

SL SERIES HYDRAULIC UNIVERSAL TESTING MACHINES



Tinius  Olsen

THE FIRST NAME
IN MATERIALS TESTING

THE SL SERIES

Up to 3,000 kN of force applied by advanced digital control.

Tinius Olsen's hydraulic testers have long been recognized as the standard for accuracy, dependability, and versatility in universal testing machines.

The many thousands of testers currently in use throughout the world attest to this fact.

Now more than ever, the SL series represents the highest standard in hydraulically powered universal testing machines.

It features a patented dual-pressure hydraulic loading system and a rugged four-column construction for exceptional load frame rigidity. In addition, it has a space-saving console with a smaller footprint and comfortable working height design.

A range of user interface options are available, including Bluetooth and/or tethered interfaces, to enable basic tests, comprehensive tests and everything in between, through Tinius Olsen's Horizon materials testing software.

SL systems are guaranteed to meet ASTM, ISO, and other national and international specifications for accuracy. Accuracy is within +/- 0.1% of the indicated load from 0.2% to 100% of frame capacity. All equipment used to calibrate the weighing and indicating systems of the SL testers is traceable to the National Institute of Standards and Technology (NIST).

For consistent accuracy, robustness, and unparalleled reliability, the Tinius Olsen SL series still sets the standard of excellence.

TOOLING

A wide variety of tooling is available on the SL series, including in-head pocket wedge grips, external grips, flexural / transverse tooling, compression platens, special application grips, and alignment assemblies to ensure accurate and repeatable testing.

ACCESSORIES

Many kinds of accessories are available for accurate and repeatable testing, including LVDT extensometers, strain gauge extensometers, position encoders, video extensometers, deflectometers, temperature cabinets, furnaces etc

HORIZON DATA ANALYSIS SOFTWARE

Our Horizon software sets new standards of data analysis by adding a host of report writing for data manipulation capabilities that will make easy work of your materials testing programs, whether they're designed for the demanding rigors of R&D or the charting and analysis functions of QC testing.

In addition to powerful reports, Horizon Materials Testing software is networkable and scalable so operators and managers can operate equipment and review test results from multiple sources and locations.



FEATURES & BENEFITS



VERSATILE

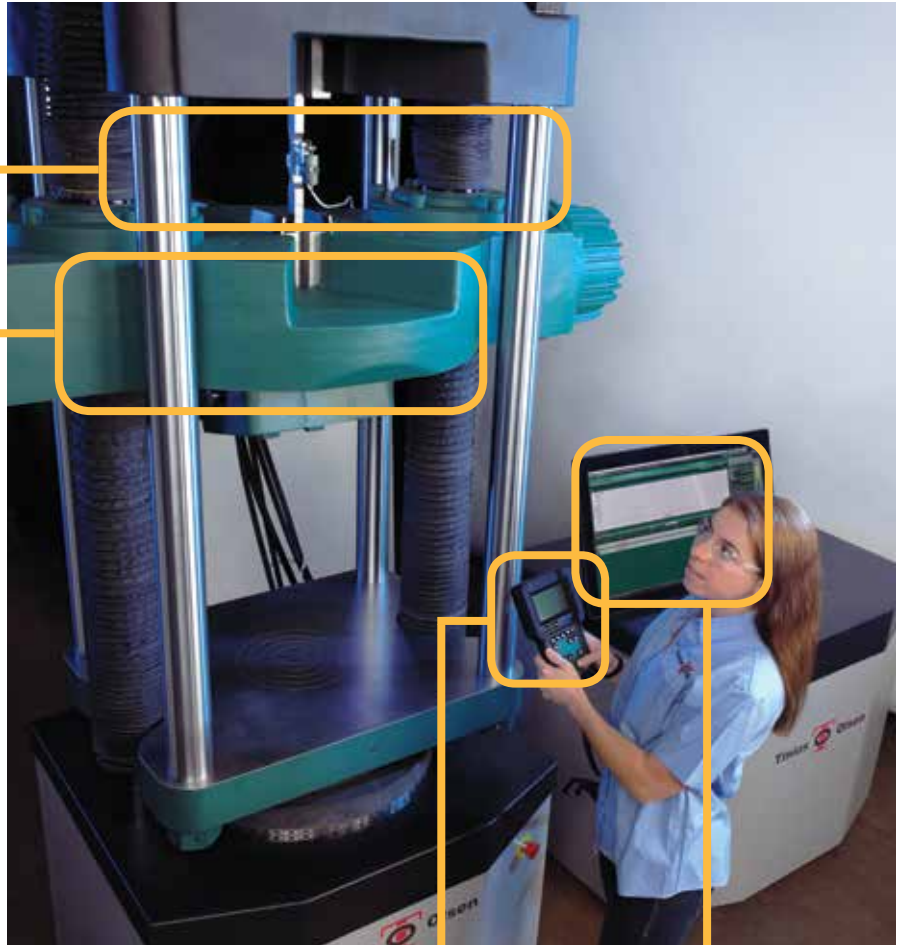
Suitable for tension, compression, transverse, and other tests on materials and assemblies.

