Tinius Olsen

Horizontal Tensile Testing Machines

Horizontal Testers

Fig. 1. 150 kN capacity horizontal tensile testing machine shown with optional extensometer and pc

Fig. 2. Basic 25 kN capacity horizontal tensile testing machine, shown with optional extensometer

For maximum tensile testing throughput and capability, Tinius Olsen offers a range of horizontal tensile testing machines in capacities of 5 kN (1,000 lbf), 25 kN (5,000 lbf), 150 kN (30,000 lbf) and 300 kN (60,000 lbf).

These horizontal testing machines offer unique benefits over vertically oriented testers by allowing a range of accessories to be mounted next to the machine that can turn it into a fully automatic testing station.

These horizontal machines are designed primarily for production departments and are typically in constant use; however, the grips can be modified to accommodate different shaped samples and alternate grips can be provided for customers to interchange when their test requirements change.

The horizontal extensometer that is typically used with the machine has a unique design that incorporates pneumatic controls that automatically lower the arms prior to the test and raise the arms at the end of the test. Air bearings on the extensometer provide accurate strain measurement through fracture.

The operation of the basic machine is sophisticated, providing accurate and repeatable specimen placement against mechanical stops, automatic clamping, extensometer lowering (if supplied), testing, extensometer removal, and grip return to the starting position, all with a single mouse click.

This advanced operation can be further developed when the pc-based machine control software provided with the machine is upgraded to include data acquisition and data analysis.

Further automation can then be achieved by the addition of a robot and sample racks. In this configuration, the robot will pick a sample from a sample rack and insert it into the machine grips; then wait for the end of test so that the broken sample pieces can be removed from the grips and placed in a suitable disposal bin.

If a sample measuring station and bar code reader are included with the system, the whole testing process is automated with the only operator requirement being the loading of the samples in the sample rack. The test data that is generated can be included into corporate manufacturing and resource planning software ensuring that quality control data is an integral part of operations.
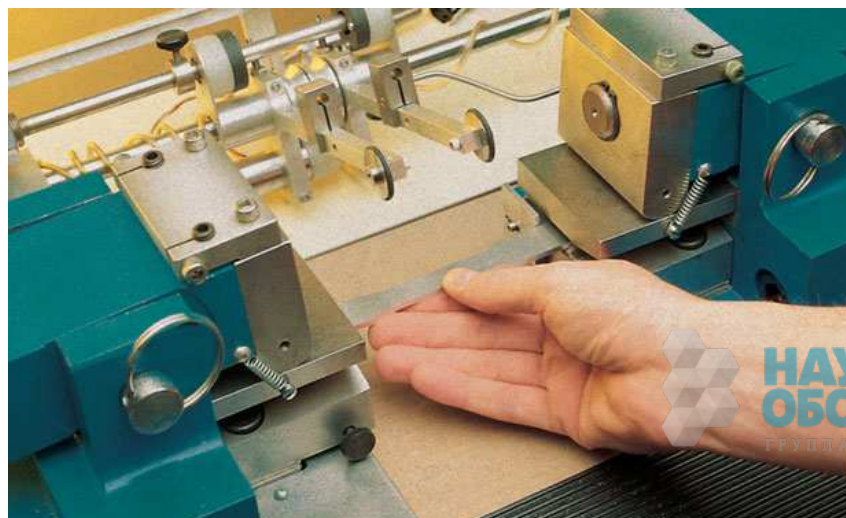

Fig. 3. Close up of unique extensometer that can stay on to sample fracture. The sample is loaded against the mechanical stops and the test started — the rest is automatic

Key Features

- Rapid, easy specimen loading
- Automatic specimen gripping
- Automatic extensometer placement and removal
- Auto-ranging for both load and strain
- Accurate strain measurement through failure
- Grips return to start position automatically
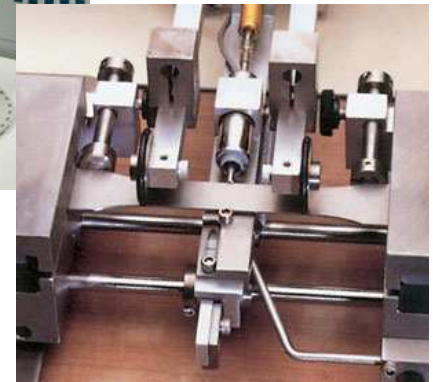- Higher throughput of test samples

