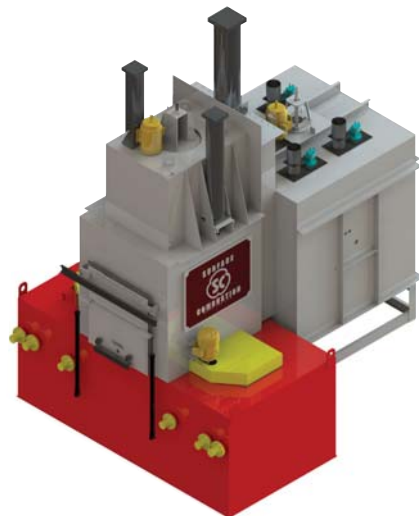


Allcase[®] Batch Integral Quench Furnaces

The industry standard for versatile, reliable,
high production, controlled atmosphere heat treating



Allcase[®] Batch Integral Quench Furnaces have been installed around the world to heat treat a wide range of components from small fasteners to large, heavy castings. With continued advances in process control, energy efficiency and automation, the Allcase remains the most respected furnace in the industry.

Reliable, Repeatable and Rugged Performance

Surface designed the first ever batch integral quench furnace – the Allcase – over 65 years ago.

Surface Solutions:

Allcase Batch Integral Quench Furnaces provide heat treaters value through greater process control, higher production and consistent results. The efficient gas heated units can be equipped with either bung mounted vertical “U” tubes or rear mounted horizontal Trident® tubes. Electrically heated units using Surface’s patented Proelectric® heating elements are also available.



A uniform environment is key to successful heat treating. The Surface designed, air cooled vibration dampening cast alloy fan provides rapid recirculation of furnace gases to ensure maximum heat transfer to the load along with maximum uniformity of temperature and atmosphere gas composition.

The furnace casing is constructed of air-tight welded steel plate supported and reinforced with structural steel members to provide tight atmosphere control and rugged performance.

The quench tank contains the optimal oil volume and agitation to harden both high capacity and high surface area loads. The double deck quench elevator enhances productivity by allowing the next load to be charged into the furnace while the previous load is quenching.

Controls and Automation

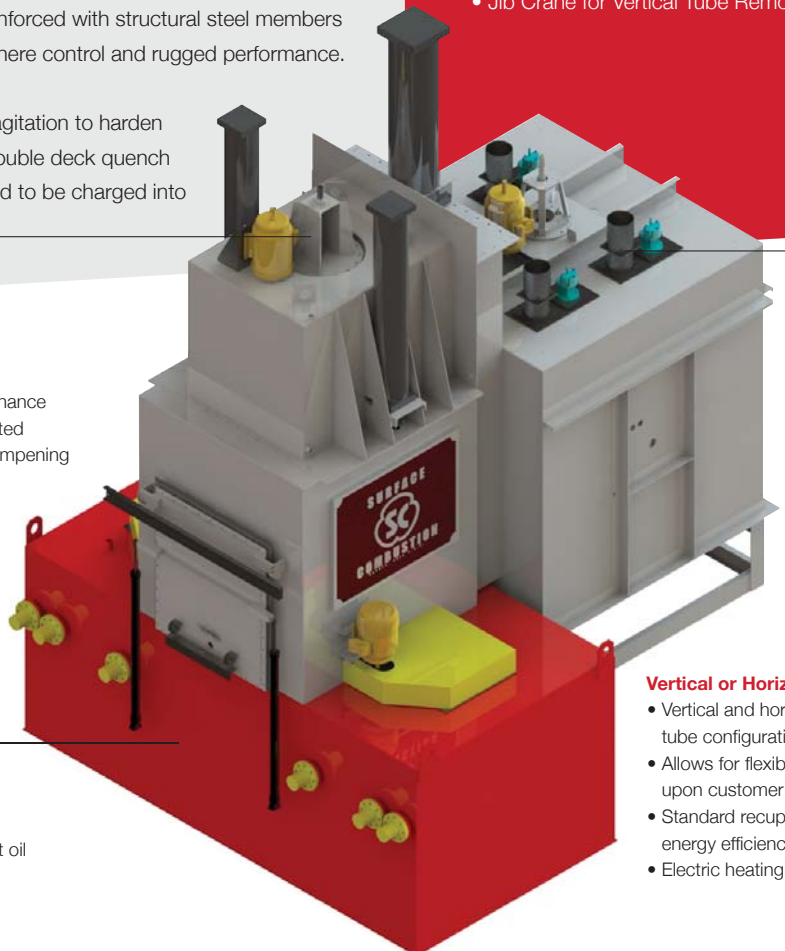
Available in 6 standard effective work sizes and 4 different configurations, an Allcase line can be fully automated with companion equipment to process loads from start to finish.

