UNIVERSAL TESTING MACHI

70 Steel mechanical testing and universal testers

This section illustrates universal testing machines and accessories, in particular those used for performing mechanical tests on steel specimens and reinforcing bars. Some of the machines shown however, for example the electromechanical models, can be used for testing other construction materials, in compression or flexure, such as concrete, cement, rock, asphalt and soil.
Most of the machines are PC-controlled, assuring a simplification and rationalization of test procedures together with all the other advantages associated with the use of the most modern electronic and technological practices.

Contents

Universal testing machines

70

Steel mechanical testing and universal testers

UTM-SC Series Combined Steel and Concrete tension and compression testers 500/1000 kN capacity

STANDARD

▸ ISO 7500-1 ▸ EN ISO 6892 (method B) ▸ EN 15630-1 ▸ ASTM C39

These machines have been designed for performing, in the field or laboratory, tension tests on steel rebars up to 26 mm diameter and compression tests on cylindrical concrete specimens up to 160 mm diameter x 320 mm height and cubes up to 150 mm, using the appropriate accessories. Very rigid structure with double acting cylinder assembly.
They are comparatively lightweight, with small dimensions, good accuracy and a low cost, making them ideal for site and educational purposes. They are proposed in the following versions:

70-S12T02
Semi-Automatic model powered by the DIGIMAX-UTM power system

70-S12F02
Automatic model powered by the AUTOMAX Pro power and control system

70-S12A02
Automatic model powered by the UTM-AUTO power and control system

AUTOMAX Multitest
Super-Automatic Tensile/Compression Testing System

MAIN FEATURES of the frame (common to all systems):

» Load capacity in tension: 500 kN

» Load capacity in compression: 1000 kN

» Tensile jaws including: 4 wedge grips for flats up to 13 mm thickness, 4 wedge grips for rounds up to 26 mm dia. and 2 sets of grips' liners 4 and 8 mm thick.

» Specimen length (tensile mode): 500 mm

» Maximum distance between grips (piston fully up): 300 mm approx.

» For compression tests (with the accessory 70-S0012/1) up to 1000 kN on cubes up to 150 mm and cylinders up to dia. 160x320mm

» Vertical daylight (compression mode): 695 mm

» Piston travel: 150 mm

» Heavy duty high-functionality jaws rated for severe prolonged use

» Distance between columns: 310 mm

SEMI-AUTOMATIC 500/1000 KN TESTING MACHINE FOR STEEL AND CONCRETE

MAIN FEATURES

» Compact design

» Ideal for site testing and educational purposes

» Heavy duty high-functionality jaws rated for severe prolonged use for testing up to 26 mm dia. rebars

» For tensile tests up to 500 kN on steel and compression tests up to 1000 kN on concrete

Hydraulics

- Complete with self-compensated proportional valve for the manual preset of load rate
- Maximum pressure: 650 bar, oil delivery 0.5 litres/min
- Maximum usable oil volume: 3.5 litres
- Power: 750 W

Hardware

DIGIMAX UTM

- Touch screen graphic display 240x128 pixel
- 4 channels: 2 channels for load sensors and 2 channels for extensometers. A maximum of 2 channels (1 for load and 1 for extensometer) selected by the user can be contemporaneously used.
- Effective sampling rate up to 50 / sec
- Effective resolution 17 bit (131000 divisions)
- Data storage on USB pen drive (included)
- Connection to PC via LAN port
- Real time clock and date

Firmware

Tensile test:

- Simultaneous display of load, stress and, using an extensometer, specimen elongation (acquisition only)
- Graphical test data option showing the load/elongation curve (when an extensometer is used)

Compression test:

- Simultaneous display of load and stress

Machine outfit

The machine is supplied complete with tensile grips for 12 to 26 mm bar dia. as described. The Extensometers, the testing software and the compression platens for compression on concrete has to be ordered separately. See accessories.

Dimensions and weight:

- 900 x 430 x 1750 mm (W x D x H)
- 555 kg

Ordering info

70-S12T02
Combined semi-automatic digital tension / compression testing machine, 500 kN cap. in tension and 1000 kN cap. In compression, for rebars tensile tests conforming to EN ISO 6892-1 (method B) and EN 15630-1. 230V, 50 Hz, 1 ph

70-S12T03
As above but 220V, 60 Hz, 1 ph

70-S12T04
As above but 110V, 60 Hz, 1ph

Accessories

70-S0012/3
150 mm travel high precision crosshead displacement transducer

70-SW/UTSL
UTS Light data acquisition and processing software for tensile test (see dedicated box)

UTM-AUTO 500/1000 KN TESTING MACHINES FOR STEEL AND CONCRETE

MAIN FEATURES

» Automatically performs steel tensile and concrete compression tests when completed with the relevant accessories.

