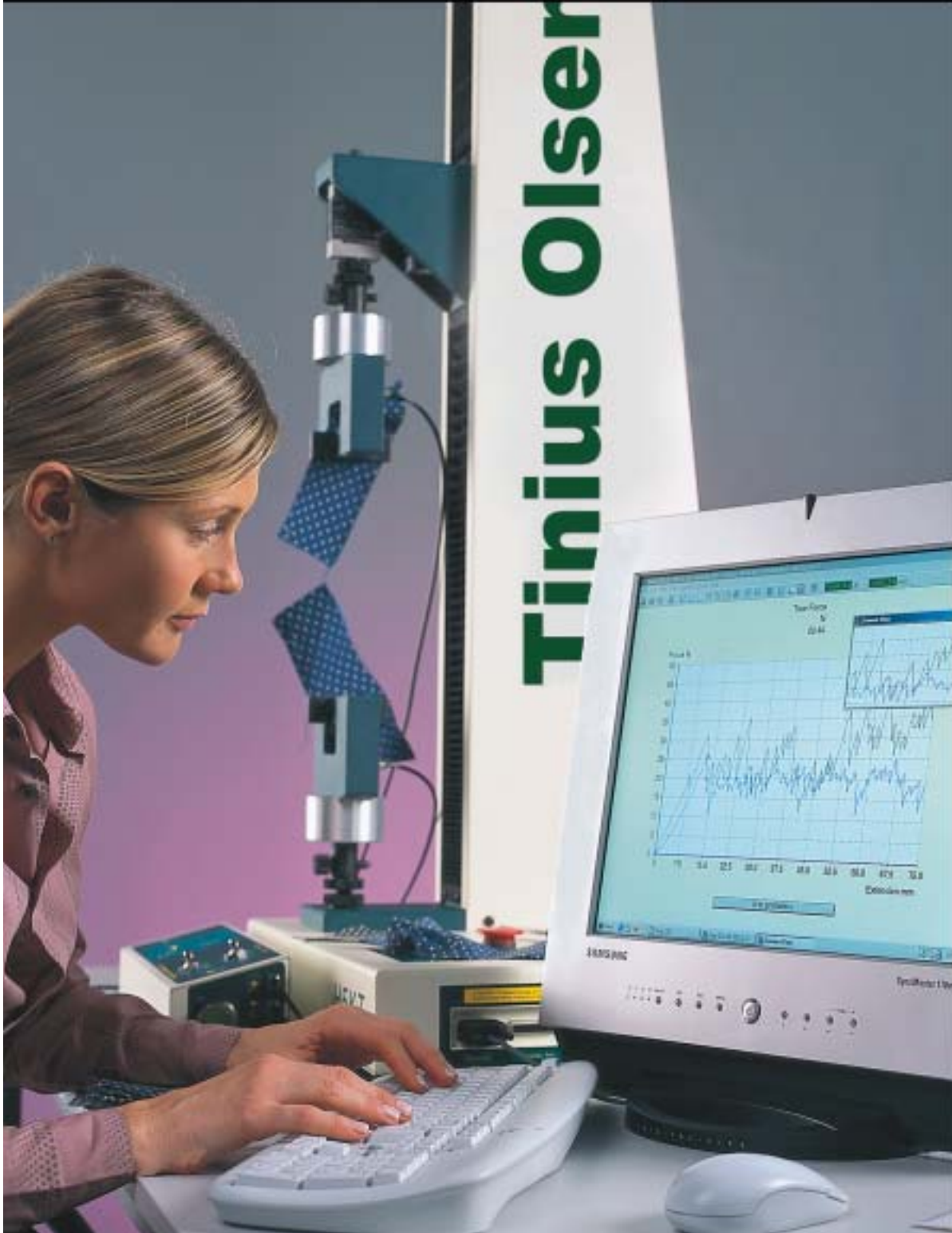




Benchtop Materials Testing Machines



Single Column Models



Fig 1. Model H5kS shown with HW11 grips

Fig 2. S Series control panel



Fig 3. Model H1kS testing paper strips; shown with HT50 tensile grips

The single column materials testing machines have frame capacities of 1 kN or 5 kN (200 lbf or 1,000 lbf) and include two model types — the S series and the T series. These machines are designed to test a wide range of materials, including, but not limited to: plastics, films, paper, packaging materials, non-woven fabrics, filter material, felt, leather, adhesives, foils, food, toys, medical products and components etc., in tension, compression, flexure, shear and peel.

