

SERIES 3710 – SINTERVAC® Horizontal Front Loading Graphite Vacuum Furnace

Description

The Sintervac® line of vacuum and controlled atmosphere furnaces is one of Centorr Vacuum Industries' most popular and longest-lasting designs first developed in the early 1970's. It is available in several different application-oriented configurations providing a variety of furnacing capabilities for the metals, ceramics, and composites industries, with over 1000 Sintervac's in service throughout the world since their inception.

The basic design comprises of three standard models: the **Sintervac®A** designed for Hardmetals and Cemented Carbides; the **Sintervac®B** model for processing tool steel and high-speed steels; and the **Sintervac®C** style, designed for processing non-oxide, structural, and high-performance ceramics.

The all-graphite furnace hot zones are available in a variety of different temperature ranges starting at 1000°C, 1315°C, 1650°C, 2250°C, 2450°C, all the way up to 2600°C in a few specific sizes. Insulation can be either graphite felt sewn in place or more durable rigid graphite boards secured to an all-stainless steel jail with CFC hardware.

Heating elements can be constructed from graphite plate or our proprietary tube-and-block design which uses precision-machined components pinned together with graphite hardware and cured and glued with high-temperature graphite cement. The horizontal design allows for individual element tubes to be repaired and replaced in-situ.

Depending on the end use application, the Sintervac® furnace can include a graphite retort or workbox inside the hot zone which, in conjunction with our proprietary Sweepgas® debinding system can be used to compartmentalize any process offgassing that takes place, directing it out of the furnace through a delube manifold plumbed out the bottom of the chamber. The use of a graphite retort also improves the temperature uniformity by providing a solid wall of radiation against the interior of the furnace.

With a long list of optional equipment the Sintervac® design is one of the most versatile custom-designed furnaces available today. Standard Furnace instrumentation includes a programmable controller with PLC for process control. A PLC/HMI system is available optionally. 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 Sintervac® furnace line is available with high-vacuum or rough vacuum pumping systems and can include Diffusion pumps, Turbomolecular pumps, or Cryogenic pumping systems, with or without cold traps and refrigerated baffles. A variety of processing environments are available including high/low vacuum and partial and/or positive pressures of Ar, He, and N₂ gases, or H₂ process gas with our G-10503A gas system.



Key Features

- Cold Wall Vacuum furnace design with stainless steel inner jacket and carbon steel outer jackets on the vessel and doors, with rod-baffled water cooling for long service life. *Optional* all stainless steel chambers available.
- Available with sealed cooling fan assembly with or without water-cooled heat exchangers for fast cooling of the load.
- Robust heavy duty graphite tube-and-block element design first used over 50 years ago. Compare this with lower cost 'slat' element designs bolted together which can come loose during operation at high-temperatures causing micro-shorting and poor temperature uniformity.
- Hot zones use a 30° rule to ensure proper radiation on all sides, and 2, 4, or 6 sided hot zones are available pending the application requirements.
- Operation to 2600°C with two-sided heating and up to 2450°C in four or six-sided heating, in partial pressures from 10⁻³ torr up to 1-3 psig positive pressures of Ar, N₂, He, and Hydrogen gases.
- PLC with Industrial Programmable Controller or PC system using Specview® or Intellution™ iFIX HMI software customized by CVI for vacuum furnaces, with extensive data acquisition; and remote monitoring capabilities.
- G-10504A Partial Pressure control system (from 1-1000μ) available for suppression of low vapor pressure compounds, and from 10-500 torr for debinding and/or sintering, and our G-10505A positive pressure Inert and G-10503A Hydrogen gas system built to NFPA 86 standards for pressureless sintering applications.
- Proprietary G-10506A Sweepgas™ BRS (binder removal system) available for handling a variety of metals and ceramics carbon-based binders including wax, methylcellulose, PEG, PVA, PVOH, and Phenolic Resin.
- Graphic control panel shows location of vacuum pumps and system status using indicator lamps/icons, and provides for manual operation of the furnace.



STD MODEL*	USABLE SIZE (cu. ft /liters).	EFFECT HOT ZONE WxHxD (in / mm)
A, B, C 50	1 (28)	12 x 12 x 12 (300 x 300 x 300)
A, B, C 100	2 (57)	12 x 12 x 24 (300 x 300 x 610)
A 300	4.5 (127)	12 x 18 x 36 (300 x 457 x 914)
C 300	4.5 (127)	18 x 12 x 36 (457 x 300 x 914)
A, B, C 500	9 (127)	24 x 18 x 36 (610 x 457 x 914)
A, B, C 600	12 (255)	24 x 18 x 48 (610 x 457 x 1220)
A, B, C 800	16 (453)	24 x 24 x 48 (610 x 610 x 1220)

* Custom sizes available upon request

FURNACE APPROVALS

Centorr/Vacuum Industries furnaces are designed to our own internal quality standards developed over our 60+ year history, and are built to the following industry standards: ASTM NFPA 86 NEC (NFPA70)

MATERIALS PROCESSED

Stainless Steels Tool Steels
Tungsten Carbide Inconels

Advanced Ceramics including: AlN, BN, SiC, Si₃N₄, B₄C, ZrB₂ and all Carbon, Graphite, and CFC materials.