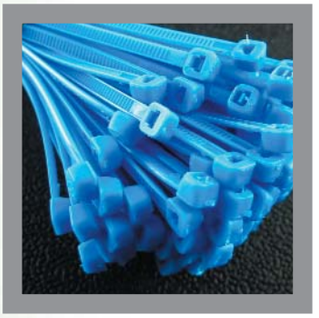
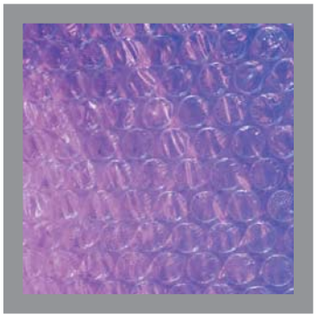
Tinius Olsen

Materials Testing & Analysis

for the Polymers Industry





Tension

Compression

Melt Flow

Impact

Heat Deflection

Stiffness

Folding Endurance

polymers

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Popular Test Methods

Tensile Strength

Tinius Olsen's line of versatile benchtop polymer testing machines can perform a diverse variety of materials test routines that meet ASTM , ISO and other international testing specifications, including tensile, compressive, tear, peel, flexural, puncture, shear and frictional resistance tests. Several different machines are available at five load tier points, namely, 1kN (225 lbf), 5kN (1,125 lbf), 10kN (2,250 lbf), 25kN (5,625 lbf), 50kN (11,250 lbf).

These machines are available with a wide selection of quick change load cells, tools and grips, extensometers, hi-res position transducers and environmental chambers. Of course, no system is complete without data acquisition and analysis software; you can choose from several software platforms so that your unique needs are perfectly met. Whether it is complex, sophisticated, scalable machine and test control, generating unique results or choosing from a database of over 1400 commonly used standards, we have the software for your needs.

Impact Resistance

Our model IT503 and model IT504 Impact Testers feature heavy-duty construction with an aerodynamic compound pendulum, ensuring maximum rigidity in the direction of impact. This unique construction virtually eliminates windage losses yet allows simple and rapid changes in capacity by adding or removing weights on the pendulum. The proper accessories allow these machines to operate in accordance with ASTM D 256, D 6110, D 4812, D 4508 , D 950, ISO 179, 180 and other similar standards. These machines feature a microprocessor based display for conducting the test, obtaining test results, calibration and configuring the system.

These machines can be supplied with an optional hot and cold conditioning chamber for testing specimens from +150°C down to –70°C. Additionally, the compound pendulum can be replaced with individual Charpy pendulums for higher, up to 50J, available energy levels and lower available energy levels to meet the specific requirements of ISO 179. The system can also be supplied with an instrumentation system that can collect and analyze up to 1 million data points per test so that an extremely detailed graphical representation of the impact curve can be analysed. The required notches for test specimens can be produced on our Model 899 Sample Notcher.

Tinius Olsen also manufactures simple drop dart testers for plastic film which can be used either as stand-alone machines or in conjunction with a benchtop tensile tester to meet ASTM and ISO standards.

Folding Endurance

With this style of machine, a pliable specimen is placed under a constant tension load.

The specimen is then folded to an angle of 135° in either direction, at a rate of 175 double folds per minute until the specimen is severed at the crease. A variable folding rate option allows the operator to vary the rate between 20 and 175 double folds per minute.

Description	ASTM	ISO
Tension		
Tensile Properties Of Plastics	D638	527
Test Methods For Vulcanised Rubber And Thermoplastic Elastomers	D412	37
Test Methods For Rubber Property	D413	
Test Methods For Rubber Property – Adhesion To Rigid Substrates	D429	
Test Methods For Tear Strength of Conventional Vulcanised Rubber And Thermoplastic Elastomers	D624	
Test Method For Shear Strength of Plastics	D732	
Tensile Properties of Plastic Sheeting	D882	527-3
Test Method For Bond or Cohesive Strength of Sheet Plastics And Electrical Insulating Materials	D952	
In-Plane Shear Strength of Reinforced Plastics	D3846	4585
Test Methods For Rubber O Rings	D1414	
Tensile And Tensile Adhesion Properties of Rigid Cellular Plastics	D1623	1926
Tensile Properties Of Plastics By Use of Microtensile Specimens	D1708	6239
Test Method For Climbing Drum Peel For Adhesives	D1781	
Test Method For The Tensile Properties of Polymer Matrix Composite Materials	D3039	
Test Methods For Flexible Cellular Materials	D3574	3386
Tear Propagation Resistance of Plastic Film & Thin Sheeting by a Single Tear Method	D1938	6383-1
Tensile Properties of Reinforced Thermosetting Plastics Using Straight Sided Specimens	D5083	3268
Compression		
Compressive Properties of Rigid Plastics	D695	604
Test Method For Rubber Properties In Compression	D575	
Flexural Properties of Unreinforced & Reinforced Plastics And Electrical Insulating Materials	D790	178
Compressive Properties of Rigid Cellular Plastics	D1621	844
Test Method For Column Crush Properties of Blown Thermoplastic Containers	D2659	
Tensile, Compressive and Flexural Creep and Creep-Rupture of Plastics	D2990	899-1, -2
Test Method For In-Plane Shear Strength For Reinforced Plastics	D3846	
Test Method For Apparent Horizontal Shear Strength of Fiber Reinforced Pultruded Plastic Rods	D4475	
Test Method For Flexural Properties of Fiber Reinforced Pultruded Plastic Rods	D4476	
Melt Flow		
Flow Rates of Thermoplastics By Extrusion Plastometer	D1238	1133
Specification For FEP-Flourocarbon Molding And Extrusion Materials	D2116	286
Polybutylene Plastics Molding And Extrusion Materials	D2581	
Specification of Modified ETFE Flouropolymer Molding & Extrusion Materials	D3159	12086
Classification of E-CTFE Flouroplastic Molding, Extrusion & Coating Materials	D3275	
Test Method For Flow Rates For Polyvinyl Chloride With Molecular Structural Implications	D3364	
Impact		
Determining The Pendulum Impact Resistance of Notched Specimens of Plastics	D256	179/180
Test Method For The Impact Strength of Adhesive Bonds	D950	
Tensile Impact Energy To Break Plastics And Electrical Insulating Materials	D1822	
Test Method For The Chip Impact Strength of Plastics	D4508	
Test Method For Determining The Charpy Impact Resistance of Notched Specimens of Plastic	D6110	
Heat Deflection under Load		
Deflection Temperature of Plastics Under Load	D648	75
Vicat Softening Temperature of Plastics	D1525	306
Stiffness		
Test Method For The Apparent Bending Modulus of Plastics By Means of A Cantilever Beam	D747	
Folding Endurance		
Test Method For Folding Endurance of Paper By MIT Tester	D2176	

