TORONTECH

BENCHTOP ELECTRIC INJECTION MOLDING MACHINE

Benchtop Electric Injection Molding Machine - ToronIMM™ B 18

ToronIMM™ B 18 benchtop electric injection molding machine is built for polymer researchers and R&D engineers who need a compact platform for test specimen preparation and small-batch precision molding. An 18mm screw and 25cm³ shot capacity suit the gram-scale shots typical of formulation work. Servo-driven injection, clamping, ejection, and screw rotation replace hydraulic actuation, eliminating fluid contamination risk and delivering axis-level repeatability. The machine serves R&D departments, academic polymer labs, and quality teams producing specimens for mechanical testing.

The machine processes a wide range of thermoplastics, from commodity resins to high-performance engineering grades, with a 380°C maximum plasticizing temperature and independently adjustable screw speed. A 200mm/s injection speed and 982 bar injection pressure handle thin-walled cavities, micro-precision features, and high-viscosity melts. Mold height adjustment from 95mm to 245mm accepts a broad range of laboratory molds and tooling. The 200kN servo-clamping unit holds each mold securely through the injection and hold phases, delivering the dimensional consistency that specimen-grade parts require.

A 15-inch touch screen provides centralized process control, letting operators configure injection speed, pressure, hold time, and screw rotation from one panel. The built-in network interface supports data logging and integration with laboratory information management systems. At 850kg on a 2500×710mm footprint, the machine fits standard lab floor plans without structural modification. For research environments that prioritize cleanliness, reproducibility, and data connectivity alongside molding performance, the ToronIMM™ B 18 meets each requirement.

APPLICATIONS

Benchtop Electric Injection Molding Machine - ToronIMM™ B 18 Applications

The ToronIMM™ B 18 benchtop electric injection molding machine supports materials research, product development, and quality control across a broad range of industries and laboratory settings.

- Polymer Research and Development: producing trial batches of test specimens from experimental formulations, blends, and composites to evaluate processability and mechanical performance
- Test Specimen Fabrication: injection molding tensile bars, flexural specimens, and impact bars to laboratory-defined dimensional standards for mechanical testing programs
- Electronic Component Prototyping: fabricating micro-precision connectors, housings, and electrical components where tight tolerances and high surface quality are required
- Medical Device Development: molding small implant components, microfluidic device bodies, and medical micro-parts under contamination-free, all-electric conditions
- Engineering Plastics Evaluation: processing and comparing high-performance thermoplastics such as PEI, PEEK, PPS, PA, and PC under controlled parameters to characterize processing windows and mechanical outputs
- Educational Polymer Laboratories: demonstrating injection molding principles and polymer processing concepts in university materials science and plastics engineering programs
- Quality Control Specimen Production: generating consistent reference specimens for mechanical, thermal, and chemical resistance testing across production batches
- Additive and Filler Compound Development: evaluating dispersion quality and processing behavior of filled, reinforced, and modified thermoplastic compounds
- Precision Gear and Micro-Part Production: small-batch molding of precision gears, actuator components, and miniature parts with complex mold geometry

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ToronIMM™ B 18
Benchtop Electric Injection
Molding Machine

FEATURES

Benchtop Electric Injection Molding Machine - ToronIMM™ B 18 Key Features

The ToronIMM™ B 18 combines all-electric servo actuation, precision screw design, and a configurable control platform to meet the consistency requirements of laboratory injection molding.

- All-Electric Servo Drive Architecture: independent servo control of injection, clamping, ejection, and screw rotation eliminates hydraulic fluid, reduces contamination risk, and enables precise, repeatable positioning on each axis
- Uniform Plasticizing and Material Mixing: screw geometry promotes consistent melt temperature and shear distribution, producing batch-to-batch uniformity in specimen properties and supporting formulation comparison studies
- Independently Adjustable Screw Speed: wide rotation speed range adapts to commodity plastics, engineering resins, and filled compounds, giving operators full control over the plasticizing stage for each material type
- High Injection Speed (200mm/s): fast, consistent cavity filling reduces short-shot risk in thin-walled molds and micro-precision cavities, supporting reliable cycle-to-cycle repeatability
- High Injection Pressure (982 bar): handles high-viscosity engineering thermoplastics and complex mold geometries across a wide range of laboratory applications
- Flexible Mold Height Range (95–245mm): accepts a broad variety of standard and custom laboratory molds, reducing the need for dedicated tooling for each experiment
- 15-Inch Touch Screen Interface: large, clear display simplifies parameter entry, process monitoring, and recipe storage, minimizing setup time between material changes
- Network Connectivity for Lab Integration: built-in network port supports process data logging and optional connection to laboratory information management systems, linking molding parameters directly to test records
- Maximum Plasticizing Temperature of 380°C: enables processing of specialty engineering thermoplastics including PEI, PPS, and high-temperature composites
- Compact Laboratory Footprint: at 2500×710×1480mm and 850kg, the machine fits standard laboratory spaces without specialized flooring or structural reinforcement

THEORY & METHOD

Theory and Method

Injection molding converts solid polymer pellets into shaped parts through two sequential operations: plasticization and injection. During plasticization, the rotating screw conveys pellets forward through the heated barrel. Shear heat generated between the screw flights and barrel wall, combined with the barrel's external heaters, melts the polymer progressively as it advances toward the screw tip. Molten material accumulates ahead of the screw tip, pushing the screw rearward until a programmed shot volume is ready at the nozzle.

Once the shot volume is set, the screw advances as a plunger under servo control, forcing melt through the nozzle into the clamped mold cavity at high velocity and pressure. Hold pressure follows immediately, compensating for the volumetric shrinkage that occurs as the polymer cools and solidifies in the cavity. When the part reaches sufficient rigidity, the mold opens and the ejector removes it. Cycle repeatability depends on the precision and consistency of each phase.

The all-electric servo architecture of the ToronIMM™ B 18 gives each motion axis (injection, clamping, ejection, and screw drive) independent, programmable control. Traditional hydraulic machines share a central pressure source across all functions, making simultaneous, independent tuning difficult. Servo motors respond faster, consume energy only when moving, and hold position accurately without pressure decay. For laboratory applications where process parameter variation directly affects the mechanical properties of molded specimens, independent control over each axis translates into measurably tighter specimen-to-specimen consistency.

TECHNICAL SPECIFICATIONS

Benchtop Electric Injection Molding Machine - ToronIMM™ B 18 Technical Specifications

Parameter	Specification
Screw Diameter	Ø18 mm
Injection Capacity	25 cm^3
Injection Pressure	982 bar
Injection Speed	200 mm/s
Max Mold Height	95–245 mm
Clamping Force	200 kN
Ejection Force	10 kN
Screw Speed	200 RPM
Max Plasticizing Temperature	380°C
Touch Screen	15 inch
Power Supply	380V
Motor Power	7 kW
Plasticizing Power	2 kW
Weight	850 kg
Overall Dimensions (L×W×H)	2500 × 710 × 1480 mm

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