single-chamber furnace in its Bergara, Spain facility, where it will run a variety of processes. SECO/WARWICK prioritized precision temperature controls for both heating and cooling as well as conserving furnace atmosphere and energy to produce optimum performance in the system design.

[www.secowarwick.com](http://www.secowarwick.com)

## Box Furnace

L&L Special Furnace Co. Inc. received an order for a large retort box furnace that will be used for de-binding ceramic composite pre-peg materials along with powder-



metals processing and hot isostatic processing. The de-binding process allows for a strong, lightweight finished part. The furnace, which has a work zone of 29 inches wide x 29 inches high x 35 inches deep, has a temperature uniformity of  $\pm 20^{\circ}\text{F}$  at  $1100^{\circ}\text{F}$  using six zones of temperature control with biasing to balance any temperature gradients. [www.lfurnace.com](http://www.lfurnace.com)

## Dual-Chamber Furnace

Wisconsin Oven Corp. shipped a natural-gas-fired, dual-chamber furnace to the automotive industry. The furnace, which will be used for preheating dies, has a maximum operating temperature of  $1250^{\circ}\text{F}$  and work-chamber dimensions of 6 feet wide x 4 feet long x 6 feet high. It has sufficient capability to heat 4,000 pounds of steel from  $70$ – $1100^{\circ}\text{F}$  within four hours when loaded into a preheated furnace. [www.wisoven.com](http://www.wisoven.com)



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# Equipment & Business News

## BUSINESS NEWS

### Bodycote Opening Heat-Treat Facility in Illinois

**Bodycote** plans to open a new heat-treating facility in Elgin, Ill. The plant 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, which is scheduled to be operational by late 2019, will support the automotive, agricultural, mining, construction and other manufacturing supply chains in the upper Midwest region.

### Gasbarre Products Updates Branding, Launches New Website

**Gasbarre Products Inc.** (Gasbarre) launched a new website, [www.gasbarre.com](http://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 product offering into three business units: Powder Compaction Solutions, Thermal Processing Systems and Manufacturing Technologies. Thermal Processing

Systems 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 the rebranding effort, Gasbarre will no longer be using the brand name J.L. Becker and has moved to Gasbarre Industrial Furnace Systems (Gasbarre IFS).

### Zeiss Invests \$45 Million in Detroit NDT Facility

Germany's **Zeiss** broke ground on a site outside of Detroit, Mich., that will consolidate four existing Michigan facilities into one location and provide room for growth. It will contain a customer demonstration area with new technologies and systems; offer training, support and metrology services; and house fixture system production and assembly. Company specialists will be able to perform proof-of-capability demonstrations for multidimensional measurement equipment, surface form and geometry equipment, and nondestructive testing and surface defect detection equipment. The 82,800-square-foot facility, which will have approximately 170 employees, is expected to open in 2020.



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## Patent Filed for Gas Blower Operating in Argon Gas

**Solar Atmospheres Inc.** filed a patent application with the U.S. Patent and Trademark 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 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. The transformer is manufactured by Magnetic Specialties Inc.

## California Brazing Partners with Private-Equity Firm

Trive Capital, a Dallas-based private-equity firm, has partnered with **California Brazing** of Newark, Calif. Founded in 2002, California Brazing manufactures complex, high-tolerance components for space, aircraft connectivity, specialty electronic and defense applications. The company specializes in heat treating, CNC machining and metallic and ceramic vacuum brazing for both OEM and Tier 1 defense and communication customers.

## Element Opens Testing Lab in U.K.

Element opened a new 20,700-square-foot nondestructive testing and inspection laboratory in Sheffield, U.K. The facility complements the existing Magna Way laboratory, which offers sample heat-treatment capabilities, metallurgical testing and CNC machining facilities. Element has invested approximately \$320,000 in equipment for immersion ultrasonic testing, dye penetrant inspection, eddy current inspection, magnetic particle inspection and on-site positive material identification. Element, in partnership with the Advanced Manufacturing Research Centre (AMRC) at the University of Sheffield, has trained five new engineering support and machinist apprentices.

## U.S. Steel Restarting Texas Mill, Adding Jobs

**U.S. Steel** will restart the No. 1 electric-weld pipe mill at Lone Star Tubular Operations in Lone Star, Texas. The company anticipates hiring 140 new employees. The No. 1 mill, which was permanently idled in 2016 due to challenging market conditions for tubular products, has an annual capacity of approximately 400,000 tons.



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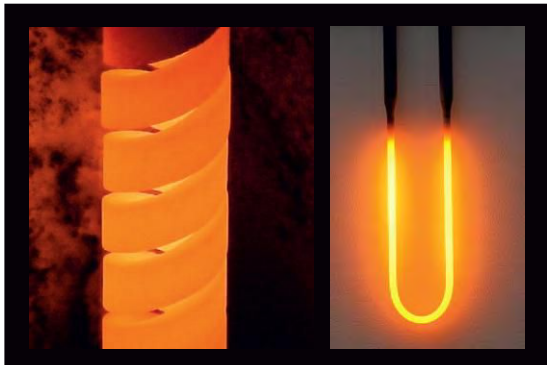
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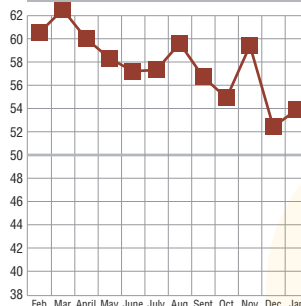
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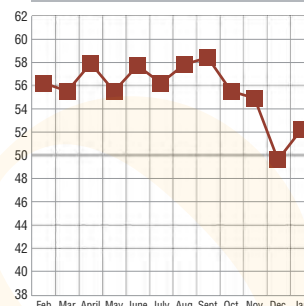
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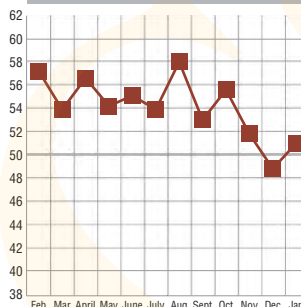
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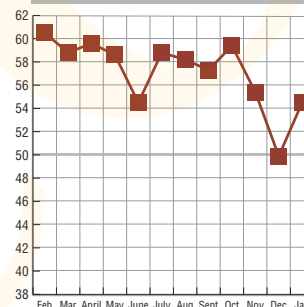
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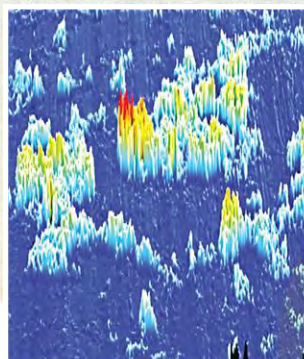
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HEAT & CORROSION RESISTANT  
MATERIALS/COMPOSITES

# Most-Viewed Heat- and Corrosion-Resistant Materials Articles

## Bill Mayer – Managing Editor

Once again, *Industrial Heating* will focus on a specific topic on our website and list the articles that are most popular amongst our readers. This time we'll take a look at Heat- and Corrosion-Resistant Materials/Composites. We hope you find this information useful, particularly if you have an interest in this topic.

These rankings are based on page views from Dec. 3, 2017 through Dec. 3, 2018, exactly one year. Articles are listed in descending order, starting with #6 and ending with #1. The following articles cover a range of processes – from deep cryogenics to sintering – and highlight heat-resistant alloys, cooling towers and heat-treat rack material.

### Selecting an Appropriate Heat-Resistant Alloy

Originally published in 2014, this article is still a hit. Provided by Marc Glasser of Rolled Alloys, this article introduces the reader to a broader understanding of many of the factors to consider when selecting an alloy of construction for a heat-resistant application.

The first factor in choosing a heat-resistant alloy for a particular application is its temperature limit. In order to obtain the desired service life, however, there are many additional

factors that must be taken into account in order to succeed in your application. Failure to consider these factors can result in premature failures and, in some instances, lead to serious safety risks for your employees.

Read this article here: [www.industrialheating.com/hralloy](http://www.industrialheating.com/hralloy).

### Deep Cryogenic Treatment for Marine and Oil-and-Gas Applications

This article, which was just published in December 2018, was popular enough for #5 on our list. It explores the benefits of deep cryogenics, why the technology stalled and where it can be next used by the oil-and-gas and marine communities. Deep cryogenic treatment is a cold-temperature process that reduces corrosion, wear, fracture and fatigue in most metal items by 20-70%.

Cryogenic treatment of metal offers breakthrough reductions in wear and corrosion to users of marine components – lowering maintenance and capital replacement cost and increasing operational uptime. The technology has languished in the starting gate since WWII, however, and only



## HEAT & CORROSION RESISTANT MATERIALS/COMPOSITES

recently emerged as a way to address wear and corrosion in post-heat-treated items.

This article can be found at [www.industrialheating.com/DCT](http://www.industrialheating.com/DCT).

### Corrosion-Resistant Plastic Cooling Towers Cut Costs

For operations using extreme heat, engineered plastic cooling towers provide cooling and can outlast traditional alternatives. Provided by Delta Cooling Towers, this article was published in March 2018 and focuses on sintering.

Few industries rely on the application of heat as much as the sintering process in powder-metal manufacturing. With temperatures in the high-heat section of a sintering furnace reaching several thousand degrees Fahrenheit, the parts must be

cooled dramatically before being handled by operators.

The most common type of cooling towers is constructed of galvanized steel. For sintering, however, these galvanized towers are unfortunately susceptible to corrosion and rust problems that can require ongoing maintenance.

You can read this feature at [www.industrialheating.com/epct](http://www.industrialheating.com/epct).

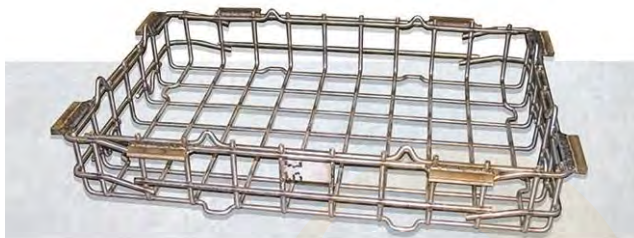
### Heat-Treat Rack Material Selection Based on Thermal Performance

The choice of heat-treat rack material is important for every heat-treat operation, whether independent or captive. The selection of rack-material composition is typically dictated by the operating conditions of the specific heat-treating process involved. The furnace operator must select materials capable of performing within these conditions, and the decision often balances performance against purchase price.

Another oldie, Carlisle Brake & Friction provided this article in December 2015, but it still ranks #3 in this topic. Three

common rack materials for heat-treat applications where temperatures exceed 815°C (1500°F) are heat-resistant steel alloys, molybdenum alloys and carbon-carbon composites. A table included in the feature displays a variety of relevant properties for these three materials.

Find this article here: [www.industrialheating.com/rackmaterial](http://www.industrialheating.com/rackmaterial).



### Considerations for Choosing the Optimum Fixtures

Marc Glasser of Rolled Alloys appears for the second time on our list with this article from September 2018. Did you know that there are many types of heat-treating fixtures, trays, racks, boxes and other part holders in the market today?

How is the heat treater supposed to decide which fixture is best? There is no easy answer. It is usually a combination of cost and design. Often, only initial cost is considered, and life-cycle costs are overlooked. Cost per pound of heat-treated product is a concept that gets almost no thought, but it should be a very important consideration. This article includes a table that details the pros and cons of cast and wrought materials.

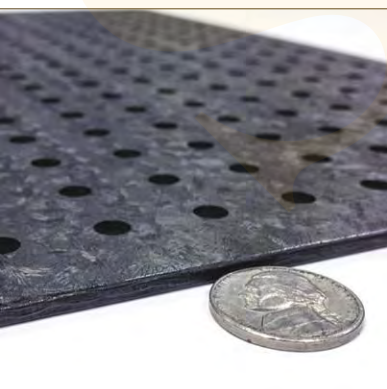
Want to learn more? Read it at [www.industrialheating.com/fixt](http://www.industrialheating.com/fixt).

### Engineering Strength: Oxide Dispersion for Bulk Alloys

This article was provided by frequent contributor Carnegie Mellon University in December 2017. Researchers at the school are answering the need for heat-tolerant materials by developing a new way to strengthen metals using oxide particles. Perhaps interest in this research propelled this article to the top spot.


Metals like iron and aluminum make up much of the modern world around us – from cars to wind-energy turbines – because they are strong, lightweight and cost-efficient materials. But as the heat is turned up on these metals, their mechanical properties and strength can be compromised. The need, therefore, continues to grow for advanced structural materials that can withstand high temperatures for applications in expanding industries like power generation and chemical processing.

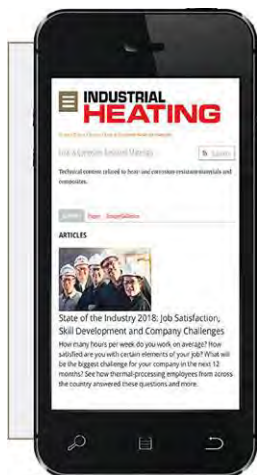
The #1 article on our list can be read in its entirety at [www.industrialheating.com/oxides](http://www.industrialheating.com/oxides).





## Conclusion

There you have it – the six most-read articles on our website pertaining to Heat- and Corrosion-Resistant Materials/ Composites (HCRMC). Our hope is that you take the time to check these articles out for yourself ... if you haven't already. To search for additional articles under the HCRMC topic in our archives, visit [www.industrialheating.com/HCRMC](http://www.industrialheating.com/HCRMC). 



Use this QR-Code to read more technical content related to heat- and corrosion-resistant materials and composites or visit [www.industrialheating.com/HCRMC](http://www.industrialheating.com/HCRMC)

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# Engineering the Surface

**Edward Rolinski and Mikel Woods –  
Advanced Heat Treat Corp., Monroe, Mich.**

The importance of early-stage design decisions for enhancing surface properties of steel and cast-iron components with nitriding and nitrocarburizing cannot be overstated.

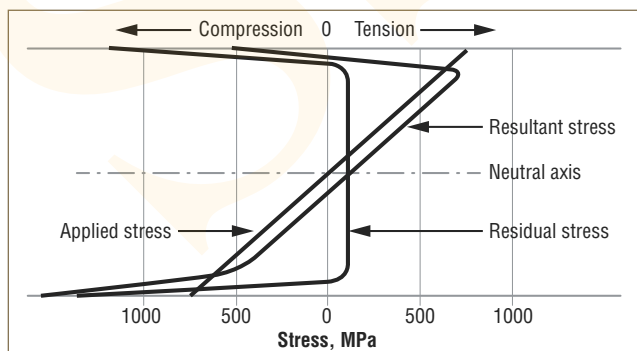
**M**odern designing of mechanical components and tools should take under consideration their intrinsic stresses and surface condition. The ability of the manufacturing technologies as well as the heat-treating processes to affect such properties must be assessed early in the design process if improving performance and durability of the component are needed.<sup>[1-3]</sup>

Mechanical surface technologies such as rolling and shot peening play important roles in inducing the surface compressive stress needed for increasing bending fatigue of components such as powdered-metal gears.<sup>[4]</sup> However, those processes are not always sufficient or well-suited for increasing surface properties to the required level.

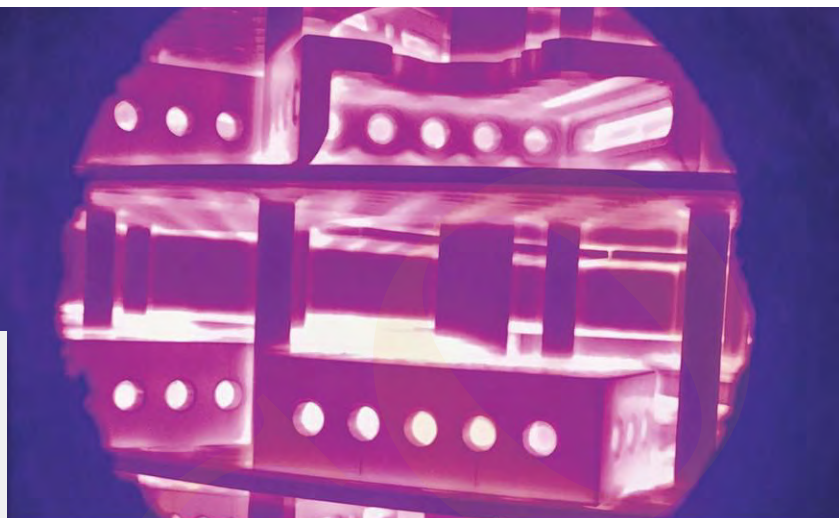
Tribological as well as corrosion properties of the product depend not only on the material used for the design, its mechanical technologies used or heat treatment but also on a possible modification of its surface chemistry.<sup>[5]</sup>

## Thermochemical Treatment

Thermochemical treatment has been the most effective way of increasing hardness and producing compressive stresses. Those



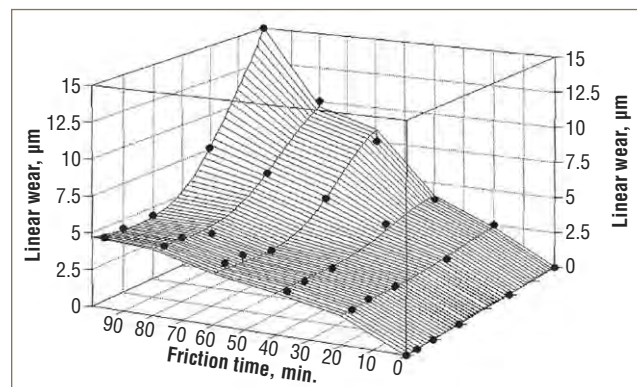
**Fig. 1. Schematic diagram showing the effects of residual stresses on the final stress patterns of a loaded specimen**  
(adopted from T. Bell and N.L. Loh)<sup>[4]</sup>



**Fig. 2. Ion/plasma nitriding of steel frames. Note the intense glow-discharge plasma surrounding treated components and the fixture**  
(courtesy of Advanced Heat Treat Corp.).

treatments are needed for increasing the life of the components by enhancing their tribological properties and reducing friction and wear. Of various thermochemical treatments, nitriding is the most effective way of generating such stresses. As can be seen from Fig. 1, the presence of compressive stress at the surface minimizes maximum surface stress generated during rotational bending.<sup>[4]</sup> As a result, a greater bending stress can be applied at the surface before the level of stress at the case-core interface is high enough to initiate failure.<sup>[4]</sup>

Nitriding and ferritic nitrocarburizing (FNC), occasionally combined with post-oxidizing, are carried out below critical temperatures of the steel and can therefore be easily applied to the majority of fully finished mechanical components as well as to metal-forming tools. Both processes can be carried out in gas using ammonia and/or in plasma using a mixture of nitrogen and hydrogen doped with hydrocarbons, if needed. The plasma ion-nitriding process is shown in Fig. 2.



**Fig. 3. Linear wear depth versus time of friction at different unit loads of the nitrided layer produced in Nit135M by controlled gas nitriding at 530°C (986°F) for 6 hours. Total case depth 0.10 mm (3.9 mils) compound layer was 0.009 mm (0.35 mils), and surface hardness was 1300 HV0.5. Linear wear at 50-200 MPa (7-29 ksi) was 4.3-7.6 μm, and wear intensity was 0.03-0.072 μm/min** (adopted from reference 5).



Nitrided surfaces are very hard (>65 HRC equivalent for Nit135M steel) and under compressive stress. As a result of the superior hardness obtained from nitriding, frictional properties and the wear resistance of the component are significantly increased.<sup>[4,6]</sup> It should be noted that the nitrided layer can resist wear by friction under a high-contact Hertzian stress up to 250 MPa. An example of the tribological behavior of nitrided Nit135 M samples is shown in Fig. 3.

### Applications of Thermochemical Treatments

Applications of nitriding are very broad. Common examples and benefits resulting from using specific nitriding processes are shown in the figures.

Machinery components requiring partial treatment are good candidates for plasma/ion nitriding (e.g., crankshafts). Bearing journals subjected to wear by friction and bending fatigue are hardened by plasma, but the internal treads are protected from the treatment by applying mechanical masks (Fig. 4).

Large and expensive parts such as engraved rolls and long shafts are very often treated by plasma because of the accessibility of the large equipment and very good control of the layer structure, as well as process uniformity (Fig. 5).

Metal-forming tools such as a large stamping dies for automotive applications, especially those made of cast iron, should only be plasma/ion nitrided. Gas nitriding may result in a significant roughening of the surface (Fig. 6).<sup>[3,7]</sup>

Various small mechanical parts usually need all-over nitriding treatment, especially when good wear and corrosion resistance are needed. The latter can be increased when the nitrided layer has a sufficiently thick compound zone (white layer). In those situations, the gas nitriding process with ammonia is used (Fig. 7).

Corrosion resistance of the nitrided parts can also be enhanced by formation of a thin magnetite layer on the surface through post-oxidation. This layer has a uniform black or blue color, which increases the product's attractiveness (Fig. 8).

It should be noted that thermochemical processes also include carburizing, boronizing and other treatments,<sup>[2]</sup> but those are carried out at a high temperature. Therefore, unlike nitriding, they cannot be applied to finished components. ☐



Fig. 4. Lot of compressor crankshafts after ion/plasma nitriding. Note mechanical masking with the ball bearings on top of the parts (courtesy of Advanced Heat Treat Corp.).

## Selecting the Proper Nitriding Method

When metal components or tools require surface enhancements, the designers should decide the treatment method early in the process to mitigate possible future problems and achieve optimal product performance. The most-common methods of nitriding and nitrocarburizing are plasma/ion and gas processes. Both can be applied to finished components with typically minimal effect on their dimensions and surface finish. Any dimensional change can be predicted, and proper tolerances can be written in advance for the machining process.

The sputtering present in plasma/ion nitriding allows treatment of any ferrous or titanium alloys without a need for additional preparation or activation of the surface. This is especially important when the treated objects are made of stainless steel or any self-passivating alloys. On the contrary, gas nitriding with ammonia can only be applied to stainless steels if a proper activation step, usually with corrosive gases, is applied.

The ion nitriding process is called a low-nitriding-potential process since the compound layers (white layers) formed are not very rich in nitrogen. Therefore, they are not brittle. When the components are made of low-alloy or plain-carbon steels, which lack nitride-forming elements, it might be necessary to produce a very thick white layer (WL). This can be achieved using the gas or plasma ferritic nitrocarburizing (FNC) process, which allows for a WL production of 0.025-0.050 mm (0.001-0.002 inch) thick.

The ion/plasma nitriding process can be selective, if desired, by applying mechanical masking, which eliminates the contact of the glow discharge with the treated surface. This is especially important when fine threads, sharp edges, etc. must not be nitrided.

A simple plug/bolt or a steel cylinder covering the threaded hole or shaft assures complete protection from the treatment. Selective hardening in gas nitriding is more difficult to achieve since it requires a galvanic coating (e.g., copper plating) if 100% effectiveness is desired. On the other hand, gas nitriding can be used to treat various components all-over by ensuring the ammonia has unrestricted contact with the treated surface.

Low-density powder-processed components cannot be nitrided using the gas method since ammonia may penetrate interconnected porosities, resulting in through-hardening and brittleness of the products. Therefore, they should be nitrided using the plasma method.



**Fig. 5. Engraved embossing roll after plasma/ion nitriding**  
(courtesy of Advanced Heat Treat Corp.)



**Fig. 6. Automotive stamping dies made of cast iron after plasma/ion nitriding**  
(courtesy of Advanced Heat Treat Corp.)

**For more information:** Contact Edward Rolinski, DrEng, Dr-habil, VP technology; Advanced Heat Treat Corp., 1625 Rose St., Monroe, Mich., 48162; tel: 319-291-3396; fax: 734-243-4066; e-mail: doctorglow@ion-nitriding.com; web: www.ahtcorp.com.

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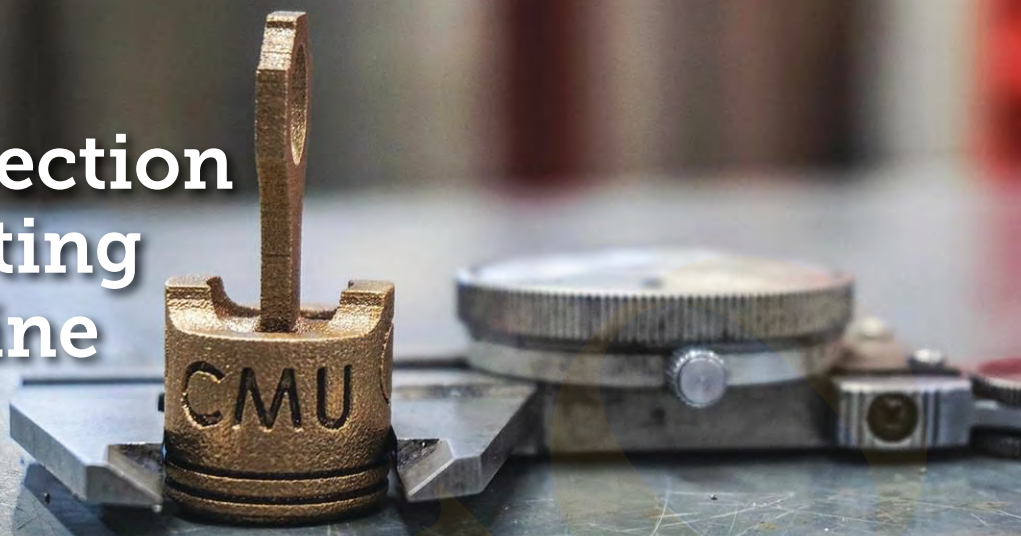
**Fig. 7. Components of the pneumatic system after gas nitriding**  
(courtesy of Advanced Heat Treat Corp.)



**Fig. 8. Slides for oil-and-gas machines after UltraOx gas processing**  
(courtesy of Advanced Heat Treat Corp.)



# The Intersection of 3D Printing and Machine Learning



**Daniel Carroll and Emily Durham –  
Carnegie Mellon University; Pittsburgh, Pa.**

In the past, the applications of metal additive manufacturing, otherwise known as 3D printing, have primarily been confined to prototyping. Recently, the field has begun to undergo a major transition, as researchers push closer to developing metal 3D printing as a reliable form of industrial manufacturing.

**M**ajor obstacles are left to tackle before the field can fully make the leap to reliable manufacturing, especially in high-risk applications such as aviation components.

“One of the biggest hurdles between just making a part that looks good and actually putting it on an aircraft is making sure that the part you’re producing doesn’t have flaws in it,” said mechanical engineering (MechE) alumnus Luke Scime.

Scime worked with MechE’s Jack Beuth, director of the NextManufacturing Center, to develop a machine-learning algorithm that detects anomalies within a part as it is being printed – a practice known as process monitoring. The specific type of printing they worked with – laser powder-bed fusion – involves spreading a thin layer of powder (just 30-60 microns in diameter) and melting it in select areas to form a layer of the printed object. The process is then repeated for the next layer, with each build containing hundreds or thousands of layers. Many of the errors that can occur during a build are due to the incorrect spreading of the powder layer.

## Process Monitoring

The race to develop a practical and comprehensive form of process monitoring is on. Various researchers are attempting to use temperature monitoring, acoustic techniques, spectroscopy and other methods in order to get the best understanding of what is happening during a build at the structural level.

Limited types of monitoring have already been introduced commercially to some degree. Most of these rudimentary forms offer only a reading to be interpreted by the machine operator, however, without any capacity for automated analysis. Scime’s work takes process monitoring to a new height, enabling automated

analysis in real time through a computer-vision algorithm.

“Computer vision is a term for using data-analysis techniques to understand what’s happening in an image,” Scime explained.

His algorithm takes images of the powder bed and extracts features from the images. It then groups them and compares these images across different levels of analysis until it can create a unique “fingerprint” of the image. By feeding the algorithm hundreds of training images, already labeled manually with what’s happening in the image, the machine learns to recognize the different flaws and how they appear. From there, the algorithm can take any new images it receives from the machine’s built-in camera and compare its fingerprint to those from its base of knowledge to successfully isolate anomalies.

In their most-recent published paper, Scime and Beuth demonstrated that the algorithm can effectively detect flaws in powder spreading in the millimeter-size scale range. These flaws have a major effect on process stability, meaning the ability to print. The algorithm is able to spot these errors as they’re developing, and it can determine what the flaw is and where it is occurring.

“The holy grail is to deploy this in a real-time environment where you’re automatically analyzing data, doing something about it and then moving on,” Scime said.

## Self-Correcting Automation

According to Scime, the advance into self-correcting automation could look a couple different ways. At the most basic end of the spectrum, the machine could send an alert to an operator when it has detected an anomaly, allowing them to address the problem before continuing the build.

## Is 3D printing the future for ceramics?

The Department of Mechanical Engineering's (MechE) B. Reeya Jayan is no stranger to accolades. She's received awards from the Army Research Office and the Air Force Office of Scientific Research and was one of *Pittsburgh Magazine's* 2017 40 under 40 honorees. Now she



has once again been recognized for innovations in materials processing as a recipient of the 2018 National Science Foundation (NSF) Faculty Early Career Development Program (CAREER) Award.

The award, including \$500,000 in research funding, is bestowed upon a faculty member in the early stages of their career with a proven potential to be both a leader in their field and to integrate their research into novel educational opportunities. The focus of her most recent work will be researching how electromagnetic (EM) waves may be used to alter the structure within ceramic materials, potentially enabling the 3D printing of ceramics.

The development of ceramic 3D printing has lagged behind that of other materials, such as polymers or metals. Traditional ceramic manufacturing uses large amounts of energy, often requiring materials to be heated at extremely high temperatures. Jayan, however, hopes to instead use EM waves (such as the microwaves we use to heat our food) to induce changes within ceramics at the structural level. If successful, she could potentially be able to achieve the same quality of results as current manufacturing methods — at a fraction of the energy cost.

The practical applications created by the possibility of this novel manufacturing process are as significant as they are varied. 3D-printed ceramic parts could find use in sustainable

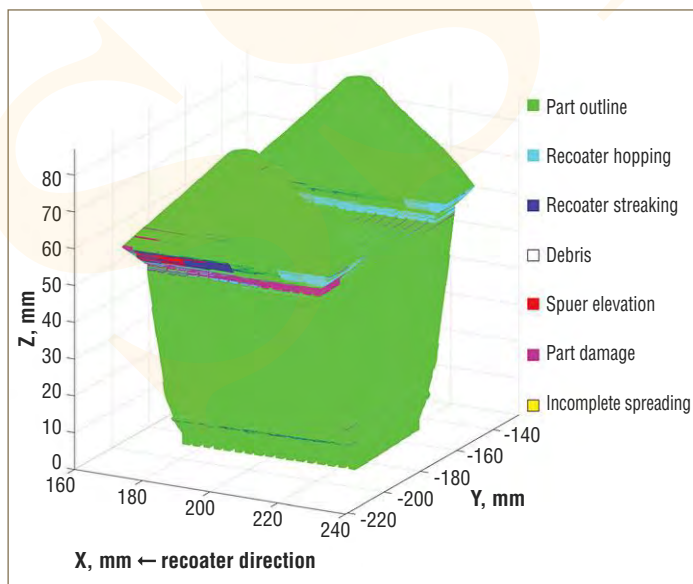
The next level of sophistication would be automating simple fixes, allowing a machine to recognize a critical flaw and react accordingly. It could, for example, stop printing a certain part while allowing others to continue or clean the blade that spreads the powder bed, with each response tailored to correct the specific type of anomaly identified.

The pinnacle of automated self-correction would be in combating an anomaly known as superelevation. Superelevation is when part of the build begins to warp or curl upward out of the powder layer, and it is responsible for the majority of part damage. Developing an

automated way to correct this type of flaw will test the limits of what researchers like Scime are capable of.

Says Scime, "What it really comes down to is can we detect it, understand that it's an issue and then design what we call processing parameters to do something different than we were doing in order to reduce the amount of warpage?"

It may be some time before we reach this level of automation because there are still multiple hurdles left to tackle. Much future work, such as accessing proprietary



3-D reconstruction of the part from several thousand image analyses

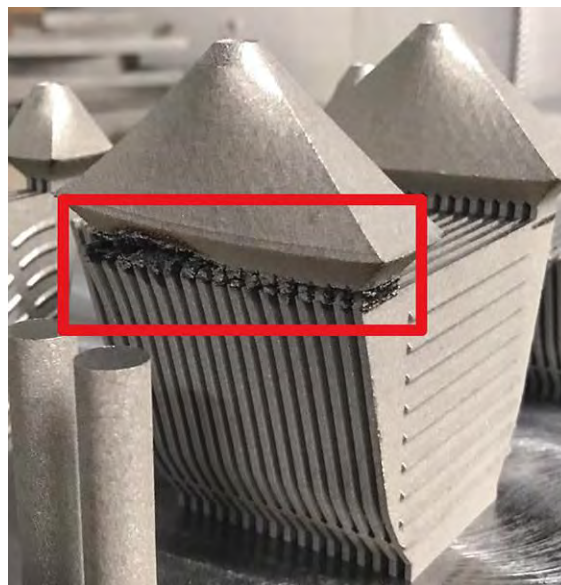


Image of the finished part with damaged region in red



infrastructure, transportation, clean energy, water management, aerospace engineering and healthcare. By combining research in the fields of electrical and computer engineering, electromagnetics, materials science, mechanical engineering and chemical engineering, the process Jayan is developing could provide a low-energy means to meet these industries' demands for lightweight, high-strength materials.

The focus of the CAREER Award is not only to continue producing breakthrough research, but also to integrate this research into an educational setting. In the past, Jayan has received media attention for being among the first to fully integrate the popular open-world game, Minecraft, into a university-level engineering course. She plans to continue using "builder's games" like Minecraft to teach students how building (aka processing) can change the way materials assemble (their structure) and alter the properties of the material.

"Games create a higher level of student engagement and a more stimulating learning environment, reaching a broader spectrum of learners in the classroom," Jayan said. "This helps address the challenge of cultivating a diverse and highly skilled workforce in manufacturing in the United States."

Ultimately, the myriad of benefits Jayan's research enables, both for engineering

students and the various industries in which 3D-printed ceramics could see use, holds great promise for the future of industrial ceramic manufacturing.




A graduate student explores the Minecraft classroom in a "Materials and Their Processing for Mechanical Engineers" lecture.

equipment and integrating software, will rely on researchers' ability to coordinate with manufacturers. There is also much left to be understood about the effects of changing processing parameters in-build.

### Next Steps

Some of Scime's future interests lie in improving the accuracy of the machine-learning algorithm and examining how more sensor data can be incorporated into its analysis. However, the current algorithm has been demonstrated to be effective at accurately identifying a range of anomalies and is ready for application. Scime will be pursuing his post-doctoral training at Oak Ridge National Laboratory, but he hopes to continue to collaborate with the college of engineering and Beuth in the future.

Although we may not be 3D printing 747s anytime too soon, Scime's and Beuth's work is a major step toward making metal additive manufacturing a completely safe and reliable method for industrial manufacturing. 

**For more information:** Contact Emily Durham, communications manager, Carnegie Mellon University, College of Engineering, 5000 Forbes Avenue, Pittsburgh, PA 15213; tel: 412.268.2406; e-mail: edurham1@andrew.cmu.edu; web: www.engineering.cmu.edu.



Professor B. Reeja Jayan discusses her work with common everyday materials doing uncommon things. New materials are important, but Prof. Jayan suggests that we give all materials a second look.

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# Generating Hydrogen for Thermal Processing and Coatings

**David Wolff – Nel Hydrogen; Wallingford, Conn.**

Atmosphere thermal processing improves the properties of fabricated metals. Operations include annealing, brazing, sintering (for powdered metals, metal injection molding and additive manufacturing) and glass or ceramic-to-metal sealing.

Oxygen, in the thermal-processing atmosphere or bound in surface contamination on the parts, must be reduced to ensure quality results. Chemically reducing atmospheres actively scrub oxygen to enhance results and protect metal surfaces.

Hydrogen is a widely used reducing agent in thermal-processing atmospheres. Reducing atmospheres generally contain hydrogen ( $H_2$ ) and may contain carbon monoxide (CO) to scrub oxygen. CO may affect metal properties and is poisonous, requiring special care in use. Where hydrogen is the sole reducing agent, it may come from hydrogen delivery, pure hydrogen generation or ammonia dissociation.

Hydrogen/nitrogen thermal-processing atmospheres may range from dilute 95%  $N_2$ , 5%  $H_2$  “forming gas” to pure hydrogen. Pure nitrogen is required by NFPA 86 Furnace Standard for purge. Certain atmospheres have specific processing capabilities and materials compatibility (e.g., brazing and carbon-steel parts are processed in forming gas), while certain grades of stainless steels require pure  $H_2$ .

Because pure  $H_2$  costs up to 10 times more than  $N_2$ , the less hydrogen you need, the less your atmosphere will cost. Drier (lower dew point) atmospheres may enable you to use a lower hydrogen-percentage atmosphere. Availability of pure hydrogen

enables more atmosphere blend flexibility than dissociated ammonia of fixed composition (75%  $H_2$ , 25%  $N_2$ ). Furnace atmosphere blend flexibility and drier gas may enable improved results at lower costs.

## Applications for Hydrogen Atmospheres

Atmospheres containing hydrogen are used in continuous and batch atmosphere furnaces, and hydrogen may be used in vacuum furnaces as a partial-pressure backfill. In addition to its chemical reducing activity, hydrogen’s high thermal conductivity provides superior heat transfer to speed full-depth materials processing. Hydrogen may enable cycling parts more quickly – running the furnace faster – because of higher heating and cooling heat-transfer speed.

