Programmable Vacuum Hot Press Benchtop System For Advanced Material Synthesis

Item Number: XP35

Introduction

KINTEK's programmable vacuum hot press: benchtop 10-ton hydraulic press with vacuum/inert gas, 400°C & 800°C configurations for battery lamination, diffusion bonding, powder metallurgy.

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Application	Description	Key Benefit
Battery Pouch-Cell Lamination	Bonding and sealing of lithium-ion battery electrodes and separators under precise temperature, pressure, and inert gas.	Eliminates voids, prevents oxidation at electrode interfaces, and improves cell impedance and longevity.
Polymer Film Lamination & Encapsulation	Multilayer bonding for flexible electronics, optical films, or barrier packaging using controlled heat and force.	Achieves optically clear, defect-free bonds with consistent thickness and zero residual stress.
Powder Metallurgy Compaction	Uniaxial pressing of metal or ceramic powders into high-density green bodies, often followed by in-situ sintering under vacuum or inert gas.	Increases sintered density, reduces porosity, and enhances mechanical strength and electrical conductivity.
Diffusion Bonding of Advanced Alloys	Solid-state joining of dissimilar metals or high-temperature alloys at elevated temperatures in a clean vacuum environment.	Creates high-integrity, contamination-free interfaces for aerospace, nuclear, and medical components.
Ceramic Matrix Composite Lamination	Consolidation of ceramic prepregs or fiber-reinforced green tapes under heat and pressure.	Ensures uniform resin distribution, minimal void content, and improved interlaminar shear strength for demanding structural applications.
Thermoelectric & Piezoelectric Material Synthesis	Processing of novel functional materials under precisely controlled thermal and atmospheric conditions.	Enables reproducible phase formation and densification, critical for optimizing energy conversion and sensor performance.
Vacuum Lamination of Solar Cell Encapsulants	Bonding of encapsulant layers onto photovoltaic cells with minimal thermal degradation.	Protects against moisture ingress and improves module reliability in outdoor installations.
Hermetic Sealing of MEMS & Sensor Packages	Vacuum-assisted sealing of micro-electromechanical systems (MEMS) or optical sensor packages under inert gas.	Achieves leak-tight seals with controlled internal atmosphere, extending device lifetime and accuracy.

Parameter	XP35 Standard Edition	XP35 Extreme High-Temp Edition
Max Working Pressure	Up to 10 Tons (100 kN)	Up to 10 Tons (100 kN)
Max Platen Temperature	≤ 400 °C	≤ 800 °C
Platen Material	Standard Tool/Die Steel	Nickel-based Superalloy
Rated Heating Power	≤ 3200 W	4500 W
Platen Dimensions	150 mm × 150 mm	150 mm × 150 mm
Platen Opening (Daylight)	≤ 60 mm	50 mm
Pressure Control	Programmable touchscreen (auto-pressurize, hold, timed release)	Programmable touchscreen (auto-pressurize, hold, timed release)
Chamber Vacuum Level	–0.1 MPa (Relative)	–0.1 MPa (Relative)
Atmospheric Gas	Nitrogen (N_2) / Argon (Ar)	Nitrogen (N_2) / Argon (Ar)

Parameter	XP35 Standard Edition	XP35 Extreme High-Temp Edition
Chamber Material	SUS 304 Stainless Steel	SUS 304 Stainless Steel
Safety Systems	Standard over-pressure relief	Auto door shutdown, over-pressure & over-temperature interlocks
Power Supply	AC 220 V / 50 Hz (Single Phase)	AC 208 V – 240 V / 60 Hz
Certification	CE compliant	CE compliant