

Dynisco is the leading supplier of components and peripheral process equipment for the plastics industries. Your partner in polymer processing for pressure and temperature measurements, as well as melt index and viscosity measurements for both lab and online. Dynisco specializes in optimizing the extrusion process with gear pumps, screen changers, sophisticated controls, pelletizers and cleaning ovens.

Dynisco has provided the most advanced and accurate instrument solutions to materials testing laboratories around the world for over 25 years. Our products are designed and manufactured to conform to industry, national and international standard test methods.

The manufacturing processes of Dynisco are accredited to the ISO 9000 Quality Standards. Dynisco products are used to test physical, mechanical, thermal and flammability properties of polymers. Our bench-scale processing instruments are used to prepare test specimens or evaluate the processability of materials. The product range also offers online rheological instruments to measure continuous, real-time ASTM D1238 Melt Flow Rate (MFR), high/low load MFR and Apparent Viscosity.

Designed and built with your needs in mind, our instruments are high-tech yet rugged. Our products ensure accurate calibration and adherence to global testing standards even when they are operated in the most demanding processing or laboratory environments.

Thermal and Flammability Properties

HDV₃ – HDT/VICAT System

This advanced HDV System offers sophisticated control and simple operation. The Windows™ control and analysis software offers easy setup, operation, analysis and calibration. Display and plot distortion vs. temperature and temperature rise rate curves.



HDV₁ – HDT/VICAT System

Provides the same basic measurement capabilities through manual operation in applications where automatic measurements are not required.

- Insulated stainless steel bath
- Up to 6 (universal) test stations
- Digital gauges with LVDT transducers
- Maximum temperature 300°C, up to 400°C (optional)
- Temperature rise rates 50°C/hour or 2°C/minute
- Invar specimen frames for low linear expansion
- PC-controlled frame calibration
- Individual specimen thermocouples for HDV₃
- Individual specimen thermometers for HDV₁
- High temperature safety reset

LOI – Limiting Oxygen Index Analyzer

Provides a means for quality control and determining the relative flammability of plastics compounds and other materials by calculating the minimum oxygen concentration that will support combustion.



- ISO 4589 and ASTM D2863
- Precision flow meters for accurate adjustment of gas mixture
- Accurate calculation of oxygen concentration
- Rigid specimen holder
- Uniform combustion atmosphere
- Dual inlet gas pressure gauges
- Ignition wand with variable gas control valve
- Gas line inlet filters
- Smoke density measurement system (optional)
- U-shaped holder for non-rigid specimens (optional)

Rheological Testing

LCR 7000 – Capillary Rheometer

Designed to meet the demands of a 24-hour-a-day shop floor operation while maintaining the highest possible level of accuracy, repeatability and sensitivity. The LCR series rheometers are versatile and easy to use yet they offer the most sophisticated materials characterization, data analysis and reporting capabilities. The LCR 7001 can be used with a standard load cell and a barrel-mounted pressure transducer. Many years of service ensured through the use of tungsten carbide dies and a hardened and honed tool steel barrel. LAB KARS advanced rheology software provides programming, control, analysis and data storage capability.

- All digital calibration
- Piston speed of 0.03–650 mm/min
- Up to 45 shear stress or shear rate data points per test
- Unique algorithms for polymer melt stability
- Multiple barrel heating zones
- Accurate and uniform heating up to 430°C (500°C optional)
- Precision servo-drive motor and transducers
- Tight control of stress and rate mode tests
- Laser micrometer for accurate measurements of die swell (optional)



LMI 4000 – Melt Flow Indexer

The most precise instrument for the measurement of Melt Flow Rate (MFR) or melt volume rate (MVR) in quality control and research applications. The LMI 4000 is the first melt flow indexer to utilize a powerful 32-bit microprocessor to provide test parameter control, self-diagnostics and digital calibration. The on-board computer controls and displays temperature to $\pm 0.1^\circ\text{C}$ using a unique PID control algorithm. Four melt indexer models are offered in the advanced Dynisco LMI 4000 series, each with features designed to meet specific application requirements.

- Advanced microprocessor design
- ASTM D1238 and other industrial standards
- Self-diagnostics capability
- Comprehensive statistical capability
- Simple push-button RTD calibration
- Smart keys for easy programming
- Bright, 4-line by 20-character vacuum fluorescent display
- Windows™ software for test database and analysis

Laboratory Scale Processing



LME – Laboratory Mixing Extruder

The LME is a versatile laboratory tool for evaluating the processability of a variety of plastics, rubbers and additives prior to production. The unique, Maxwell screwless design enables the LME to mix, compound and extrude materials that vary widely in both physical form and characteristics.

