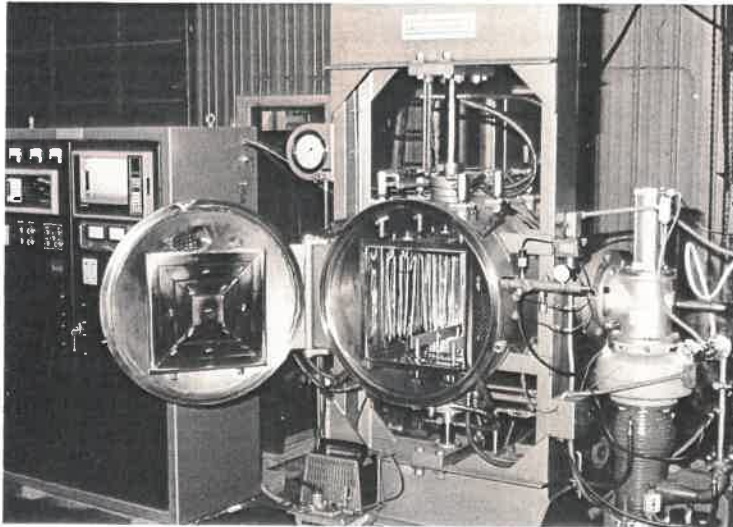


Product Information

Vacuum Industries, Inc.
Member of the Thermal Scientific Group

**DIFFUSION BONDING VACUUM HOT PRESS
SERIES 3520 MODEL 3033-1315-30T**



DESCRIPTION

The Vacuum Industries Diffusion Bonding Hot Press is a packaged system able to press up to 6" diameter workpieces to 30 tons force at temperatures to 1315°C in high vacuum or controlled atmosphere.

Assemblies which must be joined by simultaneous application of high temperature, high unit area squeeze and hard vacuums or inert atmosphere may be processed. While designed primarily for pressure-diffusion bonding work the system may be used as a general purpose high temperature facility by removing the press platens and retracting the rams. A double acting ram, stationary ram platens and cold wall furnace are contained in the horizontal stainless steel chamber. The external press frame supports the chamber, vacuum pumping system and controls. A saturable core reactor controlled power supply provides low voltage power through water cooled bus to solid copper heating element electrodes.

APPLICATIONS

When two parts are held in close contact and heated in a clean environment to a temperature well below the softening point, diffusion bonding occurs. Solid state diffusion of atoms across the interface produces a 100% metallurgical bond. The process is superior to brazing because no lower melting metal is introduced and superior to welding because no localized high stresses are produced, distortion is eliminated, inaccessible surfaces can be joined. Used in aerospace frame and engine manufacture, electronics and nuclear parts fabrication.

FEATURES AND ADVANTAGES

- 1315°C (2400°F) temperature, 10^{-5} vacuum or special atmosphere, up to 30 tons (60,000 lbs.) of compacting force.
- Replaceable, interchangeable platens.
- General purpose high temperature heating facility suitable for heat treating furnished parts after bonding.

DIFFUSION BONDING VACUUM HOT PRESS SERIES 3520 MODEL 3033-1315-30T (cont.)

SPECIFICATIONS

Chamber	Horizontal 30" diameter × 33" long stainless steel interior 100% carbon steel jacketed with full-opening, hinged front and rear clamps, supported by press frame @ 46" C _L – elevation. Ports for power, rams, thermocouples, two 2½" clear view sight port.	
Press & Frame	Hydraulic press, double-acting with electro-hydraulic pump with force/pressure regulator, reversing valve. Pressure gauges; ram high and low, primary air. Pedestal and hydraulic rams are water-cooled, may be withdrawn to clear furnace for general use. Stroke 10".	
Vacuum & Inert Gas System	6" main valve air-operated failsafe closing; 6", 1500 l/sec. diffusion pump 23 CFM combination mechanical pump; welded steel manifolding, 1½" manual roughing and fore valves; connections for gauges and leak detector; vacuum gauge control combination hot filament ionization and two-station thermocouple, 1000 microns to 2×10^{-8} torr. Inert atmosphere system includes 5 psig relief valve, 30" – 0 – 15 psig Bourdon gauge, Ball valve for gas inlet. Electrics include circuit breakers, pilot lamps, diffusion pump cascaded with mechanical pump.	
Internal Mechanism	Furnace cold wall, molybdenum rod elements and inner heat shields. Platens 6" diameter refractory metal flat face attached to water-cooled rams which act through sliding seals.	
Power Supply	50 KVA, single phase saturable core reactor with linear power control and magnetic amplifier, 10-turn digital potentiometer. Includes furnace volt and current meters, cooling water flow interlock, shunt trip circuit breaker.	
Temperature Controls (Optional)	Automatic temperature control via microprocessor programmable controller and multi-point strip chart recorder. Separate over-temperature indicator cutout with thermocouple.	
Additional Features: (Optional)	High speed load cooler, survey thermocouple port or liquid nitrogen trap with level controller.	
Space and Service Requirements	Floor	14½' wide × 9' deep × 8½' high.
	Power	480 volts, 3 phase, 60 hertz.
	Water	7 GPM @ 35 psig 80°F maximum.
	Drain	Open.
	Air	1 CFM @ 100 psig.
Performance	Temperature	1315°C maximum.
	Vacuum	5×10^{-5} torr in 25 minutes, 10^{-6} torr range ultimate.
	Press	30 tons.