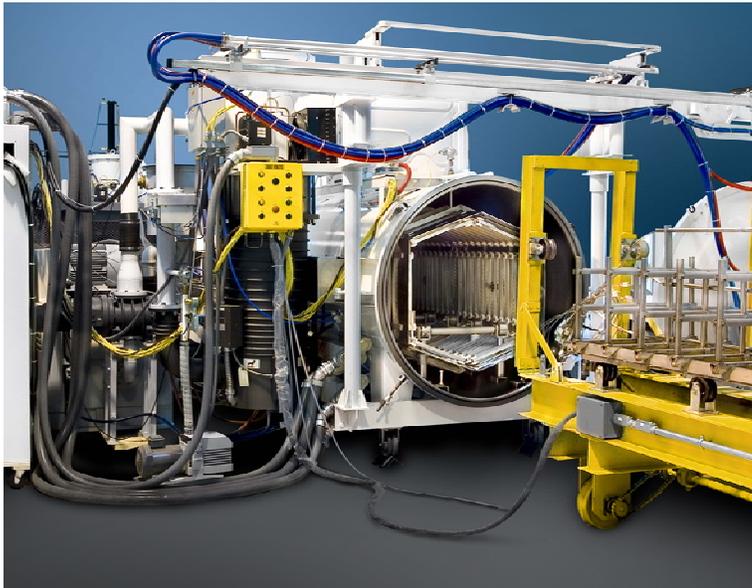


# PRODUCT

## INFORMATION



## TUBE ANNEAL FURNACES SERIES 3500 - HIGH-VACUUM BATCH FURNACE

The Series 3500 vacuum furnace design is Centorr Vacuum Industries production oriented offering for a variety of heat treatment and annealing applications.

The basic design comprises a multi-zone standard hot zone sizes available in lengths from 9-28 meters, rated to 900°C, max temperature. A long list of optional equipment makes this one of the most versatile custom-designed furnaces available today. The furnace chamber is mounted on wheels for servicing and maintenance. The "front-loading" design uses electric winches to drive in load cars with customer loads from 1000 - 7000kgs in size, and offers better ergonomics and temperature uniformity compared with vertical top/bottom loaders or round hot zone designs.

The Series 3500 furnace line contains features only found on high-end heat treat furnaces, such as a stainless steel interior vacuum chamber, heavy duty Nichrome ribbon heating elements; and all-metal SS radiation shields for high-vacuum and low contamination, resistance to oxidation, fast heating and cooling, and excellent process cleanliness. You won't find any refractory ceramic insulation or graphite felt/board in this hot zone.

Standard Furnace instrumentation includes a programmable controller with PLC for process control. Name brand vacuum sensors and gauges are available on all systems as well as analog/ digital chart recorders. A full complement of program interlocks and safeties ensures safe and efficient furnace operation and reduces the chance of operator vacuum pumping errors.

The Series 3500 furnace line is available with high-vacuum pumping systems utilizing primarily Diffusion pumping systems, with or without cold traps and refrigerated baffles.

The loading station has two (2) bays, each storing one car length fabricated from Stainless Steel. The winch design allows loading of 9-28m long loads into the furnace. The load station's hydraulic or electric drive motors provide lateral movement in front of the furnace opening to facilitate loading.

With over 20 units in the field, the Series 3500 design is one of the most proven production designs for heat treating and annealing furnaces worldwide.

### KEY FEATURES

- Cold Wall Vacuum furnace design with stainless steel inner jacket and mild steel outer jackets with baffled water cooling.
- No epoxy coated surfaces on chamber interiors results in higher vacuum integrity.
- Heavy duty Nichrome ribbon elements used instead of thin strip or foil elements which can be easily damaged. Hot zones use a 30° rule to ensure proper radiation on all sides.
- Operation to 900°C with six-sided heating elements high-vacuum or partial pressures of Argon.
- PLC with Industrial Programmable Controller or PC system using Intellution™ FIX32 HMI software customized by CVI for vacuum furnaces, with extensive data acquisition; and remote operation capabilities.
- High and low vacuum pumping systems including diffusion pumps with refrigerated or Polycold style baffles. Mechanical rotary piston pumps and Roots style blowers.
- G-10504A Partial Pressure control system (1-1000 microns) available.
- Graphic control panel shows location of vacuum pumps and system status using indicator lamps, and provides for manual operation of the furnace.
- Dual fan cooling system with optional water-cooled heat exchanger for fast cooling cycles.
- Integrated water cooling piping with color-coded hoses.
- Analog Ammeters and Voltmeters on control cabinet for each leg of the power supply for operator feedback.
- Customized loading station with dual load car design means high-productivity and fast turn-a-round time.

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# Series 3500

## Vacuum Annealing

### High-Vacuum Furnace

- **Highest Product Consistency** is assured by the uniform temperature control, elimination of temperature gradients, and automatic control of each step in the process.
- **Lowest Cost Operation** is provided by the rapid evacuation and heat up, and freedom from hand loading of parts.
- **Flexibility** is provided by the preprogrammed controls/recipes which allow different materials and part sizes to be successfully processed without manual adjustment of furnace conditions.
- **Minimum Maintenance Cost** is assured by the heavy construction and ease of access to all components of the furnace.



STD MODEL*	EFFECT HOT ZONE WxHxD (in / mm)
2420384-900-01-5Z	24 x 20 x 384 (610 x 508 x 9700)
24201102-900-01-9Z	24 x 20 x 1102 (610 x 508 x 28000)

\* Custom sizes available upon request



#### MISC. / OPTIONAL FEATURES

- Integrated cooling fans available with or without integral heat exchangers.
- CE and NFPA approval standards for compliance available.
- Rigid or Flexible water cooled busswork for improved maintenance and best electrical efficiency.
- Chambers constructed of stainless steel interiors to provide improved vacuum pumping performance when compared to mild steel epoxy coated chambers.
- Cylindrical chamber are structurally more sound, avoiding the multiple welds and resultant stresses inherent in a rectangular chamber.
- Trolley style door arrangement swings out of the way for fast and efficient loading.
- Integrated water flow indicators/flow switches with low water alarm setpoint for safe operation.



#### ALLOYS PROCESSED

- Stainless Steels
- Inconel 690 and 601
- Zirconium Alloy
- Ti, Nickel, and Superalloys



#### FURNACE APPROVALS

Centorr Vacuum Industries furnaces are designed to our own internal quality standards developed over our 50 year history, and are built to the following industry standards:

ASTM NFPA 86 NEC (NFPA 70)



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