Both hydrogen and ammonia are classified by EPA and OSHA as highly hazardous chemicals (HHCs) and are subject to many storage regulations. Whether by EPA, OSHA, local fire marshal or your facility SH&E staff, prepare for scrutiny if you store ammonia or hydrogen. Storage of more than 10,000 pounds requires emergency-response planning, record-keeping, training and equipment subject to OSHA Process Safety Management (PSM) and EPA Responsible Management Planning (RMP).



Fig. 1. PEM water-electrolysis hydrogen generators are available in a range of capacities to match any thermal-processing application.



## Sourcing Gases

Various approaches exist to receive and store (or generate) gases for your furnace atmospheres. Anhydrous ammonia, hydrogen and nitrogen may be delivered as liquid via tanker truck or as compressed gases delivered and stored in cylinders or tubes. Liquid hydrogen and nitrogen are stored in cryogenic tanks as pressurized liquid ammonia.

Alternatively, you may generate your furnace atmosphere gases. Ammonia dissociators thermally/catalytically crack stored ammonia to generate dissociated ammonia (DA) of 75% hydrogen and 25% nitrogen. Proton exchange membrane (PEM) water-electrolysis hydrogen generators crack pure water into pure, dry, pressurized product of hydrogen and by-product oxygen. Nitrogen generation is reliable, economical and well-suited for atmospheres. Nitrogen generators filter pure nitrogen from air, removing oxygen, water and CO<sub>2</sub>. They can economically reach 99.999% nitrogen purity (10 ppm residual oxygen).

Major users of stored hydrogen may use liquid hydrogen, typically limiting the amount stored to <16,000 gallons (<9,999 pounds, ~1.9MM scf), whether by tank size or so-called administrative controls, in order to stay below the HHC trigger level of 10,000 pounds stored. Users of ammonia to make DA are limited to less than 1,467 gallons (<9,999 pounds, ~450,000 scf of DA gas) to avoid triggering the HHC regulations. In contrast, the largest PEM hydrogen generator typically serving thermal-processing contains only 14 grams (0.03 pounds) of H<sub>2</sub>.

## Hydrogen from Ammonia

DA requires ammonia storage, has limited turndown and is energy-intensive because the dissociator must remain heated 24/7 to at least 1700°F (927°C). Dissociators offer no atmosphere flexibility with only 75% hydrogen and 25% nitrogen. Leaner atmospheres can be blended down with nitrogen, but purer hydrogen is unavailable.

DA-generated atmosphere is often wetter than optimum, and many installed systems are old and maintenance-intensive. Repair expertise for dissociators is becoming rare. Fewer producers of metallurgical-grade ammonia means that ammonia prices are unpredictable and generally rising.

Ammonia leaks are frequent and disruptive. Accidental ammonia releases occur daily from agricultural tanks, ice rinks and food-processing/storage facilities. These leaks are widely reported, resulting in evacuations, publicity and expensive fines. Anhydrous ammonia is toxic and corrosive to mucus membranes and tissue. If released, it disperses slowly and has a unique and powerful odor.

Many existing installations are grandfathered and do not meet current standards for distance and security. A serious new cause of leaks is sabotage and theft of ammonia for illicit drug production. Thermal-processor ammonia users are often better stewards than refrigeration and agricultural users, but all users suffer bad publicity when releases occur.

Using delivered and stored hydrogen to replace stored



**Fig. 2. An atmosphere furnace heat treating parts to adjust their hardness and improve appearance.**

ammonia may not be attractive because the rules for storing hydrogen make it as challenging as ammonia. Like ammonia, hydrogen is an HHC, and storage must comply with OSHA, EPA and NFPA (National Fire Protection Association) regulations and any requirements mandated by your local authorities having jurisdiction (AHJ) – usually your fire marshal.

- One pound of hydrogen has the energy potential of over 30 pounds of TNT.
- Hydrogen has a very wide flammability range and low activation energy – compressed-hydrogen leaks generally ignite.
- NFPA rules for hydrogen storage may require expensive, leak-prone underground piping to achieve required spacing.
- With stored hydrogen, damaged piping may permit the entire hydrogen contents of your storage to leak almost instantly into your facility, creating an emergency.

## Generating Hydrogen

To avoid the hassles of PSM and RMP compliance, you might shrink your stored quantity of HHCs. If you choose to shrink your storage capacity, you will have to increase the frequency of deliveries – when most mishaps occur. Telling a driver to fill a tank only partly full (called “administrative controls” in the regulations) is rarely successful long-term.

PEM water-electrolysis hydrogen generation is preferred to storing hazardous delivered hydrogen or ammonia. PEM hydrogen generation makes pure, dry, pressurized hydrogen from water using water electrolysis. Water (H<sub>2</sub>O) is broken into hydrogen and oxygen. The pure, dry, pressurized hydrogen is captured for your process, and the oxygen is vented. No hydrogen storage is required for PEM water electrolysis because hydrogen is made at the same rate that it is being used by your furnace.






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## HEAT TREATING



**Fig. 3. Thermal spray applying a coating to improve part performance in service.**

On-site generation offers a safer hydrogen-containing atmosphere supply. Hydrogen is leak-prone and highly flammable. While all hydrogen sources require piping that can suffer leaks, generated hydrogen mitigates the severity of possible leaks because the maximum leak rate is limited to the maximum generation rate. Also, supply piping can be shorter since the hydrogen generator is placed indoors, closer to the furnace.

While hydrogen suppliers charge more for high-purity delivered hydrogen, PEM equipment generates extremely pure (99.9995+%) hydrogen at no premium. On-site PEM water-electrolysis hydrogen-generation systems are integrated, compact and available in a range of capacities. They are easily permitted, delivered quickly, straightforward to install and operate, and provide hydrogen at process pressure for blending and subsequent use in your furnace. They load-follow, and you can turn them off and on as your work schedule permits to save electricity.

From an NFPA standpoint, you essentially create hydrogen and use it instantly – no storage. The systems are zero clearance and install in a non-classified environment, even nearby your furnace. Indoor siting negates underground piping that can corrode and cause leaks.

### Considerations

Consider custom blending generated-hydrogen and nitrogen atmospheres to meet the precise furnace atmosphere requirements for each product you thermally process. You might need a gas blender or might have blend panels on your furnace(s). You will need high-purity (low-oxygen) nitrogen – liquid or generated. You may choose to distribute pure hydrogen and pure nitrogen gases in individual piping and blend at each furnace.

Alternatively, you may choose to blend centrally and distribute a gas blend analogous to your previous DA. The goal is that your new plant atmosphere will operate like your old DA atmosphere from the furnace operator's standpoint for consistent operator procedures.

Relative to the required gas purity, PEM-generated hydrogen is very pure at 99.9995% or better, and nitrogen can be generated in a range of purity levels. The cost of generated nitrogen partially depends on the purity level. Thermal processing



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generally requires nitrogen of minimum 99.995% purity, which is easily generated using modern PSA nitrogen generators.

Consider several factors to achieve a successful change from a DA system. Document your current costs – electric, gas, dissociator maintenance, ammonia tank rental and all ammonia charges. Remember that DA atmospheres are 25% nitrogen, and size your nitrogen and hydrogen equipment accordingly. If you use liquid nitrogen, a higher potential usage volume is an opportunity to negotiate pricing.


Study your furnace(s) and determine how much gas flow is needed. Indicators and instruments on your furnaces must be calibrated for the gas you are using, or you must convert readings. It is unfortunately common to see flow meters calibrated for air or nitrogen being used for DA.

Your furnace will require a certain minimum atmosphere flow to keep air out. Determine what gas flow and composition is needed in each furnace zone. When you blend gases, you can vary the composition by furnace zone and take advantage of supplying hydrogen only where it is required. If using a dilute atmosphere blend, make sure it is sufficiently flammable so that your safety systems (e.g., pilot lights and flame curtains) operate. Comply with NFPA 86.

When you change from DA to generated/blended hydrogen/nitrogen atmospheres, atmosphere-system changes will include the removal of your ammonia tank and ammonia dissociator. You may also remove your ammonia and DA piping or repurpose the piping. Consult a knowledgeable consultant and the Fuel Gas Code to determine piping reusability. Nitrogen is probably permitted, and hydrogen is dependent on materials and fittings.

### Conclusions

If you make the changeover to PEM on-site-generated hydrogen, you will realize superior atmosphere quality and flexibility at stable, competitive atmosphere cost. You will eliminate the need for hazardous material deliveries, handling and inventories – complying with all local

hazmat storage requirements and eliminating the need to connect and disconnect fittings that are often responsible for mishaps. Finally, these on-site hydrogen generators can be expanded in the field if your thermal-processing requirements increase. 

**For more information:** Contact David Wolff, region manager – eastern U.S. and Canada, Nel Hydrogen, 10 Technology Drive, Wallingford CT 06492; tel: 203-678-2000; fax: 203-949-8016; e-mail: dwolff@nelhydrogen.com; web: www.Nelhydrogen.com.

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# Commercial Heat Treaters Directory

Welcome to *Industrial Heating's* 2019 Commercial Heat Treaters Directory. To find a company that can handle your specific heat-treating needs, browse through the capabilities listings starting on page 46. Then cross-reference those companies to this alphabetical listing

of commercial heat treaters to find contact information. If you're looking for a member of the Metal Treating Institute (MTI), keep your eyes peeled for the star (\*) that accompanies all MTI member listings. More detailed company information can be found online at [www.industrialheating.com/commercialheattreat](http://www.industrialheating.com/commercialheattreat).

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[www.amheattreat.com](http://www.amheattreat.com)

### A & M SurfTech Ltd., Surface Coatings

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**Stack Metallurgical Services Inc.\***  
Portland, OR (503) 285-7703  
www.stackmet.com

**Steel Treaters Inc.\***  
Oriskany, NY (315) 736-3081  
www.steeltraters.com

**Stokes Steel Treating Co.\***  
Flint, MI (810) 235-3573

**STT Nitrex Querétaro,  
S. De R.L. De C.V.**  
La Noria, El Marqués, Querétaro,  
Mexico 52-442-221-5243  
www.nitrexheattreat.com

**Sturm Steel Treating Inc.\***  
Indianapolis, IN (317) 357-2368

**Sun Steel Treating Inc.\***  
South Lyon, MI (877) 471-0840  
www.sunsteeltreating.com

**Superior Metal Treating &  
Equipment Inc.\***  
Kansas City, MO (816) 924-1966  
www.smtinc.com

**Tamayakin Co. Ltd.\***  
Musashimurayama, Tokyo, Japan  
81-42-560-4331



**Taylor-Winfield Technologies Inc.**  
Youngstown, OH (330) 259-8500  
www.taylor-winfield.com  
http://inductionheating-tw.com

**TC Industries Inc.\***  
Crystal Lake, IL (815) 459-2400  
www.tcindustries.com

**Techniques Surfaces do Brasil Ltda**  
Diadema - SP, Brazil  
55-11-4056-4433  
www.tsbrasil.srv.br

**Temperature Processing Co. Inc.\***  
Longmont, CO (303) 772-0250  
www.tpcolorado.com

**Temperature Processing Co. Inc.\***  
North Arlington, NJ (201) 991-8000

**Texas Heat Treating Inc.\***  
Ft. Worth, TX (972) 263-9755  
www.texasheattreating.com

**Texas Heat Treating Inc.\***  
Round Rock, TX (800) 580-5884  
www.texasheattreating.com

**Thermal Braze Inc.**  
Jupiter, FL (561) 746-6640  
www.thermalbraze.com

**Thermal Metal Treating Inc.\***  
Aberdeen, NC (910) 944-3636  
www.thermalmetal.com

**Thermal Modification Technologies\***  
Tualatin, OR (503) 654-6511  
www.thermalmodtech.com



**Thermal One Inc.**  
Westland, MI (734) 721-8500  
[www.thermal-one.com](http://www.thermal-one.com)

**Thermal Specialties\***  
Sapulpa, OK (918) 227-4800  
[www.thermalspecialties.com](http://www.thermalspecialties.com)

**Thermal Specialties of Texas LLC\***  
Ft. Worth, TX (817) 921-5100  
[www.thermalspecialties.com](http://www.thermalspecialties.com)

**Thermal-Vac Technology Inc.\***  
Orange, CA (714) 997-2601  
[www.thermalvac.com](http://www.thermalvac.com)

**Thermet Inc.\***  
Waukesha, WI (262) 544-9800

**THERMETCO Inc.\***  
Montreal, QC (514) 934-4684 x229  
[www.thermetco.com](http://www.thermetco.com)

**Thermex Metal Treating Ltd.\***  
Edmonton, AB (780) 440-4373  
[www.thermexmetal.com](http://www.thermexmetal.com)

**Thermo-Fusion Inc.\***  
Hayward, CA (510) 782-7755  
[www.thermo-fusion.com](http://www.thermo-fusion.com)



**ThermTech\***  
Waukesha, WI (800) 752-6917  
[www.thermttech.net](http://www.thermttech.net)

**Tooling and General Heat Treatment\***  
St. Marys, Australia  
(08) 8276 6866 [www.toolgen.com.au](http://www.toolgen.com.au)

**Tratamientos Termicos Nitrogas S.A.**  
Buenos Aires, Argentina  
011-54-114-441-5719  
[www.nitrogas.com.ar](http://www.nitrogas.com.ar)

**Treat All Metals,  
A Regal Beloit Affiliation\***  
Milwaukee, WI (414) 395-4137  
[www.regalptspts.com](http://www.regalptspts.com)

**Tri-City Heat Treat Co.\***  
Rock Island, IL (309) 786-2689  
[www.tcht.com](http://www.tcht.com)

**Tri-State Metal Inc.\***  
East Chicago, IN (219) 397-0470  
[www.tri-statemetal.com](http://www.tri-statemetal.com)

**Trojan Heat Treat Inc.,  
Plant 4 Heat Treat Services  
Corp. of America\***  
Homer, MI (517) 568-4403  
[www.trojanheattreat.com](http://www.trojanheattreat.com)

**University of Ljubljana,  
Faculty of Mechanical Engineering**  
Ljubljana, Slovenia 386-1-477-12-03

**Vac Aero International Inc.\***  
Oakville, ON (905) 827-4171  
[www.vacaero.com](http://www.vacaero.com)

**Vac Aero International Inc.\***  
St. Laurent, QC (514) 334-4240  
[www.vacaero.com](http://www.vacaero.com)

**Vac-Met Inc.\***  
Warren, MI (586) 264-8100  
[www.vac-met.com](http://www.vac-met.com)

**Vacu-Braze Inc.\***  
Quakertown, PA (215) 453-0414  
[www.vacubraze.net](http://www.vacubraze.net)

**Valley Heat Treat Co.**  
Valley Park (St. Louis), MO  
(636) 225-5222  
[www.valley-tech.com](http://www.valley-tech.com)

**Valley Metal Treating Inc.\***  
Pomona, CA (909) 623-6316

**Vira-Tech Inc.\***  
Santa Fe Springs, CA  
(562) 693-3277

**Virginia Metal Treating,  
East Carolina Metal Treating\***  
Lynchburg, VA (434) 333-4412  
[www.ecmtinc.com](http://www.ecmtinc.com)

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[www.voestalpine.com/highperformancemetals/canada/en](http://www.voestalpine.com/highperformancemetals/canada/en)

**Wallwork Cambridge Ltd.**  
Cambridge, United Kingdom  
44-0-1954-233700  
[www.tecvac.com](http://www.tecvac.com)

**Weiss Industries Inc.,  
Heat Treating Div.\***  
Mansfield, OH (419) 525-2291  
[www.weissind.com](http://www.weissind.com)



**Winston Heat Treating Inc.\***  
Dayton, OH  
(937) 226-0110  
[www.winstonht.com](http://www.winstonht.com)

**Wyatt Services Inc.\***  
Sterling Heights, MI (586) 264-8000  
[www.wyattservices.net](http://www.wyattservices.net)

**Zion Industries Inc.\***  
Grand Ledge, MI (517) 622-3409  
[www.zioninduction.com](http://www.zioninduction.com)

**Zion Industries Inc.\***  
Hildebran, NC (828) 397-2701  
[www.zioninduction.com](http://www.zioninduction.com)

**Zion Industries Inc.\***  
Valley City, OH (330) 483-4650  
[www.zioninduction.com](http://www.zioninduction.com)

**Z-Machine Inc.**  
Ocheyedan, IA (712) 758-3720

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## CAPABILITIES LISTINGS - COMMERCIAL HEAT TREATERS DIRECTORY

# Commercial Heat Treaters Directory— Capabilities Listings

## CERTIFICATIONS

### Certifications, A2LA

Bluewater Thermal Solutions, Chicago Plant 2  
Commercial Steel Treating Corp.  
Morgan Ohare Inc.  
Precision Thermal Processing  
TC Industries Inc.  
Texas Heat Treating Inc. (Ft. Worth TX)  
Texas Heat Treating Inc. (Round Rock TX)

### Certifications, AS 9100

Advanced Heat Treat Corp. (Midport)  
Advanced Nitriding Solutions  
Applied Thermal Technologies Inc.  
Aremac Heat Treating East LLC, Southeast  
Blanchard Metal Processing  
Bluewater Thermal Solutions (South Bend IN)  
**Bodycote (ALL LOCATIONS)**  
Braddock Metallurgical Aerospace Services  
Braddock Metallurgical (Daytona FL)  
Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Tampa FL)  
Braddock Metallurgical (Atlanta GA)  
Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
Byington Steel Treating Inc.  
Byron Products Inc.  
**Century Sun Metal Treating**  
CRIO SA de CV  
East Carolina Metal Treating Inc.  
Engineered Heat Treat Inc.  
Exactatherm Ltd.  
General Metal Heat Treating Inc.  
GFI Metal Treating  
**Hansen-Balk Steel Treating Co.**  
Hardline Heat Treating Inc.  
Hauck Heat Treatment Ltd.  
Hercules Heat Treating  
Hi TecMetal Group, HI Tech Aero  
Ionic Technologies Inc.  
Metal Treaters Inc.  
**Metcor Inc.**  
MFCO Aluminum Heat Treat  
MFCO Chihuahua Heat Treat  
**Midwest Thermal-Vac Inc.**  
Modern Metal Processing Inc.  
Nevada Heat Treating Inc.  
Nitrex Inc., Nevada Operations

Paulo (Kansas City MO)  
Paulo (Willoughby OH)  
Pinson Valley Heat Treating  
Quality Steel Treating LLC  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
→ **Solar Atmospheres (Souderton PA)**  
**Solar Atmospheres (Greenville SC)**  
The Sousa Corp.  
Spectrum Thermal Processing LLC  
Steel Treaters Inc.  
Tamayakin Co. Ltd.  
Thermal-Vac Technology Inc.  
THERMETCO Inc.  
**ThermTech**  
Vac Aero International Inc. (Oakville ON)  
Vac Aero International Inc. (St. Laurent QC)  
Vacu-Braze Inc.  
Virginia Metal Treating, East Carolina Metal Treating  
**voestalpine Thermo-Tech**  
Wallwork Cambridge Ltd.

### Certifications, CQI - 9

Accurate Steel Treating  
Advanced Heat Treat Corp. (Burton)  
Advanced Heat Treat Corp. (Midport)  
Advanced Heat Treat Corp. (Monroe MI)  
Advanced Nitriding Solutions  
Ajax TOCCO Magnethermic Corp. (Albertville AL)  
**Akron Steel Treating Co.**  
Al-Fe Heat Treating (Premier Thermal Co.)  
American Heat Treating Inc.  
American Steel Treating  
Applied Process Inc. (Ft. Smith AZ)  
Applied Process Inc. (Livonia MI)  
Applied Process Inc., Technologies Div.  
Applied Process Inc., Monster Parts Div.  
Bluewater Thermal Solutions, Chicago Plant 2  
Bluewater Thermal Solutions (St. Marys PA)  
Bluewater Thermal Solutions (Kitchener ON)  
Braddock Metallurgical (Charlotte NC)  
Certified Heat Treating Inc. (Miamisburg OH)  
Commercial Steel Treating Corp.  
**Contour Hardening**  
CRIO SA de CV  
**Eastern Metal Treating Inc.**  
East-Lind Heat Treat Inc.  
Engineered Heat Treat Inc.  
Erie Steel Ltd.  
**Flame Metals Processing Corp.**

**FPM HEAT TREATING (Cherry Valley IL)**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
**FPM HEAT TREATING (Milwaukee WI)**  
General Metal Heat Treating Inc.  
**Hansen-Balk Steel Treating Co.**  
Heat Treating Services  
Hi-Tech Steel Treating Inc.  
Hi TecMetal Group, Brazing & Metal Treating (BMT)  
Hi TecMetal Group, HI Tech Aero  
Hi TecMetal Group, Nettleton Steel Treating (NST)  
Hi TecMetal Group, Walker  
Industrial Steel Treating Co.  
Ionic Technologies Inc.  
Magnum Induction  
Metals Technology Corp.  
**Midwest Thermal-Vac Inc.**  
Modern Industries Inc. (Kersey PA)  
Modern Metal Processing Inc.  
National Metal Processing Inc.  
**Ohio Metallurgical Service**  
Ohio Vertical Heat Treat  
Paulo (St. Louis MO)  
Paulo (Murfreesboro TN)  
Paulo (Nashville TN)  
Precision Thermal Processing  
Service Heat Treating Inc.  
TC Industries Inc.  
Treat All Metals  
Zion Industries Inc. (Grand Ledge MI)  
Zion Industries Inc. (Hildebran NC)  
Zion Industries Inc. (Valley City OH)

### Certifications, HT2005

Engineered Heat Treat Inc.  
Pinson Valley Heat Treating

### Certifications, ISO 9000

Ajax TOCCO Magnethermic Corp. (Albertville AL)  
American Heat Treating Inc.  
American Metal Treating Inc.  
California Brazing  
**Century Sun Metal Treating**  
Certified Heat Treating  
Certified Heat Treating Inc. (Miamisburg OH)  
Dependable Metal Treating Inc.  
Diamond Heat Treat  
Engineered Heat Treat Inc.  
Euclid Heat Treating Co.  
Exactatherm Ltd.  
H & M Metal Processing Co.



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Heat Treating Technologies Inc.  
Hudapack Metal Treating Inc. (Elkhorn WI)  
IMT York LLC  
Ionic Technologies Inc.  
**Kowalski Heat Treating**  
Lone Star Heat Treating Corp.  
Metals Engineering Inc. (DePere WI)  
MFCO Aluminum Heat Treat  
MFCO Chihuahua Heat Treat  
Modern Metal Processing Inc.  
Nevada Heat Treating Inc.  
Peters' Heat Treating Inc. (Meadville PA)  
Pinson Valley Heat Treating  
Quality Steel Treating LLC  
Queen City Steel Treating  
Southwest Specialty Heat Treat  
Specialty Steel Treating Inc. (East Granby CT)  
Spectrum Thermal Processing LLC  
Thermo-Fusion Inc.  
Wallwork Cambridge Ltd.

### Certifications, ISO 9001

Aberfoyle Metal Treaters Ltd.  
Advanced Heat Treat Corp. (Cullman AL)  
Advanced Heat Treat Corp. (Burton)  
Advanced Heat Treat Corp. (Midport)  
Advanced Heat Treat Corp. (Monroe MI)  
Advanced Heat Treating Inc.  
Advanced Heat Treating Solutions  
Ajax TOCCO Magnethermic Corp. (Albertville AL)  
**Akron Steel Treating Co.**  
Al-Fe Heat Treating (Premier Thermal Co.)  
All-Source Heat Treating Inc.  
Allied Heat Treat Ltd.  
American Heat Treating  
American Steel Treating  
Applied Process Inc. (Ft. Smith AZ)  
Applied Process Inc. (Livonia MI)  
Applied Process Inc., Technologies Div.  
Applied Process Inc., Monster Parts Div.  
Applied Thermal Technologies Inc.  
Blanchard Metal Processing  
Bluewater Thermal Solutions, Chicago Plant 2  
Bluewater Thermal Solutions (Rockford IL)  
Bluewater Thermal Solutions (South Bend IN)  
Bluewater Thermal Solutions (Benton Harbor MI)  
Bluewater Thermal Solutions (St. Marys PA)  
Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
Braddock Metallurgical Aerospace Services  
Braddock Metallurgical (Daytona FL)  
Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Tampa FL)  
Braddock Metallurgical (Atlanta GA)  
Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
Byington Steel Treating Inc.  
Byron Products Inc.  
Cambridge Heat Treating  
Certified Heat Treating Inc. (Springfield OH)

CMC Impact Metals  
Commercial Steel Treating Corp.  
**Contour Hardening**  
County Heat Treat  
CRIO SA de CV  
Dayton Forging & Heat Treating  
East Carolina Metal Treating Inc.  
**Eastern Metal Treating Inc.**  
East-Lind Heat Treat Inc.  
Engineered Heat Treat Inc.  
Erie Steel Ltd.  
Evans Heat Treating  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Cherry Valley IL)**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
**FPM HEAT TREATING (Milwaukee WI)**  
Gallos Metal Solutions Inc.  
GFI Metal Treating  
**Hansen-Balk Steel Treating Co.**  
Hardline Heat Treating Inc.  
Hauck Heat Treatment Ltd.  
Hi-Tech Steel Treating Inc.  
Hi TecMetal Group, Brazing & Metal Treating (BMT)  
Hi TecMetal Group, HI Tech Aero  
Hi TecMetal Group, Nettleton Steel Treating (NST)  
**Houston Heat Treat**  
**H.T.I.**  
Hudapack Metal Treating Inc. (Franklin WI)  
Induction Heat Treating Corp.  
Industrial Steel Treating Co.  
Intrix Thermal Technologies



Jasco Heat Treating Inc.  
Katy Heat Treat LLC  
**Kowalski Heat Treating**  
Lark Heat Treating Inc.  
Lawrence Industries Inc.  
LST Heat Treating LLC  
Magnum Induction  
Magnum Metal Treating  
Metal Treaters Inc.  
Metals Engineering Inc. (Green Bay WI)  
Metals Technology Corp.  
**Metcor Inc.**  
MFCO Aluminum Heat Treat  
MFCO Chihuahua Heat Treat  
Mid South Metallurgical  
**Midwest Thermal-Vac Inc.**  
Missouri Heat Treat  
Modern Heat Treat Inc.  
Modern Industries Inc. (Kersey PA)  
Morgan Ohare Inc.  
National Heat Treat  
National Metal Processing Inc.  
Nevada Heat Treating Inc.  
Nitrex Inc., Chicago Operations  
Nitrex Inc., Nevada Operations  
NitroSteel - A Premier Thermal Co.

### Ohio Metallurgical Service

Ohio Vertical Heat Treat  
Oregon Induction Corp.  
P & L Heat Treating & Grinding Inc.  
Paulo (Kansas City MO)  
Paulo (Willoughby OH)  
Peters' Heat Treating Inc. (McKean PA)  
Peters' Heat Treating Inc. - West  
Pinson Valley Heat Treating  
Precision Heat Treating Corp. (Ft. Wayne IN)  
Precision Thermal Processing  
SCHMOLZ + BICKENBACH USA  
Scientific Metal Treating  
Seattle Heat Treaters, dba Stober & Chiaro  
SEI Heat Treat  
Service Heat Treating Inc.  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
➔ **Solar Atmospheres (Souderton PA)**  
**Solar Atmospheres (Greenville SC)**  
The Sousa Corp.  
Southwest Metal Treating Corp.  
Southwest Specialty Heat Treat  
Specialty Steel Treating Inc. (Farmington Hills MI)  
Sun Steel Treating Inc.  
TC Industries Inc.  
Texas Heat Treating Inc. (Ft. Worth TX)  
Texas Heat Treating Inc. (Round Rock TX)  
Thermal Metal Treating Inc.  
Thermal-Vac Technology Inc.  
Thermex Metal Treating Ltd.  
**ThermTech**  
Treat All Metals  
Tri-City Heat Treat Co.  
Vacu-Braze Inc.  
Virginia Metal Treating, East Carolina Metal Treating  
**voestalpine Thermo-Tech**  
Wallwork Cambridge Ltd.  
Weiss Industries Inc.  
**Winston Heat Treating Inc.**  
Wyatt Services Inc.

### Certifications, ISO/TS 16949

Advanced Heat Treat Corp. (Cullman AL)  
Advanced Heat Treat Corp. (Burton)  
Advanced Heat Treat Corp. (Midport)  
Advanced Heat Treat Corp. (Monroe MI)  
Advanced Nitriding Solutions  
Al-Fe Heat Treating (Premier Thermal Co.)  
American Metal Processing Co.  
American Steel Treating  
Atmosphere Annealing LLC (Bassett)  
Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
Cincinnati Steel Treating Co.  
**Contour Hardening**  
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Industrial Steel Treating Co.  
Ionic Technologies Inc.  
Modern Industries Inc. (Kersey PA)  
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## CAPABILITIES LISTINGS - COMMERCIAL HEAT TREATERS DIRECTORY

Nitrex Inc., Nevada Operations  
Paulo (St. Louis MO)  
Paulo (Murfreesboro TN)  
Paulo (Nashville TN)  
Paulo (Monterrey MX)

**Specialty Steel Treating Inc. (Fraser MI)**

STT Nitrex Querétaro, S. De R.L. De C.V.  
Zion Industries Inc. (Grand Ledge MI)  
Zion Industries Inc. (Hildebran NC)  
Zion Industries Inc. (Valley City OH)

**Certifications, MedAccred**

**Hansen-Balk Steel Treating Co.**  
**Midwest Thermal-Vac Inc.**  
**Solar Atmospheres (Hermitage PA)**  
➔ **Solar Atmospheres (Souderton PA)**

**Certifications, NADCAP**

Accurate Steel Treating  
Advanced Heat Treat Corp. (Midport)  
Advanced Nitriding Solutions  
**Akron Steel Treating Co.**  
Al-Fe Heat Treating (Premier Thermal Co.)  
Applied Thermal Technologies Inc.  
Aremac Heat Treating East LLC, Southeast  
Bennett Heat Treating & Brazing Co. (Newark NJ)  
Blanchard Metal Processing  
**Bodycote (ALL LOCATIONS)**  
Braddock Metallurgical Aerospace Services  
Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Tampa FL)  
**Braddock Metallurgical (Bridgewater NJ)**  
Byron Products Inc.  
**Century Sun Metal Treating**  
**Certified Metal Craft Inc.**  
Continental Heat Treating Inc.  
Cook Induction Heating Co.  
East Carolina Metal Treating Inc.  
Engineered Heat Treat Inc.  
Evans Heat Treating  
Exactatherm Ltd.  
**FPM HEAT TREATING (Elk Grove Village IL)**  
Galaxy Brazing Co. Inc.  
General Metal Heat Treating Inc.  
**Hansen-Balk Steel Treating Co.**  
Hauck Heat Treatment Ltd.  
Hercules Heat Treating  
HI TecMetal Group, HI Tech Aero  
Hudapack Metal Treating Inc. (Elkhorn WI)  
Ionic Technologies Inc.



Jasco Heat Treating Inc.  
Lake City Heat Treating  
**Metcor Inc.**  
MFCO Aluminum Heat Treat  
MFCO Chihuahua Heat Treat  
**Midwest Thermal-Vac Inc.**  
MPT America Corp.  
Nevada Heat Treating Inc.  
Nitrex Inc., Nevada Operations

**Ohio Metallurgical Service**

Pacific Metallurgical  
Paulo (Kansas City MO)  
Paulo (Willoughby OH)  
Phoenix Heat Treating Inc.  
Quality Steel Treating LLC  
Robert Wooler Co.  
Scarrott Metallurgical Co.

**Solar Atmospheres (Fontana CA)****Solar Atmospheres (Hermitage PA)**➔ **Solar Atmospheres (Souderton PA)****Solar Atmospheres (Greenville SC)**

The Sousa Corp.  
Specialty Steel Treating Inc. (East Granby CT)  
Spectrum Thermal Processing LLC  
Stack Metallurgical Services Inc.

Steel Treaters Inc.  
Sun Steel Treating Inc.  
Tamayakin Co. Ltd.  
Thermal-Vac Technology Inc.  
THERMETCO Inc.  
Vac Aero International Inc. (Oakville ON)  
Vac Aero International Inc. (St. Laurent QC)  
Vac-Met Inc.  
Valley Heat Treat Co.  
Vira-Tech Inc.  
**voestalpine Thermo-Tech**  
Wallwork Cambridge Ltd.  
**Winston Heat Treating Inc.**

**Certifications, QS 9000**

Advanced Heat Treat Corp. (Cullman AL)  
Advanced Heat Treat Corp. (Burton)  
Advanced Heat Treat Corp. (Midport)  
Advanced Heat Treat Corp. (Monroe MI)  
Cincinnati Steel Treating Co.  
Engineered Heat Treat Inc.  
Heat Treating Technologies Inc.  
Specialty Steel Treating Inc. (East Granby CT)  
**Specialty Steel Treating Inc. (Fraser MI)**  
Superior Metal Treating & Equipment Inc.

**Certifications, ISO 14001**

Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
Cincinnati Steel Treating Co.  
Paulo (Kansas City MO)  
TC Industries Inc.

**Certifications, ISO 17025-8001**

Bluewater Thermal Solutions, Chicago Plant 2  
Precision Thermal Processing  
TC Industries Inc.  
Texas Heat Treating Inc. (Ft. Worth TX)  
Texas Heat Treating Inc. (Round Rock TX)

**ANNEALING****Bright**

A & M Heat Treating Ltd.  
Advanced Heat Treating Solutions  
Aerobrazz Engineered Technologies  
Ajax TOCCO International Ltd.  
Ajax TOCCO Magnethermic Corp. (Alberville AL)  
Ajax TOCCO Magnethermic Corp. (Madison Heights MI)  
➔ **Ajax TOCCO Magnethermic Corp. (Warren OH)**  
Ajax TOCCO Magnethermic Corp. (Wickliffe OH)  
Ajax TOCCO Magnethermic Corp. (Ajax ON)  
Ajax TOCCO Magnethermic Corp. (Mexico)  
**Akron Steel Treating Co.**  
ALD Thermal Treatment Inc.  
Allied Heat Treat Ltd.  
Alloy Steel Treating Co. Inc.  
American Heat Treating  
American Heat Treating Inc.  
American Metal Treating Inc.  
American Steel Treating  
Applied Thermal Technologies Inc.  
Aremac Heat Treating East LLC, Southeast  
Atlantic Heat Treat  
Atmosphere Annealing LLC (Mt. Hope)  
BeeHive Heat Treating Service Inc.  
Bennett Heat Treating & Brazing Co. (Newark NJ)  
Bennett Heat Treating & Brazing Co. (Ivlyland PA)  
Blanchard Metal Processing  
Bluewater Thermal Solutions, Chicago Plant 2  
Bluewater Thermal Solutions (Rockford IL)  
Bluewater Thermal Solutions (South Bend IN)  
Bluewater Thermal Solutions (Coldwater MI)  
Bluewater Thermal Solutions, Corporate  
**Bodycote (ALL LOCATIONS)**  
Braddock Metallurgical Aerospace Services  
Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Tampa FL)

Braddock Metallurgical (Atlanta GA)  
Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
Braddock Metallurgical, Caribe Metallurgical  
Byington Steel Treating Inc.  
Byron Products Inc.  
California Brazing  
Cambridge Heat Treating  
**Century Sun Metal Treating**  
Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**

Coleman Heat Treating  
Controlled Thermal Technology  
Cook Induction Heating Co.  
County Heat Treat  
Dayton Forging & Heat Treating  
**DIE-BOND LLC**  
East Carolina Metal Treating Inc.  
East-Lind Heat Treat Inc.  
Elmira Heat Treating Inc.  
Engineered Heat Treat Inc.  
Erie Steel Ltd.  
Euclid Heat Treating Co.  
Evans Heat Treating  
Exotic Metal Treating Inc.  
Fire Kote Steel Treating  
**Flame Metals Processing Corp.**

**FPM HEAT TREATING (Elk Grove Village IL)**

Galaxy Brazing Co. Inc.  
Garner Heat Treat Inc.  
H & S Heat Treating  
**Hansen-Balk Steel Treating Co.**  
Hardline Heat Treating Inc.  
Hercules Heat Treating  
HI TecMetal Group, Brazing & Metal Treating (BMT)  
HI TecMetal Group, HI Tech Aero  
Hitech Heat Treatment Services Pte. Ltd.

**Houston Heat Treat**

Hy-Vac Technologies Inc.  
Inductoheat Inc.  
Industrial Steel Treating Co.  
Inland NW Metallurgical Services Inc.

**International Thermal Systems**

Intriplex Thermal Technologies  
Jasco Heat Treating Inc.  
Katy Heat Treat LLC  
**Kowalski Heat Treating**  
Krankka Metallurgical LLC  
Lake City Heat Treating  
Lark Heat Treating Inc.  
Magnum Metal Treating  
Med-Tek Inc.

Metal Finishing Co.  
Metal Treaters Inc.  
Metallurgical Processing Inc. (CT)  
Metals Technology Corp.

**Metcor Inc.**

Metex Heat Treating Ltd.  
Metlab  
Mid South Metallurgical  
**Midwest Thermal-Vac Inc.**  
Modern Industries Inc. (Erie PA)  
Modern Metal Processing Inc.

**MT Heat Treating Inc.**

National Heat Treat  
National Metal Processing Inc.  
Nevada Heat Treating Inc.  
Nitrex Inc., Chicago Operations  
Nitrex Inc., Indiana Operations  
Nitrex Inc., Michigan Operations  
Nitrex Inc., Nevada Operations  
Nitrex Metal Inc.

