Compact Benchtop Programmable Vacuum Hot Press For Battery Electrode Bonding And Material Processing

Item Number: XP30

Introduction

Benchtop programmable vacuum hot press delivering 10-ton hydraulic force, precision PID temperature control up to 500°C, and a vacuum or inert gas environment. Designed for battery electrode bonding, polymer lamination, and advanced materials research in a compact benchtop format.

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Application	Description	Key Benefit
Battery Electrode Bonding	Laminating cathode/anode materials onto current collectors under heat and pressure in vacuum or inert gas.	Uniform contact and minimal oxidation, enhancing electrochemical performance and cycle life.
Solid-State Electrolyte Pressing	Compacting and sintering solid electrolyte powders into dense pellets for next-generation batteries.	High density and reduced porosity improve ionic conductivity and mechanical stability.
Polymer Lamination	Bonding polymer films or sheets for electronic packaging, medical devices, or flexible displays.	Precise temperature/pressure control prevents bubbles and delamination, ensuring optical clarity and bond strength.
Composite Material Fabrication	Consolidating metal, ceramic, or carbon-fiber prepregs into high-performance composite panels.	Eliminates voids and improves interlaminar shear strength through vacuum-assisted pressing.
Powder Metallurgy Compaction	Compacting metal or ceramic powders into near-net shape preforms under vacuum to prevent oxidation.	Achieves high green density and uniformity, reducing sintering shrinkage and distortion.
MEA (Membrane Electrode Assembly) Hot Pressing	Bonding the proton exchange membrane to catalyst layers in fuel cell manufacturing.	Precise pressure distribution and inert atmosphere preserve catalyst activity and membrane integrity.
Advanced Ceramics Sintering	Pressure-assisted densification of technical ceramics such as alumina, zirconia, or silicon nitride.	Reduces sintering temperature and dwell time while achieving near-theoretical density.

Parameter	XP30-STD (Standard)	XP30-HT (High-Temp)	Notes
Model Designation	XP30-STD	XP30-HT	Selectable thermal module
Platen Working Temperature	RT – 300 °C	RT – 500 °C	Programmable PID touchscreen control
Heater Power	2400 W	≤ 3600 W	Symmetrical heating elements
Max Working Pressure	≤ 10 Tons (100 kN)	≤ 10 Tons (100 kN)	Rated at ambient (cold) state
Pressure Control	Touchscreen controller with auto-compensation	Touchscreen controller with auto-compensation	Multi-segment programmable
Platen Dimensions	180 mm × 180 mm	180 mm × 180 mm	Dual heated platens
Platen Opening (Daylight)	60 mm	60 mm	Optimized for thin-profile samples
Vacuum Level (Relative)	≤ -0.1 MPa	≤ -0.1 MPa	Measured at chamber gauge
Vacuum Level (Ultimate)	—	Up to 1×10^{-3} Torr	Achievable with external pump station
Atmospheric Gas Compatibility	N_2 / Ar	N_2 / Ar	Inert gas purging and backfilling
Cooling Method	Circulating water cooling	Circulating water cooling	Built-in platen water channels

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Power Supply	AC 220V / 60Hz	AC 208V – 220V / 60Hz	60Hz grid, single-phase
Safety Certification	CE	CE	Fully certified

Package	Included Pump	Max Temp	High-Temp Gloves	Recommended For
Base	External port only (no pump)	300 °C (XP30-STD)	Optional	Budget-conscious labs with existing vacuum pump
External Pump Station	External high-performance rotary vane pump station	500 °C (XP30-HT)	Optional	Applications requiring clean isolation or deep vacuum
Standard Integrated	Built-in rotary vane pump	500 °C (XP30-HT)	Included (1 pair)	Self-contained, turnkey operations with minimal footprint