

# VacuDraw High Performance Temper Furnaces

Ideal for any thermal process operating at  
lower temperatures.



**The VacuDraw is the right furnace for  
low-temperature vacuum processing.**

Tempering or aging parts in a vacuum furnace designed for high-temperature processing results in longer cycle times due to slower heating rates versus the higher convection heating of the VacuDraw. Furnaces designed to operate at high temperatures often have poor temperature uniformity at lower temperatures (<1200°F).

# VacuDraw Furnace Solution

**Proven design gives unsurpassed uniformity  
in heating and cooling**

## Surface Solution:

The VacuDraw High Performance Anneal/Temper Furnace is a member of Surface's successful family of high convection batch tempering furnaces that utilize principles originally developed and proven with Surface's Uni-DRAW® batch tempering furnaces. The patented design of the VacuDraw series of furnaces provides a rear mounted fan for high convection heating and cooling to provide excellent wind circulation through and around the heating source and the workload. This results in temperature uniformities of  $\pm 10^{\circ}\text{F}$  ( $\pm 6^{\circ}\text{C}$ ) in the effective workload zone without the use of moving or mechanical dampers and baffles.



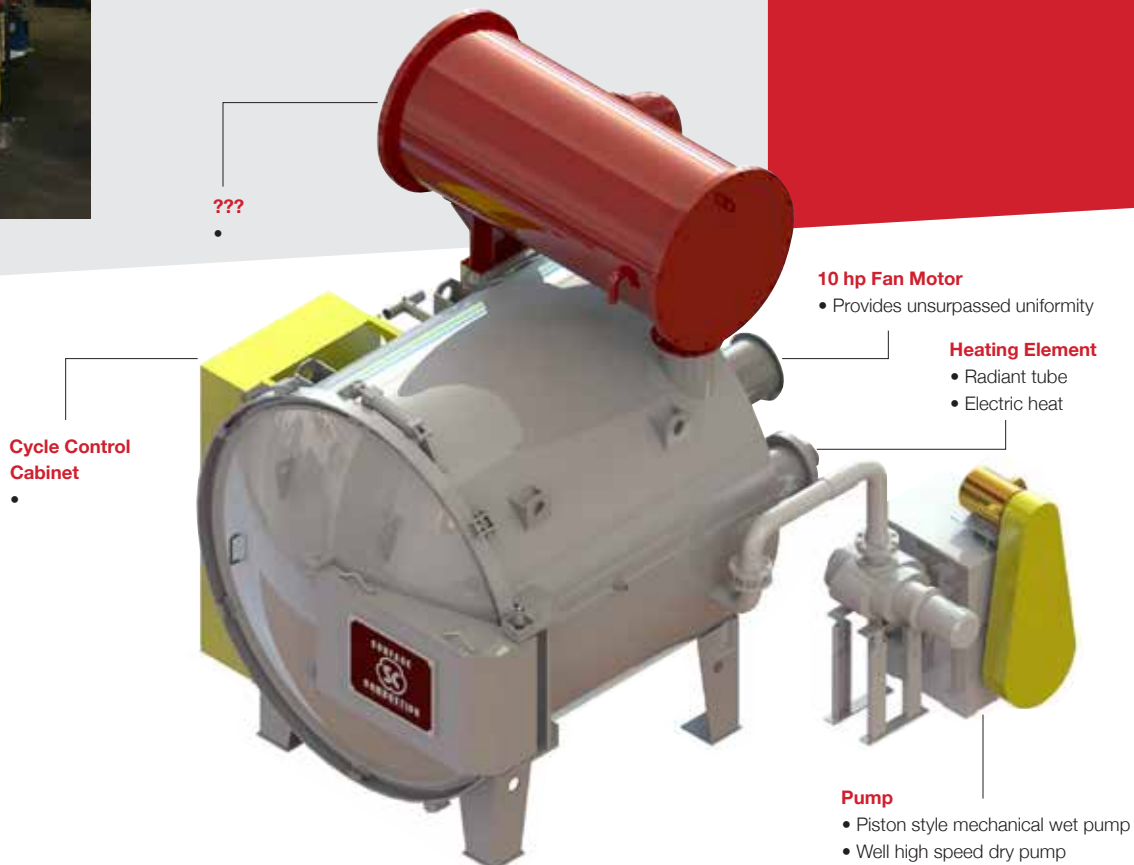
The MetaLined series of inside/out (I/O) construction furnaces are designed to handle processing problems where interaction between the work processed and the furnace insulation cannot be tolerated. The furnace design uses a metallic lining to provide for cleaner work and no contamination of the furnace fiber insulation package installed to the exterior surfaces of the lining.

