

**Tinius**  **Olsen**

## **High Energy Impact Testing Machines**



# Models IT406 and IT542 Pendulum Impact Testers

Tinius Olsen's pendulum impact testers are versatile and reliable machines designed to fully comply with the specifications outlined in ASTM E23, EN10045-2 and ISO 148. Today, the Model IT406 and the Model IT542 are widely recognized as the standards of the industry for impact testing.

The model IT 406 provides maximum testing versatility. Easy insertion of interchangeable striking bits in the pendulum head quickly adapts the machine for either Charpy or Izod testing. A notch on the rear of the pendulum head allows optional tooling to be fitted for performing tension impact tests.

A safety lock holds the pendulum in its raised position and assures a vibration-free release when activated. Once released, the pendulum quickly reaches the impact velocity of 5.47 m/s (17.0 ft/s) and has a maximum available energy of 406 J (300 ft.lbf) to impact the sample.

The superior design and construction of the model IT406 ensures maximum testing accuracy and repeatability. When the machine is properly installed and leveled, the total frictional and windage losses during the pendulum swing are guaranteed not to exceed 0.5% of the energy range.

Direct indication of the energy absorbed by the broken sample is given by a mechanical pointer on a graduated scale. This scale can be supplied in ft.lbf, J, or kg.m. For ease of use, a digital display can be fitted to the machine to provide more results on the test. It is recommended that this display be added at the time of order.

Tinius Olsen offers a number of options to make the operation of the impact tester easier—from a simple electric brake to stop the swinging pendulum, to an automatic motorized return, eliminating the need for any operator involvement other than releasing the pendulum. The digital display is included in this last

option and provides the trigger to energize the motor, which stops the swinging pendulum at the optimal position and returns it to the latched starting point. The time from pendulum release to return can be as little as 10 seconds, which means that over 400 tests per day can be made with minimal effort.

Tinius Olsen can also provide a low blow fixture that allows Charpy, Izod, or tension impact tests to be performed at any of 55 velocity/energy levels from the maximum of 5.47 m/s (17.9 ft/s) down to 0.13 m/s (0.4 ft/s).

For high traffic areas, Tinius Olsen can supply a complete enclosure for the machine so that the swinging hammer and broken specimens do not pose any concerns. The enclosure is completely interlocked so that the machine cannot operate unless all the guards are in place.

Tinius Olsen can also supply a higher capacity model, the Model IT 542, which shares all the same features as the IT 406 except that it has an available energy of 542J (400 ft.lbf). The IT 542 is also supplied complete with the electric brake, motorized return, and digital display.



**Fig. 1.** Model IT406 basic pendulum impact tester.

**Fig. 2.** Model IT542 pendulum impact tester shown with digital display.

# Technical Specifications

MODEL		IT406	IT542
<b>BASIC PENDULUM CAPACITY</b>	J ft.lb	406 300	542 400
<b>DROP HEIGHT</b>	m ft	1.52 5	1.52 5
<b>IMPACT VELOCITY</b>	m/s ft/s	5.47 17.93	5.47 17.93
<b>DIMENSIONS W x D x H</b>	mm in	2108* x 508 x 1854 83* x 20 x 73	2108* x 508 x 1854 83* x 20 x 73
<b>WEIGHT— GROSS (NET)</b>	lb kg	1620 (1430) 736 (650)	1730 (1540) 785 (1540)

\* Width of machine includes total swing clearance.

**Notes:**

**Ordering Details — Suffixes**

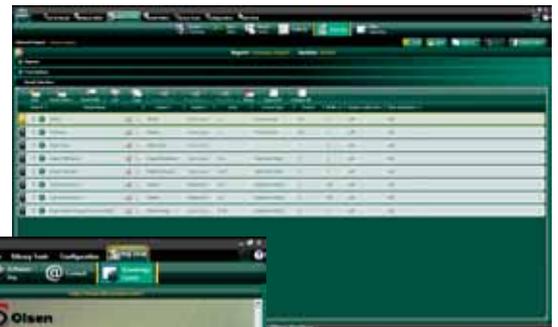
- D** Digital display option
- B** Electronic brake option
- M** Motorized return option (includes electric brake)
- E** Enclosure option (includes motorized return and digital display options)

**Example:**

If you order an IT406M, you will get the model IT406, digital display, electric brake, and motorized return.

Machines with a digital display can be linked to a stand alone PC with an RS232 port and connected to Tinius Olsen's impact testing software. Key features of this software include:

- User-selected reporting and exporting formats.
- Built-in SPC programs for X-bar, R, and frequency distribution charts/histograms.
- Test mode allows configuring, running, and saving of tests and results.
- Recall mode permits viewing of previously saved results and performs database maintenance.



**Fig. 3.** Screenshots of impact testing capabilities within Tinius Olsen's Horizon software.



**Fig. 4.** Model IT542E complete with enclosure option. This option also includes digital display, electric release, electric brake, and motorized return.



**Fig. 5.** Close up of Charpy set-up just prior to impact.

# Configurations

The different configurations that are supported are as follows:

**Charpy**—Charpy supports of rigid construction are supplied as integral parts of the anvil. Replaceable shrouds prevent the specimen from rebounding against the pendulum. The striking bit is bolted to the pendulum and available in either 8 mm (ASTM E23) or 2 mm (BS, DIN, JIS, EN, and ISO) nose radius sizes.

An optional set of self-centering tongs is extremely useful for accurately centering Charpy specimens, especially those subjected to temperature extremes prior to the test.

**Izod**—The Izod striking bit is easily secured in the pendulum while the specimen is clamped in the close clearance slots in the vice. This ensures that the sample has the correct vertical alignment while the setting gage ensures that the sample is at correct height. A wrench is provided for tightening and loosening the sample in the vise.

**Tension Impact**—The tension impact specimen is threaded into the specimen holder in the pendulum head. Tension is instantaneously applied to the specimen when the holding bar strikes the anvils. This method of support provides uniform distribution of the impact energy over the cross-section of the test specimen.

Specifications subject to change without notice.



Fig. 6. View of the Charpy striker from the pendulum head.

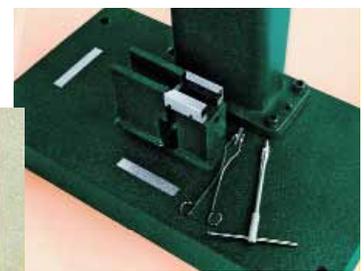


Fig. 7. View of the base with the Charpy configuration. The sample rests horizontally on the Charpy anvils (obscured by the protective shrouds). Charpy centering tongs can be seen in front.



Fig. 8. View of the Izod striker from the pendulum head.

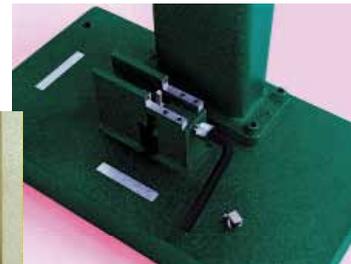


Fig. 9. View of the base with the Izod. The sample is clamped in the vertical position using the front screw.



Fig. 10. View of the tension impact striker from the pendulum head. The sample is threaded into the 'striker' and the holding bar at the back of the pendulum head.

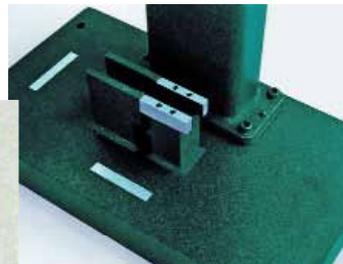


Fig. 11. View of the base with the tension impact configuration.

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