Bulletin
137-C

Tinius Olsen

Torsion Testers

Torsion Testers

For maximum versatility and capability, Tinius Olsen offers a full range of torsion testing machines in capacities from 10,000 to 300,000 in.lbf or kg.cm (1,000 to 30,000 N.m). Higher capacity and other longer length models are available upon request.

These uniquely superior torsion testers provide loading and weighing capabilities in both directions of rotation. This feature makes it possible to conveniently determine not only the ultimate torque of a specimen, but also how that specimen behaves under conditions of continuous or intermittent torque loading in both directions.

Essentially, each torsion tester comprises a variable speed drive loading system and a digital control and indicating system in a fixed section of the machine. The weighing head with its strain gage torque sensor is mounted on a movable section that can be positioned on rails to accommodate specimens of varying lengths.

Our 10,000 in.lbf (1,000 N.m) torsion tester is bench mountable and the moveable section slides on a guide rail.

All other models are floor based and are furnished with heavy duty slotted steel bed rails that are normally embedded in, or secured to, a concrete foundation to assure maximum rigidity and accessibility. The moveable section on these higher capacity machines is mounted on four rollers that glide along these slotted rails and allow rapid positioning. Additionally, these rollers allow the moveable unit to compensate for any changes in specimen length during loading. The standard maximum distance between chucks is 7 ft (approx 2.1 m); however, other lengths can be provided.

All torsion testers feature our patented bi-directional grips, which assure slip-free specimen clamping regardless of the twist direction. With these precision machined universal grips, loads can be applied in both directions without changing grips.

The rugged, electromechanical loading system employs a gear reduction system coupled directly to a variable speed drive motor. This reversible loading system provides positive, infinitely variable testing speeds from 0.5Þ to 180Þ per minute in either direction (the 10,000 in.lbf model has a testing speed range from 0.5Þ to 360Þ per minute in either direction). As the load increases, more power is delivered to the twisting head to apply increasing torque to the specimen to maintain the preselected twisting rate.

No system would be complete without controlling software and data analysis of the resultant data. Our Horizon software allows complete machine control along with capture and analysis of the resultant torsional test data, showing the material behaviour throughout the test.

Fig 2. Bench mounted 10,000 in.lbf machine.

Fig 1. 200,000 in.lbf torsion tester for testing samples that are up to 7 ft long and 5 in diameter (2.1 m long and 125 mm diameter). The machine is shown with the optional PC based software.

Technical Specifications

CAPACITY	in.lbf or kg.cm N.m	10,000 1,000	60,000 6,000	120,000 12,000	200,000 20,000	300,000 30,000
MOUNTING		Bench	Floor	Floor	Floor	Floor
MAXIMUM SPECIMEN DIAMETER	in	1.5	3	3	5	5
	mm	38	76	76	127	127
MAXIMUM SPECIMEN LENGTH	in	18	72	60	84	90
	mm	450	1829	1524	2134	2286
TEST SPEED	degrees per min	5 to 360	5 to 180	5 to 180	5 to 180	5 to 180
WEIGHT (NET)	lb	1100	6200	7625	9050	13500
	kg	500	2800	3500	4100	6130
DIMENSIONS (LXDXH)	in	62 x 25 x 29	148 x 36 x 78	176 x 45 x 78	204 x 52 x 81	220 x 64 x 84
	mm	1570 x 630 x 730	3760 x 900 x 1980	4470 x 1140 x 1980	5180 x 1320 x 2050	5590 x 1620 x 2130

Specifications

Torque Measurement Accuracy: +/- 0.5% of indicated torque from 0.2% to 100% capacity

Position Measurement Accuracy: +/- 0.1% of reading or 0.05° whichever is greater

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, wet bulb method

Power: standard optional voltages 220/240 VAC, 50– 60 Hz; power must be free of spikes and surges exceeding 10% of the nominal voltage

Notes: 1. Specifications subject to change without notice.

Optional Features: Torsional pickups can be fitted directly to the sample for exact measurement of the angle of twist.

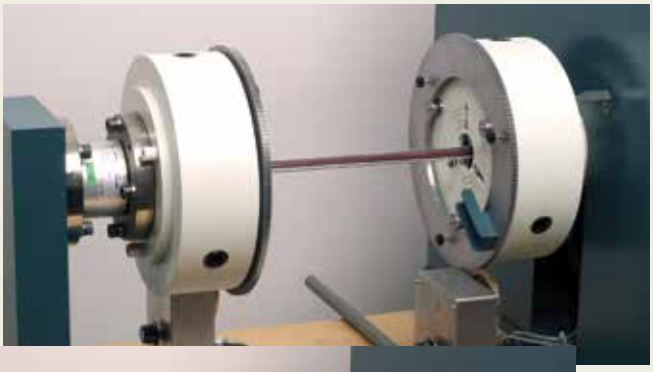

Fig. 3, 4 and 5. Test in progress on the 10,000 in.lbf model with a painted sample rod of steel.

Fig 6. Samples are easily mounted in the patented bi-directional grips.

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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