» Fully automatic test cycle with closed-loop digital feedback

» High precision displacement transducer included, for automatic control of the test and plot of stress/elongation graph, based on the crossheads separation measurement

» No need to use external extensometer to control the test

» Affordable testing machine for accurate automatic test execution

Hydraulics

- Dual stage pump: centrifugal low pressure for fast approach and automatic switching to radial multi-piston high pressure for loading
- DC motor 720 W, 50-60 Hz
- Maximum working pressure 700 bar
- ES Energy Saving technology

Hardware

- 131.000 points effective resolution
- 240 x 128 pixels touch screen graphic display
- Closed-loop P.I.D.control
- 2 channels for load sensors
- 1 channel to measure crosshead separation travel with 150mm high precision displacement transducer (included)
- 1 channel to measure rebars elongation with extensometers (see accessories)
- Digital linearization of the calibration curve (multi-coefficient)

Firmware

Tensile test:

- Automatic test execution under load/stress control and grips separation control (by using the displacement transducer supplied with the machine) with closed loop PID control
- Simultaneous display of load, stress and specimen elongation
- Possibility to overlap two elongation/stress graphs: one obtained with the included displacement transducer measuring crosshead separation travel; one obtained with an optional extensometer (coaxial or universal)
- Graphical test data option showing the load/elongation curve

Compression test:

- Automatic test execution of compression tests with closed loop PID control
- Simultaneous display of load and stress, load/time graph

Machine outfit

The machine is supplied complete with tensile grips for 12 to 26 mm bar dia. as described. The UTS light software (70-SW/UTSL) is included (see dedicated box). The extensometers and the compression platens for compression on concrete are not included and have to be ordered separately.
See accessories.

Dimensions and weight:

- 900 x 430 x 1750 mm (W x D x H)
- 555 kg

Ordering info

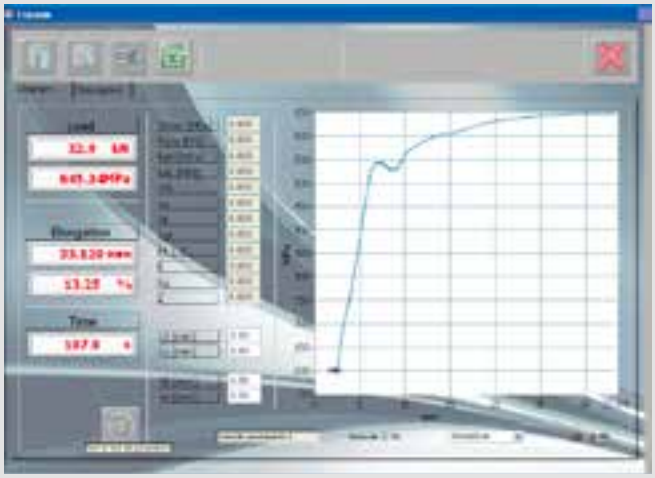
70-S12A02
UTM-AUTO Automatic combined 500/1000 kN machine, 500 kN for tensile testing on steel rebars up to 26mm diameter and 1000 kN for compression testing on concrete.
230 V, 50-60 Hz, 1 ph.

70-S12A04
Same as above but 110 V, 60 Hz, 1 ph

PC Software

70-SW/UTSL
UTS Light data acquisition and processing software for tensile test according to EN 10002 allowing:

- Input of specimen identification, test and name of customer
- Real time downloading of test data
- Simultaneous display of stress/time and stress/elongation when extensometer is adopted (coaxial extensometer series 70-C0961/xx or universal extensometer series 70-C0954/x), with possibility to display multidiagrams
- Elaboration of tension test results once test is completed: ReH, ReL or Rp, final elongation, etc. in conformity to EN ISO 6892-1 (method B) and EN 15630-1 (for steel rebars)
- Unit selection: kN, lbf, mm, in, MPa, psi
- Printout of test reports
- Multi-language selection



Tensile test execution

Tensile test results

Accessories

- Coaxial extensometers. See page 315
- Universal extensometers. See page 315
- Platens for compression tests on concrete. See page 307
- Distance pieces for compression tests. See page 307
- Fragment guard. See page 307

UTM-SC Series Combined Steel and Concrete tension and compression testers 500/1000 kN capacity

STANDARD

▸ ISO 7500-1 ▸ EN ISO 6892 (method B) ▸ EN 15630-1 ▸ ASTM C39

UTM SUPER AUTOMATIC TENSILE/COMPRESSION TESTING SYSTEM 500/1000 kN CAP.