Quench Tank

- Optimal oil volume
- High capacity and high surface area loads
- Designed for cold oil or hot oil
- Double deck elevator

VF Fan Unit

- Air cooled
- Low maintenance
- Bung mounted
- Vibration dampening



Vertical or Horizontal Firing

- Vertical and horizontal radiant tube configuration
- Allows for flexibility depending upon customer floor plan
- Standard recuperation for energy efficiency
- Electric heating also available

Application Requirement:

- Flexible thermal processing of small and large components
- High production batch line
- Gas or electric fuel option
- Constant, reliable results

Companion Products:

- Uni-DRAW® Batch Temper Furnace
- Charge Car
- Air Cooling Station
- Scissor Lift Table
- Batch Parts Washers (Spray and Dunk)
- Controls
- Networking

Product Customization Options:

- Automation
- Extended Reach, Push/Pull, or Push/Push operation
- 1950 °F (1065 °C) Operation
- Top Cool Chambers
- 350 °F (176 °C) Hot Oil Quench Tank
- Multiple Process Atmospheres
- Shim Stock Ports
- Plunge Cooling
- Jib Crane for Vertical Tube Removal

Surface Processes:

The Allcase is typically used for the following heat treating processes:

- Annealing
- Carbonitriding
- Carbon Restoration
- Carburizing
- Marquenching
- Neutral Hardening
- Normalizing
- Spheroidizing
- Stress Relieving
- Trinitriding™/Ferritic Nitrocarburizing



Ideal For:

Castings, Forgings, Gears, Hand Tools, Shafts and Machined Components



Surface Results:

Flexible

Heat treaters prefer the Surface Allcase batch integral quench furnace for the wide range of shapes and sizes of parts that can be processed. The optional top cool chamber allows cooling under atmosphere for processes that do not require quenching. Surface is your single source for a full line of available companion equipment to round out your heat treating facility. Equipment can be purchased piece by piece and easily added to the line as production levels increase.

Rugged

Surface chooses construction materials to maximize uptime and minimize maintenance. Our furnaces are built with sturdier steel, thicker insulation and heavier duty components than most of our competition. Dense, heavy and high surface area loads can be processed with the heavy-duty Allcase furnace.

Consistent and Long Lasting

Surface has over 100 years of history in the thermal processing business and has installed over 3000 Allcase furnaces. Many of the first Allcase furnaces installed are still in operation today. With the industry standard Allcase, you can be assured you will have consistent output, low operation costs and many years of quality excellence.

Efficient

Recuperated combustion systems are a part of our standard product package. Our control systems can be equipped to monitor efficiency in the areas of fuel consumption, atmosphere consumption, component production rate and overall furnace utilization. One operator can run an entire Allcase furnace line.