S Series

Using a combination of quality engineering and advanced technology, Tinius Olsen has produced a series of machines that are accurate and simple to use. All S series machines feature an easy-to-read backlit liquid crystal display that can be switched

between a numerical and graphical display. All data shown on this display is obtained in real time, with the autoranging graphical display showing the test curve of the specimen under test. The control unit features dedicated keys for moving the crosshead up, down, stop, performing the test, as well as keys for load and extension tare and crosshead return. The control panel also features an alpha-numeric keypad to allow the input of test conditions, test data and the formatting of the test report. The control unit can retain up to five separate test routines for easy and rapid recall. While powerful as stand-alone units, these machines can be enhanced by direct connection of a printer through which comprehensive test reports and high resolution graphs can be quickly obtained.

The S Series of testers are also designed for users all over the world — an optional language module can be plugged into the control panel and all data on the backlit LCD will be shown in the selected language. Language options include: English, French, Portuguese, German, Italian, Spanish and Polish.

T Series

Building on the quality and technology of the popular and successful S series, Tinius Olsen has developed the T series of machines. The T series models have similar specifications, but lack the unique S series control panel. Instead, the T series machines talk directly with a standard pc running one of our Windows based data analysis software packages, via high speed RS232 in both ASCII and super high speed binary modes.

Common Features

The S and T series use rapid change Z beam load cells that allow for simple and quick "sizing" of the machine to an appropriate capacity for the test. These load cells have an accuracy of +/- 0.5% of the applied load value, from 2% to 100% of the load cell capacity. The S and T series have a huge assortment of specimen grips and fixtures allowing the selection of an ideal configuration for your application.



Fig 4. Model H1kT testing a stuffed toy



Fig 5. Model H5kT ready to perform a flexural test

Key Features

- PC control via high speed
- RS232 using ASCII mode and super high speed binary mode
- Machines are proof loaded to 200% of capacity
- Force accuracy of 0.5% of applied load across the load cell display range
- Built-in intelligent active force and displacement alarm system
- 32 bit precision motor controller
- Displacement resolution of 0.0001 mm (T series in binary mode)
- Speed resolution of 0.001 mm/min
- 150% mechanical overload capacity on each load cell
- 20% digital load tare while maintaining full load cell capacity
- Automatic motor drive alarms that monitor over/under voltage, current and temperature



Fig 6. Model H1kT being used to test material and stitching on stuffed toy



Fig 7. Model H5kT being used to determine the flexural strength of a printed circuit board

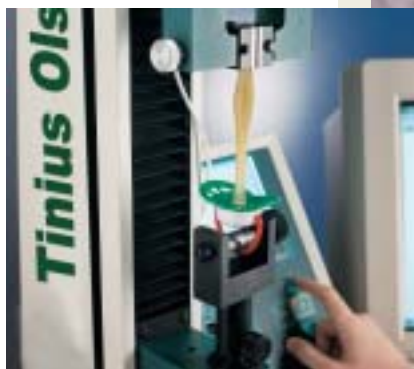


Fig 8. Model H1kS being used to find the tensile strength of a baby's pacifier

Technical Specifications

MODEL		H1k	H5k
CAPACITY	lbf	200	1000
	kN	1	5
	kg	100	500
MAXIMUM SAMPLE DIAMETER	in	6	8
	mm	150	200
LOAD CELLS		Rapid change, Z beam load cells with digital encoding for automatic recognition and scaling available — 1kN, 500N, 250N, 100N, 50N, 10N, 5N	Rapid change, Z beam load cells with digital encoding for automatic recognition and scaling available — 5kN, 2.5kN, 1kN, 500N, 250N, 100N, 50N, 10N, 5N
MAXIMUM CROSSHEAD TRAVEL (EXCLUDING GRIPS)		Measurement direct from ballscrew — fully auto scaling of single measurement range	Measurement direct from ballscrew — fully auto scaling of single measurement range
	in	17.5	30
	mm	445	750
TESTING SPEED RANGE	in/min	0.001 to 40 up to 100 lbf, 0.001 to 20 up to 200 lbf	0.001 to 40 up to 500 lbf, 0.001 to 20 up to 1000 lbf
	mm/min	0.001 to 1000 up to 500N, 0.001 to 500 up to 1kN	0.001 to 1000 up to 2.5kN, 0.001 to 500 up to 5kN
JOG SPEED	in/min	0.00004 to 40	0.00004 to 40
	mm/min	0.001 to 1000	0.001 to 1000
RETURN SPEED	in/min	0.00004 to 40	0.00004 to 40
	mm/min	0.001 to 1000	0.001 to 1000
DIMENSIONS H x W x D	in	32 x 14 x 14	32 x 14 x 14
	mm	820 x 360 x 360	820 x 360 x 360
WEIGHT	lb	55	110
	kg	25	50