Nitrex Thermal Technology Co. Ltd.  
Nitro-Vac Heat Treat Inc.

**Northeast Metals Technologies**

**Ohio Metallurgical Service**  
P & L Heat Treating & Grinding Inc.  
Pacific Heat Treating Co.  
Pacific Metallurgical  
Palmdale Heat Treating Inc.



Paulo (Kansas City MO)  
 Paulo (St. Louis MO)  
 Paulo (Willoughby OH)  
 Paulo (Murfreesboro TN)  
 Paulo (Nashville TN)  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Phoenix Heat Treating Inc.  
 Plymouth Brazing Inc.  
 Precision Heat Treating Corp. (Ft. Wayne IN)  
 Precision Thermal Processing  
 Quality Heat Treating Inc.  
 Quality Steel Treating LLC  
 Radyne Corp.  
**Refrac Systems**  
 Rex Heat Treat (Bedford PA)  
 Rex Heat Treat (Lansdale PA)  
 Robert Wooler Co.  
 Rochester Steel Treating Works Inc.  
 Rockford Heat Treaters Inc.  
 Rogers Metal Services Inc.  
 Scarrott Metallurgical Co.  
 Scientific Metal Treating  
 Service Heat Treating Inc.  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
**➔ Solar Atmospheres (Souderton PA)**  
**Solar Atmospheres (Greenville SC)**  
 The Sousa Corp.  
 Specialty Steel Treating Inc. (East Granby CT)  
**Specialty Steel Treating Inc. (Fraser MI)**  
 Spectrum Thermal Processing LLC  
 Stack Metallurgical Services Inc.  
 Steel Treaters Inc.  
 STT Nitrex Querétaro, S. De R.L. De C.V.  
 Sturm Steel Treating Inc.  
 Sun Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
 Tamayakin Co. Ltd.  
 Temperature Processing Co. Inc. (Longmont CO)  
 Temperature Processing Co. Inc. (North Arlington NJ)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal Braze Inc.  
 Thermal One Inc.  
 Thermal-Vac Technology Inc.  
 Thermo-Fusion Inc.  
 Tratamientos Termicos Nitrogas S.A.  
 Trojan Heat Treat Inc.  
 Vac Aero International Inc. (Oakville ON)  
 Vac Aero International Inc. (St. Laurent QC)  
 Vac-Met Inc.  
 Vacu-Braze Inc.  
 Valley Metal Treating Inc.  
 Vira-Tech Inc.  
**voestalpine Thermo-Tech**  
 Wallwork Cambridge Ltd.  
**Winston Heat Treating Inc.**

### Full

A & M Heat Treating Ltd.  
 Aberfoyle Metal Treaters Ltd.  
 Accurate Steel Treating  
 Advanced Heat Treat Corp. (Burton)  
 Advanced Heat Treat Corp. (Midport)  
 Advanced Heat Treating Solutions  
 Aerobrazo Engineered Technologies  
 Ajax TOCCO International Ltd.  
 Ajax TOCCO Magnethermic Corp. (Albertville AL)  
 Ajax TOCCO Magnethermic Corp. (Madison Heights MI)  
**➔ Ajax TOCCO Magnethermic Corp. (Warren OH)**  
 Ajax TOCCO Magnethermic Corp. (Wickliffe OH)  
 Ajax TOCCO Magnethermic Corp. (Ajax ON)  
 Ajax TOCCO Magnethermic Corp. (Mexico)  
**Akron Steel Treating Co.**  
 Al-Fe Heat Treating (Premier Thermal Co.)  
 All-Source Heat Treating Inc.  
 Allied Heat Treat Ltd.  
 Alloy Steel Treating Co. Inc.

American Heat Treating Inc.  
 American Metal Treating Inc.  
 American Steel Treating  
 Aremac Heat Treating East LLC, Southeast  
 Atlantic Heat Treat  
 Atmosphere Annealing LLC (North Vernon IN)  
 Atmosphere Annealing LLC (Bassett)  
 Atmosphere Annealing LLC (Mt. Hope)  
 Atmosphere Annealing LLC (Canton OH)  
 Austenit S.A.  
 Beechner Heat Treating Co. Inc.  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivlyland PA)  
 Blanchard Metal Processing  
 Bluewater Thermal Solutions, Chicago Plant 1  
 Bluewater Thermal Solutions, Chicago Plant 2  
 Bluewater Thermal Solutions (Rockford IL)  
 Bluewater Thermal Solutions (South Bend IN)  
 Bluewater Thermal Solutions (Benton Harbor MI)  
 Bluewater Thermal Solutions (Coldwater MI)  
 Bluewater Thermal Solutions, Corporate  
 Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical Aerospace Services  
 Braddock Metallurgical (Daytona FL)  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Byington Steel Treating Inc.  
 Byron Products Inc.  
 California Brazing  
 Calumet Surface Hardening Co. Inc.  
 Cambridge Heat Treating  
 Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
 Certified Heat Treating  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Cincinnati Flame Hardening Co.  
 Cincinnati Steel Treating Co.  
 Circle City Heat Treating Inc.  
 City Steel Heat Treating Inc.  
 Coleman Commercial Heat Treating Inc.  
 Coleman Heat Treating  
 Commercial Heat Treating Inc.  
 Continental Heat Treating Inc.  
 Controlled Thermal Technology  
 Cook Induction Heating Co.  
 County Heat Treat  
 Dayton Forging & Heat Treating  
 Dependable Metal Treating Inc.  
**➔ Derrick Co. Inc.**  
 Detroit Steel Treating Co.  
**DIE-BOND LLC**  
 Donohoo Steel Treating  
 East Carolina Metal Treating Inc.  
 East-Lind Heat Treat Inc.  
 Elmira Heat Treating Inc.  
 Engineered Heat Treat Inc.  
 Erie Steel Ltd.  
 Euclid Heat Treating Co.  
 Evans Heat Treating  
 Exactatherm Ltd.  
 Exotic Metal Treating Inc.  
 Fire Kote Steel Treating  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
 Galaxy Brazing Co. Inc.  
 Garner Heat Treat Inc.  
 General Surface Hardening Inc.  
 H & S Heat Treating  
**Hansen-Balk Steel Treating Co.**  
 Harchris Heat Treatment (Pty.) Ltd.  
 Hardline Heat Treating Inc.  
 Heat Treating Engineers Inc.  
 Heat Treating Services  
 Heat Treating Technologies Inc.

Heat Treatment Australia  
 Hercules Heat Treating  
 Hi Tech Heat Treating Ltd.  
 Hi-Tech Steel Treating Inc.  
 HI TecMetal Group, Brazing & Metal Treating (BMT)  
 HI TecMetal Group, HI Tech Aero  
 HI TecMetal Group, Nettleton Steel Treating (NST)  
 High Performance Heat Treating Inc.  
 Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
 Hudapack Metal Treating Inc. (Elkhorn WI)  
 Hudapack Metal Treating Inc. (Franklin WI)  
 Hy-Vac Technologies Inc.  
 IMT York LLC  
 Industrial Steel Treating Co.  
 Inland NW Metallurgical Services Inc.  
**International Thermal Systems**  
 Intriplex Thermal Technologies  
 Jasco Heat Treating Inc.  
 JF Heat Treating Inc.  
 K & D Heat Treat Inc.  
 Katy Heat Treat LLC  
**Kowalski Heat Treating**  
 Krankka Metallurgical LLC  
 L&M Heat Treating  
 Lake City Heat Treating  
 Lark Heat Treating Inc.  
 Lone Star Heat Treating Corp.  
 LST Heat Treating LLC  
 Magnum Metal Treating  
 Med-Tek Inc.  
 Metal Finishing Co.  
 Metal Treaters Inc.  
 Metallurgical Processing Inc. (CT)  
 Metallurgical Solutions Inc.  
 Metals Engineering Inc. (DePere WI)  
 Metals Engineering Inc. (Green Bay WI)  
 Metals Technology Corp.  
**Metcor Inc.**  
 Metex Heat Treating Ltd.  
 Metlab  
 Mid South Metallurgical  
**Midwest Thermal-Vac Inc.**  
 Missouri Heat Treat  
 Modern Industries Inc. (Erie PA)  
 MT Heat Treating Inc.  
 National Heat Treat  
 National Metal Processing Inc.  
 Nevada Heat Treating Inc.  
 Nitrex Inc., Chicago Operations  
 Nitrex Inc., Indiana Operations  
 Nitrex Inc., Michigan Operations  
 Nitrex Inc., Nevada Operations  
 Nitrex Metal Inc.  
 Nitrex Thermal Technology Co. Ltd.  
 Nitro-Vac Heat Treat Inc.  
 Northeast Metals Technologies  
**Ohio Metallurgical Service**  
 Ohio Vertical Heat Treat  
 P & L Heat Treating & Grinding Inc.  
 Pacific Heat Treating Co.  
 Pacific Metallurgical  
 Palmdale Heat Treating Inc.  
 Paulo (Kansas City MO)  
 Paulo (St. Louis MO)  
 Paulo (Willoughby OH)  
 Paulo (Murfreesboro TN)  
 Paulo (Nashville TN)  
 Paulo (Monterrey MX)  
 Permian Heat Treaters  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Phoenix Heat Treating Inc.  
 Pinson Valley Heat Treating  
 Plymouth Brazing Inc.  
 Precision Heat Treating Corp. (Ft. Wayne IN)  
 Precision Heat Treating Corp. (Jackson MS)  
 Precision Heat Treating Inc.  
 Precision Thermal Processing

## CAPABILITIES LISTINGS - COMMERCIAL HEAT TREATERS DIRECTORY

Q-Tech Heat Treat LLC  
Quality Heat Treating Inc.  
Quality Steel Treating LLC  
Queen City Steel Treating  
R & R Heat Treating Inc.  
Radyne Corp.  
**Refrac Systems**  
Rex Heat Treat (Bedford PA)  
Rex Heat Treat (Lansdale PA)  
Robert Wooler Co.  
Rochester Steel Treating Works Inc.  
Rockford Heat Treaters Inc.  
Rogers Metal Services Inc.  
Scarrott Metallurgical Co.  
SCHMOLZ + BICKENBACH USA  
Scientific Metal Treating  
Seattle Heat Treating, dba Stober & Chiaro  
Service Heat Treating Inc.

**Solar Atmospheres (Fontana CA)**

**Solar Atmospheres (Hermitage PA)**

➔ **Solar Atmospheres (Souderton PA)**

**Solar Atmospheres (Greenville SC)**

The Sousa Corp.  
Southwest Metal Treating Corp.  
Southwest Specialty Heat Treat  
Specialty Heat Treat Inc.  
Specialty Steel Treating Inc. (East Granby CT)  
**Specialty Steel Treating Inc. (Fraser MI)**  
Spectrum Thermal Processing LLC  
Stack Metallurgical Services Inc.  
Steel Treating Inc.  
Stokes Steel Treating Co.  
STT Nitrex Querétaro, S. De R.L. De C.V.  
Sturm Steel Treating Inc.  
Sun Steel Treating Inc.  
Superior Metal Treating & Equipment Inc.  
Tamayakin Co. Ltd.  
TC Industries Inc.  
Temperature Processing Co. Inc. (Longmont CO)  
Temperature Processing Co. Inc. (North Arlington NJ)  
Texas Heat Treating Inc. (Ft. Worth TX)  
Texas Heat Treating Inc. (Round Rock TX)  
Thermal Braze Inc.  
Thermal One Inc.  
Thermal Specialties  
Thermal Specialties of Texas LLC  
Thermal-Vac Technology Inc.  
THERMETCO Inc.  
Thermex Metal Treating Ltd.  
Thermo-Fusion Inc.  
**ThermTech**  
Treat All Metals  
Tri-City Heat Treat Co.  
Trojan Heat Treat Inc.  
Vac Aero International Inc. (Oakville ON)  
Vac Aero International Inc. (St. Laurent QC)  
Vac-Met Inc.  
Vacu-Braze Inc.  
Valley Heat Treat Co.  
Valley Metal Treating Inc.  
Vira-Tech Inc.  
**voestalpine Thermo-Tech**  
Wallwork Cambridge Ltd.  
Weiss Industries Inc.  
**Winston Heat Treating Inc.**  
Wyatt Services Inc.

### Homogenize

A & M Heat Treating Ltd.  
Aberfoyle Metal Treating Ltd.  
Accurate Steel Treating  
Advanced Heat Treat Corp. (Burton)  
Advanced Heat Treat Corp. (Midport)  
Advanced Heat Treating Solutions  
Aerobrazed Engineered Technologies  
**Akron Steel Treating Co.**  
All-Source Heat Treating Inc.  
Allied Heat Treat Ltd.  
American Heat Treating Inc.  
American Metal Treating Inc.

American Steel Treating  
Applied Thermal Technologies Inc.  
Aremac Heat Treating East LLC, Southeast  
Atlantic Heat Treat  
Atmosphere Annealing LLC (North Vernon IN)  
Atmosphere Annealing LLC (Canton OH)  
BeeHive Heat Treating Service Inc.  
Bennett Heat Treating & Brazing Co. (Newark NJ)  
Bennett Heat Treating & Brazing Co. (Ivyland PA)  
Blanchard Metal Processing  
Bluewater Thermal Solutions (Rockford IL)  
Bluewater Thermal Solutions (South Bend IN)  
Bluewater Thermal Solutions, Corporate  
**Bodycote (ALL LOCATIONS)**  
Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Tampa FL)  
Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
Braddock Metallurgical, Caribe Metallurgical  
Byington Steel Treating Inc.  
Byron Products Inc.  
Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
Certified Heat Treating  
Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
Cincinnati Steel Treating Co.  
City Steel Heat Treating Inc.  
Continental Heat Treating Inc.  
Controlled Thermal Technology  
County Heat Treat  
Dayton Forging & Heat Treating

➔ **Derrick Co. Inc.**

Detroit Steel Treating Co.

**DIE-BOND LLC**

East Carolina Metal Treating Inc.

East-Lind Heat Treat Inc.

Engineered Heat Treat Inc.

Erie Steel Ltd.

Euclid Heat Treating Co.

Exactatherm Ltd.

Exotic Metal Treating Inc.

**Flame Metals Processing Corp.**

**FPM HEAT TREATING (Elk Grove Village IL)**

General Metal Heat Treating Inc.

H & S Heat Treating

**Hansen-Balk Steel Treating Co.**

Harchris Heat Treatment (Pty.) Ltd.

Hardline Heat Treating Inc.

Heat Treating Engineers Inc.

Heat Treating Services

Hercules Heat Treating

Hi-Tech Steel Treating Inc.

HI TecMetal Group, HI Tech Aero

HI TecMetal Group, Nettleton Steel Treating (NST)

Hitech Heat Treatment Services Pte. Ltd.

**Houston Heat Treat**

Hy-Vac Technologies Inc.

Inland NW Metallurgical Services Inc.

**International Thermal Systems**

Intrix Thermal Technologies

Jasco Heat Treating Inc.

K & D Heat Treat Inc.

Katy Heat Treat LLC

**Kowalski Heat Treating**

Krankka Metallurgical LLC

Lake City Heat Treating

Lark Heat Treating Inc.

Lone Star Heat Treating Corp.

Magnum Metal Treating

Med-Tek Inc.

Metal Finishing Co.

Metal Treating Inc.

Metallurgical Processing Inc. (CT)

Metallurgical Solutions Inc.

Metals Technology Corp.

**Metcor Inc.**

Metex Heat Treating Ltd.

Metlab

Mid South Metallurgical

**Midwest Thermal-Vac Inc.**

Missouri Heat Treat

Modern Heat Treat Inc.

Modern Industries Inc. (Erie PA)

Nevada Heat Treating Inc.

Nitro-Vac Heat Treat Inc.

Northeast Metals Technologies

**Ohio Metallurgical Service**

Oregon Induction Corp.

Pacific Metallurgical

Paulo (Kansas City MO)

Paulo (St. Louis MO)

Paulo (Willoughby OH)

Paulo (Murfreesboro TN)

Paulo (Nashville TN)

Paulo (Monterrey MX)

Peters' Heat Treating Inc. (McKean PA)

Phoenix Heat Treating Inc.

Precision Thermal Processing

Q-Tech Heat Treat LLC

Quality Heat Treating Inc.

**Refrac Systems**

Robert Wooler Co.

Rochester Steel Treating Works Inc.

Rockford Heat Treating Inc.

Scarrott Metallurgical Co.

SCHMOLZ + BICKENBACH USA

Scientific Metal Treating

Service Heat Treating Inc.

**Solar Atmospheres (Fontana CA)**

**Solar Atmospheres (Hermitage PA)**

➔ **Solar Atmospheres (Souderton PA)**

**Solar Atmospheres (Greenville SC)**

The Sousa Corp.

Southwest Specialty Heat Treat

Specialty Heat Treat Inc.

Specialty Steel Treating Inc. (East Granby CT)

**Specialty Steel Treating Inc. (Fraser MI)**

Spectrum Thermal Processing LLC

Stack Metallurgical Services Inc.

Steel Treating Inc.

Sun Steel Treating Inc.

Temperature Processing Co. Inc. (Longmont CO)

Texas Heat Treating Inc. (Ft. Worth TX)

Texas Heat Treating Inc. (Round Rock TX)

Thermal Braze Inc.

Thermal-Vac Technology Inc.

THERMETCO Inc.

Thermex Metal Treating Ltd.

Thermo-Fusion Inc.

**ThermTech**

Treat All Metals

Tri-City Heat Treat Co.

Vac Aero International Inc. (Oakville ON)

Vac-Met Inc.

Vacu-Braze Inc.

Valley Metal Treating Inc.

Vira-Tech Inc.

**voestalpine Thermo-Tech**

Wyatt Services Inc.

### Isothermal

A & M Heat Treating Ltd.  
Advanced Heat Treat Corp. (Burton)  
Advanced Heat Treat Corp. (Midport)  
Advanced Heat Treating Solutions  
Aerobrazed Engineered Technologies  
**Akron Steel Treating Co.**  
All-Source Heat Treating Inc.  
Allied Heat Treat Ltd.  
American Heat Treating Inc.  
American Metal Treating Inc.  
American Steel Treating  
Atlantic Heat Treat  
Atmosphere Annealing LLC (North Vernon IN)  
Atmosphere Annealing LLC (Bassett)  
Atmosphere Annealing LLC (Mt. Hope)  
Atmosphere Annealing LLC (Canton OH)  
Bennett Heat Treating & Brazing Co. (Newark NJ)  
Bennett Heat Treating & Brazing Co. (Ivyland PA)



Blanchard Metal Processing  
 Bluewater Thermal Solutions, Chicago Plant 2  
 Bluewater Thermal Solutions (Rockford IL)  
 Bluewater Thermal Solutions (South Bend IN)  
 Bluewater Thermal Solutions (Benton Harbor MI)  
 Bluewater Thermal Solutions, Corporate  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Cincinnati Steel Treating Co.  
 City Steel Heat Treating Inc.  
 Controlled Thermal Technology  
 County Heat Treat  
**➔ Derrick Co. Inc.**  
**DIE-BOND LLC**  
 East Carolina Metal Treating Inc.  
 East-Lind Heat Treat Inc.  
 Euclid Heat Treating Co.  
 Exactatherm Ltd.  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
 Garner Heat Treat Inc.  
 General Surface Hardening Inc.  
 H & S Heat Treating  
**Hansen-Balk Steel Treating Co.**  
 Hardline Heat Treating Inc.  
 Hauck Heat Treatment Ltd.  
 Heat Treating Services  
 Heat Treatment Australia  
 Hercules Heat Treating  
 Hi-Tech Steel Treating Inc.  
 Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
 Hy-Vac Technologies Inc.  
 IMT York LLC  
 Intriplex Thermal Technologies  
 Jasco Heat Treating Inc.  
**Kowalski Heat Treating**  
 Lark Heat Treating Inc.  
 Lone Star Heat Treating Corp.  
 Med-Tek Inc.  
 Metal Finishing Co.  
 Metal Treaters Inc.  
 Metallurgical Solutions Inc.  
 Metals Technology Corp.  
 Metex Heat Treating Ltd.  
 Metlab  
**Midwest Thermal-Vac Inc.**  
 Missouri Heat Treat  
 Modern Industries Inc. (Erie PA)  
 Nevada Heat Treating Inc.  
 Nitro-Vac Heat Treat Inc.  
 Northeast Metals Technologies  
**Ohio Metallurgical Service**  
 P & L Heat Treating & Grinding Inc.  
 Pacific Heat Treating Co.  
 Pacific Metallurgical  
 Palmdale Heat Treating Inc.  
 Paulo (Kansas City MO)  
 Paulo (St. Louis MO)  
 Paulo (Willoughby OH)  
 Paulo (Murfreesboro TN)  
 Paulo (Nashville TN)  
 Paulo (Monterrey MX)  
 Peters' Heat Treating Inc. (McKean PA)  
 Phoenix Heat Treating Inc.  
 Pinson Valley Heat Treating  
 Precision Thermal Processing  
 Q-Tech Heat Treat LLC  
**Refrac Systems**  
 Robert Wooler Co.  
 Scarrott Metallurgical Co.  
 SCHMOLZ + BICKENBACH USA

Scientific Metal Treating  
 Service Heat Treating Inc.  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
**➔ Solar Atmospheres (Souderton PA)**  
 The Sousa Corp.  
 Specialty Heat Treat Inc.  
 Stack Metallurgical Services Inc.  
 Steel Treaters Inc.  
 Sun Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
 Temperature Processing Co. Inc. (Longmont CO)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal-Vac Technology Inc.  
 THERMETCO Inc.  
 Treat All Metals  
 Tri-City Heat Treat Co.  
 Trojan Heat Treat Inc.  
 Vac-Met Inc.  
 Vacu-Braze Inc.  
 Weiss Industries Inc.

### Local

A & M Heat Treating Ltd.  
 A & S Brazing Co.  
 Advanced Heat Treat Corp. (Burton)  
 Advanced Heat Treating Solutions  
 Aerobraz Engineering Technologies  
 Ajax TOCCO International Ltd.  
 Ajax TOCCO Magnethermic Corp. (Albertville AL)  
 Ajax TOCCO Magnethermic Corp. (Madison Heights MI)  
**➔ Ajax TOCCO Magnethermic Corp. (Warren OH)**  
 Ajax TOCCO Magnethermic Corp. (Wickliffe OH)  
 Ajax TOCCO Magnethermic Corp. (Ajax ON)  
 Ajax TOCCO Magnethermic Corp. (Mexico)  
**Akron Steel Treating Co.**  
 All-Source Heat Treating Inc.  
 Allied Heat Treat Ltd.  
 American Heat Treating Inc.  
 American Metal Treating Inc.  
 Atlantic Heat Treat  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Blanchard Metal Processing  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Byington Steel Treating Inc.  
 Byron Products Inc.  
 Cascade Metallurgical Inc.  
 Certified Heat Treating Inc. (Springfield OH)  
 City Steel Heat Treating Inc.  
 Coleman Commercial Heat Treating Inc.  
**Contour Hardening**  
 Cook Induction Heating Co.  
 County Heat Treat  
 Detroit Steel Treating Co.  
**DIE-BOND LLC**  
 Donohoo Steel Treating  
 East-Lind Heat Treat Inc.  
 Euclid Heat Treating Co.  
 Fire Kote Steel Treating  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
 Galaxy Brazing Co. Inc.  
 Garner Heat Treat Inc.  
 General Surface Hardening Inc.  
 Hardline Heat Treating Inc.  
 Hitech Heat Treatment Services Pte. Ltd.  
 Hudapack Metal Treating Inc. (Elkhorn WI)  
 IMT York LLC  
 Industrial Steel Treating Co.  
 Jasco Heat Treating Inc.  
**Kowalski Heat Treating**  
 Krankka Metallurgical LLC  
 Lone Star Heat Treating Corp.

Med-Tek Inc.  
 Metal Treaters Inc.  
 Metallurgical Solutions Inc.  
 Metals Engineering Inc. (DePere WI)  
 Metals Technology Corp.  
**Metcor Inc.**  
 Metex Heat Treating Ltd.  
 Metlab  
 Missouri Heat Treat  
 Modern Industries Inc. (Erie PA)  
 National Metal Processing Inc.  
 Nevada Heat Treating Inc.  
 Nitrex Inc., Chicago Operations  
 Nitrex Inc., Indiana Operations  
 Nitrex Inc., Michigan Operations  
 Nitrex Inc., Nevada Operations  
 Nitrex Metal Inc.  
 Nitrex Thermal Technology Co. Ltd.  
 Northeast Metals Technologies  
**Ohio Metallurgical Service**  
 Pacific Heat Treating Co.  
 Paulo (Kansas City MO)  
 Paulo (St. Louis MO)  
 Paulo (Murfreesboro TN)  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 R & R Heat Treating Inc.  
 Radyne Corp.  
**Refrac Systems**  
 Robert Wooler Co.  
 Rochester Steel Treating Works Inc.  
 Rockford Heat Treaters Inc.  
 Scientific Metal Treating  
 The Sousa Corp.  
 Steel Treaters Inc.  
 STT Nitrex Querétaro, S. De R.L. De C.V.  
 Superior Metal Treating & Equipment Inc.  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal Braze Inc.  
 Thermal-Vac Technology Inc.  
 Vacu-Braze Inc.  
 Valley Heat Treat Co.  
 Weiss Industries Inc.  
 Wyatt Services Inc.

### Flame/Induction

A & S Brazing Co.  
 Advanced Heat Treat Corp. (Burton)  
 Advanced Heat Treat Corp. (Midport)  
 Advanced Heat Treating Solutions  
 Ajax TOCCO International Ltd.  
 Ajax TOCCO Magnethermic Corp. (Albertville AL)  
 Ajax TOCCO Magnethermic Corp. (Madison Heights MI)  
**➔ Ajax TOCCO Magnethermic Corp. (Warren OH)**  
 Ajax TOCCO Magnethermic Corp. (Wickliffe OH)  
 Ajax TOCCO Magnethermic Corp. (Ajax ON)  
 Ajax TOCCO Magnethermic Corp. (Mexico)  
**Akron Steel Treating Co.**  
 All-Source Heat Treating Inc.  
 Allied Heat Treat Ltd.  
 Alloy Steel Treating Co. Inc.  
 American Heat Treating Inc.  
 American Metal Treating Co.  
 American Metal Treating Inc.  
 Atlantic Heat Treat  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Blanchard Metal Processing  
 Bluewater Thermal Solutions, Chicago Plant 1  
 Bluewater Thermal Solutions, Corporate  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Byron Products Inc.  
 Calumet Surface Hardening Co. Inc.

## CAPABILITIES LISTINGS - COMMERCIAL HEAT TREATERS DIRECTORY

Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
 Certified Heat Treating Inc. (Springfield OH)  
 Chicago Flame Hardening Co.  
 Cincinnati Steel Treating Co.  
 City Steel Heat Treating Inc.  
 Coleman Commercial Heat Treating Inc.  
 Coleman Heat Treating  
**Contour Hardening**  
 Cook Induction Heating Co.  
 County Heat Treat  
 Detroit Steel Treating Co.  
**DIE-BOND LLC**  
 Donohoo Steel Treating  
 East Carolina Metal Treating Inc.  
 East-Lind Heat Treat Inc.  
 ➔ **EFD Induction Inc.**  
 Elmira Heat Treating Inc.  
 Euclid Heat Treating Co.  
 Evans Heat Treating  
 Fire Kote Steel Treating  
 Flame Treating Systems Inc.  
**FPM HEAT TREATING (Elk Grove Village IL)**  
 Galaxy Brazing Co. Inc.  
 General Surface Hardening Inc.  
**Hansen-Balk Steel Treating Co.**  
 Hardline Heat Treating Inc.  
 Hi-Tech Steel Treating Inc.  
 Hitech Heat Treatment Services Pte. Ltd.  
 Hudapack Metal Treating Inc. (Elkhorn WI)  
 Hudapack Metal Treating Inc. (Franklin WI)  
 IMT York LLC  
 Induction Heat Treating Corp.  
 Induction Services Inc.  
 Inductoheat Inc.  
 Industrial Steel Treating Co.  
**International Thermal Systems**  
 Jasco Heat Treating Inc.  
 JF Heat Treating Inc.  
**Kowalski Heat Treating**  
 Krankka Metallurgical LLC  
 Lark Heat Treating Inc.  
 Lawrence Industries Inc.  
 Lone Star Heat Treating Corp.  
 Magnum Induction  
 Med-Tek Inc.  
 Metal Treaters Inc.  
 Metallurgical Solutions Inc.  
 Metals Engineering Inc. (DePere WI)  
**Metcor Inc.**  
 Metex Heat Treating Ltd.  
 Metlab  
**Midwest Thermal-Vac Inc.**  
 Missouri Heat Treat  
 Modern Industries Inc. (Erie PA)  
 Nitrex Inc., Chicago Operations  
 Nitrex Inc., Indiana Operations  
 Nitrex Inc., Michigan Operations  
 Nitrex Inc., Nevada Operations  
 Nitrex Metal Inc.  
 Nitrex Thermal Technology Co. Ltd.  
 Northeast Metals Technologies  
**Ohio Metallurgical Service**  
 Oregon Induction Corp.  
 Pacific Heat Treating Co.  
 Paulo (Kansas City MO)  
 Penna Flame Industries  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Pillar Induction  
**Power Parts International**  
 Precision Heat Treating Co.  
 Q-Tech Heat Treat LLC  
 R & R Heat Treating Inc.  
 Radyne Corp.  
**Refrac Systems**  
 Robert Wooler Co.  
 Rochester Steel Treating Works Inc.  
 Rockford Heat Treaters Inc.

Scientific Metal Treating  
 Seattle Heat Treaters, dba Stober & Chiaro  
 The Sousa Corp.  
 Steel Treaters Inc.  
 STT Nitrex Querétaro, S. De R.L. De C.V.  
 Superior Metal Treating & Equipment Inc.  
**Taylor-Winfield Technologies Inc.**  
 Temperature Processing Co. Inc. (Longmont CO)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal Braze Inc.  
 Thermal-Vac Technology Inc.  
 Thermet Inc.  
 Thermo-Fusion Inc.  
**ThermTech**  
 Tri-City Heat Treat Co.  
 Vacu-Braze Inc.  
 Wallwork Cambridge Ltd.  
**Winston Heat Treating Inc.**  
 Wyatt Services Inc.  
 Zion Industries Inc. (Grand Ledge MI)  
 Zion Industries Inc. (Hildebran NC)  
 Zion Industries Inc. (Valley City OH)

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**Normalize**


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A & M Heat Treating Ltd.  
 Aberfoyle Metal Treaters Ltd.  
 Accurate Steel Treating  
 Advanced Heat Treat Corp. (Burton)  
 Advanced Heat Treat Corp. (Midport)  
 Advanced Heat Treating Inc.  
 Advanced Heat Treating Solutions  
 Aerobraz Engineering Technologies  
 Ajax TOCCO Magnethermic Corp. (Albertville AL)  
 Ajax TOCCO Magnethermic Corp. (Madison Heights MI)  
**Akron Steel Treating Co.**  
 ALD Thermal Treating Inc.  
 ALD Vacuheat GmbH  
 All-Source Heat Treating Inc.  
 Allied Heat Treat Ltd.  
 Alloy Steel Treating Co. Inc.  
 American Heat Treating Inc.  
 American Metal Treating Inc.  
 American Steel Treating  
 Aremac Heat Treating East LLC, Southeast  
 Atlantic Heat Treat  
 Atmosphere Annealing LLC (North Vernon IN)  
 Atmosphere Annealing LLC (Bassett)  
 Atmosphere Annealing LLC (Mt. Hope)  
 Atmosphere Annealing LLC (Canton OH)  
 B & W Heat Treating Co. Inc.  
 Beechner Heat Treating Co. Inc.  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Blanchard Metal Processing  
 Bluewater Thermal Solutions, Chicago Plant 1  
 Bluewater Thermal Solutions, Chicago Plant 2  
 Bluewater Thermal Solutions (Rockford IL)  
 Bluewater Thermal Solutions (South Bend IN)  
 Bluewater Thermal Solutions (Benton Harbor MI)  
 Bluewater Thermal Solutions, Corporate  
 Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
 The Bowdil Co.  
 Braddock Metallurgical Aerospace Services  
 Braddock Metallurgical (Daytona FL)  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Byington Steel Treating Inc.  
 Byron Products Inc.  
 Cambridge Heat Treating  
 Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
 Certified Heat Treating  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Cincinnati Steel Treating Co.  
 Circle City Heat Treating Inc.  
 City Steel Heat Treating Inc.  
 CMC Impact Metals  
 Coleman Commercial Heat Treating Inc.  
 Coleman Heat Treating  
 Commercial Heat Treating Inc.  
 Commercial Steel Treating Corp.  
 Continental Heat Treating Inc.  
 Controlled Thermal Technology  
 County Heat Treat  
 CRIO SA de CV  
 Custom Heat Treat Inc.  
 Dayton Forging & Heat Treating  
 ➔ **Derrick Co. Inc.**  
 Detroit Steel Treating Co.  
 Diamond Heat Treat  
**DIE-BOND LLC**  
 Donohoo Steel Treating  
 East Carolina Metal Treating Inc.  
 East-Lind Heat Treat Inc.  
 Elmira Heat Treating Inc.  
 Engineered Heat Treat Inc.  
 Erie Steel Ltd.  
 Euclid Heat Treating Co.  
 Evans Heat Treating  
 Exactatherm Ltd.  
 Exotic Metal Treating Inc.  
 Fire Kote Steel Treating  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
**FPM HEAT TREATING (Milwaukee WI)**  
 Galaxy Brazing Co. Inc.  
 Garner Heat Treat Inc.  
 General Metal Heat Treating Inc.  
 General Surface Hardening Inc.  
 Great Lakes Metal Treating Inc.  
 H & S Heat Treating  
**Hansen-Balk Steel Treating Co.**  
 Harchris Heat Treatment (Pty.) Ltd.  
 Hardline Heat Treating Inc.  
 Hauck Heat Treatment Ltd.  
 Heat Treating Engineers Inc.  
 Heat Treating Services  
 Heat Treating Technologies Inc.  
 Heat Treatment Australia  
 Hercules Heat Treating  
 Hi Tech Heat Treating Ltd.  
 Hi-Tech Steel Treating Inc.  
 HI TecMetal Group, HI Tech Aero  
 HI TecMetal Group, Nettleton Steel Treating (NST)  
 High Performance Heat Treating Inc.  
 Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
 Hudapack Metal Treating of Illinois Inc.  
 Hudapack Metal Treating Inc. (Elkhorn WI)  
 Hudapack Metal Treating Inc. (Franklin WI)  
 Hy-Vac Technologies Inc.  
 IMT York LLC  
 Industrial Heat Treating Ltd.  
 Industrial Steel Treating Co.  
 Inland NW Metallurgical Services Inc.  
 Intriplex Thermal Technologies  
 Jasco Heat Treating Inc.  
 JF Heat Treating Inc.  
 K & D Heat Treat Inc.  
 Katy Heat Treat LLC  
**Kowalski Heat Treating**  
 Krankka Metallurgical LLC  
 Lake City Heat Treating  
 Lark Heat Treating Inc.  
 Lawrence Industries Inc.  
 Lone Star Heat Treating Corp.  
 LST Heat Treating LLC  
 Magnum Metal Treating  
 Med-Tek Inc.  
 Metal Finishing Co.  
 Metal Treaters Inc.  
 Metallurgical Processing Inc. (CT)  
 Metallurgical Solutions Inc.



Metals Engineering Inc. (DePere WI)  
 Metals Engineering Inc. (Green Bay WI)  
 Metals Technology Corp.  
**Metcor Inc.**  
 Metex Heat Treating Ltd.  
 Metlab  
 Mid South Metallurgical  
**Midwest Thermal-Vac Inc.**  
 Missouri Heat Treat  
 Modern Heat Treat Inc.  
 Modern Industries Inc. (Erie PA)  
 Modern Industries Inc. (Kersey PA)  
 Modern Metal Processing Inc.  
 MT Heat Treating Inc.  
 National Heat Treat  
 National Metal Processing Inc.  
 Nevada Heat Treating Inc.  
 Nitrex Inc., Chicago Operations  
 Nitrex Inc., Indiana Operations  
 Nitrex Inc., Michigan Operations  
 Nitrex Inc., Nevada Operations  
 Nitrex Metal Inc.  
 Nitrex Thermal Technology Co. Ltd.  
 Nitro-Vac Heat Treat Inc.  
 Northeast Metals Technologies  
**Ohio Metallurgical Service**  
 Ohio Vertical Heat Treat  
 Oregon Induction Corp.  
 P & L Heat Treating & Grinding Inc.  
 Pacific Heat Treating Co.  
 Pacific Metallurgical  
 Palmdale Heat Treating Inc.  
 Paulo (Kansas City MO)  
 Paulo (St. Louis MO)  
 Paulo (Willoughby OH)  
 Paulo (Murfreesboro TN)  
 Paulo (Nashville TN)  
 Paulo (Monterrey MX)  
 Permian Heat Treaters  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Phoenix Heat Treating Inc.  
 Pinson Valley Heat Treating  
 Plymouth Brazing Inc.  
**Power Parts International**  
 Precision Heat Treating Corp. (Ft. Wayne IN)  
 Precision Heat Treating Corp. (Jackson MS)  
 Precision Heat Treating Inc.  
 Precision Thermal Processing  
 Q-Tech Heat Treat LLC  
 Quality Heat Treating Inc.  
 Quality Steel Treating LLC  
 Queen City Steel Treating  
 Radyne Corp.  
**Refrac Systems**  
 Republic Heat Treat  
 Rex Heat Treat (Bedford PA)  
 Rex Heat Treat (Lansdale PA)  
 Robert Wooler Co.  
 Rochester Steel Treating Works Inc.  
 Rockford Heat Treaters Inc.  
 Scarrott Metallurgical Co.  
 SCHMOLZ + BICKENBACH USA  
 Scientific Metal Treating  
 Seattle Heat Treaters, dba Stober & Chiaro  
 SEI Heat Treat  
 Service Heat Treating Inc.  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
**➔ Solar Atmospheres (Souderton PA)**  
 The Sousa Corp.  
 Southwest Metal Treating Corp.  
 Southwest Specialty Heat Treat  
 Specialty Heat Treat Inc.  
 Specialty Steel Treating Inc. (East Granby CT)  
 Specialty Steel Treating Inc. (Farmington Hills MI)  
**Specialty Steel Treating Inc. (Fraser MI)**  
 Spectrum Thermal Processing LLC  
 Stack Metallurgical Services Inc.