Handling System Options:

Extended Reach™

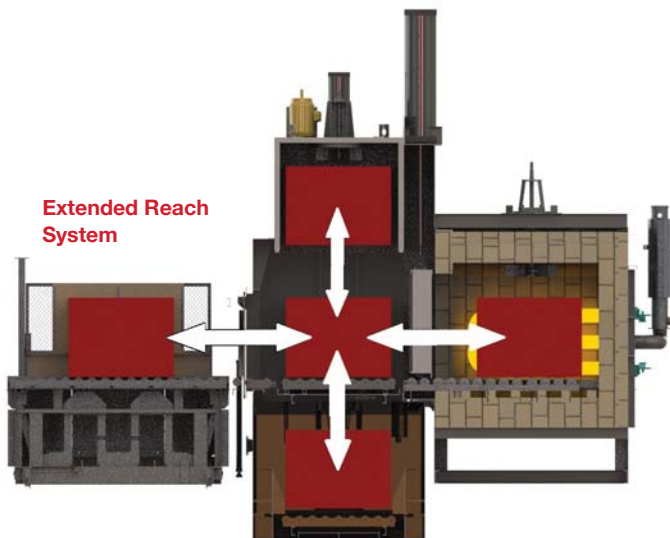
- Handler system on charge car or charge table moves the load into the vestibule, to/from the heating chamber and from the vestibule.
- Elevator moves load to/from quench tank and optional top cool.
- All motions are operator initiated.

System #1™

- Operator initiated handler system on charge car or charge table moves the load to/from the vestibule.
- Automatic rear handler system moves the load to/from the heating chamber.
- Automatic elevator moves load to/from quench tank and optional top cool.

Push/Push

- Standard operator initiated or optional automatic loading of charge vestibule and heating chamber with an Extended Reach charge car or charge table.
- Automatic rear handler system moves the load from the heating chamber.
- Automatic elevator moves load to/from quench tank and optional top cool.
- Standard operator initiated or optional automatic unloading of charge vestibule.
- Provides quickest quench transfer time – ideal for thin parts.
- ShuttleTrac™ automated charge car can be paired with fully automatic handling system.



Allcase Batch Integral Quench Furnace Configurations:

Work Zone Effective Size	Gross Loading	Gross Heating Inputs		
		Gas Horizontal Radiant Tubes	Electric	Gas Vertical Radiant Tubes
24" x 36" X 24" (610 x 915 x 610mm)	1500 lbs at 1600 °F (680 kg at 871 °C)	480 CFH (13.6 m ³ /hr)	90 kW	600 CFH (17 m ³ /hr)
30" x 48" X 30" (762 x 1220 x 762 mm)	3000 lbs at 1600 °F (1360 kg at 871 °C)	880 CFH (24.9 m ³ /hr)	120 kW	1200 CFH (34 m ³ /hr)
36" x 48" X 30" (915 x 1220 x 762 mm)	4000 lbs at 1600 °F (1814 kg at 982 °C)	880 CFH (24.9 m ³ /hr)	120 kW	1200 CFH (34 m ³ /hr)
36" x 48" X 36" (915 x 1220 x 915 mm)	4000 lbs at 1600 °F (1814 kg at 871 °C)	880 CFH (24.9 m ³ /hr)	120 kW	1200 CFH (34 m ³ /hr)
36" x 72" X 36" (915x 1830 x 915 mm)	7000 lbs at 1600 °F (3175 kg at 871°C)	1440 CFH (40.8 m ³ /hr)	270 kW	1800 CFH (51 m ³ /hr)
42" x 72" X 42" (1067 x 1830 x 1067 mm)	7000 lbs at 1600 °F (3175 kg at 871 °C)	1440 CFH (40.8 m ³ /hr)	270 kW	1800 CFH (51 m ³ /hr)

Automated Furnace Lines Include:

- Automated charge car loads/unloads furnaces and companion equipment per the cycle downloaded from the supervisory system.
- Furnaces and companion equipment process loads per the recipe downloaded from the supervisory system.
- There is limited operator interface as they only need to load and unload the line and monitor the process. The supervisory systems sets the recipe.
- Screen displays complete heat treat cycle in a simple, understandable format.
- Supervisory system provides overall coordination and management of all heat treat operations including scheduling, process recipes and load status.
- Preprogrammed cycles are tagged to part and lot numbers. Recipes can be chained for multi-recipe cycles.

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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