## Application Requirements:

- Annealing
- Low Temperature Brazing
- Soldering
- Stress Relieving
- Tempering
- Other Low Temperature Applications

## Product Customization Options:

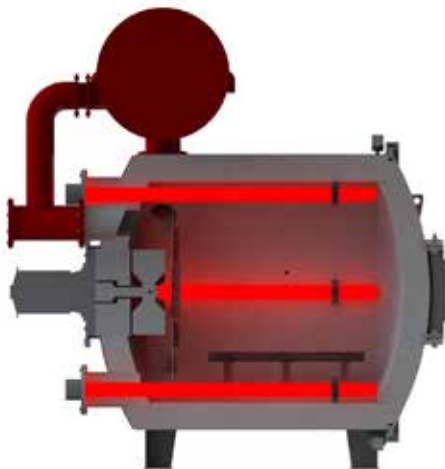
- Vacuum Pumping Size Options
- Autoclave Locking Ring Door
- Control Systems
- External Cooling Package
- Hydrogen Atmosphere Addition
- Allcase® Furnace Line Companion
- Furnace Fork Lift Loader
- Trays, Baskets and Fixtures



## Surface Processes:

- Aging
- Bright Annealing
- Low Temperature Brazing
- Soldering
- Stress Relieving
- Tempering

## Most Effective Materials: Copper, Stainless, Super Alloys, Titanium, Tool Steels



## Ideal Components:

**Aerospace Fasteners, Castings, Dies, Fasteners, Forgings,  
Medical Devices, Semi-Conductors, Wire**



## Surface Results:

### Flexibility - Heating Choice

VacuDraw furnaces can be provided with gas-fired radiant tubes or electrically heated elements to meet your preferred heating source or available utility sources. In either case, high convection heating is utilized with the furnace's patented circular wind-flow pattern. The electrically heated design VacuDraw furnace uses multiple bayonet style heating elements which are flange mounted for ease of maintenance and/or replacement. The heating elements are powered by an SCR (silicon control rectifier) power supply which provides for proportional controls of the elements.

### Rugged - Easy Maintenance

The electrically heated design VacuDraw furnace uses multiple bayonet style heating elements which are flange mounted for ease of maintenance and/or replacement. The heating elements are powered by an SCR (silicon control rectifier) power supply which provides for proportional controls of the elements.

### Consistent and Long Lasting - Industrial Leader

Surface Combustion is the industry leader in gas-fired vacuum furnace technology with more than 30 years of experience and a furnace installed base larger than any other furnace manufacturer. The furnace features a rigidized ceramic insulation that maintains external casing temperature below 110 F° (43C°). This is accomplished without the use of a conventional water cooling casing. The elimination of a water jacket removes the potential for casing rust or water leaks, another way the Surface furnace solution lasts longer.

### Efficient

The gas-fired VacuDraw furnace is heated by four single-ended radiant tubes with recuperated burners. This provides additional advantages over electrically heated units by using a lower cost energy source and allowing for faster floor-to-floor cycle times by using a "plunge cooling" feature accomplished with the radiant tube/burner assemblies and air from the combustion air blower. Gas Fired units also employ "Plunge Cooling", so cooling rates are faster than the electric counterparts.

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The I/O VacuDraw batch controlled vacuum/atmosphere furnace is available in gas-fired radiant tube or "canned" electric heating element designs. The furnace works on the same VacuDraw furnace operating principle; one charge of inert atmosphere gas is introduced after an initial vacuum evacuation of the furnace chamber.

## Allcase Batch Integral Quench Furnace Configurations:

Load Size (w x l x h)	Load Volume	Hearth Weight	Electric kW
24" x 36" x 24" (610 x 915 x 610mm)	12 cf .24 M <sup>3</sup>	1,500 lb 681 kg	40 kW
36" x 48" x 36" (915 x 1220 x 915 mm)	36 cf 1.01 M <sup>3</sup>	4,000 lb 1,818 kg	100 kW
48" x 72" x 48" (1220 x 1830 x 1220 mm)	96 cf 2.7 M <sup>3</sup>	6,000 lb 2,727 kg	200 kW
60" x 95" x 60" (1525 x 2440 x 1525 mm)	200 cf 5.66 M <sup>3</sup>	<b>6,000 lb</b> <b>2,727 kg</b>	350 kW

*Custom options available on all furnace configurations*



## Furnace Control System:

Surface offers a full line of process control systems from basic single loop controls to advanced Supervisory Control And Data Acquisition (SCADA) systems. The control systems are fully integrated with equipment safety hardware and PLC systems as required by each project.

The control system is the key to managing your furnace line for efficient production of quality product. These systems control temperature, atmosphere, motor speeds and mechanical motions.





### The advanced SCADA systems offer additional functionality in:

- Recipe database
- Alarm database
- Historical trending of all key process parameters
- Part lot tracking
- Real time part tracking through the entire process line
- Historical retrieval of part lot processing parameters including temperature, atmosphere, process times, feed rates and any alarm conditions that occurred while processing
- Predictive maintenance reminders for components like furnace alloy, oxygen probes, thermocouples and bearings.

## Get started with Surface!

Call Surface with the following information to get your furnace solution underway.

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 processing solution for your heat treating requirements. This starts with developing a complete process solution and continues through shipment, installation and equipment commissioning.

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 look forward to working with you.



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