- Able to process very small quantities of material (1 gram)
- Residence time less than a minute
- Variable speed rotor control 5–260 rpm
- Separate header and rotor heater for temperature controls
- Maximum temperature 400°C
- Various Headers and Orifices: ribbon, spinnerette, tube and wire coating

TUS – Take Up System

The Take Up System is an important accessory to the LME. The dual purpose machine draws material from the LME into fibers. The fiber is wound onto the spindle with a variable speed drive to produce the desired fiber diameter. The two lower rollers of the TUS pull the extrudate from the LME to form a strand that can be cut into pellets with the LEC Pelletizing Chopper.



LEC – Pelletizing Chopper

The Chopper pelletizes the extrudate from the LME. Pellet size is determined by the feed rate to the cutter from the Take Up System.

LMM – Laboratory Mixing Molder

The LMM is a bench-top mixer and molder that prepares miniature specimens from as little as one gram of material. Extensive mixing produces high shear rates to break up clumps of material. Intensive mixing produces a folding action to uniformly distribute ingredients. Many molds available to accommodate a range of test methods including D1208 and D1822.

- Digital display PID temperature controller
- Operating temperature from ambient to 400°C
- Accommodates mold lengths of 1 to 4 inches
- Variable speed rotor control
- Interchangeable 2.0 cc or 4.0 cc cups
- Heated C-clamp for additional control of molding process (optional)



Impact Testing

API – Advanced Pendulum Impact Tester

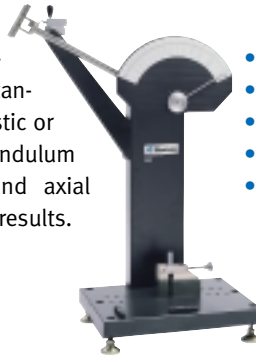
The API determines the impact strength of standard tension-impact specimens. This high-precision instrument measures the performance of plastics and composites according to ASTM and ISO test methods for Izod, Charpy and Tensile Impact. The automatic brake prevents secondary strike impacts and allows variable starting angles to ensure optimal impact velocity. Siemens-based PLC and operator interface used for all calibration and test functions.



- ISO/ASTM conformance for all sample types
- Izod, Charpy and Tensile Impact Testing
- Available for high energy Impact Testing up to 50 joules
- Automatic brake
- Computerized operator interface
- Cold box for low temperature impact testing (optional)
- Digital clamping force adjustment for Izod testing (optional)
- Test reports available through serial printer port
- Instrumented Impact hammers available for R&D applications
- ISO 179, 180, 8256
- ASTM D256, D6110, D1822 and others

BPI – Basic Pendulum Impact Tester

A manual impact tester for determining the energy required to rupture standard tension-impact specimens of plastic or ceramic materials. The precision pendulum bearing assembly controls radial and axial motion for reproducible and reliable results.



- ISO/ASTM conformance for all sample types
- Izod, Charpy and Tensile Impact Testing
- Izod/Charpy range: 2.7–21.7 joules (2–16 ft/lb)
- Tensile Impact range: 2.7–20.3 joules (2–15 ft/lb)
- Cold box for low temperature testing (optional)

ASN – Automatic Sample Notcher

The ASN prepares notched specimens for conducting impact testing of plastic and related materials per ISO and ASTM specifications. Standard 45° single tooth carbide cutter with 0.25 mm radius. Many optional cutters available including 1 mm radius.

- Variable speed rotary cutter and sample table
- Transparent safety cover with power shutoff switch
- Sample vise accommodates up to 16 samples
- Air sample cooling
- Notch verification tester available (metric or English scale)
- Various cutters available



Film Testing

DDI – Dart Drop Impact Tester

An easy-to-use, ergonomically designed instrument for measuring the impact resistance of plastic film, coated paper and related materials. The Total Energy (TE) System upgrade electronically determines the energy required to break through the sample material. Dynisco also offers bench-top Dart Drop Impact Testers.



- ISO 7765-1 and ASTM D1709
- ASTM D4272 available with Photo-electronic Total Energy System
- Adjustable dart drop height
- Pneumatic specimen clamping ring
- Pneumatic dart release exceeds 2 kg capacity
- Operator safety shield
- Fully lined dart return bin

Combi Group – Film Test Products

The Combi Group is a series of instruments which can be configured to suit your individual needs for



economical, quality control testing of Friction, Peel, Seal, Tensile and Elongation properties of film products. Each instrument is designed for ease of use and maintenance, while meeting the standards for ASTM testing. Films, Paper, and Foils can be tested with these instruments along with Heat or Chemical Seals.

