

Product Information

Vacuum Industries

Sintervac® Jr.
Vacuum Sintering Furnaces
For Hard Metals and
Ceramics



Sintervac® laboratory and quality control furnace with modular chamber/control cabinet and vacuum pump.

Photo 1405

The Sintervac® Jr. furnace processes small test batches of parts through complete sinter cycles, including delube, under operating conditions identical to production size Sintervac furnaces. Designed for both development and quality assurance tasks, a typical furnace cycle takes less than four hours. Two temperature ranges are available: range A, 1600°C max. for steels and tungsten carbide and range C, 2200°C max. for non-oxide ceramics. Optional equipment can be selected for automatic temperature control, remote programming, repeated delube cycles, and control of various process parameters.

OPERATIONAL DATA

Sintervac Jr. furnace provides a top-loaded vertical hot zone with 4 inches diameter × 5 inches high (100 × 125mm) effective work space and 5 kg max. load capacity at operating temperature. Model A will reach 1600°C in vacuum and low pressure inert gas. Model C will reach 2200°C in vacuum and in inert gas up to 5 psig (.7 bar).

DESCRIPTION

Vacuum Chamber

Cylindrical, top loading; 304 stainless steel interior, completely water-jacketed. Full-opening, water-jacketed and hinged top cover with O-ring seal and quick-release clamps. Valved sight port, hot zone top insulation and shutter mounted on top cover. Spring-loaded lower hot zone shutter mounted in bottom of chamber. Ports provided for electrical feedthrus, vacuum pump, temperature sensor, and gas backfill system.

Hot Zone

Heavy duty circular graphite resistance heating element heats work load by radiation. Carbon (or graphite) felt insulation; mounted in stainless steel mesh retainer. Graphite hearth assembly.

Vacuum Pump

Edwards Model E2M8, two-stage, 6.7 CFM (190 l/min.)

SINTERVAC JR. FURNACE DESCRIPTION (continued)

Vacuum Manifold	Electrically-heated tubular copper manifold with spent wax reservoir. Manual vacuum valve and manual wax drain valve; ports for vacuum gauge tube and mass spectrometer connection.
Power Supply and Instrument Cabinet	Free standing dust-tight cabinet. Power supply includes manual potentiometer for power control, power transformer and flexible power leads to furnace electrodes. Instrumentation consists of thermal conductivity vacuum gauge and tube, platinum-rhodium thermocouple with digital temperature indicator (1600°C model only), furnace ammeter/voltmeter, pump and power control switches. A safety interlock for cooling water pressure is provided.
Water Cooling System	Series loop flow-thru system with single supply and drain connections.
Inert Gas Backfill System	Manual ball-type gas inlet valve for static inert gas cooling. Retractable shutters open hot zone for natural convection cooling.

Utilities	Temperature Range		Model A 1600°C	Model C 2200°C
	Electrical	480v, 3 phase, 60 Hz (380/3/50 on request)	5 kVA	15 kVA
	Water	30-50 psig, 60-70°F (2-3.5 bar, 15-21°C)	5 gpm (19 l/min.)	8 gpm (30 l/min.)
	Inert Gas	per run, for cooling	2 ft. ³ (57 l)	2 ft. ³ (57 l)
Space Requirements (approx.)	Width	4.5 ft. (1.4m)		
	Length	3.5 ft. (1.0m)		
	Height	6.0 ft. (1.8m)		



Ample clearance for handling parts and sample lots in Sintervac Jr. hot zone. Quick access top-opening cover has insulation attached.

Photo 1408

Option Groups

1. Temperature controller (Honeywell Dialapak) in place of digital temperature indicator. SCR power controller in place of manual potentiometer. (Model A only)
2. Fully proportional temperature controller, (Honeywell UDC 500) in place of digital temperature indicator. SCR power controller in place of manual potentiometer. (Model A only).
3. Automatic temperature controller/programmer (Honeywell DCP 700, micro-processor based) in place of digital temperature indicator. SCR power controller in place of manual potentiometer. Addition of PP-3 parametric controller. (Model A only).
4. Overtemperature protector system (Honeywell Dialapak controller) with chromel-alumel thermocouple (inserted in outer insulation layer).
5. Automatic inert gas backfill system (for load cooling) with solenoid valve, pressure control and control switch.
6. Model G10504 partial pressure inert gas flow-through and control system. Includes solenoid inlet valve, micrometer flow control valve, vacuum gauge controller.
7. Automatic high temperature control and programming system with dual channel Honeywell DCP 700 plus 2-color optical pyrometer, low temperature chromel-alumel thermocouple, SCR power controller, PP-3 parametric power controller. (For Model C only).
8. Multipoint recorder for temperature and pressure.
9. Automatic water heating system for chamber and cover.

Note: Additional options available on request.



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