Specifications:

Load measurement accuracy: +/- 0.5% of applied load from 2% to 100% capacity; extended range down to 1% capacity with accuracy of 1% of applied load

Position measurement accuracy: +/- 0.01% of reading or 0.001 mm, whichever is greater

Speed accuracy: +/- 0.005% of set speed

Operating temperature range: 32 to 100 degrees F (0 to 38 degrees C)

Storage temperature range: 14 to 115 degrees F (-10 to 45 degrees C)

Humidity range: 10% to 90% non-condensing, web bulb method

Power: standard optional voltages 220/240VAC, 50-60 Hz, 2000W; power must be free of spikes and surges exceeding 10% of the nominal voltage

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. Strain measurement system meets or exceeds the requirements of the following standards: ASTM E83, EN 10002-4, BS 3846 and ISO 9513. 3. These models conform

to all relevant European CE Health and Safety Directives EN 50081-1, 580081-1, 73/23/EEC, EN 61010-1 4. Specifications are subject to change without notice



Fig 9. A model H5kT and a model H5kS being used to determine the bonding strength of adhesive tape

COMMON APPLICATIONS



Fig 10. Testing the ripeness of apples using a set of Magnus Taylor probes



Fig 11. Testing the strength of coffee packaging using the quick release vise grips, HT55



Fig 18. Testing the strength of LEGO blocks with a custom attachment



Fig 12. Testing the strength of fishing line using single bollard grips, HT33



Fig 13. Checking the peeling strength of the outer layer of rubber hose, using a combination of standard and custom grips



Fig 19. Testing the adhesive peeling forces of foil packaging



Fig 14. Testing the extraction force of a bullet from its cartridge using custom pneumatic grips



Fig 15. Testing the static and dynamic frictional forces to pull an iron across fabric



Fig 20. Testing the puncture and bursting strength of packaging material



Fig 16. Testing the strength of buttons using a combination of standard grips

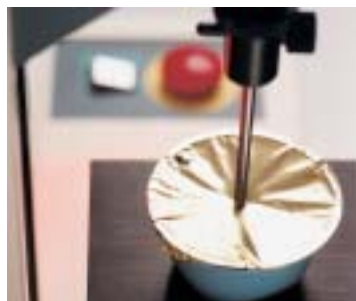


Fig 17. Testing the puncture forces on foil packaging



Fig 21. Determining the force to remove the lid from a plastic package



Fig 22. Yarn being tested with split bollard grips



Fig 23. Dumbbell sample of sheet metal being tested with HT21 grips

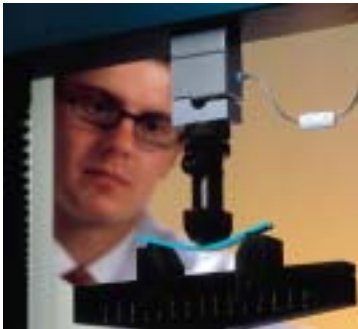


Fig 24. A 3 point bend test being performed with model HF72 flexural jig on plastic sample



Fig 25. Reinforced plastic dumbbell samples



Fig 26. Model H10kS shown with an environmental chamber for testing at elevated or reduced temperatures; note the use of a laser extensometer that can be used with the chamber to determine the elongation of the sample



Fig 27. Compression test on crash helmet



Fig 28. Testing webbing material using HT105 grips



Fig 29. Tinius Olsen high travel extensometer, model 100RC



Fig 30. Testing the puncture resistance of leather work gloves



Fig 31. Testing the extraction forces of new material for wine bottle corks



Fig 32. H10kS testing fabric with a high elongation extensometer

Dual Column Models



Fig 33. Model H10kS using split bollard grips to test yarn

The dual column materials testing machines have frame capacities of 10kN, 25kN and 50kN (2000 lbf, 5000 lbf and 10,000 lbf) and include two model types — the S series and the T series. These machines are designed to test a wide range of materials, including, but not rigid plastics, films, paper, packaging materials, non-woven fabrics, filter material, thin sheet metal, felt, leather, adhesives, foils, food, toys, medical products and components etc., in compression, flexure, shear and peel.

