CENTORR Vacuum Industries

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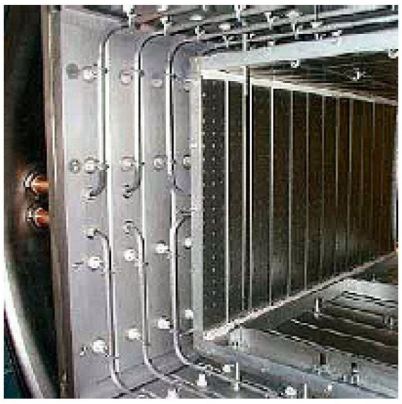
MIM-Vac™ FURNACES SERIES 3530 - VACUUM / CONTROLLED ATMOSPHERE BATCH FURNACE

The MIM-Vac™ is Centorr Vacuum Industries latest offering in its line of custom-engineered high temperature vacuum / controlled atmosphere furnaces and is 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 10 years of experience in MIM technology and over 25 years debinding and sintering PM parts.

The MIM-Vac™ 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.

Our revolutionary new gas-plenum retort has rows of perforations allowing even gas flow across all the work trays and uses Alumina ceramic support members for ease of construction and replacement. The work grid assembly also incorporates Alumina ceramic as tray supports for reduced metal-to-metal contact resulting in less sticking. The grid assembly is removable for production loading outside the unit and can be inserted into the chamber by load truck, eliminating timely hand loading of individual trays.

FEATURES

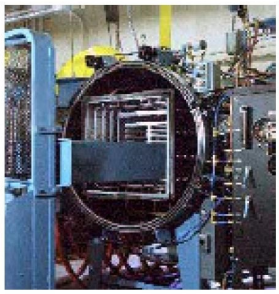
- Cold Wall Vacuum furnace design with stainless steel inner and outer jackets with baffled water cooling.
- CVI's patented Sweepgas™ Binder Removal System consisting of large diameter heat traced/insulated debind manifolding, large 'T/P' binder traps with removable media, and high-temperature easily-cleaned 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.
- Temperature uniformity of ± 5°C using up to six (6) zones of independent control.

- Operation from partial pressures of 10-760 torr positive pressures of Argon, Nitrogen, and Hydrogen. Our G-10503A positive pressure Hydrogen gas system with FM approval.
- "Component setup" for full unobstructed access to chamber, vacuum pumps, and binder trap without cumbersome panels to remove.

STD MODEL*	USABLE CU. FT.	EFFECT HOT ZONE WxHxD (in / mm)	TRAY SIZE (in / mm)
40	0.75 (21)	8 x 8 x 20 (203 x 203 x 508)	8 x 10 (203 x 250)
100	2 (57)	12 x 12 x 24 (305 x 305 x 610)	12 x 12 (305 x 305)
150	3 (85)	12 x 12 x 36 (305 x 305 x 914)	12 x 12 (305 x 305)
300	4.5 (127)	18 x 18 x 24 (457 x 457 x 610)	8.5 x 12 (216 x 305)
450	6.75 (191)	18 x 18 x 36 (457 x 457 x 914)	8.5 X 12 (216 x 305)
500	9 (255)	18 x 18 x 48 (457 x 457 x 1220)	8.5 x 12 (216 x 305)

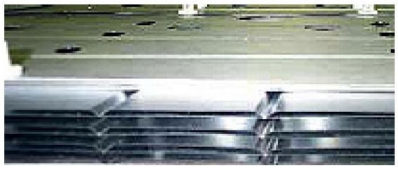
* Custom sizes available upon request

OPTIONAL FEATURES



- Manual rotameter or Mass Flow Controllers for precise, repeatable gas flow.
- Integrated cooling fans with integral heat exchangers.
- CE / VDE / TüV / CSA approvals and other non-U.S. standards for compliance.
- Rigid or Flexible water cooled busswork for improved maintenance and best electrical efficiency.
- Diffusion pumping system with backing pump and water-cooled baffle, refrigerated baffle, or liquid Nitrogen cold trap.
- Special heat-traced/Insulated debind manifolding with Combination Diffusion pump / Dry Mechanical Pump or OTO (Once-through-oiling) pumps for customers who prefer to do first stage Wax debinding in the same unit.
- Partial Pressure Hydrogen safety features including pneumatic actuated door clamps; double O-rings with vacuum pumpout grooves on all opening door flanges / binder traps; gas purged pump ballast, pump inlet, and exhaust; and no manually-actuated valves on the pumping manifolds.
- Integrated water flow indicators/flow switches with low water alarm setpoint, and optional type K thermocouples in major water circuits with overtemp alarm.
- Molybdenum alloy work trays with stiffeners.

ALLOYS PROCESSED



- 17-4 pH
- 316-L
- Tool Steels
- High Speed Steels
- Ti, Nickel, and Superalloys