15T High Vacuum Hot Press System For Diffusion Bonding And Sintering

Item Number: XP31

Introduction

The 15T high vacuum hot press system delivers precise 500°C heating and high vacuum performance via turbomolecular pump achieving 6×10^{-4} Pa for diffusion bonding sintering and processing of oxygen-sensitive advanced materials. Ideal for research labs. Contact KINTEK for quote.

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Application	Description	Key Benefit
Diffusion Bonding of Micro-Interfaces	Vacuum bonding of thin-film semiconductors, thermoelectric joints, and single crystals without interfacial oxides.	Achieves high-strength, contamination-free bonds critical for electronic and photonic devices.
Sintering of Oxygen-Sensitive Ceramics	Densification of technical ceramics, nitrides, and sulfides under pure vacuum or inert atmosphere.	Produces high-density, high-purity components with superior mechanical and electrical properties.
High-Pressure Micro-Pellet Compacts	Fabrication of small, dense pellets for spectroscopy or mechanical testing using exact pressures.	Ensures uniform density and phase integrity in sample preparation.
Thermoelectric Materials Processing	Pressing and sintering of thermoelectric alloys under vacuum to prevent compositional changes.	Enhances thermoelectric efficiency by preserving stoichiometry and reducing thermal conductivity.
Battery Electrode Compaction	Compacting electrode materials under controlled atmosphere for solid-state battery research.	Improves interfacial contact and reduces porosity, boosting electrochemical performance.
High-Temperature Alloy Densification	Densifying refractory alloys and composites using combined heat and pressure.	Achieves near-theoretical density while avoiding grain growth and oxidation.
Ceramic Matrix Composite Fabrication	Infiltration and consolidation of ceramic preforms with high-temperature matrices.	Creates dense, defect-free composites with enhanced mechanical toughness.
Semiconductor Device Packaging	Hermetic sealing and bonding of components under vacuum to ensure long-term reliability.	Prevents moisture and contaminant ingress, extending device lifespan.

Parameter	Specification
Model	XP31 – Cabinet-integrated high vacuum hot press
Max Hydraulic Force	15 Tons (150 kN)
Standard Pellet/Die Size	10 mm × 10 mm (refer to pressure safety guidelines below)
Working Temperature Range	Room temperature to 500°C, programmable PID touchscreen control
Heating Power	2100 W
Ultimate Vacuum Level	6×10^{-4} Pa (achieved via turbomolecular + rotary vane pump system)
Vacuum Pumps Included	Turbomolecular pump + Rotary vane pump
Vacuum Gauge	Digital high-vacuum gauge with real-time readout
Chamber Material	SUS 304 stainless steel
Atmospheric Gas Compatibility	Nitrogen (N_2) / Argon (Ar), vacuum-and-purge compatible

Parameter	Specification
External Dimensions	550 × 560 × 1100 mm
Power Supply	Single-Phase AC 220V / 50Hz