Steel Treaters Inc.  
 Stokes Steel Treating Co.  
 STT Nitrex Querétaro, S. De R.L. De C.V.  
 Sturm Steel Treating Inc.  
 Sun Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
 Tamayakin Co. Ltd.  
 TC Industries Inc.  
 Temperature Processing Co. Inc. (Longmont CO)  
 Temperature Processing Co. Inc. (North Arlington NJ)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal Metal Treating Inc.  
 Thermal Modification Technologies  
 Thermal One Inc.  
 Thermal Specialties  
 Thermal Specialties of Texas LLC  
 Thermal-Vac Technology Inc.  
 THERMETCO Inc.  
 Thermex Metal Treating Ltd.  
 Thermo-Fusion Inc.  
**ThermTech**  
 Treat All Metals  
 Tri-City Heat Treat Co.  
 Trojan Heat Treat Inc.  
 Vac Aero International Inc. (Oakville ON)  
 Vac Aero International Inc. (St. Laurent QC)  
 Vac-Met Inc.  
 Vacu-Braze Inc.  
 Valley Heat Treat Co.  
 Valley Metal Treating Inc.  
 Vira-Tech Inc.  
**voestalpine Thermo-Tech**  
 Wallwork Cambridge Ltd.  
 Weiss Industries Inc.  
**Winston Heat Treating Inc.**  
 Wyatt Services Inc.

### Recrystallize

A & M Heat Treating Ltd.  
 Advanced Heat Treat Corp. (Burton)  
 Advanced Heat Treat Corp. (Midport)  
 Advanced Heat Treating Solutions  
 Aerobraz Engineering Technologies  
**Akron Steel Treating Co.**  
 Allied Heat Treat Ltd.  
 American Heat Treating Inc.  
 American Metal Treating Inc.  
 Atlantic Heat Treat  
 Atmosphere Annealing LLC (North Vernon IN)  
 Atmosphere Annealing LLC (Bassett)  
 Atmosphere Annealing LLC (Mt. Hope)  
 Atmosphere Annealing LLC (Canton OH)  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Blanchard Metal Processing  
 Bluewater Thermal Solutions, Chicago Plant 2  
 Bluewater Thermal Solutions (Rockford IL)  
 Bluewater Thermal Solutions, Corporate  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Certified Heat Treating Inc. (Springfield OH)  
 City Steel Heat Treating Inc.  
 Controlled Thermal Technology  
 Detroit Steel Treating Co.  
**DIE-BOND LLC**  
 East Carolina Metal Treating Inc.  
 Euclid Heat Treating Co.  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
 H & S Heat Treating  
 Hercules Heat Treating  
 Hitech Heat Treatment Services Pte. Ltd.  
 Hy-Vac Technologies Inc.  
 Intriplex Thermal Technologies  
**Kowalski Heat Treating**

Krankka Metallurgical LLC  
 Lark Heat Treating Inc.  
 Med-Tek Inc.  
 Metal Treaters Inc.  
 Metallurgical Solutions Inc.  
 Metals Technology Corp.  
**Metcor Inc.**  
 Metlab  
**Midwest Thermal-Vac Inc.**  
 Modern Industries Inc. (Erie PA)  
 Nevada Heat Treating Inc.  
 Northeast Metals Technologies  
 Pacific Heat Treating Co.  
 Pacific Metallurgical  
 Paulo (Kansas City MO)  
 Paulo (St. Louis MO)  
 Paulo (Willoughby OH)  
 Paulo (Murfreesboro TN)  
 Paulo (Nashville TN)  
 Paulo (Monterrey MX)  
 Phoenix Heat Treating Inc.  
 Pinson Valley Heat Treating  
 Precision Thermal Processing  
 Radyne Corp.  
**Refrac Systems**  
 Robert Wooler Co.  
 Scarrott Metallurgical Co.  
 SCHMOLZ + BICKENBACH USA  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
**➔ Solar Atmospheres (Souderton PA)**  
 The Sousa Corp.  
 Specialty Heat Treat Inc.  
 Stack Metallurgical Services Inc.  
 Sun Steel Treating Inc.  
 Temperature Processing Co. Inc. (Longmont CO)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal-Vac Technology Inc.  
 THERMETCO Inc.  
 Vac-Met Inc.

### Spheriodize

A & M Heat Treating Ltd.  
 Aberfoyle Metal Treaters Ltd.  
 Advanced Heat Treat Corp. (Burton)  
 Advanced Heat Treat Corp. (Midport)  
 Advanced Heat Treating Solutions  
**Akron Steel Treating Co.**  
 ALD Thermal Treatment Inc.  
 ALD Vacuheat GmbH  
 All-Source Heat Treating Inc.  
 Allied Heat Treat Ltd.  
 American Heat Treating Inc.  
 American Metal Treating Inc.  
 American Steel Treating  
 Atlantic Heat Treat  
 Atmosphere Annealing LLC (Bassett)  
 Atmosphere Annealing LLC (Canton OH)  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Blanchard Metal Processing  
 Bluewater Thermal Solutions (Rockford IL)  
 Bluewater Thermal Solutions, Corporate  
 Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Byington Steel Treating Inc.  
**Century Sun Metal Treating**  
 Certified Heat Treating  
 Certified Heat Treating Inc. (Springfield OH)  
 Cincinnati Steel Treating Co.  
 Circle City Heat Treating Inc.  
 City Steel Heat Treating Inc.  
 Coleman Heat Treating  
 Continental Heat Treating Inc.

## CAPABILITIES LISTINGS - COMMERCIAL HEAT TREATERS DIRECTORY

Controlled Thermal Technology  
County Heat Treat  
Dayton Forging & Heat Treating  
➔ **Derrick Co. Inc.**  
Detroit Steel Treating Co.  
**DIE-BOND LLC**  
East Carolina Metal Treating Inc.  
Euclid Heat Treating Co.  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
Garner Heat Treat Inc.  
H & S Heat Treating  
**Hansen-Balk Steel Treating Co.**  
Harchris Heat Treatment (Pty.) Ltd.  
Hardline Heat Treating Inc.  
Hauck Heat Treatment Ltd.  
Heat Treating Services  
Hercules Heat Treating  
Hi-Tech Steel Treating Inc.  
HI TecMetal Group, HI Tech Aero  
HI TecMetal Group, Nettleton Steel Treating (NST)  
High Performance Heat Treating Inc.  
Hitech Heat Treatment Services Pte. Ltd.  
Hudapack Metal Treating Inc. (Elkhorn WI)  
Hy-Vac Technologies Inc.  
IMT York LLC  
Inland NW Metallurgical Services Inc.  
Jasco Heat Treating Inc.  
K & D Heat Treat Inc.  
**Kowalski Heat Treating**  
Lark Heat Treating Inc.  
Lone Star Heat Treating Corp.  
LST Heat Treating LLC  
Med-Tek Inc.  
Metal Finishing Co.  
Metal Treaters Inc.  
Metallurgical Solutions Inc.  
Metals Engineering Inc. (DePere WI)  
Metals Engineering Inc. (Green Bay WI)  
Metals Technology Corp.  
**Metcor Inc.**  
Metlab  
Mid South Metallurgical  
**Midwest Thermal-Vac Inc.**  
Missouri Heat Treat  
Modern Industries Inc. (Erie PA)  
Nevada Heat Treating Inc.  
Nitrex Inc., Chicago Operations  
Nitrex Inc., Indiana Operations  
Nitrex Inc., Michigan Operations  
Nitrex Inc., Nevada Operations  
Nitrex Metal Inc.  
Nitrex Thermal Technology Co. Ltd.  
Nitro-Vac Heat Treat Inc.  
Northeast Metals Technologies  
Pacific Heat Treating Co.  
Pacific Metallurgical  
Paulo (Kansas City MO)  
Paulo (St. Louis MO)  
Paulo (Willoughby OH)  
Paulo (Murfreesboro TN)  
Paulo (Nashville TN)  
Paulo (Monterrey MX)  
Permian Heat Treaters  
Phoenix Heat Treating Inc.  
Pinson Valley Heat Treating  
Precision Thermal Processing  
Q-Tech Heat Treat LLC  
Quality Heat Treating Inc.  
Queen City Steel Treating  
R & R Heat Treating Inc.  
**Refrac Systems**  
Robert Wooler Co.  
Rochester Steel Treating Works Inc.  
Rockford Heat Treaters Inc.  
SCHMOLZ + BICKENBACH USA  
Scientific Metal Treating  
Seattle Heat Treaters, dba Stober & Chiaro  
Service Heat Treating Inc.  
**Solar Atmospheres (Fontana CA)**

**Solar Atmospheres (Hermitage PA)**  
➔ **Solar Atmospheres (Souderton PA)**  
**Solar Atmospheres (Greenville SC)**  
Southwest Metal Treating Corp.  
Southwest Specialty Heat Treat  
Specialty Heat Treat Inc.  
Specialty Steel Treating Inc. (East Granby CT)  
**Specialty Steel Treating Inc. (Fraser MI)**  
Spectrum Thermal Processing LLC  
Stack Metallurgical Services Inc.  
Steel Treaters Inc.  
STT Nitrex Querétaro, S. De R.L. De C.V.  
Sun Steel Treating Inc.  
Superior Metal Treating & Equipment Inc.  
Temperature Processing Co. Inc. (Longmont CO)  
Temperature Processing Co. Inc. (North Arlington NJ)  
Texas Heat Treating Inc. (Ft. Worth TX)  
Texas Heat Treating Inc. (Round Rock TX)  
Thermal Specialties  
Thermal Specialties of Texas LLC  
Thermal-Vac Technology Inc.  
THERMETCO Inc.  
Thermex Metal Treating Ltd.  
**ThermTech**  
Treat All Metals  
Trojan Heat Treat Inc.  
Vac Aero International Inc. (Oakville ON)  
Vac-Met Inc.  
Vacu-Braze Inc.  
Valley Metal Treating Inc.  
Wyatt Services Inc.

## Solution (Quench)

A & M Heat Treating Ltd.  
Aberfoyle Metal Treaters Ltd.  
Accurate Steel Treating  
Advanced Heat Treating Inc.  
Advanced Heat Treating Solutions  
Ajax TOCCO Magnethermic Corp. (Albertville AL)  
Ajax TOCCO Magnethermic Corp. (Madison Heights MI)  
➔ **Ajax TOCCO Magnethermic Corp. (Warren OH)**  
Ajax TOCCO Magnethermic Corp. (Wickliffe OH)  
Ajax TOCCO Magnethermic Corp. (Ajax ON)  
Ajax TOCCO Magnethermic Corp. (Mexico)  
**Akron Steel Treating Co.**  
ALD Thermal Treatment Inc.  
Al-Fe Heat Treating (Premier Thermal Co.)  
All-Source Heat Treating Inc.  
Allied Heat Treat Ltd.  
American Heat Treating  
American Heat Treating Inc.  
American Metal Treating Inc.  
American Steel Treating  
Aremac Heat Treating East LLC, Southeast  
Atlantic Heat Treat  
BeeHive Heat Treating Service Inc.  
Bennett Heat Treating & Brazing Co. (Newark NJ)  
Bennett Heat Treating & Brazing Co. (Ivyland PA)  
Blanchard Metal Processing  
Bluewater Thermal Solutions (Rockford IL)  
Bluewater Thermal Solutions (South Bend IN)  
Bluewater Thermal Solutions, Corporate  
**Bodycote (ALL LOCATIONS)**  
Braddock Metallurgical Aerospace Services  
Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Tampa FL)  
Braddock Metallurgical (Atlanta GA)  
Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
Braddock Metallurgical, Caribe Metallurgical  
Byington Steel Treating Inc.  
Byron Products Inc.  
Cambridge Heat Treating  
Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
Certified Heat Treating  
**Certified Metal Craft Inc.**  
Cincinnati Flame Hardening Co.  
Cincinnati Steel Treating Co.  
Circle City Heat Treating Inc.

City Steel Heat Treating Inc.  
Coleman Heat Treating  
Continental Heat Treating Inc.  
Controlled Thermal Technology  
County Heat Treat  
Dayton Forging & Heat Treating  
➔ **Derrick Co. Inc.**  
Detroit Steel Treating Co.  
**DIE-BOND LLC**  
East Carolina Metal Treating Inc.  
East-Lind Heat Treat Inc.  
Elmira Heat Treating Inc.  
Engineered Heat Treat Inc.  
Erie Steel Ltd.  
Euclid Heat Treating Co.  
Exactatherm Ltd.  
Exotic Metal Treating Inc.  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
Galaxy Brazing Co. Inc.  
Garner Heat Treat Inc.  
General Metal Heat Treating Inc.  
General Surface Hardening Inc.  
H & S Heat Treating  
**Hansen-Balk Steel Treating Co.**  
Harchris Heat Treatment (Pty.) Ltd.  
Hardline Heat Treating Inc.  
Hauck Heat Treatment Ltd.  
Heat Treating Engineers Inc.  
Heat Treatment Australia  
Hercules Heat Treating  
Hi Tech Heat Treating Ltd.  
Hi-Tech Steel Treating Inc.  
HI TecMetal Group, HI Tech Aero  
HI TecMetal Group, Nettleton Steel Treating (NST)  
High Performance Heat Treating Inc.  
Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
Hudapack Metal Treating of Illinois Inc.  
Hudapack Metal Treating Inc. (Elkhorn WI)  
Hudapack Metal Treating Inc. (Franklin WI)  
Hy-Vac Technologies Inc.  
IMT Duncan LLC  
IMT York LLC  
Inland NW Metallurgical Services Inc.  
**International Thermal Systems**  
Intrixplex Thermal Technologies  
Jasco Heat Treating Inc.  
K & D Heat Treat Inc.  
Katy Heat Treat LLC  
**Kowalski Heat Treating**  
Krankka Metallurgical LLC  
L&M Heat Treating  
Lake City Heat Treating  
Lark Heat Treating Inc.  
Lawrence Industries Inc.  
Lone Star Heat Treating Corp.  
LST Heat Treating LLC  
Magnum Metal Treating  
Med-Tek Inc.  
Metal Finishing Co.  
Metal Treaters Inc.  
Metallurgical Processing Inc. (CT)  
Metallurgical Solutions Inc.  
Metals Technology Corp.  
**Metcor Inc.**  
Metlab  
Mid South Metallurgical  
**Midwest Thermal-Vac Inc.**  
Missouri Heat Treat  
Modern Heat Treat Inc.  
Modern Industries Inc. (Erie PA)  
Modern Metal Processing Inc.  
National Heat Treat  
Nevada Heat Treating Inc.  
Nitrex Inc., Chicago Operations  
Nitrex Inc., Indiana Operations  
Nitrex Inc., Michigan Operations  
Nitrex Inc., Nevada Operations  
Nitrex Metal Inc.  
Nitrex Thermal Technology Co. Ltd.  
Nitro-Vac Heat Treat Inc.



Northeast Metals Technologies  
**Ohio Metallurgical Service**  
 P & L Heat Treating & Grinding Inc.  
 Pacific Heat Treating Co.  
 Pacific Metallurgical  
 Palmdale Heat Treating Inc.  
 Paulo (Kansas City MO)  
 Paulo (St. Louis MO)  
 Paulo (Willoughby OH)  
 Paulo (Murfreesboro TN)  
 Paulo (Nashville TN)  
 Permian Heat Treaters  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Phoenix Heat Treating Inc.  
 Pinson Valley Heat Treating  
 Precision Heat Treating Corp. (Jackson MS)  
 Precision Thermal Processing  
 Q-Tech Heat Treat LLC  
 Quality Heat Treating Inc.  
 R & R Heat Treating Inc.  
 Radyne Corp.  
**Refrac Systems**  
 Republic Heat Treat  
 Robert Wooler Co.  
 Rochester Steel Treating Works Inc.  
 Rockford Heat Treaters Inc.  
 Scarrott Metallurgical Co.  
 SCHMOLZ + BICKENBACH USA  
 Scientific Metal Treating  
 Seattle Heat Treaters, dba Stober & Chiaro  
 SEI Heat Treat  
 Service Heat Treating Inc.  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
**→ Solar Atmospheres (Souderton PA)**  
**Solar Atmospheres (Greenville SC)**  
 The Sousa Corp.  
 Southwest Metal Treating Corp.  
 Southwest Specialty Heat Treat  
 Specialty Heat Treat Inc.  
 Specialty Steel Treating Inc. (East Granby CT)  
 Spectrum Thermal Processing LLC  
 Stack Metallurgical Services Inc.  
 Steel Treaters Inc.  
 STT Nitrex Querétaro, S. De R.L. De C.V.  
 Sun Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
**Taylor-Winfield Technologies Inc.**  
 Temperature Processing Co. Inc. (Longmont CO)  
 Temperature Processing Co. Inc. (North Arlington NJ)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal Braze Inc.  
 Thermal Modification Technologies  
 Thermal One Inc.  
 Thermal Specialties  
 Thermal Specialties of Texas LLC  
 Thermal-Vac Technology Inc.  
 THERMETCO Inc.  
 Thermex Metal Treating Ltd.  
 Thermo-Fusion Inc.  
**ThermTech**  
 Tratamientos Termicos Nitrogen S.A.  
 Treat All Metals  
 Tri-City Heat Treat Co.  
 Vac Aero International Inc. (Oakville ON)  
 Vac Aero International Inc. (St. Laurent QC)  
 Vac-Met Inc.  
 Vacu-Braze Inc.  
 Valley Heat Treat Co.  
 Valley Metal Treating Inc.  
 Vira-Tech Inc.  
**voestalpine Thermo-Tech**  
 Wallwork Cambridge Ltd.

### Stress Relief

A & M Heat Treating Ltd.  
 A & S Brazing Co.  
 Aberfoyle Metal Treaters Ltd.

Acadiana Testing & Heating  
 Accurate Steel Treating  
 Advanced Heat Treat Corp. (Cullman AL)  
 Advanced Heat Treat Corp. (Burton)  
 Advanced Heat Treat Corp. (Midport)  
 Advanced Heat Treat Corp. (Monroe MI)  
 Advanced Heat Treating Inc.  
 Advanced Heat Treating Solutions  
 Aerobraz Engineering Technologies  
 Ajax TOCCO Magnethermic Corp. (Albertville AL)  
 Ajax TOCCO Magnethermic Corp. (Madison Heights MI)  
**→ Ajax TOCCO Magnethermic Corp. (Warren OH)**  
 Ajax TOCCO Magnethermic Corp. (Wickliffe OH)  
 Ajax TOCCO Magnethermic Corp. (Ajax ON)  
 Ajax TOCCO Magnethermic Corp. (Mexico)  
**Akron Steel Treating Co.**  
 ALD Thermal Treatment Inc.  
 ALD Vacuheat GmbH  
 Al-Fe Heat Treating (Premier Thermal Co.)  
 All-Source Heat Treating Inc.  
 Allied Heat Treat Ltd.  
 Alloy Steel Treating Co. Inc.  
 American Heat Treating  
 American Heat Treating Inc.  
 American Metal Treating Inc.  
 American Steel Treating  
 Anderson Specialty Co.  
 Applied Thermal Technologies Inc.  
 Aremac Heat Treating East LLC, Southeast  
 Arrow Tank & Engineering Co.  
 Atlantic Heat Treat  
 Atmosphere Annealing LLC (Bassett)  
 Atmosphere Annealing LLC (Mt. Hope)  
 Atmosphere Annealing LLC (Canton OH)  
 Austenit S.A.  
 B & W Heat Treating Co. Inc.  
 Beechner Heat Treating Co. Inc.  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Blanchard Metal Processing  
 Bluewater Thermal Solutions, Chicago Plant 3  
 Bluewater Thermal Solutions, Chicago Plant 1  
 Bluewater Thermal Solutions, Chicago Plant 2  
 Bluewater Thermal Solutions (South Bend IN)  
 Bluewater Thermal Solutions (Benton Harbor MI)  
 Bluewater Thermal Solutions (Coldwater MI)  
 Bluewater Thermal Solutions (St. Marys PA)  
 Bluewater Thermal Solutions, Corporate  
 Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
**B O S Services Co.**  
 The Bowdill Co.  
 Braddock Metallurgical Aerospace Services  
 Braddock Metallurgical (Daytona FL)  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
 Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Byington Steel Treating Inc.  
 Byron Products Inc.  
 California Brazing  
 Cambridge Heat Treating  
 Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
 Certified Heat Treating  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Chicago Flame Hardening Co.  
 Cincinnati Flame Hardening Co.  
 Cincinnati Steel Treating Co.  
 Circle City Heat Treating Inc.  
 City Steel Heat Treating Inc.  
 CMC Impact Metals  
 Coleman Commercial Heat Treating Inc.  
 Coleman Heat Treating  
 Commercial Heat Treating Inc.  
 Commercial Steel Treating Corp.

Continental Heat Treating Inc.  
 Controlled Thermal Technology  
 County Heat Treat  
 CRIO SA de CV  
 Dayton Forging & Heat Treating  
 Dependable Metal Treating Inc.  
**→ Derrick Co. Inc.**  
 Detroit Steel Treating Co.  
 Diamond Heat Treat  
**DIE-BOND LLC**  
 Donohoo Steel Treating  
 East Carolina Metal Treating Inc.  
**Eastern Metal Treating Inc.**  
 East-Lind Heat Treat Inc.  
 Elmira Heat Treating Inc.  
 Engineered Heat Treat Inc.  
 Erie Steel Ltd.  
 Euclid Heat Treating Co.  
 Exactatherm Ltd.  
 Exotic Metal Treating Inc.  
 Fire Kote Steel Treating  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Cherry Valley IL)**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
**FPM HEAT TREATING (Milwaukee WI)**  
 Galaxy Brazing Co. Inc.  
 Garner Heat Treat Inc.  
 General Metal Heat Treating Inc.  
 General Surface Hardening Inc.  
 Great Lakes Metal Treating Inc.  
 H & S Heat Treating  
**Hansen-Balk Steel Treating Co.**  
 Harchris Heat Treatment (Pty.) Ltd.  
 Hardline Heat Treating Inc.  
 Hauck Heat Treatment Ltd.  
 Heat Treating Engineers Inc.  
 Heat Treating Services  
 Heat Treating Technologies Inc.  
 Heat Treatment Australia  
 Heat Treatments Ltd.  
 Hercules Heat Treating  
 Hi Tech Heat Treating Ltd.  
 Hi-Tech Steel Treating Inc.  
 HI TecMetal Group, Brazing & Metal Treating (BMT)  
 HI TecMetal Group, HI Tech Aero  
 HI TecMetal Group, Nettleton Steel Treating (NST)  
 High Performance Heat Treating Inc.  
 Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
 Hudapack Metal Treating of Illinois Inc.  
 Hudapack Metal Treating Inc. (Elkhorn WI)  
 Hudapack Metal Treating Inc. (Franklin WI)  
 Hy-Vac Technologies Inc.  
 IMT Duncan LLC  
 Inductoheat Inc.  
 Industrial Heat Treating Ltd.  
 Industrial Steel Treating Co.  
 Inland NW Metallurgical Services Inc.  
**International Thermal Systems**  
 Intriplex Thermal Technologies  
 Jasco Heat Treating Inc.  
 JF Heat Treating Inc.  
 K & D Heat Treat Inc.  
 Katy Heat Treat LLC  
**Kowalski Heat Treating**  
 Krankka Metallurgical LLC  
 L&M Heat Treating  
 Lake City Heat Treating  
 Lark Heat Treating Inc.  
 Lawrence Industries Inc.  
 Lone Star Heat Treating Corp.  
 LST Heat Treating LLC  
 Magnum Metal Treating  
 Med-Tek Inc.  
 Metal Finishing Co.  
 Metal Treaters Inc.  
 Metallurgical Processing Inc. (CT)  
 Metallurgical Solutions Inc.  
 Metals Engineering Inc. (DePere WI)  
 Metals Engineering Inc. (Green Bay WI)

## CAPABILITIES LISTINGS - COMMERCIAL HEAT TREATERS DIRECTORY

Metals Technology Corp.  
**Metcor Inc.**  
 Metex Heat Treating Ltd.  
 Metlab  
 Mid South Metallurgical  
**Midwest Thermal-Vac Inc.**  
 Missouri Heat Treat  
 Modern Heat Treat Inc.  
 Modern Industries Inc. (Erie PA)  
 Modern Industries Inc. (Kersey PA)  
 Modern Metal Processing Inc.  
 National Heat Treat  
 National Metal Processing Inc.  
 Nevada Heat Treating Inc.  
 Nitrex Inc., Chicago Operations  
 Nitrex Inc., Indiana Operations  
 Nitrex Inc., Michigan Operations  
 Nitrex Inc., Nevada Operations  
 Nitrex Metal Inc.  
 Nitrex Thermal Technology Co. Ltd.  
 Nitro-Vac Heat Treat Inc.  
 Northeast Metals Technologies  
**Ohio Metallurgical Service**  
 Ohio Vertical Heat Treat  
 Oregon Induction Corp.  
 P & L Heat Treating & Grinding Inc.  
 Pacific Heat Treating Co.  
 Pacific Metallurgical  
 Palmdale Heat Treating Inc.  
 Paulo (Kansas City MO)  
 Paulo (St. Louis MO)  
 Paulo (Willoughby OH)  
 Paulo (Murfreesboro TN)  
 Paulo (Nashville TN)  
 Paulo (Monterrey MX)  
 Penna Flame Industries  
 Permian Heat Treaters  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Phoenix Heat Treating Inc.  
 Pinson Valley Heat Treating  
 Plymouth Brazing Inc.  
**Power Parts International**  
 Precision Heat Treating Co.  
 Precision Heat Treating Corp. (Ft. Wayne IN)  
 Precision Heat Treating Corp. (Jackson MS)  
 Precision Heat Treating Inc.  
 Precision Thermal Processing  
 Q-Tech Heat Treat LLC  
 Quality Heat Treating Inc.  
 Quality Steel Treating LLC  
 Queen City Steel Treating  
 R & R Heat Treating Inc.  
 Radyne Corp.  
**Refrac Systems**  
 Republic Heat Treat  
 Rex Heat Treat (Bedford PA)  
 Robert Wooler Co.  
 Rochester Steel Treating Works Inc.  
 Rockford Heat Treaters Inc.

Scarrott Metallurgical Co.  
 SCHMOLZ + BICKENBACH USA  
 Scientific Metal Treating  
 Seattle Heat Treaters, dba Stober & Chiaro  
 SEI Heat Treat  
 Service Heat Treating Inc.  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
**→ Solar Atmospheres (Souderton PA)**  
**Solar Atmospheres (Greenville SC)**  
 The Sousa Corp.  
 Southwest Metal Treating Corp.  
 Southwest Specialty Heat Treat  
 Specialty Heat Treat Inc.  
 Specialty Steel Treating Inc. (East Granby CT)  
 Specialty Steel Treating Inc. (Farmington Hills MI)  
**Specialty Steel Treating Inc. (Fraser MI)**  
 Spectrum Thermal Processing LLC  
 Stack Metallurgical Services Inc.  
 Steel Treaters Inc.  
 STT Nitrex Querétaro, S. De R.L. De C.V.  
 Sturm Steel Treating Inc.  
 Sun Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
 Tamayakin Co. Ltd.  
**Taylor-Winfield Technologies Inc.**  
 TC Industries Inc.  
 Temperature Processing Co. Inc. (Longmont CO)  
 Temperature Processing Co. Inc. (North Arlington NJ)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal Braze Inc.  
 Thermal Metal Treating Inc.  
 Thermal Modification Technologies  
 Thermal One Inc.  
 Thermal Specialties  
 Thermal Specialties of Texas LLC  
 Thermal-Vac Technology Inc.  
 THERMETCO Inc.  
 Thermex Metal Treating Ltd.  
 Thermo-Fusion Inc.  
**ThermTech**  
 Tooling and General Heat Treatment  
 Tratamientos Termicos Nitrogas S.A.  
 Treat All Metals  
 Tri-City Heat Treat Co.  
 Trojan Heat Treat Inc.  
 Vac Aero International Inc. (Oakville ON)  
 Vac Aero International Inc. (St. Laurent QC)  
 Vac-Met Inc.  
 Vacu-Braze Inc.  
 Valley Heat Treat Co.  
 Valley Metal Treating Inc.  
 Vira-Tech Inc.  
 Virginia Metal Treating, East Carolina Metal Treating  
**voestalpine Thermo-Tech**  
 Wallwork Cambridge Ltd.  
 Weiss Industries Inc.  
**Winston Heat Treating Inc.**  
 Wyatt Services Inc.  
 Z-Machine Inc.

## BRAZING

## Dip

**International Thermal Systems**  
 Thermal-Vac Technology Inc.

## Furnace

Aerobraze Engineered Technologies  
 Allied Heat Treat Ltd.  
 Atlantic Heat Treat  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Bluewater Thermal Solutions, Chicago Plant 2  
 Bluewater Thermal Solutions (Coldwater MI)  
 Bluewater Thermal Solutions, Corporate  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical Aerospace Services  
 Braddock Metallurgical (Atlanta GA)  
 Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Brazetek Heat Exchangers  
 Byron Products Inc.  
 California Brazing  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Coleman Heat Treating  
 Cook Induction Heating Co.  
**DIE-BOND LLC**  
 Elmira Heat Treating Inc.  
 Evans Heat Treating  
 Exotic Metal Treating Inc.  
**Flame Metals Processing Corp.**  
 Galaxy Brazing Co. Inc.  
 Hardline Heat Treating Inc.  
 HI TecMetal Group, Brazing & Metal Treating (BMT)  
 HI TecMetal Group, Brite Brazing  
 HI TecMetal Group, HI Tech Aero  
 Hitech Heat Treatment Services Pte. Ltd.  
 Hy-Vac Technologies Inc.  
 Industrial Heat Treating Ltd.  
**International Thermal Systems**  
 Intriplex Thermal Technologies  
 Krankka Metallurgical LLC  
 Lark Heat Treating Inc.  
 Lone Star Heat Treating Corp.  
 Metallurgical Processing Inc. (CT)  
**Metcor Inc.**  
 Metex Heat Treating Ltd.  
**Midwest Thermal-Vac Inc.**  
 Modern Industries Inc. (Erie PA)  
 Modern Metal Processing Inc.  
 Nevada Heat Treating Inc.  
 Nitrex Thermal Technology Co. Ltd.  
 Nitro-Vac Heat Treat Inc.  
 Northeast Metals Technologies  
 Paulo (Willoughby OH)  
 Peters' Heat Treating Inc. (McKean PA)  
 Plymouth Brazing Inc.



# Derrick

Heat Treating • Blasting • Painting

**A UNIQUE COMPANY  
 WITH UNIQUE  
 CAPABILITIES**



**Now  
 Offering  
 Aluminum  
 Heat  
 Treating**



Precision Heat Treating Corp. (Ft. Wayne IN)

#### **Refrac Systems**

Robert Wooler Co.

Rockford Heat Treaters Inc.

Rogers Metal Services Inc.

Scarrott Metallurgical Co.

**Solar Atmospheres (Fontana CA)**

**Solar Atmospheres (Hermitage PA)**

#### ➔ **Solar Atmospheres (Souderton PA)**

Southwest Specialty Heat Treat

Specialty Steel Treating Inc. (East Granby CT)

Steel Treaters Inc.

STT Nitrex Querétaro, S. De R.L. De C.V.

Superior Metal Treating & Equipment Inc.

Temperature Processing Co. Inc. (North Arlington NJ)

Texas Heat Treating Inc. (Ft. Worth TX)

Texas Heat Treating Inc. (Round Rock TX)

Thermal Braze Inc.

Thermal-Vac Technology Inc.

Thermo-Fusion Inc.

Vac Aero International Inc. (Oakville ON)

Vac Aero International Inc. (St. Laurent QC)

Vac-Met Inc.

Vacu-Braze Inc.

Vira-Tech Inc.

### **Induction**

A & S Brazing Co.

Ajax TOCCO International Ltd.

Ajax TOCCO Magnethermic Corp. (Albertville AL)

Ajax TOCCO Magnethermic Corp. (Madison Heights MI)

#### ➔ **Ajax TOCCO Magnethermic Corp. (Warren OH)**

Ajax TOCCO Magnethermic Corp. (Wickliffe OH)

Ajax TOCCO Magnethermic Corp. (Ajax ON)

Ajax TOCCO Magnethermic Corp. (Mexico)

BeeHive Heat Treating Service Inc.

Bennett Heat Treating & Brazing Co. (Newark NJ)

Bennett Heat Treating & Brazing Co. (Ivlyland PA)

Bluewater Thermal Solutions (Coldwater MI)

Bluewater Thermal Solutions, Corporate

**Bodycote (ALL LOCATIONS)**

Braddock Metallurgical (Atlanta GA)

**Braddock Metallurgical (Bridgewater NJ)**

Braddock Metallurgical, Caribe Metallurgical

Byron Products Inc.

Certified Heat Treating Inc. (Springfield OH)

**Contour Hardening**

Cook Induction Heating Co.

Diamond Heat Treat

**DIE-BOND LLC**

#### ➔ **EFD Induction Inc.**

Elmira Heat Treating Inc.

Galaxy Brazing Co. Inc.

Garner Heat Treat Inc.

High Performance Heat Treating Inc.

IMT York LLC

Induction Heat Treating Corp.

Inductoheat Inc.

**International Thermal Systems**

Lone Star Heat Treating Corp.

Metallurgical Solutions Inc.

Metals Engineering Inc. (DePere WI)

**Metcor Inc.**

Metex Heat Treating Ltd.

National Metal Processing Inc.

Nitrex Inc., Chicago Operations

Nitrex Inc., Indiana Operations

Nitrex Inc., Michigan Operations

Nitrex Inc., Nevada Operations

Nitrex Metal Inc.

Nitrex Thermal Technology Co. Ltd.

Northeast Metals Technologies

Penna Flame Industries

Pillar Induction

Plymouth Brazing Inc.

**Power Parts International**

Precision Heat Treating Co.

R & R Heat Treating Inc.

Radyne Corp.

**Refrac Systems**

Rogers Metal Services Inc.

The Sousa Corp.

STT Nitrex Querétaro, S. De R.L. De C.V.

Superior Metal Treating & Equipment Inc.

**Taylor-Winfield Technologies Inc.**

Temperature Processing Co. Inc. (Longmont CO)

Texas Heat Treating Inc. (Ft. Worth TX)

Texas Heat Treating Inc. (Round Rock TX)

Thermal Braze Inc.

Thermal-Vac Technology Inc.

Thermet Inc.

University of Ljubljana

Vacu-Braze Inc.

Zion Industries Inc. (Grand Ledge MI)

Zion Industries Inc. (Hildebran NC)

Zion Industries Inc. (Valley City OH)

### **Torch**

A & S Brazing Co.

Aerobraze Engineered Technologies

BeeHive Heat Treating Service Inc.

Bennett Heat Treating & Brazing Co. (Newark NJ)

Bennett Heat Treating & Brazing Co. (Ivlyland PA)

Bluewater Thermal Solutions (Coldwater MI)

**Bodycote (ALL LOCATIONS)**

Braddock Metallurgical (Atlanta GA)

**Braddock Metallurgical (Bridgewater NJ)**

Byron Products Inc.

California Brazing

**Certified Metal Craft Inc.**

Cook Induction Heating Co.

**DIE-BOND LLC**

Galaxy Brazing Co. Inc.

Garner Heat Treat Inc.

HI TecMetal Group, Brite Brazing

Hitech Heat Treatment Services Pte. Ltd.

Intriplex Thermal Technologies

Krankka Metallurgical LLC

Lone Star Heat Treating Corp.

Metallurgical Solutions Inc.

Metals Engineering Inc. (DePere WI)

Modern Industries Inc. (Erie PA)

Modern Metal Processing Inc.

Nevada Heat Treating Inc.

Nitrex Thermal Technology Co. Ltd.

Nitro-Vac Heat Treat Inc.

Northeast Metals Technologies

Plymouth Brazing Inc.

R & R Heat Treating Inc.

**Refrac Systems**

Rockford Heat Treaters Inc.

Rogers Metal Services Inc.

Southwest Specialty Heat Treat

STT Nitrex Querétaro, S. De R.L. De C.V.

Superior Metal Treating & Equipment Inc.

Temperature Processing Co. Inc. (Longmont CO)

Texas Heat Treating Inc. (Ft. Worth TX)

Texas Heat Treating Inc. (Round Rock TX)

Thermal-Vac Technology Inc.

