Benchtop Automatic Vacuum Hot Press For Advanced Material Processing

Item Number: XP28

Introduction

High-precision benchtop automatic vacuum hot press delivering 25 tons of force, dual large-area heated platens up to 300°C, oil-free clean vacuum, programmable multi-stage pressing for repeatable results. Perfect for solid-state battery fabrication, polymer film lamination, and advanced material development.

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Application	Description	Key Benefit
Solid-State Battery Electrolyte Pressing	Processing sulfide or oxide solid electrolytes under vacuum and controlled heat to bond them with electrode materials, forming dense, ion-conductive interfaces. This eliminates voids that cause impedance, improving overall cell performance.	Achieves high ionic conductivity and mechanical cohesion without contamination.
Polymer Thin-Film Lamination	Hot pressing multi-layer polymer films under vacuum to encapsulate flexible electronics or create FPC substrates. The vacuum environment ensures no trapped air bubbles, while uniform heat and pressure enhance bond strength.	Produces optically clear, uniform laminates with excellent peel strength and reliability.
XRF / FTIR Pellet Preparation	Compacting powdered analytical samples into pellets under vacuum to prevent moisture adsorption and oxidation. Ideal for preparing stable samples for spectroscopic analysis where surface smoothness and consistency are critical.	Delivers reproducible, contamination-free pellets for accurate elemental or structural analysis.
Ceramic Matrix Composite (CMC) Curing	Vacuum-assisted hot pressing of pre-ceramic polymer infiltrated fabrics or prepregs to consolidate layers and remove volatiles before high-temperature pyrolysis. This step is crucial for achieving high density in final components.	Reduces porosity and enhances densification, leading to superior mechanical and thermal properties.
Pouch Cell Lamination & Sealing	Assembling electrode-separator stacks and sealing aluminum laminate pouch films under heat and vacuum for lithium-ion battery prototyping. The controlled environment ensures robust sealing and uniform electrode compression.	Creates hermetically sealed cells with optimized electrode contact, extending cycle life.
Aerospace Composite Panel Pressing	Pressing carbon or glass fiber prepregs under vacuum to achieve low void content and high fiber volume fraction for structural aircraft components. The oil-free vacuum avoids contamination that could compromise mechanical properties.	Meets stringent aerospace standards for strength, lightweight, and outgassing.
Membrane Electrode Assembly (MEA) Hot Pressing	Bonding catalyst-coated membranes with gas diffusion layers under precisely controlled heat and pressure in a vacuum, critical for fuel cell and electrolyzer performance.	Maximizes electrochemically active surface area and reduces interfacial resistance.

Parameter	Specification	Notes
Model	XP28	Automatic vacuum heating hot press
Maximum Design Load	25 Tons (250 kN)	Auto servo-hydraulic control
Force Control Range	0.3T – 25T	Minimum adjustable pressure is 0.3T
Force Resolution	±0.01T	High-resolution stepper control
Pressing Program	Auto-pressurize, step pressurize, auto-holding, pressure compensation, timed decompression	Stage times are unlimited and configurable
Real-time Stress Calculation	Automatic conversion to MPa	Input die/mold diameter via touchscreen
Vacuum Level	-0.1 MPa	Relative gauge pressure
Vacuum Pump Configuration	Electric chemical-resistant dry vacuum pump	Standard inclusion (oil-free)

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Heating Temperature Range	Room Temperature (RT) to ≥300 °C	0.1 °C steps
Temperature Control	Programmable multi-stage heating & holding	Unlimited stage holding times
Platen Size (Each)	180 mm × 180 mm	Dual heated platens
Platen Clearance (Daylight)	≥ 60 mm	Designed for flat molds, films, and sheets
Cooling Method	Natural cooling	Optional forced-air or water cooling chiller
Power Supply	Single-phase AC 220V ± 16%, 50Hz	Complies with HK and international standards
Safety Features	Overpressure auto-release + emergency stop + visual high-temp alert	High-temp warning triggers above 50 °C
Certification	CE certified	