S Series

Using a combination of quality engineering and advanced technology, Tinius Olsen has produced a series of machines that are accurate and simple to use. All S Series machines feature an easy-to-read backlit liquid

crystal display that can be switched between a numerical and graphical display. All data shown on this display is obtained in real time, with the autoranging graphical



Fig 34. Model H50kS with model HT43 bollard grips testing seatbelt webbing



Fig 35. Model H10kT being used with HT29 grips to test thin rope



Fig 36. Model H25kT using model HT40 grips to test fabrics



Fig 37. Model H50kT with HT21 grips

display showing the test curve of the specimen under test. The control unit features dedicated keys for moving the crosshead up, down, stop, performing the test, as well as keys for load and extension tare and crosshead return. The control panel also features an alpha-numeric keypad to allow input of test conditions, test data and the formatting of the test report. The control unit can retain up to five separate test routines for easy and rapid recall. While powerful as stand-alone units, these machines can be enhanced by direct connection of a printer through which comprehensive test reports and high resolution graphs can be quickly obtained.

The S Series of testers are also designed for users all over the world — an optional language module can be plugged into the control panel and all data on the backlit LCD will be shown in the selected language. Language options include: English, French, Portuguese, German, Italian, Spanish and Polish.

T Series

Building on the quality and technology the popular and successful S series, Tinius Olsen has developed the new T series of machines. The T series models have similar specifications, but they lack the unique, S series control panel. Instead, the T series machines talk directly to a standard

pc running one of our Windows based data analysis software packages, via a high speed RS232 in both ASCII and super high speed binary modes.

Common Features

The S and T series use rapid change Z beam load cells that allow for simple and quick “sizing” of the machine to an appropriate capacity for the test. These load cells have an accuracy of +/- 0.5% of the applied load value, from 2% to 100% of the load cell capacity.

The S and T series have a huge assortment of different grips and fixtures available allowing the selection of an ideal configuration for your application.

Key Features

- PC control via high speed RS232 using ASCII and super high speed binary modes
- Force accuracy of 0.5% of applied load across the load cell display range
- 32 bit precision motor controller
- Displacement resolution of 0.0001 mm (T series in binary mode)
- Speed resolution of 0.001 mm/min
- 150% mechanical overload on load cells
- 20% digital load tare while maintaining full load cell capacity
- Automatic motor alarms monitor over/under voltage, current and temperature
- Built-in intelligent active force and displacement alarm system



Fig 38. Machine being used to determine the strength of a geotextile

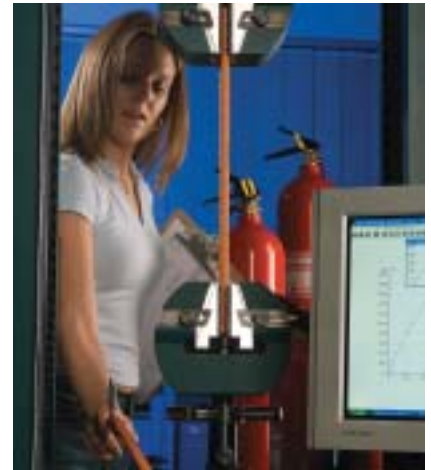


Fig 39. Machine being used to determine the strength of fire extinguisher hose

Technical Specifications

MODEL		H10K	H25K	H50K
CAPACITY	lbf kN kg	2000 10 1000	5000 25 2500	10,000 50 5000
CLEARANCE BETWEEN COLUMNS	in mm	16 405	16 405	16 405
LOAD CELLS		Rapid change, low profile Z type, load cells with digital encoding for automatic recognition and scaling available – 10kN, 5kN, 2.5kN, 1kN, 500N, 250N, 100N, 50N, 10N, 5N	Rapid change, low profile Z type, load cells with digital encoding for automatic recognition and scaling available – 25kN, 10kN, 5kN, 2.5kN, 1kN, 500N, 250N, 100N, 50N, 10N, 5N	Rapid change, low profile Z type, load cells with digital encoding for automatic recognition and scaling available – 50kN, 25kN, 10kN, 5kN, 2.5kN, 1kN, 500N, 250N, 100N, 50N, 10N, 5N
MAXIMUM CROSSHEAD TRAVEL	in mm	Measurement direct from ballscrew – fully auto scaling of single measurement range 43 1100	Measurement direct from ballscrew – fully auto scaling of single measurement range 43 1100	Measurement direct from ballscrew – fully auto scaling of single measurement range 43 1100
TESTING SPEED RANGE	in/min mm/min	0.001 to 40 0.001 to 1000	0.001 to 40 0.001 to 1000	0.001 to 20 0.001 to 500
CAPACITY AT MAXIMUM SPEED	lbf kN	1000 5	2000 10	5000 25
MAXIMUM SPEED AT CAPACITY	in/min mm/min	20 500	20 500	10 250
JOG SPEED	in/min mm/min	0.001 to 40 0.001 to 1000	0.001 to 40 0.001 to 1000	0.001 to 20 0.001 to 500
RETURN SPEED	in/min mm/min	0.001 to 30 0.001 to 750	0.001 to 30 0.001 to 750	0.001 to 30 0.001 to 750
DIMENSIONS H x W x D	in mm	63 x 26 x 18 1600 x 650 x 450	63 x 26 x 18 1600 x 650 x 450	64 x 29 x 20 1613 x 720 x 500
WEIGHT	lb kg	255 115	265 120	310 140