Please note that this is a very brief summary of some of our most popular requests for standards compliance; it is by no means a complete list of the thousands of ASTM, DIN, EN, ISO, CNS, JIS, GOST, BIS and other international and industrial standards we comply with.

Deflection Temperature Under Load

We manufacture two models that perform Deflection Temperature Under Load (DTUL, also called Heat Distortion) and Vicat penetration tests, with six and three test stations respectively. The larger machine can test up to six different specimens simultaneously, with an automated test sequence that proceeds according to user programmed control and configuration parameters.

Unique features to these machines include air bearing supports on loading arms to ensure ultra-smooth operation and precision displacement measurement accuracy; specimen basket to catch samples that fall off their test station at high oil flow rates; pneumatic lift and lowering of test station gantry to start and end the test; and cooling options to increase the number of tests that can be performed per day.

Melt Flow Indexers

We are a leading manufacturer of melt index testers for resin flow verification. There are now two models to choose from that are fully compliant with the requirements of ASTM D1238, ISO 1133 and other international standards. The MP200 is ideal for budget conscious organizations in need of an economical, Procedure A only machine.

The versatile MP600 features a modular design for easy upgrading from its basic Procedure A (Cut & Weigh) configuration. For Procedure B testing, the MP600 can be equipped with an optional PPDT-600 automatic timing switch. This switch uses a precision optical encoder to measure the piston position to better than 0.025 mm (0.001 in). Among its capabilities are: calculation and display of Capture Time, Flow Rate and Volume Rate for each capture; calculation of Apparent Shear Stress, Shear Rate, and Viscosity; calculation of Melt Density using a cut-off weight; and automatic selection of piston travel distance.

Other optional features, such as a programmable motorized weight platform, Flow Rate Ratio attachment, and a pneumatic purge & cleaning fixture, allow for more automated testing.

Again, the MP600 is complimented by software. This EP600 software can control up to 10 individual melt indexers from one pc, take multiple readings from each indexer and perform data analysis with powerful SPC for each indexer or for the group.

Stiffness

Tinius Olsen Stiffness testers are ideal for determining the stiffness properties of a wide range of materials and products. Operation is simple; a specimen is clamped at one end and a controlled load applied at the free end. The load is applied steadily by a motor drive, and an accurate indication of load and resulting angle of bend are shown simultaneously on analog scales.

Cantilever bending is probably one of the earliest methods of testing, dating back to Galileo in the 16th century, but is brought completely up to date with Tinius Olsen's three standard machines with capacities of 50 in.lb, 6 in.lb, and 1 in.lb.

Typical Results

Breaking Load
Bond Strength
Bursting Strength
Charpy Impact Strength
Climbing Drum Peel Strength
Coefficient of Dynamic Friction
Coefficient of Static Friction
Compression Deflection
Compression Set
Compressive Strength
Compressive Deformation
Creep
Creep Rupture Strength
Crushing Load
Deformation Under Load
Delamination Strength
Deflection Temperature Under Load
Elastic Hysteresis
Elastic Limit
Elasticity
Elongation
Energy Absorption
Flexural Modulus of Elasticity
Flexural Strength
Impact Energy
Izod Impact Strength
Maximum Fiber Stress
Modulus of Rupture (MOR)
Modulus of Elasticity
Maximum / Ultimate Stress
Maximum / Ultimate Strain
Melt Volume Rate
Mass Flow Rate
Melt Index
Offset Yield Strength
Peel Strength
Proof Stress
Rupture Strength
Secant Modulus of Elasticity
Shear Modulus of Elasticity
Shear Strength
Stiffness
Strain
Stress
Tangent Modulus of Elasticity
Tear Length
Tear Resistance
Tearing Strength
Tenacity
Tensile Impact Energy
Tensile Strength
Ultimate Load
Vicat Softening Point
Yield Strength
Young's Modulus

Familiar Tests

Tensile
Compression
Flexure
Puncture
Burst
Friction
Bend
Melt Flow
Stiffness
DTUL
Vicat
Impact
Peel
Delamination
Dart Drop

Tinius Olsen

Tinius Olsen Ltd.
6 Perrywood Business Park, Honeycrock Lane, Salfords, Redhill, Surrey RH1 5DZ, UK
Tel: +44 (0)1737 765001 **Fax:** +44 (0)1737 764768 **Email:** sales@tiniusolsen.co.uk **www.tiniusolsen.com**

Tinius Olsen Inc.
Corporate Headquarters,1065 Easton Road, P O Box 1009, Horsham, PA 19044-8009 USA
Tel: (215) 675 7100 **Fax:** (215)441 0899 **Email:** info@tiniusolsen.com **www.tiniusolsen.com**