Optional Features

- Robotic loading and removal of samples
- Sample dimension and barcode reading
- Instrumentation and determination of r value

Fig. 5. Close up of pick-and-place robot and sample racks

Fig. 4. Optional r value instrumentation on computer controlled extensometer allows fast, accurate r value calculations

Technical Specifications

MODEL		MHT-1,000	MHT-5,000	MHT-30,000	MHT-60,000
CAPACITY	lbf kN kg	1,000 5 500	5,000 25 2,500	30,000 150 15,000	60,000 300 30,000
MAXIMUM CROSSHEAD TRAVEL	in mm	17 430	17 430	20 500	20 500
GRIP ACTUATION		Pneumatic	Pneumatic	Hydraulic	Hydraulic
TESTING SPEED RANGE	in/min mm/min	0.002 to 20 0.05 to 500	0.002 to 20 0.05 to 500	0.002 to 10 0.05 to 250	0.002 to 10 0.05 to 250
DIMENSIONS H x W x D	in mm	14 x 48 x 28 356 x 1219 x 711	41 x 61 x 29 1041 x 1549 x 737	50 x 70 x 20 1257 x 1770 x 514	48 x 77 x 21 1229 x 1965 x 533
WEIGHT	lb kg	2000 910	2000 910	2700 1225	2700 1225
CONSOLE DIMENSIONS	in mm	N/A	N/A	40 x 48 x 31 1016 x 1219 x 787	40 x 48 x 31 1016 x 1219 x 787
CONSOLE WEIGHT	lb kg	N/A	N/A	880 400	880 400

Fig. 6. Detail showing the pick-and-place robot, sample racks, laser barcode reader, and sample dimension measuring station, broken sample bin, and another test station. This second test station could be a flexure test, a hardness test, or another kind of physical test

Specifications:

Load measurement accuracy: +/- 0.5% of applied load from 0.2% to full capacity
Position measurement accuracy: 0.1% of reading
Speed accuracy: 0.1% of set speed
Operating temperature range: 32 to 100° F (0 to 38° C)
Storage temperature range: 14 to 115° F (-10 to 45° C)
Humidity range: 10% to 90% non-condensing, web bulb method
Power: standard optional voltages 110/240VAC, 50-60 Hz, 1 θ for small machines, 3 θ for high capacity machines; power must be free of spikes and surges exceeding 10% of the nominal voltage
Clean Air: dry air filtered to 50 microns at up to 85 psi (5.9 bar) min

Notes: **1.** Load weighing system meets or exceeds the requirements of the following standards: ASTM E4, EN 10002-2, BS 1610, DIN 51221, ISO 7500-1. Tinius Olsen recommends that systems are verified at installation in accordance with ASTM E4 and ISO 75001. **2.** Alternate, lower capacity load measurement cells can be supplied for these frame capacities. **3.** Strain measurement system meets or exceeds the requirements of the following standards: ASTM E83, EN 10002-4, BS 3846 or ISO 9513. **4.** Specifications are subject to change without notice

Software

Tinius Olsen has built upon its long history of providing solutions to an enormous variety of testing problems to develop Horizon, a comprehensive software program that makes testing simple, precise, and efficient. Whether the test sample is metal, paper, composite, polymer, rubber, textile, or a micro component, Tinius Olsen's Horizon software goes far beyond data collection and presentation. It will help you automate your operations, from R&D to the charting and analysis of QC testing. Horizon provides a library of standard, specific, and application-focused test routines that have been developed in close cooperation with our customers around the world and to the standards they are using.

Among the many valuable features offered by Horizon are: a test routine library; simultaneous multiple machine control; test, output, method, and result editors; and multilayered security. This software is designed for data acquisition, data analysis, and closed loop control of nearly all Tinius Olsen testing machines.

Horizon also includes the following:
- Generation of user customized reports
- Standard SPC programs for X-bar, R, and frequency distributions/histograms
- Ability to recall, replot and rescale test curves
- Recall of data that spans different test modules
- User-configurable machine parameter and control settings
- Multilingual capabilities

Horizon is rich with capabilities that improve productivity and enable you to build, access, and use a modern, powerful materials testing database. It employs the latest Windows environments to create an intuitive user experience. Built-in tutorials, on-line help, and help desk access provide additional user support.

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