RUGGED LOAD FRAME

Four-column construction provides exceptional load frame rigidity.

CONFIGURABLE LOAD FRAME

The SL loadframes can be configured according to your application needs. These options include closed, semi open, or fully open crossheads, which can be either motorised or fixed. The top crosshead can also be made "adjustable" meaning it can be raised or lowered on notched support columns. Additionally, the columns and drive screws can be lengthened in increments of 305 mm by up to an additional 914 mm.



HANDHELD INTERFACE

Two types of handheld machine controller interface are available. The first option is a wireless Bluetooth interface controller.



HANDHELD INTERFACE

The second controller interface is the tethered option, right, with larger buttons for machine and test control. This controller interface is better suited for operators who wear gloves as part of their testing protocol.



VIRTUAL INTERFACE

The third type of controller interface is a virtual one and is depicted graphically on a computer screen. This application runs independently of our Horizon software, but if connected, works seamlessly with the software.

SPECIFICATIONS

FOR MOST USERS, THE STANDARD SL LINE:

For Most Users the standard SL line:

Model 150SL - 150kN

(15,000 kgf / 30,000 lbf)

Model 300SL - 300kN

(30,000 kgf / 60,000 lbf)

Model 600SL - 600kN

(60,000 kgf / 120,000 lbf)

Model 1,000SL - 1,000kN

(100,000 kgf / 200,000 lbf)

Model 1,500SL - 1,500kN

(150,000 kgf / 300,000 lbf)

Model 2,000SL - 2,000kN

(200,000kgf / 400,000 lbf)

Typical 150 kN (30,000 lbf) SL
with handheld controller.



FOR RAPID SEQUENCE PRODUCTION TESTING, SL MODELS A AND AF:

150 to 1,000 kN (30,000 to
200,000 lbf); open-front crossheads
and/or fixed position crossheads.

Typical 300 kN (60,000 lbf) SL
with optional computer running
Tinius Olsen's Horizon software.



FOR EXTRAORDINARY TESTING, HIGH CAPACITY AND SPECIAL PURPOSE SL's:

3,000 kN (600,000 lbf) and beyond

OPTIONS FOR ALL SL MODELS:

- Extra-length screws and columns, with or without an adjustable upper crosshead, to increase the available test space for longer test samples
- Semi-open front crossheads for easier loading of samples
- Hydraulically actuated lever grips to allow rapid loading and unloading of samples
- Accordion-type, non-metallic screw covers to protect the screws and increase the life of your system
- Tooling for tension, compression, shear, flexure, and other tests
- Broad range of instrumentation
- Low capacity load cells
- Tee-slotted table for locating and securing customized tooling
- Controlled temperature cabinets for temperatures from -185° to 535°C (-300° to 1,000°F)
- Furnaces for temperatures to 1200°C (2200°F)

Typical 600 kN (120,000 lbf) SL
with closed crossheads and rack
and pinion grips and a furnace.



