

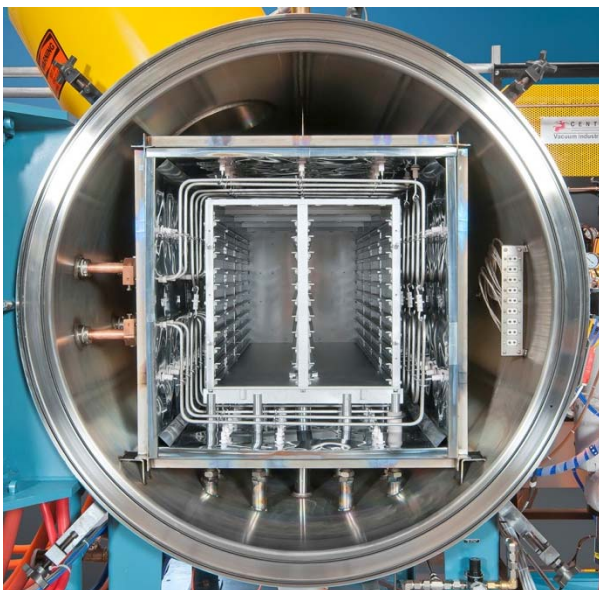
# SERIES 3570 – MIM-Vac™ M Vacuum/Controlled Atmosphere Batch Furnace

## Description

The MIM-Vac M™ is Centorr/Vacuum Industries latest offering in its line of custom-engineered high temperature vacuum / controlled atmosphere furnaces designed specifically for the Metal Injection Molding Market. Following the success of its graphite hot zone Injectavac™ which CVI pioneered in the early 1980's for the debind and sinter of parts containing 1st and 2nd stage MIM binders, today's MIM-Vac™ furnaces are the result of more than 20 years of experience in MIM technology and over 40 years debinding and sintering PM parts. The core design is based on Centorr/Vacuum Industries Workhorse® Metal Hot Zone furnaces, which have been sold worldwide for the sintering of powdered metals, and the binder removal technology of Sintervac® units developed for the Tungsten Carbide industry (with over 1000 in use worldwide). The MIM-Vac™ M' is designed primarily for 2nd stage binder removal and sintering, and has a number of design improvements specific for use with MIM Feedstocks. Tight partial pressure control and even gas flow in conjunction with effective event-based programming and sound retort design allows the entire load to view the same series of conditions as a function of time. This results in consistent microstructures and repeatable carbon control. Depending on the customer's process requirements, a variety of wax and polymer condensation strategies have been developed, including vacuum delube/condensation; Sweepgas™; Injectavac™ BRS™; MIM-Vac™ BRS™; and Thermal Incineration. The judicious use of advanced Molybdenum alloys in the hot zone and retort offers excellent creep resistance, higher recrystallization temperatures, and longer life. Our revolutionary new gas-plenum retort has rows of perforations allowing even gas flow across all the work trays and is constructed of heavy gauge Lanthanated and



TZM Molybdenum for low creep operation even at maximum temperatures, unlike other retort designs which warp and require replacing after as little as one year. The Modular design offers quick and easy access to all major furnace components and results in significantly lower maintenance and repair costs over the life of the unit.

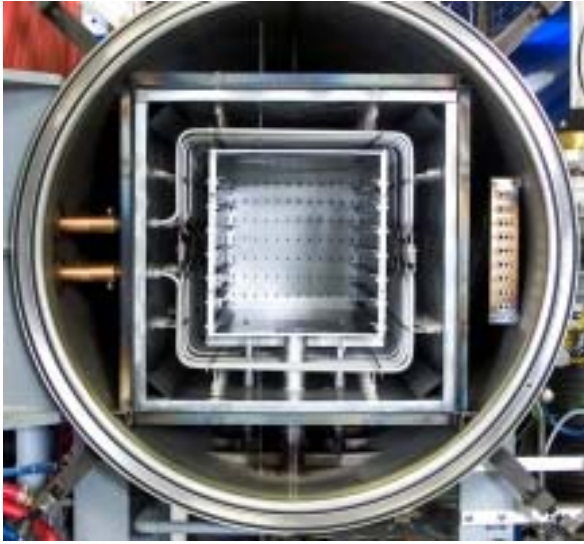


## Key Features

- Cold Wall Vacuum furnace design with stainless steel inner and outer jackets with baffled water cooling.
- Operation to 1650°C. Temperature uniformity of  $\pm 5^\circ\text{C}$  using up to six (6) zones of independent control.
- PLC with PC/HMI system using Intellution™ iFIX software customized by CVI for vacuum furnaces, with extensive data acquisition; maintenance screens, and remote monitoring capabilities.

# MIM-Vac™ 'M' Vacuum / Controlled Atmosphere Furnace

- **Highest Product Consistency** is assured by the uniform binder removal, close temperature gradients, automatic control of each step in the process, and vacuum sintering.
- **Lowest Cost Operation** is provided by the rapid debind step, unattended operation, and freedom from hand loading of parts.
- **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.



- CVI's patented Sweepgas™ Binder Removal System consisting of heat traced/insulated debind manifolding, large 'T/P' binder traps with removable media, and high-temperature easily-cleaned isolation valves.
- Novel Molybdenum retort designed for durability, ease of replacement and low cost. Integral gas plenum provides for consistent gas flow dynamics and efficient binder removal.
- Advanced Molybdenum alloys used in Key Shields, retort, and heath posts and rails with heavy-duty Tungsten rod element design.
- Operation from partial pressures of 10 - 750 torr in either Argon/Nitrogen, and Hydrogen.
- "Modular setup" for full unobstructed access to chamber, vacuum pumps, and binder trap without cumbersome panels to remove, providing fast and easy furnace setup on site with one drop connections for air, water, inert/process gases and power.

STD MODEL*	USABLE SIZE cu. ft (liters).	EFFECT HOT ZONE WxHxD in (mm)
100	2 (56)	12 x 12 x 24 (300 x 300 x 600)
450	4.5 (128)	18 x 18 x 24 (457 x 457 x 610)
675	6.75 (191)	18 x 18 x 36 (457 x 457 x 914)
900	9 (255)	18 x 18 x 48 (457 x 457 x 1220)
1125	11.25 (319)	18 x 18 x 60 (610 x 457 x 1525)

\* 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 NFA 86 NEC (NFA70)

## ALLOYS PROCESSED

Stainless Steels  
Ferrous and Non-Ferrous  
Alloys

Tool Steels  
High Speed Steels  
Ti, Ni, and Superalloys