Thermo-Fusion Inc.

Vacu-Braze Inc.

Vira-Tech Inc.

### **Vacuum**

Aerobraze Engineered Technologies

Ajax TOCCO International Ltd.

Ajax TOCCO Magnethermic Corp. (Albertville AL)

Ajax TOCCO Magnethermic Corp. (Madison Heights MI)

#### ➔ **Ajax TOCCO Magnethermic Corp. (Warren OH)**

Ajax TOCCO Magnethermic Corp. (Wickliffe OH)

Ajax TOCCO Magnethermic Corp. (Ajax ON)

Ajax TOCCO Magnethermic Corp. (Mexico)

ALD Vacuheat GmbH

Allied Heat Treat Ltd.

American Heat Treating Inc.

Applied Thermal Technologies Inc.

BeeHive Heat Treating Service Inc.

Bennett Heat Treating & Brazing Co. (Newark NJ)

Bennett Heat Treating & Brazing Co. (Ivlyland PA)

Bluewater Thermal Solutions (Rockford IL)

Bluewater Thermal Solutions, Corporate

**Bodycote (ALL LOCATIONS)**

Braddock Metallurgical Aerospace Services

Braddock Metallurgical (Atlanta GA)

Braddock Metallurgical (Charlotte NC)

**Braddock Metallurgical (Bridgewater NJ)**

Braddock Metallurgical, Caribe Metallurgical

Brazetek Heat Exchangers

Byron Products Inc.

California Brazing

**Certified Metal Craft Inc.**

Coleman Heat Treating

County Heat Treat

**DIE-BOND LLC**

Dynamic Surface Technologies

East Carolina Metal Treating Inc.

Elmira Heat Treating Inc.

Exotic Metal Treating Inc.

**Flame Metals Processing Corp.**

**FPM HEAT TREATING (Elk Grove Village IL)**

Galaxy Brazing Co. Inc.

- ✓ **Solution Treating**
- ✓ **Aging**
- ✓ **Annealing**
- ✓ **Stress Relieving**
- ✓ **Forgings / Castings**
- ✓ **Wrought**
- ✓ **Single Part/**
- ✓ **Large Batch**



# Derrick

*Heat Treating • Blasting • Painting*

**4560 Kellogg Ave., Cincinnati, OH 45226**

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**Phone: 513-321-8122**

**www.derrickcompany.com**

## CAPABILITIES LISTINGS - COMMERCIAL HEAT TREATERS DIRECTORY

Garner Heat Treat Inc.  
**Hansen-Balk Steel Treating Co.**  
 Hardline Heat Treating Inc.  
 Hauck Heat Treatment Ltd.  
 Heat Treatment Australia  
 HI TecMetal Group, HI Tech Aero  
 Hitech Heat Treatment Services Pte. Ltd.  
 Hy-Vac Technologies Inc.  
 Inland NW Metallurgical Services Inc.  
**Kowalski Heat Treating**  
 Krankka Metallurgical LLC  
 Lark Heat Treating Inc.  
 Med-Tek Inc.  
 Metallurgical Processing Inc. (CT)  
 Metals Technology Corp.  
**Metcor Inc.**  
**Midwest Thermal-Vac Inc.**  
 Modern Heat Treat Inc.  
 Modern Industries Inc. (Erie PA)  
 Modern Metal Processing Inc.  
 National Heat Treat  
 Nevada Heat Treating Inc.  
 Nitrex Inc., Chicago Operations  
 Nitrex Inc., Indiana Operations  
 Nitrex Inc., Michigan Operations  
 Nitrex Inc., Nevada Operations  
 Nitrex Metal Inc.  
 Nitrex Thermal Technology Co. Ltd.  
 Nitro-Vac Heat Treat Inc.  
 Northeast Metals Technologies  
 Paulo (Willoughby OH)  
 Pinson Valley Heat Treating  
 Quality Steel Treating LLC  
 Radyne Corp.  
**Refrac Systems**  
 Robert Wooler Co.  
 Rockford Heat Treaters Inc.  
 Scarrott Metallurgical Co.  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
**➔ Solar Atmospheres (Souderton PA)**  
**Solar Atmospheres (Greenville SC)**  
 Specialty Steel Treating Inc. (East Granby CT)  
**Specialty Steel Treating Inc. (Fraser MI)**  
 Spectrum Thermal Processing LLC  
 Steel Treaters Inc.  
 STT Nitrex Querétaro, S. De R.L. De C.V.  
 Superior Metal Treating & Equipment Inc.  
**Taylor-Winfield Technologies Inc.**  
 Temperature Processing Co. Inc. (Longmont CO)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal Braze Inc.  
 Thermal-Vac Technology Inc.  
 Thermo-Fusion Inc.  
 Tratamientos Termicos Nitrogen S.A.  
 Vac Aero International Inc. (Oakville ON)  
 Vac Aero International Inc. (St. Laurent QC)  
 Vac-Met Inc.  
 Vacu-Braze Inc.  
 Vira-Tech Inc.  
 Wallwork Cambridge Ltd.

## CARBONITRIDING

## Fluid Bed

Dynamic Surface Technologies  
 Hardline Heat Treating Inc.  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Phoenix Heat Treating Inc.  
 Tooling and General Heat Treatment

## Gas

A & M Heat Treating Ltd.  
 Accurate Steel Treating  
 Advanced Heat Treat Corp. (Burton)  
 Advanced Heat Treat Corp. (Midport)

Advanced Heat Treating Inc.  
 Advanced Heat Treating Solutions  
 Advanced Nitriding Solutions  
**Akron Steel Treating Co.**  
 Allied Heat Treat Ltd.  
 Alloy Steel Treating Co. Inc.  
 American Heat Treating Inc.  
 American Metal Processing Co.  
 American Metal Treating Inc.  
 American Steel Treating  
 Aremac Heat Treating East LLC, Southeast  
 Atlantic Heat Treat  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Blanchard Metal Processing  
 Bluewater Thermal Solutions (Rockford IL)  
 Bluewater Thermal Solutions (South Bend IN)  
 Bluewater Thermal Solutions (Benton Harbor MI)  
 Bluewater Thermal Solutions (St. Marys PA)  
 Bluewater Thermal Solutions, Corporate  
 Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical Aerospace Services  
 Braddock Metallurgical (Daytona FL)  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
 Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Byington Steel Treating Inc.  
 Cambridge Heat Treating  
 Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
 Certified Heat Treating  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Cincinnati Steel Treating Co.  
 Circle City Heat Treating Inc.  
 City Steel Heat Treating Inc.  
 Coleman Heat Treating  
 Commercial Steel Treating Corp.  
 Continental Heat Treating Inc.  
**Contour Hardening**  
 Controlled Thermal Technology  
 County Heat Treat  
 CRIO SA de CV  
 Dayton Forging & Heat Treating  
 Dependable Metal Treating Inc.  
 Detroit Steel Treating Co.  
 Diamond Heat Treat  
 Donohoo Steel Treating  
 East Carolina Metal Treating Inc.  
 East-Lind Heat Treat Inc.  
 Elmira Heat Treating Inc.  
 Engineered Heat Treat Inc.  
 Erie Steel Ltd.  
 Euclid Heat Treating Co.  
 Evans Heat Treating  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Cherry Valley IL)**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
**FPM HEAT TREATING (Milwaukee WI)**  
 Garner Heat Treat Inc.  
 General Metal Heat Treating Inc.  
 General Surface Hardening Inc.  
 H & S Heat Treating  
 Hardline Heat Treating Inc.  
 Hauck Heat Treatment Ltd.  
 Heat Treating Technologies Inc.  
 Heat Treatments Ltd.  
 Hi-Tech Steel Treating Inc.  
 HI TecMetal Group, Nettleton Steel Treating (NST)  
 Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
 Hudapack Metal Treating Inc. (Elkhorn WI)  
 Hudapack Metal Treating Inc. (Franklin WI)  
 IMT York LLC  
 Industrial Steel Treating Co.

Inland NW Metallurgical Services Inc.  
 Jasco Heat Treating Inc.  
 JF Heat Treating Inc.  
 Lark Heat Treating Inc.  
 Lawrence Industries Inc.  
 Lone Star Heat Treating Corp.  
 LST Heat Treating LLC  
 Magnum Metal Treating  
 Med-Tek Inc.  
 Metal Treaters Inc.  
 Metallurgical Processing Co.  
 Metallurgical Processing Inc. (CT)  
 Metals Engineering Inc. (DePere WI)  
 Metals Technology Corp.  
**Metcor Inc.**  
 Metex Heat Treating Ltd.  
 Metlab  
 Mid South Metallurgical  
 Missouri Heat Treat  
 Modern Industries Inc. (Erie PA)  
 Modern Industries Inc. (Kersey PA)  
 Morgan Ohare Inc.  
 MT Heat Treating Inc.  
 National Metal Processing Inc.  
 Nevada Heat Treating Inc.  
 Nitrex Inc., Chicago Operations  
 Nitrex Inc., Indiana Operations  
 Nitrex Inc., Michigan Operations  
 Nitrex Inc., Nevada Operations  
 Nitrex Metal Inc.  
 Nitrex Thermal Technology Co. Ltd.  
**Ohio Metallurgical Service**  
 Palmdale Heat Treating Inc.  
 Paulo (Kansas City MO)  
 Paulo (St. Louis MO)  
 Paulo (Murfreesboro TN)  
 Paulo (Nashville TN)  
 Phoenix Heat Treating Inc.  
 Pinson Valley Heat Treating  
 Precision Heat Treating Co.  
 Precision Heat Treating Corp. (Ft. Wayne IN)  
 Precision Heat Treating Corp. (Jackson MS)  
 Q-Tech Heat Treat LLC  
 Queen City Steel Treating  
 R & R Heat Treating Inc.  
 Rex Heat Treat (Bedford PA)  
 Rex Heat Treat (Lansdale PA)  
 Robert Wooler Co.  
 Rochester Steel Treating Works Inc.  
 Rockford Heat Treaters Inc.  
 Scientific Metal Treating  
 Seattle Heat Treaters, dba Stober & Chiaro  
 Service Heat Treating Inc.  
 The Sousa Corp.  
 Specialty Heat Treat Inc.  
 Specialty Steel Treating Inc. (East Granby CT)  
 Specialty Steel Treating Inc. (Farmington Hills MI)  
**Specialty Steel Treating Inc. (Fraser MI)**  
 Stack Metallurgical Services Inc.  
 Steel Treaters Inc.  
 Stokes Steel Treating Co.  
 STT Nitrex Querétaro, S. De R.L. De C.V.  
 Sturm Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
 Tamayakin Co. Ltd.  
 Temperature Processing Co. Inc. (Longmont CO)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal Metal Treating Inc.  
 Thermal Specialties  
 Thermal Specialties of Texas LLC  
 Thermal-Vac Technology Inc.  
 THERMETCO Inc.  
 Thermex Metal Treating Ltd.  
 Thermo-Fusion Inc.  
**ThermTech**  
 Treat All Metals  
 Tri-City Heat Treat Co.  
 Vacu-Braze Inc.  
 Valley Metal Treating Inc.



**voestalpine Thermo-Tech**  
Wallwork Cambridge Ltd.  
Weiss Industries Inc.  
**Winston Heat Treating Inc.**

### Salt

Austenit S.A.  
BeeHive Heat Treating Service Inc.  
Commercial Heat Treating Inc.  
Controlled Thermal Technology  
East-Lind Heat Treat Inc.  
General Metal Heat Treating Inc.  
Hauck Heat Treatment Ltd.  
**Metcor Inc.**

### Vacuum

ALD Vacuheat GmbH  
**Bodycote (ALL LOCATIONS)**  
**Contour Hardening**  
Hardline Heat Treating Inc.  
**Midwest Thermal-Vac Inc.**  
Modern Heat Treat Inc.  
**voestalpine Thermo-Tech**

## CARBURIZING

### Fluid Bed

Dynamic Surface Technologies  
Hardline Heat Treating Inc.  
Peters' Heat Treating Inc. (McKean PA)  
Peters' Heat Treating Inc. (Meadville PA)  
Peters' Heat Treating Inc. - West  
Tooling and General Heat Treatment

### Gas

A & M Heat Treating Ltd.  
A & M SurfTech Ltd.  
Accurate Steel Treating  
Advanced Heat Treat Corp. (Burton)  
Advanced Heat Treat Corp. (Midport)  
Advanced Heat Treating Inc.  
Advanced Heat Treating Solutions  
**Akron Steel Treating Co.**  
ALD Vacuheat GmbH  
All-Source Heat Treating Inc.  
Allied Heat Treat Ltd.  
Alloy Steel Treating Co. Inc.  
American Heat Treating Inc.  
American Metal Processing Co.  
American Metal Treating Inc.  
American Steel Treating  
Applied Process Inc. (Ft. Smith AZ)  
Applied Process Inc. (Livonia MI)  
Applied Process Inc., Technologies Div.  
Applied Process Inc., Monster Parts Div.  
Aremac Heat Treating East LLC, Southeast  
Atlantic Heat Treat  
BeeHive Heat Treating Service Inc.  
Bennett Heat Treating & Brazing Co. (Newark NJ)  
Bennett Heat Treating & Brazing Co. (Ivyland PA)  
Blanchard Metal Processing  
Bluewater Thermal Solutions, Chicago Plant 3  
Bluewater Thermal Solutions (Rockford IL)  
Bluewater Thermal Solutions (South Bend IN)  
Bluewater Thermal Solutions (Benton Harbor MI)  
Bluewater Thermal Solutions (St. Marys PA)  
Bluewater Thermal Solutions, Corporate  
Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
Braddock Metallurgical Aerospace Services  
Braddock Metallurgical (Daytona FL)  
Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Tampa FL)  
Braddock Metallurgical (Atlanta GA)  
Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
Braddock Metallurgical, Caribe Metallurgical  
Byington Steel Treating Inc.

Cambridge Heat Treating  
Cargill Heat Treat  
Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
Certified Heat Treating  
Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
Cincinnati Steel Treating Co.  
Circle City Heat Treating Inc.  
City Steel Heat Treating Inc.  
Coleman Heat Treating  
Commercial Steel Treating Corp.  
Continental Heat Treating Inc.  
Controlled Thermal Technology  
County Heat Treat  
Dayton Forging & Heat Treating  
Dependable Metal Treating Inc.  
Detroit Steel Treating Co.  
Donohoo Steel Treating  
East Carolina Metal Treating Inc.  
East-Lind Heat Treat Inc.  
Elmira Heat Treating Inc.  
Engineered Heat Treat Inc.  
Erie Steel Ltd.  
Euclid Heat Treating Co.  
Evans Heat Treating  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Cherry Valley IL)**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
**FPM HEAT TREATING (Milwaukee WI)**  
Garner Heat Treat Inc.  
General Metal Heat Treating Inc.  
General Surface Hardening Inc.  
Great Lakes Metal Treating Inc.  
H & S Heat Treating  
**Hansen-Balk Steel Treating Co.**  
Hardline Heat Treating Inc.  
Hauck Heat Treatment Ltd.  
Heat Treating Technologies Inc.  
Heat Treatments Ltd.



Hi Tech Heat Treating Ltd.  
Hi-Tech Steel Treating Inc.  
HI TecMetal Group, Nettleton Steel Treating (NST)  
High Performance Heat Treating Inc.  
Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
Hudapack Metal Treating Inc. (Elkhorn WI)  
Hudapack Metal Treating Inc. (Franklin WI)  
IMT York LLC  
Industrial Steel Treating Co.  
Inland NW Metallurgical Services Inc.  
Jasco Heat Treating Inc.  
JF Heat Treating Inc.  
Lark Heat Treating Inc.  
Lawrence Industries Inc.  
Lone Star Heat Treating Corp.  
LST Heat Treating LLC  
Magnum Metal Treating  
Med-Tek Inc.  
Metal Finishing Co.  
Metal Treaters Inc.  
Metallurgical Processing Co.  
Metallurgical Processing Inc. (CT)  
Metallurgical Solutions Inc.  
Metals Engineering Inc. (DePere WI)  
Metals Technology Corp.  
**Metcor Inc.**  
Metex Heat Treating Ltd.  
Metlab  
Mid South Metallurgical  
Missouri Heat Treat  
Modern Industries Inc. (Erie PA)  
Modern Industries Inc. (Kersey PA)  
MT Heat Treating Inc.

National Metal Processing Inc.  
Nevada Heat Treating Inc.  
Nitrex Inc., Chicago Operations  
Nitrex Inc., Indiana Operations  
Nitrex Inc., Michigan Operations  
Nitrex Inc., Nevada Operations  
Nitrex Metal Inc.  
Nitrex Thermal Technology Co. Ltd.  
Nitro-Vac Heat Treat Inc.  
**Ohio Metallurgical Service**  
Ohio Vertical Heat Treat  
Pacific Heat Treating Co.  
Pacific Metallurgical  
Palmdale Heat Treating Inc.  
Parker Trutec Inc. (Springfield OH)  
Paulo (Kansas City MO)  
Paulo (St. Louis MO)  
Paulo (Murfreesboro TN)  
Paulo (Nashville TN)  
Peters' Heat Treating Inc. (McKean PA)  
Peters' Heat Treating Inc. (Meadville PA)  
Peters' Heat Treating Inc. - West  
Phoenix Heat Treating Inc.  
Pinson Valley Heat Treating  
Precision Heat Treating Co.  
Precision Heat Treating Corp. (Ft. Wayne IN)  
Precision Heat Treating Corp. (Jackson MS)  
Precision Heat Treating Inc.  
Precision Thermal Processing  
Q-Tech Heat Treat LLC  
Quality Heat Treating Inc.  
Queen City Steel Treating  
R & R Heat Treating Inc.  
Rex Heat Treat (Bedford PA)  
Rex Heat Treat (Lansdale PA)  
Robert Wooler Co.  
Rochester Steel Treating Works Inc.  
Rockford Heat Treating Inc.  
Scientific Metal Treating  
Seattle Heat Treating, dba Stober & Chiaro  
Service Heat Treating Inc.  
**Solar Atmospheres (Hermitage PA)**  
➔ **Solar Atmospheres (Souderton PA)**  
The Sousa Corp.  
Southwest Specialty Heat Treat  
Specialty Heat Treat Inc.  
Specialty Steel Treating Inc. (East Granby CT)  
Specialty Steel Treating Inc. (Farmington Hills MI)  
**Specialty Steel Treating Inc. (Fraser MI)**  
Stack Metallurgical Services Inc.  
Steel Treating Inc.  
Stokes Steel Treating Co.  
STT Nitrex Querétaro, S. De R.L. De C.V.  
Sturm Steel Treating Inc.  
Superior Metal Treating & Equipment Inc.  
Tamayakin Co. Ltd.  
Temperature Processing Co. Inc. (Longmont CO)  
Texas Heat Treating Inc. (Ft. Worth TX)  
Texas Heat Treating Inc. (Round Rock TX)  
Thermal Metal Treating Inc.  
Thermal Specialties  
Thermal Specialties of Texas LLC  
Thermal-Vac Technology Inc.  
THERMETCO Inc.  
Thermex Metal Treating Ltd.  
Thermo-Fusion Inc.  
**ThermTech**  
Treat All Metals  
Tri-City Heat Treat Co.  
Vacu-Braze Inc.  
Valley Metal Treating Inc.  
Wallwork Cambridge Ltd.  
Weiss Industries Inc.  
**Winston Heat Treating Inc.**  
Wyatt Services Inc.

### Pack

All-Source Heat Treating Inc.  
BeeHive Heat Treating Service Inc.  
Braddock Metallurgical (Jacksonville FL)

## CAPABILITIES LISTINGS - COMMERCIAL HEAT TREATERS DIRECTORY

Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Calumet Surface Hardening Co. Inc.  
 City Steel Heat Treating Inc.  
 Commercial Heat Treating Inc.  
 East-Lind Heat Treat Inc.  
 Hardline Heat Treating Inc.  
 Hitech Heat Treatment Services Pte. Ltd.  
 Krankka Metallurgical LLC  
 Nitro-Vac Heat Treat Inc.  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 R & R Heat Treating Inc.  
 University of Ljubljana

**Salt**

A & M Heat Treating Ltd.  
 Anderson Specialty Co.  
 Austenit S.A.  
 BeeHive Heat Treating Service Inc.  
 East-Lind Heat Treat Inc.  
 Heat Treatment Australia  
 Metlab  
 Palmdale Heat Treating Inc.

**Vacuum**

ALD Thermal Treatment Inc.  
 ALD Vacuheat GmbH  
**Bodycote (ALL LOCATIONS)**  
**Contour Hardening**  
**DIE-BOND LLC**  
 Hardline Heat Treating Inc.  
 Hauck Heat Treatment Ltd.  
 Hitech Heat Treatment Services Pte. Ltd.  
 Metallurgical Processing Co.  
**Midwest Thermal-Vac Inc.**  
 Nitrex Inc., Chicago Operations  
 Nitrex Inc., Indiana Operations  
 Nitrex Inc., Michigan Operations  
 Nitrex Inc., Nevada Operations  
 Nitrex Metal Inc.  
 Nitrex Thermal Technology Co. Ltd.  
 Paulo (Nashville TN)  
 Radyne Corp.  
**Refrac Systems**  
 Scientific Metal Treating  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
 ➔ **Solar Atmospheres (Souderton PA)**  
**Solar Atmospheres (Greenville SC)**  
 The Sousa Corp.  
**Specialty Steel Treating Inc. (Fraser MI)**  
 Spectrum Thermal Processing LLC  
 Stack Metallurgical Services Inc.  
 STT Nitrex Querétaro, S. De R.L. De C.V.  
 Techniques Surfaces do Brasil Ltda  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
**ThermTech**  
 Vacu-Braze Inc.  
 Wallwork Cambridge Ltd.

**HARDENING (Q&T)****Flame**

A & S Brazing Co.  
 Advanced Flame Hardening Inc.  
 All-Source Heat Treating Inc.  
 Alloy Steel Treating Co. Inc.  
 American Heat Treating  
 Atlantic Heat Treat  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivlyland PA)  
 Blanchard Metal Processing  
**Bodycote (ALL LOCATIONS)**

The Bowdil Co.  
 Braddock Metallurgical (Daytona FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
 Braddock Metallurgical, Caribe Metallurgical  
 Calumet Surface Hardening Co. Inc.  
 Cascade Metallurgical Inc.  
 Certified Heat Treating Inc. (Springfield OH)  
 Chicago Flame Hardening Co.  
 Cincinnati Flame Hardening Co.  
 Cincinnati Steel Treating Co.  
 Circle City Heat Treating Inc.  
 Coleman Commercial Heat Treating Inc.  
 Coleman Heat Treating  
 Commercial Heat Treating Inc.  
 Cook Induction Heating Co.  
 County Heat Treat  
 Detroit Steel Treating Co.

**DIE-BOND LLC**

East-Lind Heat Treat Inc.  
 Flame Treating Systems Inc.  
**Hansen-Balk Steel Treating Co.**  
 Hardline Heat Treating Inc.  
 Hi Tech Heat Treating Ltd.  
 Hi-Tech Steel Treating Inc.  
 Hitech Heat Treatment Services Pte. Ltd.  
**International Thermal Systems**  
 Jasco Heat Treating Inc.  
**Kowalski Heat Treating**  
 Krankka Metallurgical LLC  
**Metcor Inc.**  
 Metlab  
**Midwest Thermal-Vac Inc.**  
 Missouri Heat Treat  
 Modern Heat Treat Inc.  
 National Heat Treat  
 Nevada Heat Treating Inc.  
 Northeast Metals Technologies  
 Pacific Heat Treating Co.  
 Pacific Metallurgical  
 Penna Flame Industries  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Q-Tech Heat Treat LLC  
 R & R Heat Treating Inc.

**Refrac Systems**

Rockford Heat Treaters Inc.  
 Scientific Metal Treating  
 Seattle Heat Treaters, dba Stober & Chiaro  
 Southwest Metal Treating Corp.  
 Southwest Specialty Heat Treat  
 Steel Treating Inc.  
 Sturm Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermo-Fusion Inc.  
**ThermTech**  
 University of Ljubljana  
 Vacu-Braze Inc.  
**Winston Heat Treating Inc.**  
 Wyatt Services Inc.

**Fluid Bed**

BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Ivlyland PA)  
 Commercial Heat Treating Inc.  
 East-Lind Heat Treat Inc.  
 Hardline Heat Treating Inc.  
 Metallurgical Solutions Inc.  
 Paulo (St. Louis MO)  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Phoenix Heat Treating Inc.  
 Robert Wooler Co.  
 Rochester Steel Treating Works Inc.  
 Tratamientos Termicos Nitrogas S.A.  
 Wallwork Cambridge Ltd.

**Furnace**

A & M Heat Treating Ltd.  
 Aberfoyle Metal Treating Ltd.  
 Accurate Steel Treating  
 Advanced Heat Treat Corp. (Burton)  
 Advanced Heat Treat Corp. (Midport)  
 Advanced Heat Treating Inc.  
 Advanced Heat Treating Solutions  
 Aerobraz Engineering Technologies  
 Ajax TOCCO Magnethermic Corp. (Alberville AL)  
**Akron Steel Treating Co.**  
 Al-Fe Heat Treating (Premier Thermal Co.)  
 All-Source Heat Treating Inc.  
 Allied Heat Treat Ltd.  
 Alloy Steel Treating Co. Inc.  
 American Heat Treating Inc.  
 American Metal Processing Co.  
 American Metal Treating Inc.  
 American Steel Treating  
 Aremac Heat Treating East LLC, Southeast  
 Atlantic Heat Treat  
 Atmosphere Annealing LLC (North Vernon IN)  
 Atmosphere Annealing LLC (Bassett)  
 Atmosphere Annealing LLC (Mt. Hope)  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivlyland PA)  
 Blanchard Metal Processing  
 Bluewater Thermal Solutions, Chicago Plant 1  
 Bluewater Thermal Solutions (Rockford IL)  
 Bluewater Thermal Solutions (South Bend IN)  
 Bluewater Thermal Solutions (Benton Harbor MI)  
 Bluewater Thermal Solutions (St. Marys PA)  
 Bluewater Thermal Solutions, Corporate  
 Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical Aerospace Services  
 Braddock Metallurgical (Daytona FL)  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
 Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Byington Steel Treating Inc.  
 Byron Products Inc.  
 Cambridge Heat Treating  
 Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
 Certified Heat Treating  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Cincinnati Steel Treating Co.  
 Circle City Heat Treating Inc.  
 City Steel Heat Treating Inc.  
 CMC Impact Metals  
 Coleman Commercial Heat Treating Inc.  
 Coleman Heat Treating  
 Commercial Heat Treating Inc.  
 Commercial Steel Treating Corp.  
 Continental Heat Treating Inc.  
**Contour Hardening**  
 Controlled Thermal Technology  
 County Heat Treat  
 Dayton Forging & Heat Treating  
 Dependable Metal Treating Inc.  
 Detroit Steel Treating Co.  
**DIE-BOND LLC**  
 Donohoo Steel Treating  
 East Carolina Metal Treating Inc.  
**Eastern Metal Treating Inc.**  
 East-Lind Heat Treat Inc.  
 Elmira Heat Treating Inc.  
 Engineered Heat Treat Inc.  
 Erie Steel Ltd.  
 Euclid Heat Treating Co.  
 Evans Heat Treating  
 Exotic Metal Treating Inc.  
**Flame Metals Processing Corp.**



Flame Treating Systems Inc.

**FPM HEAT TREATING (Cherry Valley IL)**

**FPM HEAT TREATING (Elk Grove Village IL)**

**FPM HEAT TREATING (Milwaukee WI)**

Garner Heat Treat Inc.

General Metal Heat Treating Inc.

General Surface Hardening Inc.

H & S Heat Treating

**Hansen-Balk Steel Treating Co.**

Harchris Heat Treatment (Pty.) Ltd.

Hardline Heat Treating Inc.

Hauck Heat Treatment Ltd.

Heat Treating Services

Heat Treating Technologies Inc.

Hercules Heat Treating

Hi Tech Heat Treating Ltd.

Hi-Tech Steel Treating Inc.

Hi TecMetal Group, Nettleton Steel Treating (NST)

High Performance Heat Treating Inc.

Hitech Heat Treatment Services Pte. Ltd.

**Houston Heat Treat**

Hudapack Metal Treating of Illinois Inc.

Hudapack Metal Treating Inc. (Elkhorn WI)

Hudapack Metal Treating Inc. (Franklin WI)

IMT York LLC

Industrial Steel Treating Co.

Inland NW Metallurgical Services Inc.

**International Thermal Systems**

Intriplex Thermal Technologies

Jasco Heat Treating Inc.

JF Heat Treating Inc.

K & D Heat Treat Inc.

Katy Heat Treat LLC

**Kowalski Heat Treating**

Krankka Metallurgical LLC

Lark Heat Treating Inc.

Lawrence Industries Inc.

Lone Star Heat Treating Corp.

LST Heat Treating LLC

Magnum Metal Treating

Med-Tek Inc.

Metal Finishing Co.

Metal Treaters Inc.

Metallurgical Processing Co.

Metallurgical Processing Inc. (CT)

Metallurgical Solutions Inc.

Metals Engineering Inc. (DePere WI)

Metals Technology Corp.

**Metcor Inc.**

Metex Heat Treating Ltd.

Metlab

**Midwest Thermal-Vac Inc.**

Missouri Heat Treat

Modern Industries Inc. (Erie PA)

Modern Industries Inc. (Kersey PA)

Morgan Ohare Inc.

MT Heat Treating Inc.

National Metal Processing Inc.

Nevada Heat Treating Inc.

Nitrex Inc., Chicago Operations

Nitrex Inc., Indiana Operations

Nitrex Inc., Michigan Operations

Nitrex Inc., Nevada Operations

Nitrex Metal Inc.

Nitrex Thermal Technology Co. Ltd.

Northeast Metals Technologies

**Ohio Metallurgical Service**

Ohio Vertical Heat Treat

P & L Heat Treating & Grinding Inc.

Pacific Heat Treating Co.

Pacific Metallurgical

Palmdale Heat Treating Inc.

Paulo (Kansas City MO)

Paulo (St. Louis MO)

Paulo (Willoughby OH)

Paulo (Murfreesboro TN)

Paulo (Nashville TN)

Peters' Heat Treating Inc. (McKean PA)

Peters' Heat Treating Inc. (Meadville PA)

Peters' Heat Treating Inc. - West

Phoenix Heat Treating Inc.

Pinson Valley Heat Treating

Precision Heat Treating Co.

Precision Heat Treating Corp. (Ft. Wayne IN)

Precision Heat Treating Corp. (Jackson MS)

Precision Heat Treating Inc.

Precision Thermal Processing

Q-Tech Heat Treat LLC

Quality Heat Treating Inc.

Queen City Steel Treating

R & R Heat Treating Inc.

Radyne Corp.

**Refrac Systems**

Rex Heat Treat (Bedford PA)

Robert Wooler Co.

Rochester Steel Treating Works Inc.

Rockford Heat Treaters Inc.

Scarrott Metallurgical Co.

SCHMOLZ + BICKENBACH USA

Scientific Metal Treating

Seattle Heat Treaters, dba Stober & Chiaro

Service Heat Treating Inc.

**Solar Atmospheres (Fontana CA)**

**Solar Atmospheres (Hermitage PA)**

➔ **Solar Atmospheres (Souderton PA)**

The Sousa Corp.

Southwest Specialty Heat Treat

Specialty Heat Treat Inc.

Specialty Steel Treating Inc. (East Granby CT)

Specialty Steel Treating Inc. (Farmington Hills MI)

**Specialty Steel Treating Inc. (Fraser MI)**

Spectrum Thermal Processing LLC

Stack Metallurgical Services Inc.

Steel Treaters Inc.

Stokes Steel Treating Co.

STT Nitrex Querétaro, S. De R.L. De C.V.

Sturm Steel Treating Inc.

Superior Metal Treating & Equipment Inc.

Tamayakin Co. Ltd.

TC Industries Inc.

Temperature Processing Co. Inc. (Longmont CO)

Temperature Processing Co. Inc. (North Arlington NJ)

Texas Heat Treating Inc. (Ft. Worth TX)

Texas Heat Treating Inc. (Round Rock TX)

Thermal Braze Inc.

Thermal Metal Treating Inc.

Thermal Specialties

Thermal Specialties of Texas LLC

Thermal-Vac Technology Inc.

THERMETCO Inc.

Thermex Metal Treating Ltd.

Thermo-Fusion Inc.

**ThermTech**

Treat All Metals

Tri-City Heat Treat Co.

University of Ljubljana

Vac Aero International Inc. (Oakville ON)

Vac Aero International Inc. (St. Laurent QC)

Vac-Met Inc.

Vacu-Braze Inc.

Valley Heat Treat Co.

Valley Metal Treating Inc.

Vira-Tech Inc.

**voestalpine Thermo-Tech**

Wallwork Cambridge Ltd.

Weiss Industries Inc.

**Winston Heat Treating Inc.**

Wyatt Services Inc.

## Induction

A & S Brazing Co.

Advanced Heat Treat Corp. (Burton)

Advanced Heat Treat Corp. (Midport)

Advanced Heat Treating Solutions

Ajax TOCCO International Ltd.

Ajax TOCCO Magnethermic Corp. (Albertville AL)

Ajax TOCCO Magnethermic Corp. (Madison Heights MI)

➔ **Ajax TOCCO Magnethermic Corp. (Warren OH)**

Ajax TOCCO Magnethermic Corp. (Wickliffe OH)

Ajax TOCCO Magnethermic Corp. (Ajax ON)

Ajax TOCCO Magnethermic Corp. (Mexico)

Alloy Steel Treating Co. Inc.

American Heat Treating Inc.

American Metal Treating Co.

American Metal Treating Inc.

Atlantic Heat Treat

BeeHive Heat Treating Service Inc.

Bennett Heat Treating & Brazing Co. (Newark NJ)

Bennett Heat Treating & Brazing Co. (Ivlyland PA)

Blanchard Metal Processing

Bluewater Thermal Solutions, Chicago Plant 3

Bluewater Thermal Solutions, Chicago Plant 2

Bluewater Thermal Solutions (St. Marys PA)

Bluewater Thermal Solutions, Corporate

**Bodycote (ALL LOCATIONS)**

Braddock Metallurgical (Jacksonville FL)

Braddock Metallurgical (Tampa FL)

Braddock Metallurgical (Atlanta GA)

**Braddock Metallurgical (Bridgewater NJ)**

Byington Steel Treating Inc.

Calumet Surface Hardening Co. Inc.

Cascade Metallurgical Inc.

**Century Sun Metal Treating**

Certified Heat Treating

Certified Heat Treating Inc. (Springfield OH)

Cincinnati Steel Treating Co.

City Steel Heat Treating Inc.

CMC Impact Metals

Coleman Heat Treating

Commercial Steel Treating Corp.

**CONTOUR**

**Contour Hardening**

Cook Induction Heating Co.

Diamond Heat Treat

**DIE-BOND LLC**

Donohoo Steel Treating

East Carolina Metal Treating Inc.

➔ **EFD Induction Inc.**

Elmira Heat Treating Inc.

Euclid Heat Treating Co.

Evans Heat Treating

**Flame Metals Processing Corp.**

**FPM HEAT TREATING (Cherry Valley IL)**

**FPM HEAT TREATING (Elk Grove Village IL)**

Galaxy Brazing Co. Inc.

Garner Heat Treat Inc.

General Surface Hardening Inc.

Great Lakes Metal Treating Inc.

H & S Heat Treating

**Hansen-Balk Steel Treating Co.**

Hardline Heat Treating Inc.

Hauck Heat Treatment Ltd.

Heat Treatments Ltd.

Hi-Tech Steel Treating Inc.

Hitech Heat Treatment Services Pte. Ltd.

Hudapack Metal Treating Inc. (Elkhorn WI)

Hudapack Metal Treating Inc. (Franklin WI)

IMT York LLC

Induction Heat Treating Corp.

Induction Services Inc.

Inductoheat Inc.

Industrial Steel Treating Co.

Inland NW Metallurgical Services Inc.

**International Thermal Systems**

Jasco Heat Treating Inc.

JF Heat Treating Inc.

Krankka Metallurgical LLC

Lark Heat Treating Inc.

Lawrence Industries Inc.

Lone Star Heat Treating Corp.

LST Heat Treating LLC

Magnum Induction

Master Induction Heat Treat LLC

Med-Tek Inc.

Metal Treaters Inc.

Metallurgical Processing Co.

Metallurgical Solutions Inc.