Typical 2,000 kN (400,000 lbf)
standard SL load frame with
semi-open front crossheads.



CUSTOMIZATION



Tinius Olsen can supply an SL structured to handle nearly any sample. The keys are grips and fixtures properly fitted to hold your sample, as well as accessible crosshead and column designs that enable easy sample loading.

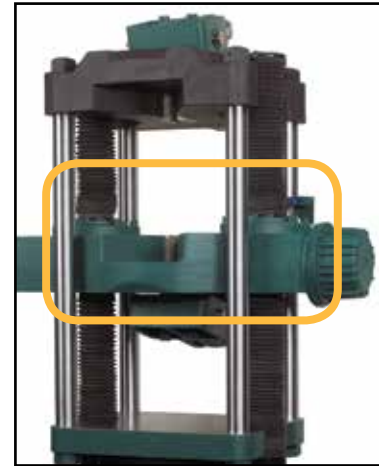
CROSSHEAD OPTIONS

A number of options are available to best suit the needs of your application, including:

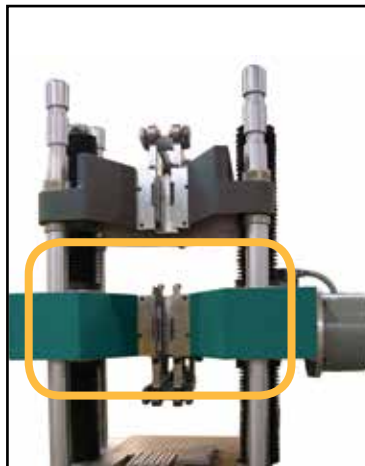
- Closed—This is the most common, and simplest, option on lower capacity frames.
- Semi-open front—Here the crossheads are partially “opened” to allow easy access for loading specimens.
- Fully-open front—Here the crossheads have full openings to allow specimens to be directly inserted into the grips.
- Adjustable—Testers with adjustable columns allow smaller or larger test areas to be accessible; when the tester has these, an adjustable crosshead is required so it can be raised or lowered.
- Fixed—Testers with fixed, non-motorised crossheads allow fast specimen insertion and removal and are primarily used for repetitive testing of the same product.



Closed crosshead.

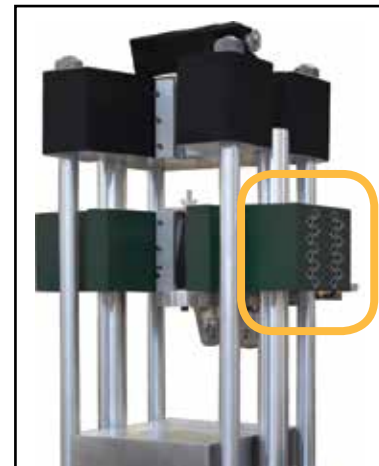


Semi-open front crosshead.



Fully-open front crosshead.

This also shows an adjustable top crosshead and notched columns to locate the adjustable top crosshead at different heights.

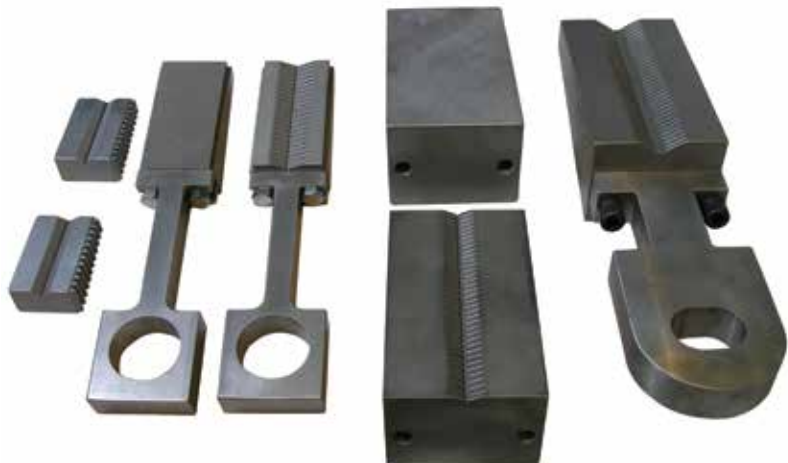


Fixed crosshead.

