# PRODUCT

**INFORMATION** 



## **KEY FEATURES AND BENEFITS**

- Operation from 1000°C to 2800°C in vacuum, inert gas or Hydrogen.
- Operation from partial pressures of 10<sup>-6</sup> torr up to 1-3 psig positive pressures.
- · Low initial cost and efficient design with small footprint.
- Inexpensive to operate.
- Clean, compact, vacuum tight construction.
- · Low thermal mass offering rapid heating and cooling.
- Cold Wall Vacuum furnace design with stainless steel inner and outer jackets with baffled water cooling.
- PLC with Industrial Programmable Controller or PC system using Intellution<sup>™</sup> FIX32 HMI software customized by C/VI for vacuum furnaces, with extensive data acquisition; and remote operation capabilities.
- Our G-10503A positive pressure Hydrogen gas system with FM approval.
- "Component setup" for full unobstructed access to chamber and vacuum pumps without cumbersome panels to remove.

### APPLICATIONS

Annealing

Brazing

Degassing

Casting

- Diffusion Bonding
- Heat Treating
  - Homogenization
- Ceramic Firing
- MeltingSintering



## Series 50 FURNACE VACUUM / CONTROLLED ATMOSPHERE FRONT LOADING BATCH FURNACE

The Centorr Model 50 High Temperature High Vacuum/ Controlled Atmosphere Front Loading Cold Wall Furnace is simple, easy to operate and essentially trouble free. This furnace consists of an electropolished, double walled, all stainless steel, water-jacketed horizontal chamber inside of which is a rectangular heat zone.

The heat zone is resistance heated using metallic heating elements. Heat shields consist of multiple layers of refractory metal sheets. Heating elements and heat shields are easily accessible for inspection and maintenance. The entire inside of the vacuum chamber is designed to conform to the best high vacuum practices with particular attention given to surface finishes and choices of construction materials.

A Centorr "proprietary" rotatable sight port is provided for visual observation of the specimen and for optical pyrometer monitoring. Ports are also provided for thermocouples, gauges, inert gas, and other pertinent instrumentation.

Clamps are provided for operation to slightly positive pressure. Loading is done through the full opening front door. The door is hinged by means of a double-pin assembly to prevent scuffing of the O-ring gasket.

The furnace may be mounted on top of a cabinet or on an open steel frame with the vacuum pumping system located immediately underneath the furnace chamber for maximum efficiency. This Furnace may be completely disassembled cleaned and reassembled in under a few hours.

With the proper choice of heat zone material, this furnace can operate in vacuum, inert gas, nitrogen and reducing or oxidizing atmospheres.

All controls and instrumentation are front panel mounted in a control cabinet providing ease of visual monitoring and operation. Power input is controlled by silicon controlled rectifiers. Complete system and operator protection are provided by proper vacuum valve sequencing and water-flow interlocks.

The unit is ready to operate as soon as power is connected to the main circuit breaker and water and inert gas connections are made. The furnace is completely assembled and thoroughly tested prior to shipment.

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## Series 50 Vacuum / Controlled Atmosphere Furnace

 Highest Product Consistency is assured by the close temperature gradients and automatic temperature control of each step in the process.

• Lowest Cost Operation is provided by the rapid heatup step, unattended operation, fast cooldowns.

**Flexibility** is provided by the preprogrammed controls which allow different materials and part sizes to be successfully processed without time-consuming 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*	HOT ZONE SIZE WxHxD in (mm)	
6612	6 x 6 x 12	(150 x 150 x 305)
6624	6 x 6 x 24	(150 x 150 x 610)
6636	6 x 6 x 36	(150 x 150 x 914)
9912	9 x 9 x 12	(230 x 230 x 305)
9924	9 x 9 x 24	(230 x 230 x 610)
9936	9 x 9 x 36	(230 x 230 x 914)
121212	12 x 12 x 12	(305 x 305 x 305)
121224	12 x 12 x 24	(305 x 305 x 610)
121236	12 x 12 x 36	(305 x 305 x 914)

\* Custom sizes available upon request

#### **MISC. / OPTIONAL FEATURES**

- Furnaces are available with and without vacuum pumping system; inert gas kits; power supply; temperature control instrumentation; cabinet; forced gas circulation fan; Hydrogen burn-off tower with igniter and blow-off port, etc.
- Vacuum pumping systems typically include diffusion pumps with backing pump and multi-coolant trap/baffle and/or mechanical pumps using manual or semi-automatic valves. Vacuum gauges and sensors include Combination Ion Gauges and Vacuum Thermocouple Gauge Tubes.
- Full range temperature control is available with either simple manual control of power output, or programmable control using closed-loop PID's. Temperature input is via power transducer, thermocouple, or optical pyrometer.
- Power supply includes SCR controller, current limiter, stepdown transformer, circuit breaker, contactor, separate controls transformer, and ammeter/voltmeters for display.
- Control Cabinets include push buttons, indicator lights, and water safety interlocks, completely wired in an attractive floor-standing cabinet.
- · Furnaces may be used within glove boxes or hot cells.
- Manual rotameter or Mass Flow Controllers for precise, repeatable gas flow.
- CE / VDE / TüV / CSA approvals and other non-U.S. standards for compliance.



## FURNACE APPROVALS

Centorr Vacuum Industries furnaces are designed to our own internal quality standards developed over our 45 year history, and are built to the following industry standards:

ASTM NFPA 86D FM (for G-10503A Hydrogen Systems)



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