Metals Engineering Inc. (DePere WI)

## CAPABILITIES LISTINGS - COMMERCIAL HEAT TREATERS DIRECTORY

Metals Technology Corp.  
**Metcor Inc.**  
 Metex Heat Treating Ltd.  
 Metlab  
**Midwest Thermal-Vac Inc.**  
 Missouri Heat Treat  
 Modern Industries Inc. (Erie PA)  
 National Metal Processing Inc.  
 Nitrex Inc., Chicago Operations  
 Nitrex Inc., Indiana Operations  
 Nitrex Inc., Michigan Operations  
 Nitrex Inc., Nevada Operations  
 Nitrex Metal Inc.  
 Nitrex Thermal Technology Co. Ltd.  
 Northeast Metals Technologies  
**Ohio Metallurgical Service**  
 Oregon Induction Corp.  
 Pacific Heat Treating Co.  
 Paulo (Kansas City MO)  
 Paulo (Nashville TN)  
 Penna Flame Industries  
 Permian Heat Treaters  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Phoenix Heat Treating Inc.  
 Pillar Induction  
**Power Parts International**  
 Precision Heat Treating Co.  
 Precision Heat Treating Corp. (Jackson MS)  
 Queen City Steel Treating  
 R & R Heat Treating Inc.  
 Radyne Corp.  
**Refrac Systems**  
 Rex Heat Treat (Lansdale PA)  
 Robert Wooler Co.  
 Rochester Steel Treating Works Inc.  
 Rockford Heat Treaters Inc.  
 Scientific Metal Treating  
 Seattle Heat Treaters, dba Stober & Chiaro  
 The Sousa Corp.  
 Southwest Metal Treating Corp.  
 STT Nitrex Querétaro, S. De R.L. De C.V.  
 Sturm Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
**Taylor-Winfield Technologies Inc.**  
 Temperature Processing Co. Inc. (Longmont CO)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal Metal Treating Inc.  
 Thermal Modification Technologies  
 Thermal-Vac Technology Inc.  
 Thermet Inc.  
 Thermex Metal Treating Ltd.  
 Thermo-Fusion Inc.  
 Tooling and General Heat Treatment  
 Tri-City Heat Treat Co.  
 University of Ljubljana  
 Vacu-Braze Inc.  
 Wallwork Cambridge Ltd.  
**Winston Heat Treating Inc.**  
 Zion Industries Inc. (Grand Ledge MI)  
 Zion Industries Inc. (Hildebran NC)  
 Zion Industries Inc. (Valley City OH)  
 Z-Machine Inc.

### Intensive Quenching

Ajax TOCCO Magnethermic Corp. (Albertville AL)  
**Akron Steel Treating Co.**  
**Contour Hardening**  
 Euclid Heat Treating Co.  
 Modern Heat Treat Inc.  
 Permian Heat Treaters  
 Radyne Corp.  
 Thermal-Vac Technology Inc.

### Neutral Salts

A & M Heat Treating Ltd.  
 Accurate Steel Treating

**Akron Steel Treating Co.**  
 American Heat Treating  
 American Heat Treating Inc.  
 American Metal Treating Inc.  
 Anderson Specialty Co.  
 Applied Process Inc. (Ft. Smith AZ)  
 Applied Process Inc. (Livonia MI)  
 Applied Process Inc., Technologies Div.  
 Applied Process Inc., Monster Parts Div.  
 Aremac Heat Treating East LLC, Southeast  
 Austenit S.A.  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Blanchard Metal Processing  
 Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical, Caribe Metallurgical  
**Century Sun Metal Treating**  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Custom Heat Treat Inc.  
 Diamond Heat Treat



**Eastern Metal Treating Inc.**  
 East-Lind Heat Treat Inc.  
 Elmira Heat Treating Inc.  
 Engineered Heat Treat Inc.  
 Euclid Heat Treating Co.  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
**FPM HEAT TREATING (Milwaukee WI)**

Gallos Metal Solutions Inc.  
 General Metal Heat Treating Inc.  
 Hardline Heat Treating Inc.  
 Hercules Heat Treating  
 Hitech Heat Treatment Services Pte. Ltd.  
 Hudapack Metal Treating of Illinois Inc.  
 Jasco Heat Treating Inc.  
**Kowalski Heat Treating**  
 Med-Tek Inc.  
 Metallurgical Solutions Inc.  
 Metals Technology Corp.  
**Metcor Inc.**  
 Metlab  
 Palmdale Heat Treating Inc.  
 Parker Trutec Inc. (Springfield OH)  
 Paulo (Kansas City MO)  
 Phoenix Heat Treating Inc.  
 Quality Heat Treating Inc.  
 Rex Heat Treat (Bedford PA)  
 Robert Wooler Co.  
 Sun Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
 Techniques Surfaces do Brasil Ltda  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
**ThermTech**  
 Valley Heat Treat Co.  
 Valley Metal Treating Inc.  
 Virginia Metal Treating, East Carolina Metal Treating  
 Wallwork Cambridge Ltd.  
 Weiss Industries Inc.

### Precipitation

A & M Heat Treating Ltd.  
 Aberfoyle Metal Treaters Ltd.  
 Accurate Steel Treating  
 Advanced Heat Treat Corp. (Burton)  
 Advanced Heat Treat Corp. (Midport)  
 Advanced Heat Treating Solutions  
**Akron Steel Treating Co.**  
 ALD Thermal Treatment Inc.  
 All-Source Heat Treating Inc.  
 Allied Heat Treat Ltd.  
 American Heat Treating  
 American Heat Treating Inc.  
 American Metal Treating Inc.  
 American Steel Treating  
 Applied Thermal Technologies Inc.  
 Aremac Heat Treating East LLC, Southeast  
 Atlantic Heat Treat  
 B & W Heat Treating Co. Inc.  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Blanchard Metal Processing  
 Bluewater Thermal Solutions (South Bend IN)  
 Bluewater Thermal Solutions, Corporate  
 Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical Aerospace Services  
 Braddock Metallurgical (Daytona FL)  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
 Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Byington Steel Treating Inc.  
 Byron Products Inc.  
 Cargill Heat Treat  
 Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
 Certified Heat Treating  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Cincinnati Heat Treating Co.  
 Circle City Heat Treating Inc.  
 City Steel Heat Treating Inc.  
 Coleman Commercial Heat Treating Inc.  
 Coleman Heat Treating  
 Continental Heat Treating Inc.  
 Controlled Thermal Technology  
 Cook Induction Heating Co.  
 County Heat Treat  
 Dayton Forging & Heat Treating  
 Dependable Metal Treating Inc.  
 Detroit Steel Treating Co.  
 Diamond Heat Treat  
**DIE-BOND LLC**  
 Donohoo Steel Treating  
 East Carolina Metal Treating Inc.  
 East-Lind Heat Treat Inc.  
 Elmira Heat Treating Inc.  
 Engineered Heat Treat Inc.  
 Erie Steel Ltd.  
 Euclid Heat Treating Co.  
 Evans Heat Treating  
 Exactatherm Ltd.  
 Exotic Metal Treating Inc.  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
**FPM HEAT TREATING (Milwaukee WI)**  
 General Metal Heat Treating Inc.  
 General Surface Hardening Inc.  
 H & S Heat Treating  
**Hansen-Balk Steel Treating Co.**  
 Harchris Heat Treatment (Pty.) Ltd.  
 Hardline Heat Treating Inc.  
 Hauck Heat Treatment Ltd.  
 Heat Treating Engineers Inc.  
 Heat Treating Technologies Inc.  
 Hercules Heat Treating  
 Hi Tech Heat Treating Ltd.  
 Hi-Tech Steel Treating Inc.  
 HI TecMetal Group, HI Tech Aero  
 HI TecMetal Group, Nettleton Steel Treating (NST)  
 HI TecMetal Group, Walker  
 High Performance Heat Treating Inc.  
 Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
 Hudapack Metal Treating of Illinois Inc.  
 Hudapack Metal Treating Inc. (Elkhorn WI)  
 Hy-Vac Technologies Inc.  
 IMT York LLC  
 Inland NW Metallurgical Services Inc.



Intriplex Thermal Technologies  
 Jasco Heat Treating Inc.  
 K & D Heat Treat Inc.  
 Katy Heat Treat LLC  
**Kowalski Heat Treating**  
 Krankka Metallurgical LLC  
 L&M Heat Treating  
 Lake City Heat Treating  
 Lark Heat Treating Inc.  
 Lawrence Industries Inc.  
 Lone Star Heat Treating Corp.  
 LST Heat Treating LLC  
 Magnum Metal Treating  
 Med-Tek Inc.  
 Metal Finishing Co.  
 Metal Treaters Inc.  
 Metallurgical Processing Inc. (CT)  
 Metallurgical Solutions Inc.  
 Metals Engineering Inc. (DePere WI)  
 Metals Technology Corp.  
**Metcor Inc.**  
 Metlab  
 Mid South Metallurgical  
**Midwest Thermal-Vac Inc.**  
 Missouri Heat Treat  
 Modern Heat Treat Inc.  
 Modern Industries Inc. (Erie PA)  
 MT Heat Treating Inc.  
 Nevada Heat Treating Inc.  
 Nitrex Inc., Chicago Operations  
 Nitrex Inc., Indiana Operations  
 Nitrex Inc., Michigan Operations  
 Nitrex Inc., Nevada Operations  
 Nitrex Metal Inc.  
 Nitrex Thermal Technology Co. Ltd.  
 Nitro-Vac Heat Treat Inc.  
 Northeast Metals Technologies  
 Oregon Induction Corp.  
 P & L Heat Treating & Grinding Inc.  
 Pacific Heat Treating Co.  
 Pacific Metallurgical  
 Palmdale Heat Treating Inc.  
 Paulo (Kansas City MO)  
 Paulo (St. Louis MO)  
 Paulo (Willoughby OH)  
 Paulo (Murfreesboro TN)  
 Paulo (Nashville TN)  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Phoenix Heat Treating Inc.  
 Pinson Valley Heat Treating  
 Precision Heat Treating Corp. (Jackson MS)  
 Precision Thermal Processing  
 Q-Tech Heat Treat LLC  
 Quality Heat Treating Inc.  
 Queen City Steel Treating  
 R & R Heat Treating Inc.  
**Refrac Systems**  
 Rex Heat Treat (Bedford PA)  
 Rex Heat Treat (Lansdale PA)  
 Robert Wooler Co.  
 Rochester Steel Treating Works Inc.  
 Rockford Heat Treaters Inc.  
 Scarrott Metallurgical Co.  
 SCHMOLZ + BICKENBACH USA  
 Scientific Metal Treating  
 Seattle Heat Treaters, dba Stober & Chiaro  
 SEI Heat Treat  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
**→ Solar Atmospheres (Souderton PA)**  
 The Sousa Corp.  
 Southwest Specialty Heat Treat  
 Specialty Heat Treat Inc.  
 Specialty Steel Treating Inc. (East Granby CT)  
**Specialty Steel Treating Inc. (Fraser MI)**  
 Spectrum Thermal Processing LLC  
 Stack Metallurgical Services Inc.  
 Steel Treaters Inc.

STT Nitrex Querétaro, S. De R.L. De C.V.  
 Sturm Steel Treating Inc.  
 Sun Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
 Tamayakin Co. Ltd.  
 Temperature Processing Co. Inc. (Longmont CO)  
 Temperature Processing Co. Inc. (North Arlington NJ)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal Braze Inc.  
 Thermal-Vac Technology Inc.  
 Thermex Metal Treating Ltd.  
 Thermo-Fusion Inc.  
**ThermTech**  
 Treat All Metals  
 Tri-City Heat Treat Co.  
 University of Ljubljana  
 Vac Aero International Inc. (Oakville ON)  
 Vac Aero International Inc. (St. Laurent QC)  
 Vac-Met Inc.  
 Vacu-Braze Inc.  
 Valley Heat Treat Co.  
 Valley Metal Treating Inc.  
 Vira-Tech Inc.  
 Virginia Metal Treating, East Carolina Metal Treating  
 Wallwork Cambridge Ltd.  
 Weiss Industries Inc.  
**Winston Heat Treating Inc.**  
 Wyatt Services Inc.

### Press Quenching

Ajax TOCCO Magnethermic Corp. (Albertville AL)  
 Ajax TOCCO Magnethermic Corp. (Madison Heights MI)  
**→ Ajax TOCCO Magnethermic Corp. (Warren OH)**  
 Ajax TOCCO Magnethermic Corp. (Wickliffe OH)  
 Ajax TOCCO Magnethermic Corp. (Ajax ON)  
 All-Source Heat Treating Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
**Bodycote (ALL LOCATIONS)**  
 Cincinnati Steel Treating Co.  
 CRIO SA de CV  
**DIE-BOND LLC**  
 Engineered Heat Treat Inc.  
 Erie Steel Ltd.  
 Euclid Heat Treating Co.  
**Flame Metals Processing Corp.**  
 H & S Heat Treating  
 Hitech Heat Treatment Services Pte. Ltd.  
**International Thermal Systems**  
**Kowalski Heat Treating**  
 Lone Star Heat Treating Corp.  
 Metallurgical Processing Inc. (CT)  
 Metallurgical Solutions Inc.  
 Metlab  
 Pacific Metallurgical  
 Paulo (St. Louis MO)  
 R & R Heat Treating Inc.  
 Radyne Corp.  
**Refrac Systems**  
 Seattle Heat Treaters, dba Stober & Chiaro  
**Specialty Steel Treating Inc. (Fraser MI)**  
 Treat All Metals  
 Tri-City Heat Treat Co.

### Vacuum

A & M Heat Treating Ltd.  
 Accurate Steel Treating  
 Advanced Heat Treating Solutions  
 Aerobraze Engineered Technologies  
 Ajax TOCCO International Ltd.  
 Ajax TOCCO Magnethermic Corp. (Albertville AL)  
 Ajax TOCCO Magnethermic Corp. (Madison Heights MI)  
**→ Ajax TOCCO Magnethermic Corp. (Warren OH)**  
 Ajax TOCCO Magnethermic Corp. (Wickliffe OH)  
 Ajax TOCCO Magnethermic Corp. (Ajax ON)  
 Ajax TOCCO Magnethermic Corp. (Mexico)  
**Akron Steel Treating Co.**  
 ALD Thermal Treatment Inc.

ALD Vacuheat GmbH  
 Allied Heat Treat Ltd.  
 American Heat Treating Inc.  
 American Metal Treating Inc.  
 American Steel Treating  
 Applied Thermal Technologies Inc.  
 Aremac Heat Treating East LLC, Southeast  
 Atlantic Heat Treat  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Blanchard Metal Processing  
 Bluewater Thermal Solutions (Rockford IL)  
 Bluewater Thermal Solutions (South Bend IN)  
 Bluewater Thermal Solutions, Corporate  
**Bodycote (ALL LOCATIONS)**  
 The Bowdill Co.  
 Braddock Metallurgical Aerospace Services  
 Braddock Metallurgical (Daytona FL)  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
 Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Byington Steel Treating Inc.  
 Byron Products Inc.  
 Cambridge Heat Treating  
**Century Sun Metal Treating**  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Circle City Heat Treating Inc.  
 City Steel Heat Treating Inc.  
 Continental Heat Treating Inc.  
**Contour Hardening**  
 County Heat Treat  
**DIE-BOND LLC**  
 Dynamic Surface Technologies  
 East Carolina Metal Treating Inc.  
 East-Lind Heat Treat Inc.  
 Elmira Heat Treating Inc.  
 Engineered Heat Treat Inc.  
 Erie Steel Ltd.  
 Euclid Heat Treating Co.  
 Exactatherm Ltd.  
 Exotic Metal Treating Inc.  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
 Garner Heat Treat Inc.  
 General Metal Heat Treating Inc.  
**Hansen-Balk Steel Treating Co.**  
 Hardline Heat Treating Inc.  
 Hauck Heat Treatment Ltd.  
 Heat Treatment Australia  
 Hercules Heat Treating  
 Hi-Tech Steel Treating Inc.  
 HI TecMetal Group, HI Tech Aero  
 HI TecMetal Group, Nettleton Steel Treating (NST)  
 HI TecMetal Group, Walker  
 Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
 Hy-Vac Technologies Inc.  
 Inland NW Metallurgical Services Inc.  
 Ionic Technologies Inc.  
 Jasco Heat Treating Inc.  
 Katy Heat Treat LLC  
**Kowalski Heat Treating**  
 Krankka Metallurgical LLC  
 Lake City Heat Treating  
 Lark Heat Treating Inc.  
 Lawrence Industries Inc.  
 Magnum Metal Treating  
 Med-Tek Inc.  
 Metal Finishing Co.  
 Metal Treaters Inc.  
 Metallurgical Processing Inc. (CT)  
 Metallurgical Solutions Inc.  
 Metals Technology Corp.  
**Metcor Inc.**  
 Metlab  
 Mid South Metallurgical

## CAPABILITIES LISTINGS - COMMERCIAL HEAT TREATERS DIRECTORY

**Midwest Thermal-Vac Inc.**

Modern Heat Treat Inc.  
 Modern Industries Inc. (Erie PA)  
 National Heat Treat  
 National Metal Processing Inc.  
 Nevada Heat Treating Inc.  
 Nitrex Inc., Chicago Operations  
 Nitrex Inc., Indiana Operations  
 Nitrex Inc., Michigan Operations  
 Nitrex Inc., Nevada Operations  
 Nitrex Metal Inc.  
 Nitrex Thermal Technology Co. Ltd.  
 Nitro-Vac Heat Treat Inc.  
 Northeast Metals Technologies  
**Ohio Metallurgical Service**  
 P & L Heat Treating & Grinding Inc.  
 Pacific Heat Treating Co.  
 Pacific Metallurgical  
 Palmdale Heat Treating Inc.  
 Paulo (Kansas City MO)  
 Paulo (St. Louis MO)  
 Paulo (Willoughby OH)  
 Paulo (Nashville TN)  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Phoenix Heat Treating Inc.  
 Pinson Valley Heat Treating  
 Precision Heat Treating Corp. (Jackson MS)  
 Precision Thermal Processing  
 Q-Tech Heat Treat LLC  
 Quality Heat Treating Inc.  
 Radyne Corp.  
**Refrac Systems**  
 Rex Heat Treat (Lansdale PA)  
 Robert Wooler Co.  
 Rochester Steel Treating Works Inc.  
 Rockford Heat Treaters Inc.  
 Scarrott Metallurgical Co.  
 SCHMOLZ + BICKENBACH USA  
 Scientific Metal Treating  
 Seattle Heat Treaters, dba Stober & Chiaro  
 Service Heat Treating Inc.  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
**→ Solar Atmospheres (Souderton PA)**  
**Solar Atmospheres (Greenville SC)**  
 The Sousa Corp.  
 Southwest Metal Treating Corp.  
 Specialty Steel Treating Inc. (East Granby CT)  
**Specialty Steel Treating Inc. (Fraser MI)**  
 Spectrum Thermal Processing LLC  
 Stack Metallurgical Services Inc.  
 Steel Treaters Inc.  
 STT Nitrex Querétaro, S. De R.L. De C.V.  
 Sturm Steel Treating Inc.  
 Sun Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
 Tamayakin Co. Ltd.  
 Techniques Surfaces do Brasil Ltda  
 Temperature Processing Co. Inc. (North Arlington NJ)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal Braze Inc.  
 Thermal-Vac Technology Inc.  
 THERMETCO Inc.  
 Thermo-Fusion Inc.  
**ThermTech**  
 Tratamientos Termicos Nitrogas S.A.  
 Tri-City Heat Treat Co.  
 Vac Aero International Inc. (Oakville ON)  
 Vac Aero International Inc. (St. Laurent QC)  
 Vac-Met Inc.  
 Vacu-Braze Inc.  
 Valley Metal Treating Inc.  
 Vira-Tech Inc.  
**voestalpine Thermo-Tech**  
 Wallwork Cambridge Ltd.  
**Winston Heat Treating Inc.**

**HIGH SPEED STEEL****Fluid Bed**

Hardline Heat Treating Inc.  
 Phoenix Heat Treating Inc.

**Furnace**

Accurate Steel Treating  
 Advanced Heat Treat Corp. (Burton)  
 Advanced Heat Treat Corp. (Midport)  
 Ajax TOCCO Magnethermic Corp. (Albertville AL)  
**Akron Steel Treating Co.**  
 All-Source Heat Treating Inc.  
 Alloy Steel Treating Co. Inc.  
 American Heat Treating Inc.  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bluewater Thermal Solutions (South Bend IN)  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical Aerospace Services  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Byron Products Inc.  
**Century Sun Metal Treating**  
**Certified Metal Craft Inc.**  
 City Steel Heat Treating Inc.  
 Coleman Commercial Heat Treating Inc.  
 Commercial Heat Treating Inc.  
 Continental Heat Treating Inc.  
 Controlled Thermal Technology  
**DIE-BOND LLC**  
 Engineered Heat Treat Inc.  
 Euclid Heat Treating Co.  
**Flame Metals Processing Corp.**  
 Garner Heat Treat Inc.  
 General Metal Heat Treating Inc.  
 HI TecMetal Group, Walker  
 Hitech Heat Treatment Services Pte. Ltd.  
 Intrixplex Thermal Technologies  
 JF Heat Treating Inc.  
**Kowalski Heat Treating**  
 Krankka Metallurgical LLC  
 Lark Heat Treating Inc.  
 Metal Finishing Co.  
 Metallurgical Processing Inc. (CT)  
 Metals Technology Corp.  
 Metlab  
 Missouri Heat Treat  
 Modern Industries Inc. (Erie PA)  
 Nevada Heat Treating Inc.  
 Northeast Metals Technologies  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Pinson Valley Heat Treating  
 Precision Heat Treating Corp. (Ft. Wayne IN)  
 Precision Heat Treating Corp. (Jackson MS)  
 Precision Heat Treating Inc.  
 Q-Tech Heat Treat LLC  
 Quality Heat Treating Inc.  
 Queen City Steel Treating  
 R & R Heat Treating Inc.  
**Refrac Systems**  
 Rockford Heat Treaters Inc.  
 Scientific Metal Treating  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
**→ Solar Atmospheres (Souderton PA)**  
 Southwest Specialty Heat Treat  
 Specialty Steel Treating Inc. (East Granby CT)  
 Spectrum Thermal Processing LLC  
 Steel Treaters Inc.  
 Tamayakin Co. Ltd.  
 Temperature Processing Co. Inc. (Longmont CO)  
 Temperature Processing Co. Inc. (North Arlington NJ)  
 Thermal-Vac Technology Inc.

Tri-City Heat Treat Co.  
 Vac Aero International Inc. (Oakville ON)  
 Vac Aero International Inc. (St. Laurent QC)  
 Vacu-Braze Inc.  
 Wallwork Cambridge Ltd.  
 Weiss Industries Inc.

**Salt**

A & M Heat Treating Ltd.  
 Accurate Steel Treating  
**Akron Steel Treating Co.**  
**Century Sun Metal Treating**  
 Custom Heat Treat Inc.  
 Engineered Heat Treat Inc.  
 General Metal Heat Treating Inc.  
 Jasco Heat Treating Inc.  
 Metallurgical Solutions Inc.  
 Paulo (Kansas City MO)  
 Sun Steel Treating Inc.  
 Techniques Surfaces do Brasil Ltda  
 Wallwork Cambridge Ltd.

**Vacuum**

A & M Heat Treating Ltd.  
 Accurate Steel Treating  
 Advanced Heat Treating Solutions  
 Ajax TOCCO Magnethermic Corp. (Albertville AL)  
**Akron Steel Treating Co.**  
 ALD Thermal Treatment Inc.  
 ALD Vacuheat GmbH  
 Allied Heat Treat Ltd.  
 American Heat Treating Inc.  
 American Metal Treating Inc.  
 American Steel Treating  
 Applied Thermal Technologies Inc.  
 Aremac Heat Treating East LLC, Southeast  
 Atlantic Heat Treat  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Blanchard Metal Processing  
 Bluewater Thermal Solutions (Rockford IL)  
 Bluewater Thermal Solutions, Corporate  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical Aerospace Services  
 Braddock Metallurgical (Daytona FL)  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Byington Steel Treating Inc.  
 Byron Products Inc.  
 Cambridge Heat Treating  
**Century Sun Metal Treating**  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Circle City Heat Treating Inc.  
 City Steel Heat Treating Inc.  
 Coleman Heat Treating  
 Continental Heat Treating Inc.  
**Contour Hardening**  
 Controlled Thermal Technology  
 County Heat Treat  
**DIE-BOND LLC**  
 Dynamic Surface Technologies  
 East Carolina Metal Treating Inc.  
 Elmira Heat Treating Inc.  
 Engineered Heat Treat Inc.  
 Euclid Heat Treating Co.  
 Exactatherm Ltd.  
 Exotic Metal Treating Inc.  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
 General Metal Heat Treating Inc.  
**Hansen-Balk Steel Treating Co.**  
 Hardline Heat Treating Inc.  
 Hauck Heat Treatment Ltd.  
 Hercules Heat Treating



Hi-Tech Steel Treating Inc.  
 HI TecMetal Group, Walker  
 Hitech Heat Treatment Services Pte. Ltd.

#### **Houston Heat Treat**

Hy-Vac Technologies Inc.  
 Inland NW Metallurgical Services Inc.  
 Jasco Heat Treating Inc.  
 Katy Heat Treat LLC

#### **Kowalski Heat Treating**

Krankka Metallurgical LLC  
 Lake City Heat Treating  
 Lark Heat Treating Inc.  
 Lawrence Industries Inc.  
 Magnum Metal Treating  
 Med-Tek Inc.  
 Metal Finishing Co.  
 Metal Treaters Inc.  
 Metallurgical Processing Inc. (CT)  
 Metallurgical Solutions Inc.  
 Metals Technology Corp.

#### **Metcor Inc.**

Metlab

#### **Midwest Thermal-Vac Inc.**

Modern Industries Inc. (Erie PA)  
 Nevada Heat Treating Inc.  
 Nitrex Inc., Chicago Operations  
 Nitrex Inc., Indiana Operations  
 Nitrex Inc., Michigan Operations  
 Nitrex Inc., Nevada Operations  
 Nitrex Metal Inc.  
 Nitrex Thermal Technology Co. Ltd.  
 Nitro-Vac Heat Treat Inc.  
 Northeast Metals Technologies

#### **Ohio Metallurgical Service**

P & L Heat Treating & Grinding Inc.  
 Pacific Heat Treating Co.  
 Pacific Metallurgical  
 Paulo (Kansas City MO)  
 Paulo (St. Louis MO)  
 Paulo (Nashville TN)  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Phoenix Heat Treating Inc.  
 Pinson Valley Heat Treating  
 Precision Heat Treating Corp. (Ft. Wayne IN)  
 Precision Heat Treating Corp. (Jackson MS)  
 Precision Thermal Processing  
 Q-Tech Heat Treat LLC  
 Quality Heat Treating Inc.

#### **Refrac Systems**

Robert Wooler Co.  
 Rochester Steel Treating Works Inc.  
 Rockford Heat Treaters Inc.  
 Scientific Metal Treating  
 Seattle Heat Treaters, dba Stober & Chiaro  
 Service Heat Treating Inc.

#### **Solar Atmospheres (Fontana CA)**

#### **Solar Atmospheres (Hermitage PA)**

#### **→ Solar Atmospheres (Souderton PA)**

#### **Solar Atmospheres (Greenville SC)**

The Sousa Corp.  
 Specialty Steel Treating Inc. (East Granby CT)  
**Specialty Steel Treating Inc. (Fraser MI)**  
 Spectrum Thermal Processing LLC  
 Stack Metallurgical Services Inc.  
 Steel Treaters Inc.  
 STT Nitrex Querétaro, S. De R.L. De C.V.  
 Sturm Steel Treating Inc.  
 Sun Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
 Tamayakin Co. Ltd.  
 Temperature Processing Co. Inc. (North Arlington NJ)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal Braze Inc.  
 Thermal One Inc.  
 Thermal-Vac Technology Inc.  
 THERMETCO Inc.  
 Thermo-Fusion Inc.

#### **ThermTech**

Tratamientos Termicos Nitrogas S.A.  
 Tri-City Heat Treat Co.  
 Vac Aero International Inc. (Oakville ON)  
 Vac Aero International Inc. (St. Laurent QC)  
 Vac-Met Inc.  
 Vacu-Braze Inc.  
 Valley Metal Treating Inc.  
**voestalpine Thermo-Tech**  
 Wallwork Cambridge Ltd.  
**Winston Heat Treating Inc.**

## **FERRITIC NITROCARBURIZING**

### **Fluid Bed**

Dynamic Surface Technologies  
 Hardline Heat Treating Inc.  
 NitroSteel - A Premier Thermal Co.  
 Paulo (St. Louis MO)  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Phoenix Heat Treating Inc.  
 Rochester Steel Treating Works Inc.  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Tratamientos Termicos Nitrogas S.A.

### **Gas**

A & M Heat Treating Ltd.  
 Advanced Heat Treat Corp. (Cullman AL)  
 Advanced Heat Treat Corp. (Midport)  
 Advanced Heat Treat Corp. (Monroe MI)  
 Advanced Heat Treating Solutions  
 Advanced Nitriding Solutions  
 ALD Vacuheat GmbH  
 Alloy Steel Treating Co. Inc.  
 American Metal Treating Inc.  
 American Steel Treating  
 Atmosphere Annealing LLC (Bassett)  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Bluewater Thermal Solutions, Corporate  
 Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical Aerospace Services  
 Braddock Metallurgical (Daytona FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
 Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Cambridge Heat Treating  
 Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
 Certified Heat Treating Inc. (Springfield OH)  
 Cincinnati Steel Treating Co.  
 City Steel Heat Treating Inc.  
**Contour Hardening**  
 Controlled Thermal Technology  
 County Heat Treat  
 Diamond Heat Treat  
 East Carolina Metal Treating Inc.  
 Euclid Heat Treating Co.  
 Evans Heat Treating

#### **Braddock Metallurgical (Bridgewater NJ)**

Cambridge Heat Treating

Cascade Metallurgical Inc.

#### **Century Sun Metal Treating**

Certified Heat Treating Inc. (Springfield OH)

Cincinnati Steel Treating Co.

City Steel Heat Treating Inc.

#### **Contour Hardening**

Controlled Thermal Technology

County Heat Treat

Diamond Heat Treat

East Carolina Metal Treating Inc.

Euclid Heat Treating Co.

Evans Heat Treating

#### **FPM HEAT TREATING (Cherry Valley IL)**

#### **FPM HEAT TREATING (Elk Grove Village IL)**

Garner Heat Treat Inc.

General Metal Heat Treating Inc.

Hardline Heat Treating Inc.

Hauck Heat Treatment Ltd.

Heat Treating Technologies Inc.

Hi-Tech Steel Treating Inc.

HI TecMetal Group, Nettleton Steel Treating (NST)

Hitech Heat Treatment Services Pte. Ltd.

Hudapack Metal Treating Inc. (Elkhorn WI)

Hudapack Metal Treating Inc. (Franklin WI)

Jasco Heat Treating Inc.

Lone Star Heat Treating Corp.

Metallurgical Processing Co.

Metallurgical Processing Inc. (CT)  
 Metals Technology Corp.

#### **Metcor Inc.**

Metlab

Modern Industries Inc. (Erie PA)

Nevada Heat Treating Inc.

Nitrex Inc., Chicago Operations

Nitrex Inc., Indiana Operations

Nitrex Inc., Michigan Operations

Nitrex Inc., Nevada Operations

Nitrex Metal Inc.

Nitrex Thermal Technology Co. Ltd.

Paulo (Kansas City MO)

Paulo (St. Louis MO)

Paulo (Nashville TN)

Paulo (Monterrey MX)

Queen City Steel Treating

Scientific Metal Treating

Service Heat Treating Inc.

#### **Specialty Steel Treating Inc. (Fraser MI)**

Steel Treaters Inc.

Superior Metal Treating & Equipment Inc.

Tamayakin Co. Ltd.

Temperature Processing Co. Inc. (Longmont CO)

Texas Heat Treating Inc. (Ft. Worth TX)

Texas Heat Treating Inc. (Round Rock TX)

Thermex Metal Treating Ltd.

Thermo-Fusion Inc.

Tratamientos Termicos Nitrogas S.A.

Vacu-Braze Inc.

Valley Metal Treating Inc.

Wallwork Cambridge Ltd.

Weiss Industries Inc.

### **Ion**

A & M Heat Treating Ltd.  
 Advanced Heat Treat Corp. (Cullman AL)  
 Advanced Heat Treat Corp. (Midport)  
 Advanced Heat Treat Corp. (Monroe MI)  
 Advanced Nitriding Solutions  
 Hauck Heat Treatment Ltd.  
 Hitech Heat Treatment Services Pte. Ltd.  
**Kowalski Heat Treating**  
**Midwest Thermal-Vac Inc.**  
 MPT America Corp.  
 Stack Metallurgical Services Inc.  
 Wallwork Cambridge Ltd.

### **Salt**

Austenit S.A.  
**Bodycote (ALL LOCATIONS)**  
 Controlled Thermal Technology  
**Flame Metals Processing Corp.**  
 General Metal Heat Treating Inc.  
 H & M Metal Processing Co.  
 Hauck Heat Treatment Ltd.  
 Hitech Heat Treatment Services Pte. Ltd.  
 Metallurgical Solutions Inc.  
**Metcor Inc.**  
 Metlab  
 Parker Trutec - MMI Inc. (Paragould AR)  
 Parker Trutec - MMI Inc. (Sevierville TN)  
 Thermex Metal Treating Ltd.  
 Wallwork Cambridge Ltd.

## **NITRIDING**

### **Fluid Bed**

American Metal Treating Inc.  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Dynamic Surface Technologies  
 Hardline Heat Treating Inc.  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Rochester Steel Treating Works Inc.  
 Rockford Heat Treaters Inc.  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Tratamientos Termicos Nitrogas S.A.

## CAPABILITIES LISTINGS - COMMERCIAL HEAT TREATERS DIRECTORY

**Gas**

A & M Heat Treating Ltd.  
A & M SurfTech Ltd.  
Accurate Steel Treating  
Advanced Heat Treat Corp. (Cullman AL)  
Advanced Heat Treat Corp. (Midport)  
Advanced Heat Treat Corp. (Monroe MI)  
Advanced Heat Treating Solutions  
Advanced Nitriding Solutions  
ALD Vacuheat GmbH  
Allied Heat Treat Ltd.  
Alloy Steel Treating Co. Inc.  
American Steel Treating  
Aremac Heat Treating East LLC, Southeast  
Atlantic Heat Treat  
Bennett Heat Treating & Brazing Co. (Newark NJ)  
Bennett Heat Treating & Brazing Co. (Ivyland PA)  
Blanchard Metal Processing  
Bluewater Thermal Solutions (South Bend IN)  
Bluewater Thermal Solutions (Benton Harbor MI)  
Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
Braddock Metallurgical (Daytona FL)  
Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Tampa FL)  
Braddock Metallurgical (Atlanta GA)  
Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
Byington Steel Treating Inc.  
Cambridge Heat Treating  
Cincinnati Steel Treating Co.  
City Steel Heat Treating Inc.  
Coleman Heat Treating  
Commercial Steel Treating Corp.  
Continental Heat Treating Inc.  
**Contour Hardening**  
Controlled Thermal Technology  
County Heat Treat  
Dynamic Surface Technologies  
East Carolina Metal Treating Inc.  
Elmira Heat Treating Inc.  
Engineered Heat Treat Inc.  
Euclid Heat Treating Co.  
Evans Heat Treating  
**FPM HEAT TREATING (Cherry Valley IL)**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
**Hansen-Balk Steel Treating Co.**  
Hardline Heat Treating Inc.  
Hauck Heat Treatment Ltd.  
Heat Treatments Ltd.



Hi Tech Heat Treating Ltd.  
Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
Hudapack Metal Treating Inc. (Franklin WI)  
Ionic Technologies Inc.  
Jasco Heat Treating Inc.  
Lark Heat Treating Inc.  
Lone Star Heat Treating Corp.  
LST Heat Treating LLC  
Metals Technology Corp.  
**Metcor Inc.**  
Metlab  
Modern Industries Inc. (Erie PA)  
National Heat Treat  
Nevada Heat Treating Inc.  
Nitrex Inc., Chicago Operations  
Nitrex Inc., Indiana Operations  
Nitrex Inc., Michigan Operations  
Nitrex Inc., Nevada Operations  
Nitrex Metal Inc.  
Nitrex Thermal Technology Co. Ltd.  
Nitro-Vac Heat Treat Inc.  
P & L Heat Treating & Grinding Inc.  
Pacific Metallurgical

Parker Trutec Inc. (Springfield OH)  
Paulo (Kansas City MO)  
Paulo (St. Louis MO)  
Paulo (Nashville TN)  
Peters' Heat Treating Inc. (McKean PA)  
Peters' Heat Treating Inc. (Meadville PA)  
Peters' Heat Treating Inc. - West  
Precision Heat Treating Corp. (Ft. Wayne IN)  
Queen City Steel Treating  
R & R Heat Treating Inc.  
Rex Heat Treat (Lansdale PA)  
Rochester Steel Treating Works Inc.  
Rockford Heat Treaters Inc.  
Scientific Metal Treating  
SEI Heat Treat  
Service Heat Treating Inc.  
**Specialty Steel Treating Inc. (Fraser MI)**  
Spectrum Thermal Processing LLC  
STT Nitrex Querétaro, S. De R.L. De C.V.  
Superior Metal Treating & Equipment Inc.  
Tamayakin Co. Ltd.  
Temperature Processing Co. Inc. (Longmont CO)  
Temperature Processing Co. Inc. (North Arlington NJ)  
Texas Heat Treating Inc. (Ft. Worth TX)  
Texas Heat Treating Inc. (Round Rock TX)  
Thermal-Vac Technology Inc.  
THERMETCO Inc.  
Thermex Metal Treating Ltd.  
Thermo-Fusion Inc.  
**ThermTech**  
Tooling and General Heat Treatment  
Tratamientos Termicos Nitrogas S.A.  
Treat All Metals  
Vac Aero International Inc. (Oakville ON)  
Vac Aero International Inc. (St. Laurent QC)  
Vacu-Braze Inc.  
Wallwork Cambridge Ltd.  
**Winston Heat Treating Inc.**  
Wyatt Services Inc.