HTH2 – Hot Tack Heatsealer

A bench-top heatsealer for modeling or simulating commercial seal applications. The HTH2 is the most versatile system available for film seal strength testing. It conforms to ASTM F 1921-98 method "A".

It is really four machines in one with functionality for Hot Tack, Heatsealing, Heatsealing and Ultimate Strength, or Peel Strength of heat-seals or laminations. Dynisco's HTH2 has the best timing precision and temperature accuracy on the market, resulting in unsurpassed capability for commercial machine simulation. LABSEAL Windows™-based software

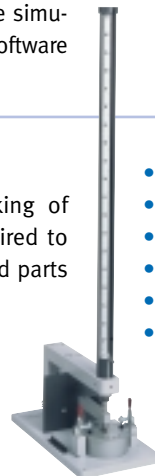


allows test results to be graphically and numerically displayed.

- ASTM F 1921-98 method "A"
- Automatic calibration of temperatures, pressures and sealing times
- Die temperatures are controlled to $\pm 0.2^\circ\text{C}$
- Timing circuits are accurate to ± 2 milliseconds
- Windows™-based software
- Automatic operation from start to finish

FWI – Falling Weight Impact Tester

The FWI determines the relative ranking of materials according to the energy required to crack or break flat plastic specimens and parts under various conditions of impact.



- ASTM D5420 and D4226
- Heavy duty steel construction
- Slotted drop tube with both metric/English scale
- Drop tubes of 42, 72 or 96 inches
- Operator safety shield
- Optional weights, impactors and drop tubes to meet specific test specifications

Online Processing

ViscoSensor – Online Rheometer

The world's smallest in-line polymer melt rheology instrument, measuring only 25 inches in length by 10 inches in width. The ViscoSensor is extremely easy to install, calibrate and operate making it the most cost-effective in-line sensor on the market. The ViscoSensor's zero discharge system returns the polymer back to the process, eliminating material waste. The ViscoSensor can be used to generate shear rate vs. viscosity data or continuous ASTM melt index data. The ViscoSensor is an important quality



control tool that can be used to help improve product quality and consistency during processing.

- Attaches to the process using a single M18 port
- Online viscosity or melt index monitoring
- No waste stream
- Online ASTM D1238 Melt Flow Rate
- Apparent Viscosity and shear rate vs. viscosity data available
- Capillary is easy to replace

CMRIII – Continuous Melt Rheometer

Specifically designed for the thermoplastics resin industry, provides continuous measurements of the Melt Flow Rate or Apparent Viscosity directly on the manufacturing process. The CMR measures the flow of the molten resin through a single die. The CMR series can be configured to measure Melt Flow Rate, high/low load MFR, Apparent Viscosity, or to perform other customer-defined tests. Communications to an external distributed control system are available.



- Online ASTM D1238 Melt Flow Rate
- Online Apparent Viscosity
- Data exchange by analog and digital input/outputs
- Systems for hazardous locations
- Compact measuring head
- A range of metering pumps for specific applications
- Rugged industrial designs

FCR – Flow Characterization Rheometer

The FCR measures the flow of molten resin through two separate dies. The FCR can be configured to measure dual Melt Flow Rates, simultaneous MFR and Apparent Viscosity, a range of apparent shear viscosity, and extensional viscosity using the Cogswell Equations. Simple “in the field” calibration. Systems for hazardous locations available.

- Dual capillary design
- Online ASTM D1238 Melt Flow Rate at two load conditions
- Ideal for flow ratio measurements
- Online Apparent Viscosity over broad shear rate range
- Online measurements of polymer extensional properties

REX – Rheology Extrusion System

Designed to continuously sample polymer powder, flake, or pellets from a process and convey it to a small 3/4-inch extruder, which melts and conditions the sample for rheological testing. This system provides capability for continuous monitoring of polymer MFR and viscosity, or other analyses, for quality and process control.



- Multiple online analyses (rheology, composition, contamination)
- Installation on the manufacturing floor or outside of the production area
- Automated pneumatic transfer of samples to extruder
- Fast response time for process control applications
- Simple calibration
- Data i/o communication to a distributed control system (DCS) via digital or analog signals



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