Tinius Olsen has grips, fixtures, frames, crossheads, columns, and special purpose SL frames for all requirements.

GRIPS

- Crank-operated rack and pinion type wedge grips with flat and/or vee gripping faces for all closed crosshead SL frames
- Hydraulically actuated wedge style grips for semi-open and fully-open front crossheads. Whenever hydraulically actuated grips are selected, an operational pendant grip opener is supplied with the test frame.
- Additional external grips for testing flats, rounds, headed and threaded specimens, fasteners, and many other types of products and materials



CUSTOMIZATION

COLUMNS AND SCREWS

Columns and screws can be lengthened and crossheads can be made adjustable to meet your specific requirements. If we don't have an existing design that meets your testing needs (very unlikely given that we've been developing solutions since 1880), we will develop a custom configuration that addresses them precisely.



On this 150SL frame the columns have been extended to accommodate large test specimens.



On this 600SL frame the columns have been extended while the screws for the adjustable crosshead are standard length. Additionally, the columns are notched to accommodate the adjustable top crosshead and the whole machine is surrounded by a fragmentation guard.

CONTROLLER INTERFACES

SL systems can be operated by a choice of different interface panels. Choose from a tethered interface, a wireless interface, or a virtual interface running on a connected PC.



This virtual interface runs on a connected PC and can be used to set up and run a test to provide a quick numerical result. The addition of Horizon software with any of these interfaces allows complex tests to be created and recalled, along with sophisticated data analysis of all graphical data.



This Bluetooth connected interface features easy to operate tactile buttons and a high resolution touch screen to set-up and monitor tests where parameters and results are shown numerically. The interface also features an 8MP camera and has Wifi connectivity



This tethered interface option features larger tactile feedback buttons for the operation of the testing frame; these make it ideal for users who need to wear protective gloves while operating the machine. The display provides simple numerical display of individual channels used on the testing machine.



MODEL		150SL	300SL	600SL	1000SL	1500SL	2000SL
CAPACITY	lbf	30,000	60,000	120,000	200,000	300,000	400,000
	kN	150	300	600	1,000	1,500	2,000
	kgf	15,000	30,000	60,000	100,000	150,000	200,000
MACHINE SPECIFICATIONS	Stroke in mm	6 152	6 152	6 152	9 229	9 229	9 229
	Testing Speeds in/min mm/min	0-3 0-76	0-3 0-76	0-3 0-76	0-3 0-76	0-3 0-76	0-3 0-76
	Adjustable Crosshead Speed in/min mm/min	20 508	20 508	12 305	12 305	12 305	12 305
LOAD FRAME(A) DIMENSIONS¹	Clearance Between Screws ⁷ in mm	12.5 317.5	12.5 317.5	18 457	19.5 495	22.25 565	22.25 565
	(B) Standard Opening in mm	29 737	29 737	36 914	42 1067	46.25 1175	46.25 1175
	(C) Crosshead Thickness in mm	3.5 89	3.5 89	5.5 140	8 203	8.5 216	8.5 216
	(D) Grip Guard Thickness in mm	1 25	1 25	2.75 70	2.75 70	4.5 114	4.5 114
	(E) Lever Height in mm	— —	— —	— —	8.75 222	8.75 222	8.75 222
	(F) Width ³ in mm	29 737	29 737	30 762	34 864	37 940	37 940
	(G) Depth ³ in mm	19 483	19 483	25 635	26 660	33.5 851	33.5 851
	(H) Height ^{2, 4} in mm	72.5 1842	72.5 1842	77 1956	90.125 2289	96.25 2445	96.25 2445
	MACHINE WEIGHT¹	Net lbs kg	2600 1180	2600 1180	4700 2132	9000 4082	12,000 5444
Gross lbs kg		3100 1406	3100 1406	5700 2586	9900 4490	13,300 6034	13,300 6034
NOMINAL MAXIMUM SPECIMEN SIZES²	Max.-TL Rack & Pinion in mm	24 610	24 610	32 813	34 837	38 965	38 965
	Max.-TL Lever Grips in mm	— —	— —	— —	30 762	32 813	32 813
TENSION LENGTH⁵	Width in mm	2 51	2 51	2.5 64	3 76	3.5 89	3.5 89
	Thickness in mm	1 25	1 25	1.75 44	2.125 54	2.125 54	2.125 54
	Diameter in mm	1.125 29	1.125 29	2.25 57	2.375 60	2.625 67	2.625 67
	Max.-CH Rack & Pinion in mm	22 559	22 559	24 610	28 711	32 813	32 813
COMPRESSION HEIGHT	Max.-CH Lever Grips in mm	— —	— —	— —	30 762	36 914	36 914

