

30 Ton 350X350Mm Vacuum Hot Press For Battery Research And Materials Processing

Item Number: XP27



Introduction

30-Ton laboratory vacuum hot press featuring 350×350mm work area, 300°C max temperature, multi-zone heating, precise ±0.1T pressure control, dual-loop water cooling, and PLC automation. Ideal for battery research, solid-state electrolyte processing, ceramic sintering, and advanced composite materials fabrication.

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Application	Description	Key Benefit
Solid-State Battery Electrolyte Processing	Densification of sulfide or oxide solid electrolyte layers between cathode and anode under vacuum, preventing moisture absorption and achieving high ionic conductivity.	Uniform density with minimal interfacial resistance, critical for next-generation battery performance.
Fuel Cell Membrane Electrode Assembly (MEA)	Hot-pressing catalyst-coated membranes with gas diffusion layers at precisely controlled temperature and pressure to produce uniform electrode assemblies for PEM fuel cells.	Enhanced bonding and consistent thickness across large-area MEAs, improving fuel cell efficiency and lifespan.
Polymer Film and Flexible Circuit Lamination	Multi-layer stacking of polymer films, adhesives, and copper foils for flexible printed circuits (FPC) and composite sheets, using custom temperature/pressure profiles.	Void-free lamination with excellent peel strength and dimensional stability.
Ceramic and Metal Powder Compaction	Pressing of ceramic or metallic powders into flat pre-forms prior to high-temperature sintering, achieving high green density and uniform particle packing.	Better sintered final density and mechanical properties with reduced post-processing time.
Carbon Fiber Reinforced Polymer (CFRP) Panel Forming	Consolidation of carbon fiber prepreg layers into thick or thin panels for aerospace and automotive R&D, using vacuum to eliminate air pockets.	Superior fiber-matrix adhesion and consistent thickness, enabling lightweight structural prototypes.
Wafer and Sensor Thermocompression Bonding	Binding of silicon wafers, glass, or thin-film sensors with thermoplastic adhesives in a vacuum environment to avoid bubble defects.	High-quality, bubble-free bonds essential for microelectronics and MEMS device reliability.
Sputtering Target Production	Hot pressing of ceramic or metal powders into dense sputtering targets under vacuum to eliminate oxides and reduce porosity.	Target materials with uniform density and composition, increasing film deposition quality and target utilization.

Functionally Graded Material (FGM) Research	Sequential pressing of multiple powder layers with differing compositions to create gradients in thermal or electrical properties for advanced applications.	Precise layer thickness and composition control, enabling exploration of novel material architectures.
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Parameter	Standard Configuration	Optional & Custom Upgrades	Remarks
Working Pressure	30 Tons (300 kN)	-	Hydraulic system with over-pressure relief valve
Pressure Control Accuracy	±0.1 Ton	-	Closed-loop sensor feedback, automatic pressure maintenance
Pressure Control Method	PLC touchscreen programmable	-	Multi-step pressure, dwell, and automatic release programming
Platen Effective Size (W × D)	350 × 350 mm	-	High-precision surface grinding, minimal parallelism error

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Platen Opening Height	50 mm	80 mm / 100 mm (custom)	Larger openings require increased vacuum chamber height
Maximum Working Temperature	300 °C	-	Do not sustain 300 °C without water cooling
Heating Power	9,000 W (9 kW)	-	Matrix multi-zone heating element layout
Temperature Controller	7-inch color touchscreen PLC	-	Integrated pressure control, data export support
Cooling Method	Dual-loop internal water cooling	-	G1/2" quick connectors; requires chilled water supply
Optional Cooling Module	User-supplied chilled water (≤25 °C)	2HP precision recirculating chiller	Chiller recommended for closed-loop, water-saving operation
Vacuum Chamber Material	SUS 304 stainless steel	-	High strength, corrosion resistant, low leak rate
Working Atmosphere	Nitrogen (N ₂) / Argon (Ar)	Other non-reactive gases	Dual gas inlet control valves and manual vacuum break valve
Ultimate Vacuum Level	< -0.1 MPa	-	Dependent on pump speed and line sealing
Vacuum Pump Configuration	Two-stage rotary vane mechanical pump	-	Recommended pump displacement ≥ 240 L/min
Standard Power Supply	Three-phase AC 380V / 50Hz	Single-phase AC 220V / 50Hz (custom, requires ≥50A circuit breaker, ≥6mm ² copper wire)	Three-phase strongly recommended for load balancing
Compliance	CE safety certified	-	Core electrical components with overload protection