**Ion**

A & M Heat Treating Ltd.  
Accurate Steel Treating  
Advanced Heat Treat Corp. (Cullman AL)  
Advanced Heat Treat Corp. (Midport)  
Advanced Heat Treat Corp. (Monroe MI)  
Advanced Heat Treating Solutions  
Advanced Nitriding Solutions  
**Bodycote (ALL LOCATIONS)**  
Cambridge Heat Treating  
**Century Sun Metal Treating**  
Exactatherm Ltd.  
**Hansen-Balk Steel Treating Co.**  
Hauck Heat Treatment Ltd.  
Hitech Heat Treatment Services Pte. Ltd.  
Ionic Technologies Inc.  
**Kowalski Heat Treating**  
Magnum Metal Treating  
Metallurgical Processing Inc. (CT)  
Mid South Metallurgical  
**Midwest Thermal-Vac Inc.**  
MPT America Corp.  
Nitrex Inc., Chicago Operations  
Nitrex Inc., Indiana Operations  
Nitrex Inc., Michigan Operations  
Nitrex Inc., Nevada Operations  
Nitrex Metal Inc.  
Nitrex Thermal Technology Co. Ltd.  
**Solar Atmospheres (Hermitage PA)**  
➔ **Solar Atmospheres (Souderton PA)**  
Stack Metallurgical Services Inc.  
STT Nitrex Querétaro, S. De R.L. De C.V.  
Sun Steel Treating Inc.  
Temperature Processing Co. Inc. (North Arlington NJ)  
Thermal Modification Technologies  
Thermal Specialties  
Thermal Specialties of Texas LLC  
Tratamientos Termicos Nitrogas S.A.  
**voestalpine Thermo-Tech**  
Wallwork Cambridge Ltd.

**Salt**

Anderson Specialty Co.  
Austenit S.A.  
Controlled Thermal Technology  
**Flame Metals Processing Corp.**  
Hauck Heat Treatment Ltd.  
Hitech Heat Treatment Services Pte. Ltd.  
Med-Tek Inc.  
Metallurgical Solutions Inc.  
**Metcor Inc.**  
Nitro-Vac Heat Treat Inc.  
Parker Trutec Inc. (Springfield OH)  
Parker Trutec Mexicana S.A. de C.V.  
Parker Trutec - MMI Inc. (Paragould AR)  
Parker Trutec - MMI Inc. (Sevierville TN)  
Techniques Surfaces do Brasil Ltda  
Thermex Metal Treating Ltd.

**Vacuum**

Advanced Nitriding Solutions  
Braddock Metallurgical (Atlanta GA)  
Braddock Metallurgical (Charlotte NC)  
Hitech Heat Treatment Services Pte. Ltd.  
**Midwest Thermal-Vac Inc.**  
Paulo (Nashville TN)  
**Solar Atmospheres (Hermitage PA)**  
➔ **Solar Atmospheres (Souderton PA)**  
THERMETCO Inc.  
Tratamientos Termicos Nitrogas S.A.  
Wallwork Cambridge Ltd.

**TOOL STEEL****Fluid Bed**

American Metal Treating Inc.  
Bennett Heat Treating & Brazing Co. (Ivyland PA)  
Commercial Heat Treating Inc.  
East-Lind Heat Treat Inc.  
Evans Heat Treating  
Hardline Heat Treating Inc.  
Metallurgical Solutions Inc.  
Peters' Heat Treating Inc. (McKean PA)  
Peters' Heat Treating Inc. (Meadville PA)  
Peters' Heat Treating Inc. - West  
Phoenix Heat Treating Inc.  
Tratamientos Termicos Nitrogas S.A.

**Furnace**

A & M Heat Treating Ltd.  
Aberfoyle Metal Treating Ltd.  
Accurate Steel Treating  
Advanced Heat Treat Corp. (Burton)  
Advanced Heat Treating Inc.  
**Akron Steel Treating Co.**  
All-Source Heat Treating Inc.  
Allied Heat Treat Ltd.  
Alloy Steel Treating Co. Inc.  
American Heat Treating Inc.  
American Metal Treating Inc.  
American Steel Treating  
Aremac Heat Treating East LLC, Southeast  
BeeHive Heat Treating Service Inc.  
Bennett Heat Treating & Brazing Co. (Newark NJ)  
Bennett Heat Treating & Brazing Co. (Ivyland PA)  
Blanchard Metal Processing  
Bluewater Thermal Solutions (Rockford IL)  
Bluewater Thermal Solutions (Benton Harbor MI)  
Bluewater Thermal Solutions (St. Marys PA)  
Bluewater Thermal Solutions, Corporate  
Braddock Metallurgical Aerospace Services  
Braddock Metallurgical (Daytona FL)  
Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Tampa FL)  
Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
Braddock Metallurgical, Caribe Metallurgical  
Byington Steel Treating Inc.  
Cambridge Heat Treating



Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
 Certified Heat Treating  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Cincinnati Steel Treating Co.  
 Circle City Heat Treating Inc.  
 City Steel Heat Treating Inc.  
 Coleman Commercial Heat Treating Inc.  
 Coleman Heat Treating  
 Commercial Heat Treating Inc.  
 Continental Heat Treating Inc.  
**Contour Hardening**  
 Controlled Thermal Technology  
 County Heat Treat  
 Dayton Forging & Heat Treating  
 Dependable Metal Treating Inc.  
 Detroit Steel Treating Co.  
**DIE-BOND LLC**  
 Donohoo Steel Treating  
 East Carolina Metal Treating Inc.  
 East-Lind Heat Treat Inc.  
 Elmira Heat Treating Inc.  
 Engineered Heat Treat Inc.  
 Euclid Heat Treating Co.  
 Evans Heat Treating  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
 Garner Heat Treat Inc.  
 General Metal Heat Treating Inc.  
 General Surface Hardening Inc.  
 H & S Heat Treating  
**Hansen-Balk Steel Treating Co.**  
 Hardline Heat Treating Inc.  
 Hi Tech Heat Treating Ltd.  
 Hi-Tech Steel Treating Inc.  
 HI TecMetal Group, Nettleton Steel Treating (NST)  
 High Performance Heat Treating Inc.  
 Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
 Hudapack Metal Treating Inc. (Elkhorn WI)  
 Hudapack Metal Treating Inc. (Franklin WI)  
 IMT York LLC  
 Inland NW Metallurgical Services Inc.  
 Intriplex Thermal Technologies  
 Jasco Heat Treating Inc.  
 JF Heat Treating Inc.  
**Kowalski Heat Treating**  
 Krankka Metallurgical LLC  
 Lark Heat Treating Inc.  
 Lawrence Industries Inc.  
 Lone Star Heat Treating Corp.  
 LST Heat Treating LLC  
 Magnum Metal Treating  
 Metal Finishing Co.  
 Metal Treaters Inc.  
 Metallurgical Processing Inc. (CT)  
 Metallurgical Solutions Inc.  
 Metals Engineering Inc. (DePere WI)  
 Metals Technology Corp.  
**Metcor Inc.**  
 Metlab  
 Missouri Heat Treat  
 Modern Industries Inc. (Erie PA)  
 MT Heat Treating Inc.  
 Nevada Heat Treating Inc.  
 Nitrex Inc., Chicago Operations  
 Nitrex Inc., Indiana Operations  
 Nitrex Inc., Michigan Operations  
 Nitrex Inc., Nevada Operations  
 Nitrex Metal Inc.  
 Nitrex Thermal Technology Co. Ltd.  
 Northeast Metals Technologies  
 Ohio Vertical Heat Treat  
 P & L Heat Treating & Grinding Inc.  
 Pacific Heat Treating Co.  
 Pacific Metallurgical  
 Palmdale Heat Treating Inc.  
 Paulo (Kansas City MO)  
 Paulo (St. Louis MO)

Paulo (Nashville TN)  
 Peters' Heat Treating Inc. (McKean PA)  
 Peters' Heat Treating Inc. (Meadville PA)  
 Peters' Heat Treating Inc. - West  
 Phoenix Heat Treating Inc.  
 Pinson Valley Heat Treating  
 Precision Heat Treating Corp. (Ft. Wayne IN)  
 Precision Heat Treating Corp. (Jackson MS)  
 Precision Heat Treating Inc.  
 Precision Thermal Processing  
 Q-Tech Heat Treat LLC  
 Quality Heat Treating Inc.  
 Queen City Steel Treating  
 R & R Heat Treating Inc.  
**Refrac Systems**  
 Rex Heat Treat (Bedford PA)  
 Robert Wooler Co.  
 Rockford Heat Treaters Inc.  
 SCHMOLZ + BICKENBACH USA  
 Seattle Heat Treaters, dba Stober & Chiaro  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
**➔ Solar Atmospheres (Souderton PA)**  
 The Sousa Corp.  
 Southwest Specialty Heat Treat  
 Specialty Heat Treat Inc.  
**Specialty Steel Treating Inc. (Fraser MI)**  
 Stack Metallurgical Services Inc.  
 Steel Treaters Inc.  
 Stokes Steel Treating Co.  
 STT Nitrex Querétaro, S. De R.L. De C.V.  
 Sturm Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
 Tamayakin Co. Ltd.  
 Temperature Processing Co. Inc. (Longmont CO)  
 Temperature Processing Co. Inc. (North Arlington NJ)  
 Texas Heat Treating Inc. (Ft. Worth TX)  
 Texas Heat Treating Inc. (Round Rock TX)  
 Thermal Braze Inc.  
 Thermal Metal Treating Inc.  
 Thermal Specialties  
 Thermal Specialties of Texas LLC  
 Thermal-Vac Technology Inc.  
 Thermex Metal Treating Ltd.  
 Tri-City Heat Treat Co.  
 University of Ljubljana  
 Vac Aero International Inc. (Oakville ON)  
 Vac-Met Inc.  
 Vacu-Braze Inc.  
 Valley Heat Treat Co.  
 Valley Metal Treating Inc.  
 Vira-Tech Inc.  
**voestalpine Thermo-Tech**  
 Wallwork Cambridge Ltd.  
 Weiss Industries Inc.  
 Wyatt Services Inc.

### Salt

A & M Heat Treating Ltd.  
 Accurate Steel Treating  
**Akron Steel Treating Co.**  
 American Heat Treating Inc.  
 American Metal Treating Inc.  
 Anderson Specialty Co.  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Blanchard Metal Processing  
 Braddock Metallurgical, Caribe Metallurgical  
**Century Sun Metal Treating**  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Custom Heat Treat Inc.  
 East-Lind Heat Treat Inc.  
 Elmira Heat Treating Inc.  
 Engineered Heat Treat Inc.  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
 General Metal Heat Treating Inc.  
 Hardline Heat Treating Inc.

Hitech Heat Treatment Services Pte. Ltd.  
 Jasco Heat Treating Inc.  
**Kowalski Heat Treating**  
 Med-Tek Inc.  
 Metallurgical Solutions Inc.  
**Metcor Inc.**  
 Palmdale Heat Treating Inc.  
 Paulo (Kansas City MO)  
 Phoenix Heat Treating Inc.  
 Quality Heat Treating Inc.  
 Robert Wooler Co.  
 Sun Steel Treating Inc.  
 Superior Metal Treating & Equipment Inc.  
 Techniques Surfaces do Brasil Ltda  
 Valley Heat Treat Co.  
 Valley Metal Treating Inc.  
 Virginia Metal Treating, East Carolina Metal Treating  
 Wallwork Cambridge Ltd.

### Vacuum

A & M Heat Treating Ltd.  
 Accurate Steel Treating  
 Advanced Heat Treating Solutions  
**Akron Steel Treating Co.**  
 ALD Thermal Treatment Inc.  
 ALD Vacuheat GmbH  
 All-Source Heat Treating Inc.  
 Allied Heat Treat Ltd.  
 American Heat Treating Inc.  
 American Metal Treating Inc.  
 American Steel Treating  
 Applied Thermal Technologies Inc.  
 Aremac Heat Treating East LLC, Southeast  
 Atlantic Heat Treat  
 BeeHive Heat Treating Service Inc.  
 Bennett Heat Treating & Brazing Co. (Newark NJ)  
 Bennett Heat Treating & Brazing Co. (Ivyland PA)  
 Blanchard Metal Processing  
 Bluewater Thermal Solutions (Rockford IL)  
 Bluewater Thermal Solutions (South Bend IN)  
 Bluewater Thermal Solutions, Corporate  
**Bodycote (ALL LOCATIONS)**  
 Braddock Metallurgical Aerospace Services  
 Braddock Metallurgical (Daytona FL)  
 Braddock Metallurgical (Jacksonville FL)  
 Braddock Metallurgical (Tampa FL)  
 Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
 Braddock Metallurgical, Caribe Metallurgical  
 Byington Steel Treating Inc.  
 Byron Products Inc.  
 Cambridge Heat Treating  
**Century Sun Metal Treating**  
 Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
 Circle City Heat Treating Inc.  
 City Steel Heat Treating Inc.  
 Coleman Heat Treating  
 Continental Heat Treating Inc.  
**Contour Hardening**  
 Controlled Thermal Technology  
 County Heat Treat  
 Diamond Heat Treat  
**DIE-BOND LLC**  
 Dynamic Surface Technologies  
 East Carolina Metal Treating Inc.  
 East-Lind Heat Treat Inc.  
 Elmira Heat Treating Inc.  
 Engineered Heat Treat Inc.  
 Erie Steel Ltd.  
 Euclid Heat Treating Co.  
 Exactatherm Ltd.  
 Exotic Metal Treating Inc.  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
 Garner Heat Treat Inc.  
 General Metal Heat Treating Inc.  
**Hansen-Balk Steel Treating Co.**  
 Hardline Heat Treating Inc.  
 Hauck Heat Treatment Ltd.

## CAPABILITIES LISTINGS - COMMERCIAL HEAT TREATERS DIRECTORY

Hercules Heat Treating  
Hi-Tech Steel Treating Inc.  
Hitech Heat Treatment Services Pte. Ltd.

**Houston Heat Treat**

Hy-Vac Technologies Inc.  
Inland NW Metallurgical Services Inc.  
Jasco Heat Treating Inc.  
Katy Heat Treat LLC

**Kowalski Heat Treating**

Krankka Metallurgical LLC  
Lake City Heat Treating  
Lark Heat Treating Inc.  
Lawrence Industries Inc.  
Magnum Metal Treating  
Med-Tek Inc.  
Metal Finishing Co.  
Metal Treaters Inc.  
Metallurgical Processing Inc. (CT)  
Metallurgical Solutions Inc.  
Metals Technology Corp.

**Metcor Inc.**

Metlab  
Mid South Metallurgical  
**Midwest Thermal-Vac Inc.**  
Modern Heat Treat Inc.  
Modern Industries Inc. (Erie PA)  
National Heat Treat  
National Metal Processing Inc.  
Nevada Heat Treating Inc.  
Nitrex Inc., Chicago Operations  
Nitrex Inc., Indiana Operations  
Nitrex Inc., Michigan Operations  
Nitrex Inc., Nevada Operations  
Nitrex Metal Inc.  
Nitrex Thermal Technology Co. Ltd.  
Nitro-Vac Heat Treat Inc.  
Northeast Metals Technologies

**Ohio Metallurgical Service**

P & L Heat Treating & Grinding Inc.  
Pacific Heat Treating Co.  
Pacific Metallurgical  
Palmdale Heat Treating Inc.  
Paulo (Kansas City MO)  
Paulo (St. Louis MO)  
Paulo (Nashville TN)  
Peters' Heat Treating Inc. (McKean PA)  
Peters' Heat Treating Inc. (Meadville PA)  
Peters' Heat Treating Inc. - West  
Phoenix Heat Treating Inc.  
Pinson Valley Heat Treating  
Precision Heat Treating Corp. (Ft. Wayne IN)  
Precision Heat Treating Corp. (Jackson MS)  
Precision Thermal Processing  
Q-Tech Heat Treat LLC  
Quality Heat Treating Inc.

**Refrac Systems**

Robert Wooler Co.  
Rochester Steel Treating Works Inc.  
Rockford Heat Treaters Inc.  
SCHMOLZ + BICKENBACH USA  
Scientific Metal Treating  
Seattle Heat Treaters, dba Stober & Chiaro  
Service Heat Treating Inc.

**Solar Atmospheres (Fontana CA)****Solar Atmospheres (Hermitage PA)****→ Solar Atmospheres (Souderton PA)****Solar Atmospheres (Greenville SC)**

The Sousa Corp.  
Specialty Steel Treating Inc. (East Granby CT)  
**Specialty Steel Treating Inc. (Fraser MI)**  
Spectrum Thermal Processing LLC  
Stack Metallurgical Services Inc.  
Steel Treaters Inc.  
STT Nitrex Querétaro, S. De R.L. De C.V.  
Sturm Steel Treating Inc.  
Sun Steel Treating Inc.  
Superior Metal Treating & Equipment Inc.  
Tamayakin Co. Ltd.  
Techniques Surfaces do Brasil Ltda  
Temperature Processing Co. Inc. (North Arlington NJ)

Texas Heat Treating Inc. (Ft. Worth TX)  
Texas Heat Treating Inc. (Round Rock TX)  
Thermal Braze Inc.  
Thermal One Inc.  
Thermal-Vac Technology Inc.  
THERMETCO Inc.  
Thermo-Fusion Inc.

**ThermTech**

Tooling and General Heat Treatment  
Tratamientos Termicos Nitrogas S.A.  
Tri-City Heat Treat Co.  
Vac Aero International Inc. (Oakville ON)  
Vac Aero International Inc. (St. Laurent QC)  
Vac-Met Inc.  
Vacu-Braze Inc.  
Valley Metal Treating Inc.  
Vira-Tech Inc.

**voestalpine Thermo-Tech**

Wallwork Cambridge Ltd.  
**Winston Heat Treating Inc.**

## MISCELLANEOUS

## Aluminum/Nonferrous

A & M Heat Treating Ltd.  
Aberfoyle Metal Treaters Ltd.  
Ajax TOCCO International Ltd.  
Ajax TOCCO Magnethermic Corp. (Albertville AL)  
Ajax TOCCO Magnethermic Corp. (Madison Heights MI)  
**→ Ajax TOCCO Magnethermic Corp. (Warren OH)**  
Ajax TOCCO Magnethermic Corp. (Wickliffe OH)  
Ajax TOCCO Magnethermic Corp. (Ajax ON)  
Ajax TOCCO Magnethermic Corp. (Mexico)  
**Akron Steel Treating Co.**  
Al-Fe Heat Treating (Premier Thermal Co.)  
All-Source Heat Treating Inc.  
Allied Heat Treat Ltd.  
American Heat Treating Inc.  
American Metal Treating Inc.  
American Steel Treating  
Aremac Heat Treating East LLC, Southeast  
Atlantic Heat Treat  
BeeHive Heat Treating Service Inc.  
Bennett Heat Treating & Brazing Co. (Newark NJ)  
Bennett Heat Treating & Brazing Co. (Ivyland PA)  
Blanchard Metal Processing  
Bluewater Thermal Solutions, Chicago Plant 1  
Bluewater Thermal Solutions (Rockford IL)  
Bluewater Thermal Solutions (Saginaw MI)  
Bluewater Thermal Solutions, Corporate  
Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
Braddock Metallurgical (Daytona FL)  
Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Tampa FL)  
Braddock Metallurgical (Atlanta GA)  
Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
Byington Steel Treating Inc.  
Cascade Metallurgical Inc.  
Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
Cincinnati Steel Treating Co.  
Circle City Heat Treating Inc.  
Coleman Commercial Heat Treating Inc.  
Coleman Heat Treating  
Controlled Thermal Technology  
County Heat Treat  
Dayton Forging & Heat Treating  
**→ Derrick Co. Inc.**  
Detroit Steel Treating Co.  
**DIE-BOND LLC**  
East Carolina Metal Treating Inc.  
East-Lind Heat Treat Inc.  
Elmira Heat Treating Inc.  
Engineered Heat Treat Inc.  
Erie Steel Ltd.  
Euclid Heat Treating Co.  
Evans Heat Treating  
**Flame Metals Processing Corp.**

**FPM HEAT TREATING (Elk Grove Village IL)**

Garner Heat Treat Inc.  
Harchris Heat Treatment (Pty.) Ltd.  
Hardline Heat Treating Inc.  
Heat Treating Engineers Inc.  
Heat Treatments Ltd.  
Hercules Heat Treating  
Hi-Tech Steel Treating Inc.  
Hitech Heat Treatment Services Pte. Ltd.  
Hudapack Metal Treating Inc. (Elkhorn WI)  
Hudapack Metal Treating Inc. (Franklin WI)  
Hy-Vac Technologies Inc.  
IMT Duncan LLC  
IMT York LLC  
Industrial Heat Treating Ltd.  
Inland NW Metallurgical Services Inc.

**International Thermal Systems**

Jasco Heat Treating Inc.  
JF Heat Treating Inc.

**Kowalski Heat Treating**

Krankka Metallurgical LLC  
L&M Heat Treating  
Med-Tek Inc.  
Metal Treaters Inc.  
Metallurgical Processing Inc. (CT)  
Metallurgical Solutions Inc.  
Metals Technology Corp.

**Metcor Inc.**

Metlab  
MFCO Aluminum Heat Treat  
MFCO Chihuahua Heat Treat  
**Midwest Thermal-Vac Inc.**  
Missouri Heat Treat  
Modern Industries Inc. (Erie PA)  
Modern Metal Processing Inc.  
Nevada Heat Treating Inc.  
Northeast Metals Technologies  
**Ohio Metallurgical Service**  
Ohio Vertical Heat Treat  
Oregon Induction Corp.  
Pacific Heat Treating Co.  
Pacific Metallurgical  
Palmdale Heat Treating Inc.  
Paulo (St. Louis MO)  
Paulo (Willoughby OH)  
Paulo (Nashville TN)  
Permian Heat Treaters  
Peters' Heat Treating Inc. (McKean PA)  
Phoenix Heat Treating Inc.  
Pinson Valley Heat Treating  
Q-Tech Heat Treat LLC  
Quality Steel Treating LLC  
R & R Heat Treating Inc.  
Radyne Corp.

**Refrac Systems**

Rex Heat Treat (Lansdale PA)  
Robert Wooler Co.  
Rockford Heat Treaters Inc.  
Scarrott Metallurgical Co.  
Scientific Metal Treating

**Solar Atmospheres (Hermitage PA)****→ Solar Atmospheres (Souderton PA)**

Southwest Metal Treating Corp.  
Southwest Specialty Heat Treat  
Stack Metallurgical Services Inc.  
Steel Treaters Inc.  
Sturm Steel Treating Inc.  
Superior Metal Treating & Equipment Inc.  
Tamayakin Co. Ltd.  
**Taylor-Winfield Technologies Inc.**  
Temperature Processing Co. Inc. (Longmont CO)  
Temperature Processing Co. Inc. (North Arlington NJ)  
Texas Heat Treating Inc. (Ft. Worth TX)  
Texas Heat Treating Inc. (Round Rock TX)  
Thermal Braze Inc.  
Thermal-Vac Technology Inc.  
THERMETCO Inc.  
Thermo-Fusion Inc.  
**ThermTech**  
Tri-City Heat Treat Co.  
Vac Aero International Inc. (Oakville ON)



Vac Aero International Inc. (St. Laurent QC)  
Valley Heat Treat Co.  
Wallwork Cambridge Ltd.  
Weiss Industries Inc.  
Wyatt Services Inc.

### Austempering

Advanced Heat Treating Solutions  
Ajax TOCCO Magnethermic Corp. (Albertville AL)  
**Akron Steel Treating Co.**  
Alloy Steel Treating Co. Inc.  
American Heat Treating Inc.  
American Metal Treating Inc.  
Anderson Specialty Co.  
Applied Process Inc. (Ft. Smith AZ)  
Applied Process Inc. (Livonia MI)  
Applied Process Inc., Technologies Div.  
Applied Process Inc., Monster Parts Div.  
Aremac Heat Treating East LLC, Southeast  
Atmosphere Heat Treating / Austemper Inc.  
Austenit S.A.  
BeeHive Heat Treating Service Inc.  
Bennett Heat Treating & Brazing Co. (Newark NJ)  
**Bodycote (ALL LOCATIONS)**  
**Century Sun Metal Treating**  
**Certified Metal Craft Inc.**  
Custom Heat Treat Inc.



### Eastern Metal Treating Inc.

Engineered Heat Treat Inc.  
Evans Heat Treating  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
Garner Heat Treat Inc.  
General Metal Heat Treating Inc.  
Hardline Heat Treating Inc.  
Heat Treatment Australia  
Hitech Heat Treatment Services Pte. Ltd.  
**H.T.I.**  
Hudapack Metal Treating of Illinois Inc.  
Hudapack Metal Treating Inc. (Franklin WI)  
Industrial Heat Treating Ltd.  
Jasco Heat Treating Inc.  
**Kowalski Heat Treating**  
Lake City Heat Treating  
Med-Tek Inc.  
Metallurgical Solutions Inc.  
Metals Technology Corp.  
**Midwest Thermal-Vac Inc.**  
Paulo (Kansas City MO)  
Paulo (Murfreesboro TN)  
Phoenix Heat Treating Inc.  
Radyne Corp.  
Rex Heat Treat (Anniston AL)  
Rex Heat Treat (Bedford PA)  
Rex Heat Treat (Lansdale PA)  
Robert Wooler Co.  
Sun Steel Treating Inc.  
Superior Metal Treating & Equipment Inc.  
Texas Heat Treating Inc. (Ft. Worth TX)  
Texas Heat Treating Inc. (Round Rock TX)  
Thermal Specialties  
Thermal Specialties of Texas LLC  
Thermal-Vac Technology Inc.  
Thermo-Fusion Inc.  
**ThermTech**  
Valley Metal Treating Inc.  
Virginia Metal Treating, East Carolina Metal Treating  
Wallwork Cambridge Ltd.

### Boronizing

National Heat Treat

### Carbon Restoration

A & M Heat Treating Ltd.  
Accurate Steel Treating  
Advanced Heat Treat Corp. (Burton)

Advanced Heat Treat Corp. (Midport)  
Advanced Heat Treating Solutions  
**Akron Steel Treating Co.**  
ALD Thermal Treatment Inc.  
All-Source Heat Treating Inc.  
Allied Heat Treat Ltd.  
American Heat Treating Inc.  
American Metal Treating Inc.  
American Steel Treating  
Atlantic Heat Treat  
BeeHive Heat Treating Service Inc.  
Bennett Heat Treating & Brazing Co. (Newark NJ)  
Bennett Heat Treating & Brazing Co. (Ivlyland PA)  
Blanchard Metal Processing  
Bluewater Thermal Solutions, Chicago Plant 3  
Bluewater Thermal Solutions (Rockford IL)  
Bluewater Thermal Solutions (South Bend IN)  
Bluewater Thermal Solutions (Benton Harbor MI)  
Bluewater Thermal Solutions, Corporate  
Bluewater Thermal Solutions (Kitchener ON)  
Braddock Metallurgical (Daytona FL)  
Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Tampa FL)  
Braddock Metallurgical (Atlanta GA)  
Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
Braddock Metallurgical, Caribe Metallurgical  
Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
Certified Heat Treating  
Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
Cincinnati Steel Treating Co.  
City Steel Heat Treating Inc.  
Coleman Heat Treating  
Commercial Steel Treating Corp.  
Continental Heat Treating Inc.  
Controlled Thermal Technology  
County Heat Treat  
Dayton Forging & Heat Treating  
Dependable Metal Treating Inc.  
Detroit Steel Treating Co.  
Donohoo Steel Treating  
East Carolina Metal Treating Inc.  
East-Lind Heat Treat Inc.  
Elmira Heat Treating Inc.  
Euclid Heat Treating Co.  
Evans Heat Treating  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Cherry Valley IL)**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
**FPM HEAT TREATING (Milwaukee WI)**  
General Metal Heat Treating Inc.  
General Surface Hardening Inc.  
Great Lakes Metal Treating Inc.  
H & S Heat Treating  
**Hansen-Balk Steel Treating Co.**  
Hardline Heat Treating Inc.  
Hauck Heat Treatment Ltd.  
Heat Treating Technologies Inc.  
Hi-Tech Steel Treating Inc.  
HI TecMetal Group, Nettleton Steel Treating (NST)  
Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
Hudapack Metal Treating Inc. (Elkhorn WI)  
Hudapack Metal Treating Inc. (Franklin WI)  
IMT York LLC  
Industrial Steel Treating Co.  
Inland NW Metallurgical Services Inc.  
**International Thermal Systems**  
Jasco Heat Treating Inc.  
Lark Heat Treating Inc.  
Lone Star Heat Treating Corp.  
Magnum Metal Treating  
Med-Tek Inc.  
Metal Finishing Co.  
Metal Treating Inc.  
Metallurgical Processing Inc. (CT)  
Metals Engineering Inc. (DePere WI)  
Metals Technology Corp.

### Metcor Inc.

Metex Heat Treating Ltd.  
Metlab  
Mid South Metallurgical  
**Midwest Thermal-Vac Inc.**  
Missouri Heat Treat  
Modern Heat Treat Inc.  
Modern Industries Inc. (Erie PA)  
MT Heat Treating Inc.  
National Heat Treat  
Nevada Heat Treating Inc.  
Nitrex Inc., Chicago Operations  
Nitrex Inc., Indiana Operations  
Nitrex Inc., Michigan Operations  
Nitrex Inc., Nevada Operations  
Nitrex Metal Inc.  
**Ohio Metallurgical Service**  
Pacific Heat Treating Co.  
Pacific Metallurgical  
Palmdale Heat Treating Inc.  
Paulo (Kansas City MO)  
Paulo (St. Louis MO)  
Paulo (Murfreesboro TN)  
Paulo (Nashville TN)  
Peters' Heat Treating Inc. (McKean PA)  
Peters' Heat Treating Inc. (Meadville PA)  
Peters' Heat Treating Inc. - West  
Phoenix Heat Treating Inc.  
Pinson Valley Heat Treating  
Precision Heat Treating Corp. (Jackson MS)  
Precision Thermal Processing  
Q-Tech Heat Treat LLC  
Quality Heat Treating Inc.  
Queen City Steel Treating  
R & R Heat Treating Inc.  
Rex Heat Treat (Bedford PA)  
Rex Heat Treat (Lansdale PA)  
Robert Wooler Co.  
Rochester Steel Treating Works Inc.  
Rockford Heat Treating Inc.  
Scientific Metal Treating  
Seattle Heat Treating, dba Stober & Chiaro  
Service Heat Treating Inc.  
The Sousa Corp.  
Specialty Heat Treat Inc.  
Specialty Steel Treating Inc. (East Granby CT)  
**Specialty Steel Treating Inc. (Fraser MI)**  
Stack Metallurgical Services Inc.  
Steel Treating Inc.  
Sturm Steel Treating Inc.  
Superior Metal Treating & Equipment Inc.  
Temperature Processing Co. Inc. (Longmont CO)  
Texas Heat Treating Inc. (Ft. Worth TX)  
Texas Heat Treating Inc. (Round Rock TX)  
Thermal Modification Technologies  
Thermal Specialties  
Thermal Specialties of Texas LLC  
THERMETCO Inc.  
**ThermTech**  
Treat All Metals  
Tri-City Heat Treat Co.  
Vacu-Braze Inc.  
Valley Metal Treating Inc.  
Wallwork Cambridge Ltd.  
Weiss Industries Inc.  
Wyatt Services Inc.

### Cryogenic Treating

A & M Heat Treating Ltd.  
Accurate Steel Treating  
Advanced Heat Treating Solutions  
**Akron Steel Treating Co.**  
ALD Thermal Treatment Inc.  
ALD Vacuheat GmbH  
Allied Heat Treat Ltd.  
American Heat Treating  
American Metal Treating Inc.  
American Steel Treating  
Applied Thermal Technologies Inc.  
Aremac Heat Treating East LLC, Southeast

## CAPABILITIES LISTINGS - COMMERCIAL HEAT TREATERS DIRECTORY

Atlantic Heat Treat  
BeeHive Heat Treating Service Inc.  
Bennett Heat Treating & Brazing Co. (Newark NJ)  
Bennett Heat Treating & Brazing Co. (Ivyland PA)  
Blanchard Metal Processing  
Bluewater Thermal Solutions (Rockford IL)  
Bluewater Thermal Solutions (South Bend IN)  
Bluewater Thermal Solutions, Corporate  
Braddock Metallurgical Aerospace Services  
Braddock Metallurgical (Daytona FL)  
Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Tampa FL)  
Braddock Metallurgical (Atlanta GA)  
Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
Braddock Metallurgical, Caribe Metallurgical  
Byington Steel Treating Inc.  
Byron Products Inc.  
Calumet Surface Hardening Co. Inc.  
Cambridge Heat Treating  
Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
Certified Heat Treating Inc. (Miamisburg OH)  
Certified Heat Treating Inc. (Springfield OH)  
**Certified Metal Craft Inc.**  
Cincinnati Steel Treating Co.  
Circle City Heat Treating Inc.  
Continental Heat Treating Inc.  
Cook Induction Heating Co.  
County Heat Treat  
CryoPlus Inc.  
Dayton Forging & Heat Treating  
Detroit Steel Treating Co.  
Diamond Heat Treat  
**DIE-BOND LLC**  
East Carolina Metal Treating Inc.  
East-Lind Heat Treat Inc.  
Elmira Heat Treating Inc.  
Engineered Heat Treat Inc.  
Evans Heat Treating  
Exactatherm Ltd.  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
Garner Heat Treat Inc.  
General Metal Heat Treating Inc.  
General Surface Hardening Inc.  
**Hansen-Balk Steel Treating Co.**  
Hardline Heat Treating Inc.  
Hauck Heat Treatment Ltd.  
Heat Treatment Australia  
Heat Treatments Ltd.  
Hercules Heat Treating  
Hi-Tech Steel Treating Inc.  
Hi TecMetal Group, Nettleton Steel Treating (NST)  
High Performance Heat Treating Inc.  
Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
Hudapack Metal Treating Inc. (Elkhorn WI)  
Hudapack Metal Treating Inc. (Franklin WI)  
Inland NW Metallurgical Services Inc.  
Intriplex Thermal Technologies  
Ionic Technologies Inc.  
Jasco Heat Treating Inc.  
Katy Heat Treat LLC  
**Kowalski Heat Treating**  
Krankka Metallurgical LLC  
Lake City Heat Treating  
Lark Heat Treating Inc.  
Lone Star Heat Treating Corp.  
Magnum Metal Treating  
Master Induction Heat Treat LLC  
Med-Tek Inc.  
Metal Finishing Co.  
Metal Treaters Inc.  
Metallurgical Processing Inc. (CT)  
Metallurgical Solutions Inc.  
Metals Engineering Inc. (Green Bay WI)  
Metals Technology Corp.  
**Metcor Inc.**  
Metlab  
**Midwest Thermal-Vac Inc.**

Modern Heat Treat Inc.  
Modern Industries Inc. (Erie PA)  
MT Heat Treating Inc.  
National Metal Processing Inc.  
Nevada Heat Treating Inc.  
Nitrex Inc., Chicago Operations  
Nitrex Inc., Indiana Operations  
Nitrex Inc., Michigan Operations  
Nitrex Inc., Nevada Operations  
Nitrex Metal Inc.  
Nitrex Thermal Technology Co. Ltd.  
Nitro-Vac Heat Treat Inc.  
Northeast Metals Technologies  
**Ohio Metallurgical Service**  
P & L Heat Treating & Grinding Inc.  
Pacific Heat Treating Co.  
Pacific Metallurgical  
Palmdale Heat Treating Inc.  
Paulo (Kansas City MO)  
Paulo (St. Louis MO)  
Paulo (Willoughby OH)  
Paulo (Nashville TN)  
Penna Flame Industries  
Permian Heat Treaters  
Peters' Heat Treating Inc. (McKean PA)  
Peters' Heat Treating Inc. (Meadville PA)  
Peters' Heat Treating Inc. - West  
Phoenix Heat Treating Inc.  
Pinson Valley Heat Treating  
Q-Tech Heat Treat LLC  
Quality Heat Treating Inc.  
Queen City Steel Treating  
R & R Heat Treating Inc.  
**Refrac Systems**  
Rex Heat Treat (Bedford PA)  
Rex Heat Treat (Lansdale PA)  
Robert Wooler Co.  
Rochester Steel Treating Works Inc.  
Rockford Heat Treaters Inc.  
Scarrott Metallurgical Co.  
Scientific Metal Treating  
Seattle Heat Treaters, dba Stober & Chiaro  
SEI Heat Treat  
Service Heat Treating Inc.  
**Solar Atmospheres (Fontana CA)**  
**Solar Atmospheres (Hermitage PA)**  
→ **Solar Atmospheres (Souderton PA)**  
**Solar Atmospheres (Greenville SC)**  
The Sousa Corp.  
Southwest Metal Treating Corp.  
Specialty Heat Treat Inc.  
Specialty Steel Treating Inc. (East Granby CT)  
**Specialty Steel Treating Inc. (Fraser MI)**  
Stack Metallurgical Services Inc.  
Steel Treaters Inc.  
STT Nitrex Querétaro, S. De R.L. De C.V.  
Sturm Steel Treating Inc.  
Sun Steel Treating Inc.  
Superior Metal Treating & Equipment Inc.  
Temperature Processing Co. Inc. (Longmont CO)  
Temperature Processing Co. Inc. (North Arlington NJ)  
Texas Heat Treating Inc. (Ft. Worth TX)  
Texas Heat Treating Inc. (Round Rock TX)  
Thermal Braze Inc.  
Thermal Metal Treating Inc.  
Thermal One Inc.  
Thermal-Vac Technology Inc.  
THERMETCO Inc.  
Thermo-Fusion Inc.  
**ThermTech**  
Tratamientos Termicos Nitrogas S.A.  
Treat All Metals  
Tri-City Heat Treat Co.  
Vac Aero International Inc. (Oakville ON)  
Vac-Met Inc.  
Vacu-Braze Inc.  
Valley Heat Treat Co.  
Valley Metal Treating Inc.  
Vira-Tech Inc.  
**voestalpine Thermo-Tech**  
Wallwork Cambridge Ltd.

