Thermal Solutions Engineered to Perform. Built to Last.
Surface® Combustion launched our first patented heating concept in 1915. Since then, we have continued to lead the industry in solutions and innovations that provide our clients competitive advantages.

Surface Combustion has earned a trusted reputation over 100 years of providing rugged, reliable thermal processing solutions equipped with the latest technology and backed by strong technical support.

Surface strives to build customer relationships that endure long after the initial equipment purchase. When you require a thermal processing partner who can draw from a broad portfolio of proven designs, including pioneering atmosphere and vacuum products, let us show you the Value of Surface.
Our Mission

To provide thermal systems and equipment which will enhance the physical properties and surface characteristics of materials and improve the performance and competitiveness of our customer’s products.

Our Purpose

To foster customer relationships through thermal processing solutions which are based on ingenuity, reliability, technology transfer, continuous partnership and excellent aftermarket support.

This allows Surface Combustion to maintain its leadership globally and accelerate the success of our clients.

Our Value

The strength of Surface lies in the breadth of our product portfolio, our unparalleled process knowledge and our commitment to customer service.

From our standard atmosphere and vacuum furnace designs, to custom engineered thermal process solutions, to quick, responsive aftermarket support, Surface stands ready to serve you.

**Tradition – Integrity – Technology**
Increasing Value Through Strategic Thermal Processing Solutions

Our long-term customer relationships are testament to the value we add. We have been everywhere in the world of thermal processing and with that knowledge, we can solve your manufacturing challenges.

From defining the solution, to commissioning, to aftermarket support, we partner with our customer for long-term success.

When a company requires the ability to control their thermal process, Surface is the answer. Our long history in this industry affords us the depth of knowledge to select the best technology for each customer application using our extensive design library.

Surface maintains a complete process and metallurgical lab and testing facility. Our trained staff can perform sample processing in virtually any type of furnace as well as provide the required subsequent metallurgical analysis.

Other uses of the lab include developing or fine tuning new processes for customers such as Ferritic Nitrocarburizing (FNC), plasma or gas nitriding, Low Pressure Vacuum Carburizing (LPC), unique annealing or carburizing cycles. Surface also maintains field service test equipment such as atmosphere and combustion analyzers, pressure and temperature sensors and data logging equipment.

Surface excels in assisting customers with metallurgical needs to solve problems and develop new products.

“Surface Combustion’s engineering and reliability are the foundation of our successful commercial heat treat operations. When selecting equipment for multiple locations, we invest in Surface for their Allcase® furnaces and RX® generators because their equipment just runs, their system requires virtually no unplanned maintenance, and its versatility meets our varying customers’ market demands. We also value their customer service and spare parts availability.”

Jim Hedman, Director-Engineering
Bluewater Thermal Solutions
Solving Thermal Processing Challenges

Surface offers the industry's most diverse product line of advanced systems and equipment for thermal processing applications.

Allcase® Batch Integral Quench Furnace:
The Allcase® has over 3,000 units installed worldwide. Continued product improvements and ease of maintenance enhancements have maintained the Allcase as the industry leader for batch processes, including hardening, annealing, normalizing, gas carburizing, carbon restoration, carbonitriding and ferritic nitrocarburizing.

Companion Equipment:
Flexibility is the reason most industries prefer Surface Allcase Lines. The companion equipment combined with this furnace design allows for simple future expansion. We provide what you need for a profitable heat treating facility including: Uni-DRAW® tempering furnace, radiant tube box (RTB) furnaces, washers, charge cars, load tables, atmosphere generators, quench tanks, air blast cooling stations, automated handling equipment, process controls, SCADA systems, trays, baskets and liners.

Gas and Ion Nitriding Equipment:
The process imparts very uniform metallurgical properties to materials. Surface offers bottom load, bell, pit and horizontal loading configurations.

Vacuum Equipment:
For over 50 years, Surface has been manufacturing vacuum furnace equipment. This expanding product line includes the Power Convection® Single-Chamber Vacuum Furnace with 2- and 6-Bar quenching capability. The Multi-Chamber Furnace family includes 2-Chamber, 3-Chamber and Clovereaf™ configurations. The multiple-chamber configuration allows for higher production with separate high-heat, low-pressure carburizing and high-pressure quench (up to 20-bar) chambers. The VacuDraw® High Convection Vacuum Temper Furnace completes the line and includes sizes ranging from 36-48-36 to 60-90-60. Surface’s exclusive patented gas-fired vacuum furnaces have been in use for over thirty years offering an alternative energy source with natural gas cost savings.