STANDARD SL CONSOLE DIMENSIONS			
MODEL	150 to 600	1000 to 2000	
WIDTH	in	36	48
	mm	915	1219
DEPTH	in	31	31
	mm	788	788
HEIGHT	in	40	40
	mm	1016	1016

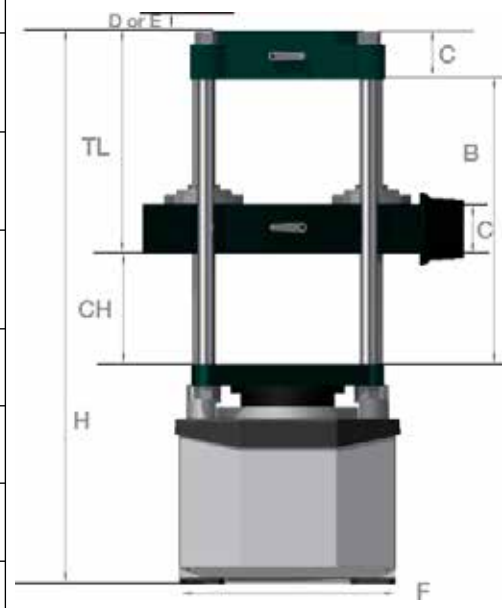


Fig. 9. Schematic of load frame. Refer to table at left for actual dimensions.

NOTES:

1. Approximate
2. Additional height clearances can be provided
3. Dimension of footprint base; overall dimensions will depend on options selected
4. Add D or E as applicable and add stroke
5. With full stroke remaining
6. These machines can be floor- or pit-mounted to meet customer testing requirements; pit mounting may require additional components
7. If wider clearance is required, please consult factory
8. Load measurement meets or surpasses the following standards: ASTM E4, BS 1610, DIN 51221, EN 10002-2 and ISO 7500-1
9. Strain measurement meets or surpasses the following standards: ASTM E83, BS 3846, ISO 10002-4 and ISO 9513
10. These systems conform to all relevant European directives and carry a CE mark
11. Specifications 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.

Our Horizon software sets new standards of data analysis by adding a host of report writing and data manipulation capabilities that will make easy work of your materials testing programs. As with most features of Horizon, flexibility is key; reports can be customised by operators in any way they wish, as can all user screens, allowing operators to focus on features that are most important to them.

In addition to powerful reports, Horizon Materials Testing software is networkable and scalable so operators and managers can operate equipment and review test results from multiple sources and locations. Horizon provides a library of standard, specific, and application-focused test routines that have been developed in close cooperation with 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 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, running on touchscreen enabled monitors, to create an intuitive user experience. Built-in tutorials, on-line help, and help desk access provide additional user support.



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