Weiss Industries Inc.  
**Winston Heat Treating Inc.**  
Wyatt Services Inc.

## Flattening/Straightening

A & M Heat Treating Ltd.  
Aberfoyle Metal Treaters Ltd.  
Accurate Steel Treating  
Advanced Heat Treat Corp. (Burton)  
Advanced Heat Treat Corp. (Midport)  
**Akron Steel Treating Co.**  
Al-Fe Heat Treating (Premier Thermal Co.)  
All-Source Heat Treating Inc.  
Allied Heat Treat Ltd.  
Alloy Steel Treating Co. Inc.  
American Heat Treating  
American Steel Treating  
Arrow Tank & Engineering Co.  
B & W Heat Treating Co. Inc.  
Bennett Heat Treating & Brazing Co. (Newark NJ)  
Bennett Heat Treating & Brazing Co. (Ivyland PA)  
Blanchard Metal Processing  
Bluewater Thermal Solutions (Rockford IL)  
Bluewater Thermal Solutions (South Bend IN)  
Bluewater Thermal Solutions, Corporate  
The Bowdill Co.  
Braddock Metallurgical (Daytona FL)  
Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Tampa FL)  
Braddock Metallurgical (Atlanta GA)  
**Braddock Metallurgical (Bridgewater NJ)**  
Braddock Metallurgical, Caribe Metallurgical  
Byington Steel Treating Inc.  
Calumet Surface Hardening Co. Inc.  
Cargill Heat Treat  
Cascade Metallurgical Inc.  
**Century Sun Metal Treating**  
Certified Heat Treating Inc. (Springfield OH)  
Chicago Flame Hardening Co.  
Cincinnati Flame Hardening Co.  
Cincinnati Steel Treating Co.  
Circle City Heat Treating Inc.  
City Steel Heat Treating Inc.  
Coleman Heat Treating  
Commercial Heat Treating Inc.  
Continental Heat Treating Inc.  
County Heat Treat  
Dayton Forging & Heat Treating  
Detroit Steel Treating Co.  
Diamond Heat Treat  
**DIE-BOND LLC**  
East Carolina Metal Treating Inc.  
East-Lind Heat Treat Inc.  
Elmira Heat Treating Inc.  
Engineered Heat Treat Inc.  
Erie Steel Ltd.  
Euclid Heat Treating Co.  
**Flame Metals Processing Corp.**  
**FPM HEAT TREATING (Cherry Valley IL)**  
**FPM HEAT TREATING (Elk Grove Village IL)**  
**FPM HEAT TREATING (Milwaukee WI)**  
Garner Heat Treat Inc.  
General Surface Hardening Inc.  
H & S Heat Treating  
Harchris Heat Treatment (Pty.) Ltd.  
Heat Treating Technologies Inc.  
Hercules Heat Treating  
Hi-Tech Steel Treating Inc.  
Hi TecMetal Group, Nettleton Steel Treating (NST)  
High Performance Heat Treating Inc.  
Hitech Heat Treatment Services Pte. Ltd.  
**Houston Heat Treat**  
Hudapack Metal Treating of Illinois Inc.  
Hudapack Metal Treating Inc. (Elkhorn WI)  
Hudapack Metal Treating Inc. (Franklin WI)  
IMT Duncan LLC  
Industrial Steel Treating Co.  
Inland NW Metallurgical Services Inc.  
Jasco Heat Treating Inc.  
**Kowalski Heat Treating**  
Krankka Metallurgical LLC



Lark Heat Treating Inc.  
Lone Star Heat Treating Corp.  
LST Heat Treating LLC  
Med-Tek Inc.  
Metal Finishing Co.  
Metal Treaters Inc.  
Metallurgical Processing Inc. (CT)  
Metallurgical Solutions Inc.  
Metals Engineering Inc. (DePere WI)  
Metals Engineering Inc. (Green Bay WI)  
Metals Technology Corp.

#### **Metcor Inc.**

Metex Heat Treating Ltd.  
Metlab  
MFCO Aluminum Heat Treat  
MFCO Chihuahua Heat Treat  
Mid South Metallurgical  
**Midwest Thermal-Vac Inc.**  
Missouri Heat Treat  
Modern Heat Treat Inc.  
Modern Industries Inc. (Erie PA)  
Nevada Heat Treating Inc.  
Nitrex Inc., Chicago Operations  
Nitrex Inc., Indiana Operations  
Nitrex Inc., Michigan Operations  
Nitrex Inc., Nevada Operations  
Nitrex Metal Inc.  
Nitrex Thermal Technology Co. Ltd.  
Northeast Metals Technologies

#### **Ohio Metallurgical Service**

Ohio Vertical Heat Treat  
Pacific Heat Treating Co.  
Pacific Metallurgical  
Palmdale Heat Treating Inc.  
Paulo (Kansas City MO)  
Paulo (St. Louis MO)  
Paulo (Nashville TN)  
Penna Flame Industries  
Peters' Heat Treating Inc. (McKean PA)  
Peters' Heat Treating Inc. (Meadville PA)  
Peters' Heat Treating Inc. - West  
Phoenix Heat Treating Inc.  
Pinson Valley Heat Treating  
Precision Thermal Processing  
Q-Tech Heat Treat LLC  
Quality Heat Treating Inc.  
Queen City Steel Treating  
R & R Heat Treating Inc.  
Radyne Corp.

#### **Refrac Systems**

Robert Wooler Co.  
Rockford Heat Treaters Inc.  
Scientific Metal Treating  
Seattle Heat Treaters, dba Stober & Chiaro  
Service Heat Treating Inc.

#### **Solar Atmospheres (Hermitage PA)**

#### ➔ **Solar Atmospheres (Souderton PA)**

The Sousa Corp.  
Southwest Metal Treating Corp.  
Specialty Heat Treat Inc.  
Steel Treaters Inc.  
Stokes Steel Treating Co.  
STT Nitrex Querétaro, S. De R.L. De C.V.  
Sturm Steel Treating Inc.  
Sun Steel Treating Inc.  
Superior Metal Treating & Equipment Inc.  
TC Industries Inc.  
Temperature Processing Co. Inc. (Longmont CO)  
Texas Heat Treating Inc. (Ft. Worth TX)  
Texas Heat Treating Inc. (Round Rock TX)  
Thermal One Inc.  
Thermal Specialties  
Thermal Specialties of Texas LLC  
Thermal-Vac Technology Inc.  
THERMETCO Inc.  
Thermo-Fusion Inc.

#### **ThermTech**

Treat All Metals  
Tri-City Heat Treat Co.  
Vac Aero International Inc. (Oakville ON)  
Vacu-Braze Inc.

Valley Heat Treat Co.  
Valley Metal Treating Inc.  
Wallwork Cambridge Ltd.  
Weiss Industries Inc.  
**Winston Heat Treating Inc.**  
Wyatt Services Inc.  
Zion Industries Inc. (Grand Ledge MI)  
Zion Industries Inc. (Hildebran NC)  
Zion Industries Inc. (Valley City OH)  
Z-Machine Inc.

#### **Laser HT**

Hitech Heat Treatment Services Pte. Ltd.  
National Metal Processing Inc.  
University of Ljubljana

#### **Marquenching**

Accurate Steel Treating  
**Akron Steel Treating Co.**  
American Heat Treating  
American Heat Treating Inc.  
American Metal Treating Inc.  
Anderson Specialty Co.  
Applied Process Inc. (Ft. Smith AZ)  
Applied Process Inc. (Livonia MI)  
Applied Process Inc., Technologies Div.  
Applied Process Inc., Monster Parts Div.  
Atmosphere Heat Treating / Austemper Inc.  
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Bennett Heat Treating & Brazing Co. (Ivyland PA)  
Blanchard Metal Processing  
Bluewater Thermal Solutions, Corporate  
Bluewater Thermal Solutions (Kitchener ON)  
**Bodycote (ALL LOCATIONS)**  
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Braddock Metallurgical (Jacksonville FL)  
Braddock Metallurgical (Charlotte NC)  
**Braddock Metallurgical (Bridgewater NJ)**  
**Century Sun Metal Treating**  
Certified Heat Treating Inc. (Springfield OH)  
Continental Heat Treating Inc.  
Detroit Steel Treating Co.  
**DIE-BOND LLC**  
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Engineered Heat Treat Inc.  
Erie Steel Ltd.

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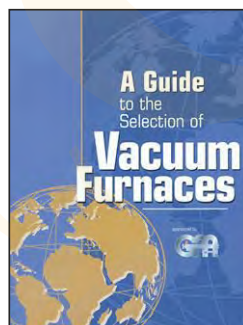
EFD Induction is pleased to announce the release of its brochure, "Induction Brazing: A Guide to Key Features and Benefits." This 36-page, full-color brochure presents a sampling of signature brazing projects, best-practice brazing methods and an overview of EFD Induction's full range of brazing equipment. [www.efd-induction.com](http://www.efd-induction.com)



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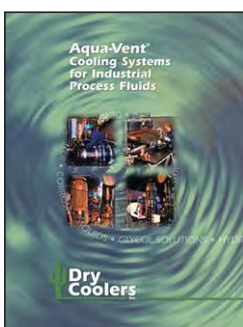
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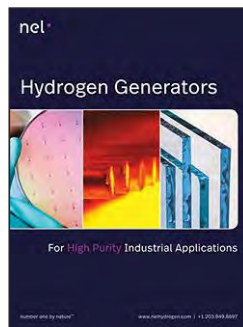
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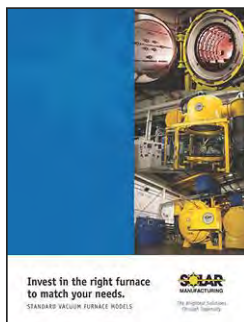
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[www.grievecorp.com](http://www.grievecorp.com)



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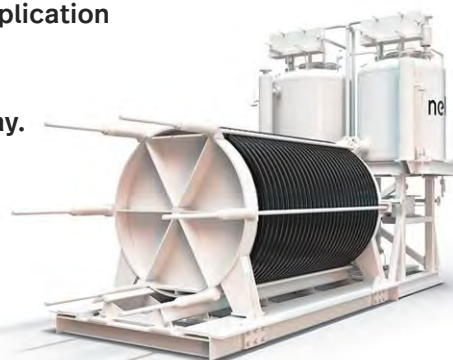
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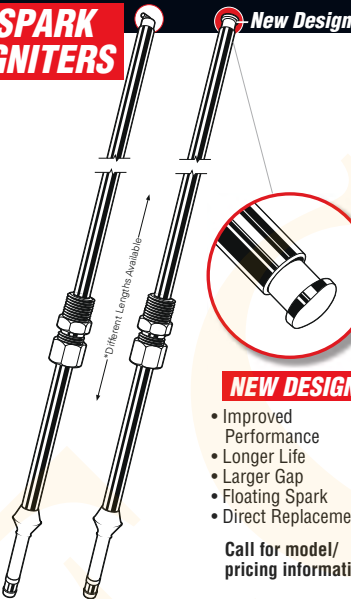
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Online at [www.heavycarbon.com](http://www.heavycarbon.com)

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# INDUSTRIAL HEATING





## CLASSIFIED MARKETPLACE

## FOR SALE

## EQUIPMENT FOR SALE

**We Have Over 500 Pieces of Equipment in Stock**

If your needs are not listed below, please let us know and we will locate a furnace/oven to suit your needs. We have all the ancillary equipment available for the above such as Tempering Furnaces, Washers, Charge Cars and Endo Generators.

Price is what you pay. Value is what you get. —Warren Buffett

**BAKER**

Baker Gas Fired Oven with Cooling, 7"W x 7"H x 8'L (Heating chamber), 7"W x 7"H x 8'L (Cooling chamber), vertical rising door between chambers, 600°F, 750,000 BTUH, powered carts, stainless steel interior and controls.

**SELAS**

Selas Gas Fired Car Bottom Furnace, 6"W x 7"H x 10'L, 1,800°F, 3,000,000 BTUH, 6 North American Tempest Burners, 460V/3Ph/60Hz, variable speed drive, combustion blower complete with free-standing panel and controls.

**SHERWOOD**

Sherwood Gas Fired Mesh Belt Furnace, 5"W x 10"H x 30'L (Heated), 500°F, 500,000 BTUH c/w controls.

**VACUUM INDUSTRIES (CENTORR)**

Vacuum Industries (Centorr) VII Metallurgical Vacuum System, 6"W x 5"H x 15"L, 2,400°F, 460V/3 PHASE/60 CY/55 AMPS/38 KVA c/w controls, pumps etc

**CAR BOTTOM FURNACE**

Gas Fired Car Bottom Furnace, 10' wide x 25' long x 8' high, 1,650°F, 18,000,000 BTUH, 16 North American Burners, 3 zones of control, 440V, 3 Phase, 60 Cycle complete with controls.

**ABAR**

ABAR HORIZONTAL VACUUM FURNACE, 2 BAR, 24"W x 18"H x 36"L, 2,400°F, 1,000 LBS, 150 KW complete with Nitrogen or Argon Atmosphere, Spencer Blower, Varian Diffusion Pump, Stokes Mechanical Pump, Roots Blower Moly Elements, controls, circular hot zone and loader.

**ABAR**

ABAR HORIZONTAL VACUUM FURNACE, 2 BAR, 24"W x 24"H x 36"L, 2,400°F, 1,000 LBS, 150 KW complete with Nitrogen or Argon Atmosphere, Spencer Blower, Varian Diffusion Pump, Stokes Mechanical Pump, Roots Blower Moly Elements, controls, circular hot zone and loader.

**INDUSTRIAL HEATING EQUIPMENT**

Industrial Heating Equipment Gas Fired Mesh Belt Furnace, 24"W x 10"H x 22'L, 500,000 BTUH, 950°F c/w controls.



★ Visit us online at: [www.parkthermal.com](http://www.parkthermal.com) ★

**Park Thermal International (1996) Corp.**

62 Todd Road, Georgetown, ON L7G 4R7

Tel: (905) 877-5254 • Fax: (905) 877-6205 • Toll Free: (877) 834-HEAT (4328)

Email: [jmistry@parkthermal.com](mailto:jmistry@parkthermal.com) • Website: [www.parkthermal.com](http://www.parkthermal.com)

**PARK THERMAL**

Park Thermal Electric Salt Bath Nitriding System complete with 30" Dia. X 90" deep heat Furnace, 30" deep Oxidation Quench Tank, 2 Wash Tanks, 3 Rinse Tanks, 4 Air Cool Stations and Controls.

**PARK THERMAL**

Park Thermal Gas Fired Mesh Belt Furnace, 17-1/2"W x 7"H x 15' 8"L, 375,000 BTUH, 900°F c/w controls.

**SURFACE COMBUSTION**

Surface Combustion Gas Fired Mesh Belt Furnace, 42"W x 10'H x 30'L, 2,000,000 BTUH, 2 zones, 3 tanks and controls.

**SURFACE COMBUSTION**

Electric Batch/Oil Quench Furnace, 30" W x 30" H x 48"L, Max. Temp. 1,950°F, System 1 Rear Handler, 3500 Gal. Quench Tank, 2 Agitators & Controls.

**AFC - HOLCROFT**

(2) INTEGRAL QUENCH FURNACES, 36"W x 30"H x 48"L, 1,800°F Max, Recuperated with Top Cool, Rear Handler, Oil Heaters (54kW), Re-Circ. Fan, Control System.

**SURFACE COMBUSTION ONE SOLD**

(2) INTEGRAL QUENCH FURNACES, 30"W x 30"H x 48"L, 1,750°F, 1,000,000 BTUH, Trident Tubes, Endo/Natural Gas/Ammonia, SSI Atmosphere Controllers, SSI Gold Probes, Oil Filters And SBS Coolers. System Comes Complete with a Gas Fired Temper, Washer and Charge Car.

**SURFACE COMBUSTION**

INTEGRAL QUENCH FURNACE, 10,000 lb. payload, 87" W x 87" L x 36" H, 1,850°F, 4,600,000 BTUH, 12,500 Gallons, 6 Agitators, Eclipse Burners, 3 Rear Handlers & Controls with PLC.

**HOLCROFT**

Holcroft Gas Fired Mesh Belt Furnace, 24"W x 9"H x 14' 8"L, 400,000 BTUH, 750°F c/w controls.

## FOR SALE

## FOR SALE

**Sauder Car Bottom Furnace**

• 1' 2" 1/2" 3" 4" 5" 6" 7" 8" 9" 10" 11" 12" 13" 14" 15" 16" 17" 18" 19" 20" 21" 22" 23" 24" 25" 26" 27" 28" 29" 30" 31" 32" 33" 34" 35" 36" 37" 38" 39" 40" 41" 42" 43" 44" 45" 46" 47" 48" 49" 50" 51" 52" 53" 54" 55" 56" 57" 58" 59" 60" 61" 62" 63" 64" 65" 66" 67" 68" 69" 70" 71" 72" 73" 74" 75" 76" 77" 78" 79" 80" 81" 82" 83" 84" 85" 86" 87" 88" 89" 90" 91" 92" 93" 94" 95" 96" 97" 98" 99" 100" 101" 102" 103" 104" 105" 106" 107" 108" 109" 110" 111" 112" 113" 114" 115" 116" 117" 118" 119" 120" 121" 122" 123" 124" 125" 126" 127" 128" 129" 130" 131" 132" 133" 134" 135" 136" 137" 138" 139" 140" 141" 142" 143" 144" 145" 146" 147" 148" 149" 150" 151" 152" 153" 154" 155" 156" 157" 158" 159" 160" 161" 162" 163" 164" 165" 166" 167" 168" 169" 170" 171" 172" 173" 174" 175" 176" 177" 178" 179" 180" 181" 182" 183" 184" 185" 186" 187" 188" 189" 190" 191" 192" 193" 194" 195" 196" 197" 198" 199" 200" 201" 202" 203" 204" 205" 206" 207" 208" 209" 210" 211" 212" 213" 214" 215" 216" 217" 218" 219" 220" 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## CLASSIFIED MARKETPLACE

## HEAT TREAT EQUIPMENT

42056 Michigan Avenue, Canton, MI 48188  
Phone: 734-331-3939 • Fax: 734-331-3915  
E-mail: john@heattreatequip.com

**Batch**

- C0052 Surface Combustion Temper Furnace (30"W x 48"L x 30"H, 1200°F, gas-fired)  
C0068 Despatch Aluminum Aging Box Furnace (60"W x 72"D x 66"H, 395°F, electric)  
U3624 Lindberg Nitrogen Temper Furnace (24"W x 36"D x 18"H, 1350°F, gas-fired)  
U3656 Despatch Batch Temper Furnace (56"W x 72"D x 55"H, 1400°F, electric)  
V1010 Dow Batch Temper Furnace (30"W x 48"L x 20"H, 1250°F, gas-fired)  
V1024 PIFCO Batch Temper Furnace, Skid Hearth (36"W x 48"L x 30"H, 1200°F, electric)  
V1095 Surface Combustion Temper Furnace (30"W x 48"D x 30"H, 1250°F, gas-fired)  
V1106 Dow Batch Normalizer Furnace (45"W x 84"D x 32"H, 1800°F, gas-fired)

**Batch High-Temp Furnaces**

- U3556 Pacific Industrial Batch High-Temp Furnace (24"W x 36"L x 18"H, 2800°F, electric)  
U3637 Pacific Scientific Batch Temper Furnace (30"W x 48"D x 24"H, 1600°F, gas-fired)  
U3643 Surface Combustion Temper Furnace (30"W x 48"D x 42"H, 1400°F, electric, 81kw)  
V1013 Thermolyne High-Temp Batch Furnace (10"W x 14"L x 9"H, 2000°F, electric)  
V1067 Seco Warwick High-Temp Batch Furnace (24"W x 36"D x 24"H, 2000°F, electric)  
V1068 Surface Combustion Oil Quench Furnace (30"W x 30"D x 48"H, 1950°F, gas-fired)  
V1130 Onspec Slot Forge Furnace (72"W x 96"D x 48"H, 2400°F, gas-fired)

**Car Bottom Furnaces**

- U3653 Thermal Dynamix Car Bottom Furnace (5"W x 10"D x 5"H, 1650°F, gas-fired)  
V1144 Selas Car Bottom Furnace (72"W x 120"D x 84"H, 1800°F, gas)

**Drop Bottom Furnaces**

- C0069 Enviro-Pak Drop Bottom Furnace (48"W x 48"D x 48"H, 1200°F, electric)  
U3543 Despatch AL Quench Drop Bottom Furnace (48"W x 72"L x 48"H, 1200°F, electric)

**Internal Quench Furnaces**

- C0064 Lucifer IQ Furnace (18"W x 24"D x 18"H, 1900°F, electric)  
U3569 Surface Combustion IQ Furnace (24"W x 36"D x 18"H, 1750°F, gas-fired)  
V1046 Surface Combustion IQ Furnace (87"W x 87"L x 36"H, 1850°F, gas-fired)  
V1082 Holcroft IQ Furnace with Top Cool (36"W x 48"D x 30"H, 1850°F, gas-fired)  
V1111 Surface Combustion IQ Furnace (30"W x 48"D x 30"H, 1850°F, gas-fired)

**Mesh Belt Brazing Furnaces**

- C0102JL Becker MB Brazing Furnace w/Exo & Dryer (30"W x 24.5"heated L x 10"H, 2050°F, electric)  
U3529 CI Hayes Mesh Belt Brazing Furnace (18"W x 6"H x 8' heating, 2100°F, electric)  
U3592 JL Becker Mesh Belt Brazing Furnace (12"W x 6"H, 2100°F, electric)  
V1035 Seco Warwick Mesh Belt Brazing Furnace (18"W x 12"H x 8'heated, 2100°F, electric)

**Mesh Belt Tempering Furnaces**

- C0044 CGS Moore Mesh Belt Curing Oven (22"W x 20"L x 10"H, 500°F, gas-fired)  
C0073 Heat Machine Mesh Belt Tempering Furnace (24"W x 10"L x 4"H, 1000°F, gas-fired)  
C0075 Industrial Heating Mesh Belt Tempering Furnace (24"W x 22"L x 10"H, 950°F, gas-fired)  
C0080 Surface Combustion Mesh Belt Temper Furnace (18"W x 11"H, 13' long, 1000°F, gas-fired)  
C0081 Park Thermal Mesh Belt Temper Furnace (17.5"W x 7"H, 15'8" long, 900°F, gas-fired)  
C0083 Eltropuls Plasma Furnace System (56"Dia x 80"D, 1022°F, electric)

- C0090 Hengli Mesh Belt Sealing Furnace - Atmosphere (6"W x 3.5"H, 2100°F, electric)  
U3638 American Gas Furnace MB Temper Furnace (31"W x 5"H, 17' heated length, 1200°F, gas-fired)

**Pit Furnaces**

- V1088 Leeds & Northrup Pit Furnace (24"D x 30"D, 750°F, electric)

**Pusher Furnaces**

- U3648 Ipsen P-12 Pusher Furnace (30"W x 30"L x 30"H, 1650°F, gas-fired)

**Roller Hearth & Rotary Furnaces**

- U3550 PIFCO Powered Roller Hearth Temper Furnace (21"W x 120"L x 18"H, 1000°F, electric)  
V1009 Ipsen Continuous Temper Roller Hearth Furnace (24"W x 120"L x 18"H, 1350°F, electric)  
V1091 Finn & Drefflein Rotary Hearth Furnace (13'3"D x 5'3"D x 4"W x 2'8"H, 2275°F, electric)

**Salt Pot Furnaces**

- C0136 Park Thermal Salt Pot Furnace (16" dia x 30" deep, 1650°F-1750°F, elect)

**Steam Tempering Furnace**

- U3616 Degussa Durferrit Steam Tempering Furnace (24"Dia x 48"D, 1200°F, electric)

**Tip Up Furnaces**

- C0043 Industrial Furnace Tip-Up Furnace (8"W x 22'4"D x 6'H, 1800°F, gas-fired)

**Vacuum Furnaces**

- C0013 CI Hayes Oil Quench Vacuum Furnace (24"W x 36"D x 18"H, 2400°F, electric)  
C0027 Pacific Scientific Vacuum Temper Furnace (24"W x 36"D x 24"H, 1450°F, electric)  
C0111 Lindberg Vacuum Furnace (15"W x 24"L x 12"H, 2400°F, electric)  
C0137 Surface Combustion 2-Bar Vacuum Furnace (48"W x 60"D x 48"H, 2400°F, elect)  
U3612 AVS Vacuum Annealing Furnace 2-Bar (18"W x 24"D x 12"H, 2400°F, electric)  
V1004 CI Hayes Vacuum Furnace, Oil Quench (18"W x 30"L x 12"H, 2400°F, electric)  
V1131 Abar Vacuum Furnace (24"W x 60"D x 24"H, 2250°F, electric)  
V1135 Abar Vacuum Furn Vert Bottom Load 2 Bar (72"Dia x 72"Deep, 2400°F, electric)  
V1136 Surface Combustion Vacuum Furnace, 2-Bar (26"W x 36"L x 22"H, 2400°F, electric)  
V1138 Ipsen Vacuum Furnace, 5-Bar (24"W x 36"L x 14"H, 2400°F, electric)  
V1143 Surface Combustion Vacuum 2-Bar Furnace (48"W x 60"D x 48"H, 2400°F, elect)

**Endothermic Gas Generators**

- U3594 AFC-Holcroft Gas Generator (3,000 CFH Endo, gas)  
U3635 Lindberg Hydrying Gas Generator (6000 CFH Endo, gas)  
U3647 Lindberg Gas Generator (3000 CFH Endo, 2050°F, gas)  
V1075 Lindberg Gas Generator (3,000 CFH Endo, gas)

**Exothermic Gas Generators**

- U3652 Surface Combustion Gas Generator (10,000 CFH Exo, gas)  
V1036 Seco Warwick Gas Generator (3,000 CFH Exo, gas)

**Material Handling - Conveyors**

- U3565 Conveyor - Roller (48"W x 20'L)

**Ovens - Cabinet**

- U3625 Lindberg Atmosphere Oven (38"W x 38"D x 38"H, 850°F, electric)  
U3629 Cabinet Oven (30"W x 30"D x 36"H, 750°F, electric)  
U3642 Blue-M Oven/Ref, 20"W x 18"D x 20"H, (-4°F/400°F)

**Ovens - Walk-In**

- C0039 Gehnrich Walk-In Oven (72"W x 96"L x 72"H, 400°F, electric)  
C0108 Park Thermal Walk-In Oven (90"W x 144"D x 72"H, 850°F, gas-fired)  
U3654 Precision Quincy Walk-In Oven (60"W x 72"D x 72"H, 700°F, gas-fired)  
U3655 Wisconsin Oven Walk-In Oven (61"W x 144"D x 97"H, 650°F, elect)

**Freezers**

- V1129 Webber Freezer (-120°F, electric)

**Blowers**

- U018 Twin City Blower (20 HP, RBA-SW, Class 22)

**Charge Cars**

- U3621 Dow Charge Car, DEDP (66"W x 60"D x 54"H)  
V1085 Holcroft Charge Car (DE/DP, 36"W x 48"D)

**Scissors Lifts & Holding Tables**

- V1086 Holcroft Scissors Lift & (2) Holding Tables

**Heat Exchanger Systems**

- U030 Graham Systems Heat Exchanger - Plate  
V1104 SBS Heat Exchanger - Air Cooled

**Holding & Cooling Stations**

- V1113 Surface Combustion Forced Cool Station (30"W x 48"D x 30"H)  
*Many other holding stations - ask for details*

**Water Cooling Systems**

- U3404 JL Becker Cooling Tower with Tank: Tower: (51"W x 36"D x 64"H, Tank: 72"W x 84"D x 66"H)  
U3595 JL Becker 2-Tank Water Cooling System, 2 Dayton 1HP Motors  
U3646 HydroThrift, Duplex Pump Base, Water Cooling System  
V1038 Bell & Gossett Shell & Tube Heat Exchanger with Tank

**Washers**

- C0134 Surface Combustion Washer (60"W 60"D 40"H, 180°F, gas-fired)  
V1084 Holcroft Spray/Dunk Washer (36"W x 48"D x 30"H, 190°F, gas-fired)  
V1101 Surface Combustion Spray Washer (36"W x 48"D x 30"H, 180°F, electric, 58kw)

**Transformers**

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**Baskets & Boxes**

*Extensive inventory of heat treat baskets and boxes Heat Treat Lines*

**Heat Treat Lines**

- V1137 T-6 Annealing & Aging Furnace Line

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750CFH	Endothermic Ipsen	Gas
800CFH	Endothermic Surface	Gas
1,000CFH	Exothermic Gas Atmos.	Gas
1,500CFH	Endothermic Lindberg (Air)	Gas
2,000CFH	Ammonia Dissoc. Drever (3)	Elec
3,000CFH	Endothermic Lindberg (3) - Air	Gas
3,600CFH	Endothermic Surface (2)	Gas
5,600CFH	Endothermic Surface (2)	Gas
6,000CFH	Gas Atmos. Nitrogen Generator	Gas

**BOX FURNACES**

12" x 24" x 10"	Lindberg (Atmos.)	Elec 2000°F
12" x 24" x 10"	Lindberg (Atmos.)	Elec 2500°F
12" x 24" x 12"	Hevi Duty (2)	Elec 1950°F
12" x 32" x 12"	L&L (Retort)	Elec 2000°F
13" x 24" x 12"	Electra Up/Down	Elec 2000°F
17" x 14.5" x 12"	L&L (New)	Elec 2350°F
18" x 30" x 13"	Hevi-Duty	Elec 1850°F
18" x 36" x 18"	Lindberg (Atmos)	Elec 2500°F
18" x 36" x 18"	Hevi Duty	Elec 2000°F
18" x 36" x 18"	Lindberg (Fan)	Elec 1850°F
20" x 48" x 12"	Hoskins	Elec 2000°F
36" x 72" x 42"	Eisenmann (Car Bottom)	Gas 3100°F
60" x 216" x 48"	IFSI (Car Bottom)	Gas 2400°F
60" x 156" x 60"	Lindberg Car Bottom	Gas 1850°F
96" x 360" x 48"	Sauder Car Bottom	Elec 1400°F
126" x 420" x 72"	Drever "Lift-Off" (2) (Atmos.)	Gas 1450°F

**PIT FURNACES**

14" Dia x 60"D	Procedyne Fluid Bed	Elec 1850°F
72" Dia x 72"D	Flynn & Drefflein (2) (Atmos.)	Elec 1400°F
60" Dia x 52"H	"Bell" Nitridor (Retort)	Elec 1200°F

**VACUUM FURNACES**

12" x 20" x 12"	Abar	Elec 2400°F
24" x 36" x 18"	Hayes (Oil Quench)	Elec 2400°F
24" x 36" x 24"	TM - Temper	Elec 1400°F
48" x 48" x 24"	Surface (2-Bar)	Elec 2400°F
48" x 48" x 36"	Ipsen "Like New"	Elec 2400°F
60" Dia x 96"H	Ipsen "Bottom Load"	Elec 2400°F
72" Dia x 96"H	Abar "Bottom Load" (5 Bar)	Elec 2400°F

**INTEGRAL QUENCH FURNACES**

24" x 36" x 24"	AFC (Top-Cool-Line)	Elec 1850°F
30" x 48" x 20"	Surface (2)	Gas 1750°F
30" x 48" x 24"	Surface	Gas 1750°F

**BELT FURNACES/OVENS**

10" x 6" x 7"	Abbott (Brazing) "Like New"	Elec 2150°F
24" x 12" x 18"	Gruenberg	Elec 450°F
24" x 18"L	Thermal Basic Belt Line	Gas 1750°F
32" x 24" x 12"	OSI Slat Belt	Gas 450°F
36" x 24" x 8"	Surface Cast Belt (Line)	Gas 1750°F
60" x 30" x 10"	Sherwood	Gas 500°F
60" x 40" x 14"	GE Roller Hearth (Atmos)	Elec 1650°F
60" x 40" x 14"	Wellman Roller Hearth (Atmos)	Elec 1650°F

**MISCELLANEOUS**

Combustion Air Blowers (All sizes)		
24" x 36"	Lindberg Charge Car (Manual)	
30" x 48"	Surface Charge Car (SE-ER)	
SBS Air/Oil Coolers (4)		
24" x 36" x 24"	Salt Quench Tanks (2)	Elec 1000°F
30" x 48" x 30"	Surface Washer	Gas
30" x 48" x 30"	Surface Washer (2)	Gas
(2) Bell & Gossett "Shell & Tube" Heat Exchangers		
26" x 15" x 15"	Belt Washer/Dryoff	Gas
36" x 48"	AFC Charge Car (DE)	Elec

**MISCELLANEOUS (continued)**

24" Wide Table	Surface rotary Hearth	Gas 1750°F
30" x 30" x 30"	Subzero	-105 to 375°F Elec.
SBS Air/Oil Coolers (4)		
AFC Pusher Line	(Atmos.)	Gas 1750°F
36" Wide Table - Rotary	Hearth (Atmos.)	Elec 1850°F
30" x 48"	Surface Roller Table	
36" x 48"	Holcroft Charge Car (DE)	
48" x 60" x 60"	Steel "Roll-in" Carts (3)	
54" Dia x 108" H	Ebner Bell (Atmos.)	Gas 1650°F

**OVENS/BOX TEMPERING**

8" x 18" x 8"	Lucifer	Elec 1250°F
12" x 16" x 18"	Lindberg (3)	Elec 1250°F
14" x 14" x 14"	Blue-M	Elec 1050°F
14" x 14" x 14"	Gruenberg	Elec 1200°F
14" x 14" x 14"	Blue-M	Elec 650°F
14" x 14" x 14"	Gruenberg (solvent)	Elec 450°F
15" x 24" x 12"	Sunbeam (N <sub>2</sub> )	Elec 1200°F
20" x 18" x 20"	Blue-M	Elec 400°F
20" x 18" x 20"	Despatch	Elec 650°F
20" x 18" x 20"	Blue-M	Elec 650°F
20" x 18" x 20"	Blue-M (2)	Elec 800°F
24" x 20" x 20"	Blue-M	Elec 1000°F
24" x 24" x 24"	Grieve	Elec 500°F
24" x 24" x 24"	Despatch	Elec 1350°F
24" x 24" x 36"	New England	Elec 800°F
24" x 24" x 48"	Blue-M	Elec 600°F
24" x 36" x 24"	Grieve	Elec 500°F
24" x 36" x 24"	Demtec (N <sub>2</sub> )	Elec 500°F
24" x 36" x 24"	AFC (N <sub>2</sub> )	Elec 1250°F
24" x 36" x 24"	Grieve	Elec 1000°F
24" x 36" x 24"	Trent	Elec 1400°F
25" x 20" x 20"	Blue-M	Elec 650°F
24" x 36" x 48"	Gruenberg	Elec 500°F
25" x 20" x 20"	Blue-M (Inert)	Elec 1100°F
26" x 26" x 38"	Grieve (2)	Elec 850°F
30" x 30" x 60"	Gruenberg	Elec 450°F
30" x 30" x 48"	Process Heat	Elec 650°F
30" x 38" x 48"	Gruenberg (Inert) (2)	Elec 450°F
30" x 48" x 30"	Surface (2)	Elec 1400°F
30" x 48" x 30"	Surface	Elec 1250°F
36" x 36" x 36"	Grieve	Elec 1000°F
36" x 36" x 36"	Grieve	Elec 350°F
36" x 36" x 36"	Blue M Environment Chamber (-18°C to +93°C)	
36" x 30" x 36"	Trent	Elec 1400°F
36" x 42" x 72"	Gruenberg	Elec 450°F
36" x 48" x 36"	Pollution Control Burn Off	Gas 850°F
36" x 48" x 36"	Grieve	Elec 350°F
36" x 48" x 36"	AFC	Gas 1250°F
36" x 48" x 36"	TPS (Environmental) Elec -40°C to +200°C	
36" x 60" x 36"	CEC (2)	Elec 650°F
36" x 36" x 78"	Despatch	Elec 1050°F
36" x 84" x 36"	Lindberg (1996)	Gas 850°F
37" x 25" x 37"	Despatch	Elec 500°F
37" x 25" x 37"	Despatch	Elec 850°F
38" x 20" x 26"	Grieve	Elec 500°F
42" x 72" x 36"	Despatch	Elec 1350°F
48" x 24" x 36"	Blue-M	Elec 600°F
48" x 48" x 20"	Lindberg (Hyd. Press)	Elec 1250°F
48" x 34" x 52"	Heat Mach. (2)	Elec 500°F
48" x 48" x 48"	TPS - Environmental	Elec 392°F
48" x 48" x 72"	Gruenberg	Elec 500°F
55" x 30" x 60"	Precision Quincy	Elec 350°F
72" x 72" x 72"	Despatch (2)	Gas 500°F
72" x 96" x 72"	Michigan Oven	Gas 500°F
72" x 120" x 72"	Precision Quincy	Elec 500°F
72" x 252" x 60"	Precision Quincy "Car Oven"	Gas 500°F
96" x 360" x 48"	Sauder Car Bottom	Elec 1400°F
108" x 96" x 65"	Eisenmann (3)	Gas 1200°F

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