Atmosphere Generators:
Surface offers reliable, easy to maintain, economical on-site atmosphere generation. This includes the benchmark RX® endothermic gas generators, DX® exothermic gas and custom engineered generators.
Engineered Products:
Engineered to order batch and continuous furnace designs meet customer specified thermal processing and production requirements. Surface provides pit, revolving retort, rotary hearth, pusher tray, mesh belt, cast belt, roller hearth, screw conveyor, box, car bottom, and countless other custom designed products based on over 100 years of history and experience.

Advanced Combustion Products:
Surface offers a diverse selection of thermal processing systems, such as hazardous and toxic waste disposal systems, thermal cleaning, mineral and resource recovery, chemical weapons and munitions demilitarization, carbon and graphite processing, end-of-life tire, upcycling and waste-to-energy.

Process Controls:
Surface Combustion’s pioneering process control systems, such as our CLX/CASEmate® and C6™ A batch atmosphere furnace controllers, are designed to work integrally with all types of heat treat equipment. We maintain and develop our own process and mechanical motion controls to meet industry standards. Surface will incorporate other commercially available control systems per request.

Rebuilds and Upgrades:
Surface provides maintenance and upgrades by offering retrofit packages. Surface Combustion can improve product repeatability, increase productivity and reduce energy consumption of your furnace. When extensive equipment modifications are necessary, our rebuilding and construction services can provide an alternative to replacing equipment.

Surface products are built with the following parameters for optimal performance:

- Fuel economy
- Decreased unplanned maintenance
- Temperature uniformity
- Technology & engineering disciplines
- Reduction of manual adjustment
- Long component life
- Reduced atmosphere consumption
- Atmosphere uniformity
- Easy inspection and preventative maintenance
Surface Combustion provides a single source for atmosphere and vacuum heat treatment furnaces for the global manufacturing company. We efficiently generate the most creative standard and custom heat treatment solutions that are low maintenance, rugged and reliable.

Our extensive knowledge, solid reputation and excellent support services create a natural fit as a superior business partner dedicated to attaining your short and long term manufacturing success.

Our product names are ubiquitous in the marketplace. The longevity of our relationships and the quality of our solutions bring customer satisfaction that inspires our innovation.
Non-ferrous
- Aluminum
  - Holding Furnaces
  - Ingot Reheat Furnaces
  - Homogenizers
  - Continuous Floaters
  - Solution Heat Treat Furnaces
  - Coil Annealers
  - Uni-DROP® Drop Bottom Furnaces
- Brass & Copper
  - Coil Annealers
  - Continuous Strip Annealers
  - Walking Beam Cake Heating Furnaces
- Carbon Baking
  - Pit Furnaces
  - Carbottom Furnaces
  - Electrode Preheat Furnaces
- Nickel Alloys
- Titanium Alloys

Steel Mill
- Rotary Hearth Furnaces
- SRM Furnaces
- Tube Quench & Temper Furnaces
- Batch Coil Anneal Furnaces
- Bases
- Continuous Annealing Lines
- Continuous Galvanize, Galvalume & Tin
- Walking Beam Furnaces (Top & Bottom)
- Walking Hearth Furnaces

Environmental
- Incinerators
  - Pyrobatch®/Pyrotherm®
  - Rich/Lean Fume
  - Liquid Injection
  - Sludge
- Drum Furnaces
- Rotary Kiln
- Sliding Bed™ Preheater
- Controlled Atmosphere Thermal Processing
- Test Furnaces
- Feasibility Studies
- EPA Permitting Assistance

General Heat Treat
- Batch Furnaces
  - Batchmaster® Oven Lines
  - Carbottom
  - Cover & Base
  - Elevator Hearth
  - Forge
  - Lift Cover
  - Pit
  - Tempering/Draw
  - Batch Integral Quench (BIQ)
- Continuous Furnaces
  - Cast Belt
  - Chain Conveyor
  - Mesh Belt
  - Pusher Dog Beam
  - Pusher Roller Rail
  - Pusher Roller Tray
  - Pusher Tray
  - Revolving Retort
  - Roller Hearth
  - Rotary Hearth
  - Rotating Finger
  - Screw Conveyor
  - Shaker Hearth
  - Stat & Flight Conveyor

Process Controls
- Controllers
  - C6™-A Batch Atmosphere Furnace
  - C6™-AX Multiple Atmosphere Furnaces
  - C6™-T Batch Furnace
  - C6™-M Multiple Batch Furnaces
  - C6™-E Endothermic Generator
  - CLX/CASEmate® Batch Atmosphere Furnace
  - CLX/TEMPmate® Batch Furnace
  - CLX/DATAVAC® Vacuum Furnace
  - CLX/IONPRO® Ion Nitrider
  - CLX/BELTmate™ Belt Furnace
  - CLX/GP5® Gas Processing System
  - ESA®-8200 Endothermic Generator
  - ESA®-3200 Dew Point
  - S-1™ Oxygen Probe
  - HTM®-Pro Heat Treat Management System
  - TAL®-Pro Trend Alarm Log Program
  - Advanced SCADA Systems
  - Custom Control Systems
  - Automation Systems
Our customers have unique needs and applications that require special attention. Surface offers different equipment designs and configurations to accommodate many thermal processing solutions. Our equipment processes include:

- Aging
- Annealing
- Austempering
- Bluing
- Brazing
- Calcining
- Carbon Restoration
- Carbobritizing
- Case Hardening
- Ferritic Nitrocarburizing (FNC)
- Forging Preheat
- Gas Carburizing
- Gas Nitriding
- Hardening
- Ion Carburizing
- Ion Nitriding
- Malleabilizing
- Marquenching
- Normalizing
- Press Quenching
- Quenching
- Reheating
- Scale Free Heating
- Sintering
- Solution Heat Treating
- Spheroidizing
- Stress Relieving
- Tempering
- Triniding™
- Vacuum Hardening

Creative, Continuous Innovation

Surface is here for your pre-process, in process and post-process needs. We engineer furnaces with uniform temperatures, controlled atmospheres and high uptime which yield repeatable, high quality parts. When a Surface Combustion furnace is in place, you can rely on consistent output.
Surface has the knowledge and experience to build a furnace system for a wide-range of processes. From standard equipment to special builds, we know how to create the thermal processing solution needed for your application.
We provide value every step of the way

Concept To Production

1. Identify need
   New process, expanding production or changing process – we help with all heat treatment challenges.

2. Create & Verify Solution
   Surface creates a furnace system based on manufacturing requirements. Using our lab and existing manufacturing environments, we can test the product and verify the result.

3. Project Management
   Projects are led by an engineer who coordinates all aspects from design to delivery to commissioning. This continuity ensures efficient and expedient solutions.
Surface provides engineering documentation such as operating instructions, drawings of your furnace, recommended spares parts list and a maintenance schedule. Our aftermarket support includes OEM part inventory, service technicians and engineering support staff. We also have onsite testing and training available.

**Manufacture & Assemble**
Once the design is engineered, Surface assembles the furnace per specifications. We maintain enough manufacturing capacity to enable quick production for solutions large and small.

**Install & Commission**
Installation and commissioning occurs under the direction of a commissioning engineer. A custom operations manual is created which includes a maintenance guide and aftermarket parts list.

**Aftermarket Support**
Using the preventative maintenance guide and the expert advice of our aftermarket parts department, your furnace should run with optimal uptime.
Your Long-Term Aftermarket Support

Already a Surface customer and need help?

Call us with your equipment serial number for customer support. If you have a new project, please call your sales engineer.

To reduce downtime, we start with telephone support. If we cannot solve the issue remotely, we can dispatch an engineer to your site. Our goal is to get you back up and running as quickly as possible. Surface Combustion’s service support is backed by one of the largest replacement parts inventories in the industry. Critical parts and components are often shipped within 24 hours.

Maintenance and rebuild services include:

- Onsite testing
- Replacement of refractory lining
- Updating control and combustion systems
- Electric/gas heating conversions
- Energy-efficient process improvement
- Increased productivity modifications
Get started with Surface!

Call Surface with the following pieces of information ready to initiate your furnace solution.

**Work Description and your Process needed:**
- Cycle
- Operation
- Hours per year
- Available space
- Operating temperature range
- Heat source

We will work with you to develop the best solution for your thermal processing requirements. This starts with developing a complete process solution and continues through shipment, installation, and equipment commission.

Once your furnace is in place, we continue working with you for the life of the equipment through our industry leading aftermarket services including customer service, Aftermarket Parts, Rebuild and Upgrade Service.

We value our customer relationships. You can count on us for support and solutions well into the future.

“Surface can supply and support all our heat-treating equipment needs. The engineering and documentation on 40-year-old equipment is as thorough as our most recent installation of a 6-Bar Power Convection® vacuum furnace. We count on Surface for maintaining and rebuilding equipment and always ask Surface for their latest technology which works from the start.”

Dennis Stevermer, CEO
Flame Metals Processing Corporation

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Standard Equipment:
Allcase® Batch Integral Quench Furnace
Companion Equipment including Uni-Draw®
Auxiliary Equipment
Atmosphere Generators including RX®
Ion Nitriding
Ion Carburizing
Vacuum Furnaces including VacuDraw®
Process Controls including CLX/Tempmate®

Non-Ferrous Equipment:
Aluminum including Uni-Drop®
Brass & Copper
Carbon Baking
Nickel and Titanium Alloys

Steel Mill:
Rotary Hearth Furnaces
Tube Quench and Temper Furnaces
Batch Coil Anneal Furnaces
Continuous Annealing Lines

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Incinertators
Drum Furnaces
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