Specifications:

Load measurement accuracy: +/- 0.5% of indicated load from 2% to 100% capacity; extended range down to 1% capacity with accuracy of 1% of indicated load

Position measurement accuracy: +/- 0.01% of reading or 0.001 mm, whichever is greater

Speed accuracy: +/- 0.005% of set speed

Operating temperature range: 32 to 100 degrees F (0 to 38 degrees C)

Storage temperature range: 14 to 115 degrees F (-10 to 45 degrees C)

Humidity range: 10% to 90% non-condensing, web bulb method

Power: standard optional voltages 220/240VAC, 50-60 Hz, 2000W; power must be free of spikes and surges exceeding 10% of the nominal voltage

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. Strain measurement system meets or exceeds the requirements of the following standards: ASTM E83, EN 10002-4, BS 3846 and ISO 9513. 3. These models conform to all relevant European CE Health and Safety Directives EN 50081-1, 580081-1, 73/23/EEC, EN 61010-1 4. Specifications are subject to change without notice.

Software

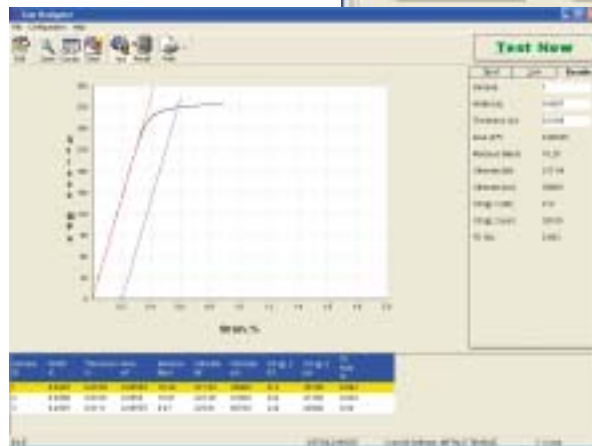
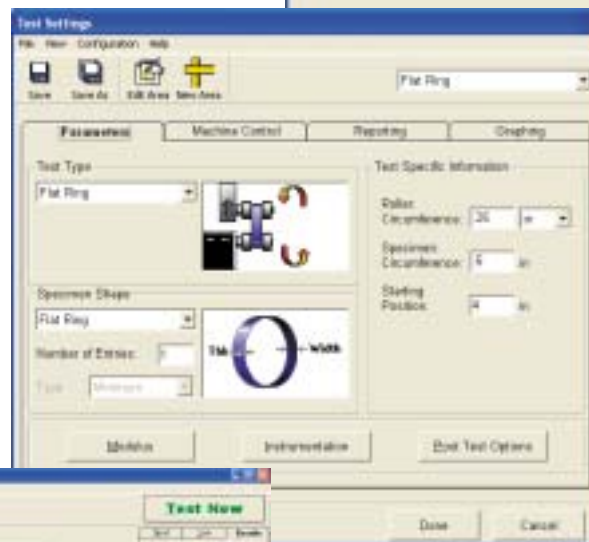
Building on our long history of providing solutions to an enormous variety of testing problems, Tinius Olsen offers a comprehensive range of software products, each designed to make testing simple, precise and efficient, no matter whether the material is metal, paper, composite, polymer, rubber, textile or micro components. Tinius Olsen software goes far beyond basic module changes for unique applications; instead, specific and focused application software products have been developed in close cooperation with our customers around the world.

There are several valuable features that are common to all, perhaps the most important is the ability to further customize the testing parameters that are used to collect and document testing data, as well as control the testing machine. Specifically, our range of application software is for data acquisition, data analysis and also closed loop control of Tinius Olsen testing machines that have a compatible servo system or four-quadrant drive.

All versions of our focused application software are rich with standard features that improve productivity and enable you to

build, access and use a powerful materials testing database:

- Use of modern databases.
- Generation of user customized reports.
- Standard SPC programs for X-bar, R and frequency distributions/histograms.
- Ability to recall, replot and rescale curves.
- Recall of data that spans different test modules.
- User-configurable machine parameter and control settings.



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