

DATASHEET

Three-Point Pressing Solid-State Battery Test Mold — Uniform.

A three-point locking pressing split-cell die with a PEEK-ceramic composite core and a double-seal structure for solid-state battery research. Unlike single-axis pellet dies, the three-point locking geometry distributes the stack force more evenly across the electrode/electrolyte interface — a practical advantage with brittle oxide electrolytes, thin lithium-metal foils and pressure-sensitive sulfide pellets. One mold covers the workflow from powder pressing, pellet forming and cell assembly to ionic-conductivity testing. Choose the Standard variant for a pure mechanical workflow, or the With-Sensor variant with a bottom-mounted load module (500–5000 kg selectable) for quantitative force read-out.

APPLICATION

Solid-state electrolyte powder pressing and pellet forming; all-solid-state cell assembly and interface-contact optimisation; lithium-metal anode / solid-electrolyte interface studies; oxide, sulfide and polymer solid-electrolyte screening; ionic-conductivity testing and electrochemical evaluation; academic and industrial lithium-battery material R&D; glovebox-based fast sample loading and electrode swapping.

KEY FEATURES

- Three-point locking pressing — force distributed evenly across the interface
- PEEK-ceramic composite core — insulated, chemically inert, stable to 5 T
- Double-seal (FKM) structure for glove-box workflows
- Standard and With-Sensor variants on one platform
- Compact $\Phi 36 \times H62$ mm body, 180 g — glove-box friendly

1. Specifications

Variants	MOL5A100A-SS (Standard, mechanical) · MOL5A100A-SS-PS1 (With Pressure Sensor)
Working cavity diameter	$\varnothing 10$ mm (standard) — customizable on request
Mold body dimensions / weight	$\Phi 36$ mm $\times$ H62 mm / 180 g
Pressing frame	Three-point locking frame — alloy-steel top/bottom plates with three posts
Materials	Ceramic, PEEK, alloy steel — PEEK-ceramic composite core
Sealing	Double-seal ring structure — fluoroelastomer (FKM)
Maximum stack force	5 T (≈ 620 MPa over the $\varnothing 10$ mm cavity)
Maximum operating temperature	200 °C (mold body material rating)
Control method	Manual mechanical (Standard) / PLC intelligent control (With-Sensor)
Load sensor range (With-Sensor)	

	500 kg / 1000 kg / 3000 kg / 5000 kg, selectable on request – sensor signal output, accuracy and power-supply specifications to be confirmed in a later revision
Applications	Electrolyte pellet pressing, cell assembly, ionic-conductivity testing, lithium-metal anode studies, process validation

2. Standard package – complete kit, ready to use

Top & bottom plates	1 set	Alloy-steel end plates; transmit the press load
Three posts with locking nuts	1 set	Form the three-point locking frame; retain the stack force
Upper & lower punch assemblies	1 set	Alloy-steel plungers; transmit the stack force
PEEK-ceramic composite liner	1	φ10 mm working cavity
Double FKM seal rings	1 set	Cavity sealing against air and moisture
Load sensor module	option	With-Sensor variant only – mold-bottom mounted, 500–5000 kg selectable, cable with circular connector
Fasteners & accessories	1 set	Washers, loading tools, spares

3. How three-point pressing works

Stack force from the laboratory tablet press or hydraulic jack is carried by the alloy-steel top and bottom plates and distributed by the three-post locking frame across the electrode/electrolyte interface. Because the three-point locking geometry spreads the load more evenly than a single-axis pellet die, pressure stays balanced from powder forming through cell testing – a practical advantage with brittle oxide electrolytes, thin lithium-metal foils and pressure-sensitive sulfide pellets. With the load applied, the three locking nuts can be tightened evenly to retain the stack force, so the mold can be removed from the press while staying loaded.

The **Standard** variant (MOL5A100A-SS) is a pure mechanical mold – no wiring, no software. The **With-Sensor** variant (MOL5A100A-SS-PS1) integrates a high-precision load module at the bottom of the mold; stack force is read in real time through PLC intelligent control, with selectable 500 / 1000 / 3000 / 5000 kg ranges. The 500–1000 kg ranges cover routine electrolyte and lithium-metal studies; 3000–5000 kg suits high-modulus oxide systems or larger safety margins. Detailed sensor electrical specifications will be documented in a later revision.

4. Safety and handling

Do not exceed the maximum stack force of 5 T (≈ 620 MPa over the φ10 mm cavity) – overloading causes permanent structural damage and may eject parts at high velocity. Do not operate above 200 °C. Mount the mold at the centre of the press platen to avoid offset loading, and wear safety goggles. Tighten the three locking nuts evenly in turn – never force a single nut. On the With-Sensor variant, never apply force beyond the selected sensor range. Handle the PEEK-ceramic composite parts with care (good wear resistance, limited impact resistance). Store the mold assembled but unloaded; do not leave electrolyte or electrode residues inside the cavity. Damage from overloading or misuse is not covered under warranty.

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Specifications and instructions are subject to change without notice. The mold ships with no electrolyte or lithium metal included and is not classified as dangerous goods. Pressure sensor and PLC control unit require anti-shock packaging. This is a special-purpose laboratory instrument and shall not be used for non-laboratory applications.