These systems can be used for automatic tensile tests on steel rebars, when ordering the codes here suggested. However, they may be upgraded with additional frames and accessories in order to fulfil future needs to perform:

- Compression/flexure/splitting tests on different type of construction materials
- Elastic modulus/Poisson ratio on concrete, cement, rocks
- Displacement controlled tests on FRC/Shotcrete specimens

See detailed information on page 208 and page 210

MAIN FEATURES

» Large 7" graphic touchscreen color display for intuitive, quick and simple use

» Double frame control as standard with optional control of additional third and fourth frame: active frame selection via console display or software

» Oversampling function increasing the sampling rate when specimen is approaching the failure for better identification of peak value

AUTOMAX PRO

AUTOMAX PRO 500/1000 KN TESTING MACHINES FOR STEEL AND CONCRETE

Automax Pro Power and Control System

See detailed information on page 172

Machine outfit

The machine is supplied complete with tensile grips for 12 to 26 mm bar dia. as described. The UTS software (70-SW/UTS) is available on request (see dedicated box). The extensometers and the compression platens for compression on concrete are not included and have to be ordered separately. See accessories.

Ordering info

70-S12F02
Automax Pro Automatic combined 500/1000 kN machine, 500 kN for tensile testing on steel rebars up to 26mm diameter and 1000 kN for compression testing on concrete.
230 V, 50-60 Hz, 1 ph.

70-S12F04
Same as above but 110 V, 60 Hz, 1 ph

Accessories

- Coaxial extensometers. See page 315
- Universal extensometers. See page 315
- Platens for compression tests on concrete. See page 307
- Distance pieces for compression tests. See page 307
- Fragment guard. See page 307

AUTOMAX MULTITEST

AUTOMAX MULTITEST 500/1000 KN TESTING SYSTEM FOR STEEL AND CONCRETE

MAIN FEATURES

» Ergonomic and compact stand-alone control console

» PC controlled testing system

» All-in-one PC included

» 14 channels available to connect several types of sensors

» DATAMANAGER PC software for compression, flexure and indirect tensile tests included

This testing system include the tensile testing frame 70-S12Z00 described on page 304 and the AUTOMAX Multitest control console whose high performances are detailed on page 175

Ordering info

70-S12Z00
Combined 500/1000 kN frame, including tensile jaws with wedges grips and 150 mm travel displacement transducer allowing test execution under crosshead separation control to EN ISO 6892-1 (method B) and EN 15630-1.

50-C20M82
Automax Multitest stand-alone power and control console for the control of up to 2 (expandable to 4) testing frames. PC included.
230 V, 50-60 Hz, 1 ph.

50-C20M84
Same as above but 110 V, 60 Hz, 1 ph

70-SW/UTS
PC software for tensile test (see dedicated box)

Accessories

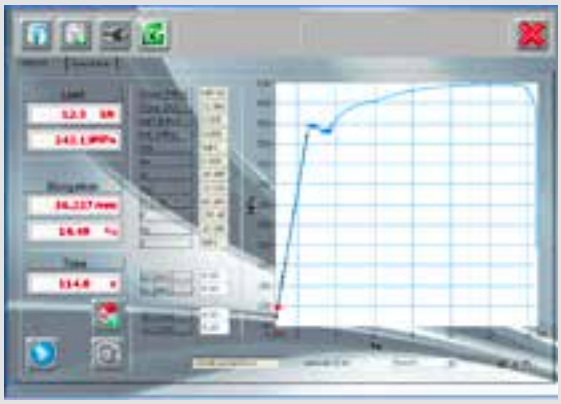
PC Software

70-SW/UTS

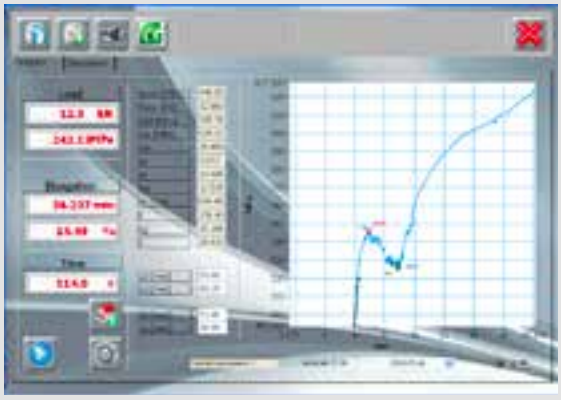
UTS software package for steel tensile testing allowing:

- Load/stress control
- Crosshead separation control
- Simultaneous display of: stress/elongation [mm], stress/time; stress/elongation [%] and elongation [mm]/time, with possibility to display multi diagrams
- Elaboration of tension test results: ReH, ReL or Rp, final elongation, etc.in conformity to EN ISO 6892-1 (method B) and EN 15630-1 (for steel rebars)
- Unit selection: kN, lbf, mm, in, MPa, psi
- Printout of test reports
- Multi Language software

Test data input



Tensile test execution



Test results

ACCESSORIES
(FOR ALL UTM-SC SERIES MODELS)

Compression platens

70-S0012/1

Set of lower platen and upper platen with spherical seat, 220 mm dia., for testing cylinders up to dia. 160x320 mm and cubes from 100 to 150 mm. To be completed with the suitable distance pieces depending on the specimen height. Vertical daylight between platens 695 mm.
Weight approx.: 45 kg

STANDARD

- EN 1338 - EN 12390-6
- ASTM C496

Splitting tensile test devices for cubes, cylinders and block pavers

See page 200

Fragment guard

70-S0012/2

Front and rear fragment guard

Distance pieces

Made of steel, these pieces are used to reduce the vertical clearance of the compression machine to a height that is appropriate for the size of the specimen and considering that, in general, the maximum piston travel is 150mm.

Code	Dimensions (d x h, mm)	Weight Kg.
50-C9080	200 x 30	7.3
50-C9082	200 x 50	12.3
50-C9083	200 x 68	16.7
50-C9084	96 x 158	9
50-C9086	200 x 100	25
50-C9087	96 x 130	8

Universal testing machines

UTM HPT SERIES

STANDARD

▸ ISO 6892 (method B) ▸ EN ISO 7500-1 ▸ EN ISO 15630-1 ▸ ASTM A370

To test:

STEEL Tensile tests on rebars and round, flats, wire strands, electro-welded screen, Transverse test, Bend and re-bend, Brinnel with 10 mm ball, Shear test on rounds

CONCRETE Compression tests on cubes and cylinders, Flexural test on beams, Indirect tensile on cylinders, cubes and paving blocks, Modulus of Elasticity, Pull out test

VARIOUS Compression on Rock, Masonry units, Refractories etc. Wire rope tensile test. Nut and bolt testing. Tensile test on headed and shouldered specimens

The UTM-HPT Universal testers are available in two versions:

- **HPU** 200 Series, 1000, 1200, 1500 and 2000 kN cap., controlled by the HPU 200 computerized control unit
- **AUTOMAX**-T Model, 1000 kN cap., controlled by the AUTOMAX-T control console (page 310)

HPT 2000

HPT 1000

HPU200 SERIES

1000, 1200, 1500 and 2000 KN CAP., CONTROLLED BY THE HPU 200 COMPUTERIZED CONTROL UNIT

All models are controlled by the new and sophisticated HPU 200 control unit and are supplied with PC, upper and lower hydraulically operated jaws, complete set of grips for rounds and flats, transverse test attachment and high precision load cell providing high accuracy from the very beginning of the load scale. Automatically performs steel tensile testing, compression, splitting tests, Elastic Modulus and Poisson's ratio determination on concrete specimens. PC and software enable remote control of the complete system.

Loading frame

The frame consists essentially of a robust four columns frame with three sturdy crossheads: upper is directly connected to the lower one by two main columns; the middle one, moving on two screw columns, can be adjusted through an electric motor by using the dedicated push button panel, in order to set the required vertical daylight both for compression and tensile tests; the lower is controlled by a simple effect piston centrally positioned. Jaws and wedge grips are included. The tensile jaws are directly operated by the Power control console with a push-button panel. The compression tests are performed between the lower and the mobile middle crossheads, using the suitable accessories.

MAIN FEATURES

» Ideal for the construction industry to perform both tension tests on steel rounds and flats, and compression/transverse/splitting tests on concrete

» Superior hydraulics: Oil flow (max 3.2 l/min) control by servo-controlled proportional valve for high throughput of accurate tests.

» Rugged high stiffness four column frame with large vertical clearance suitable for tension and compression tests

» Complete range from 1000 kN up to 2000 kN capacity

» Front open crosshead for easy insertion of tensile specimens. The jaws and grips can be easily removed by just pulling from the front. Jaws are operated by dedicated push button panel

» Load measurement by high precision load cell, providing high accuracy from the very beginning of load scale.

» Full range of accessories available to perform various tests

» PC controlled for completely automatic test execution

» Software packages included to perform a wide range of tests on steel, concrete and other construction material.

» Second frame control may be used to connect concrete compression up to 5000 kN capacity or flexural frame

» Second frame can also be used for the determination of Modulus of Elasticity of concrete with the dedicated software package

HPU Power and Control Console

It features space-saving ergonomic design with small footprint housing the hydraulic power unit, the electronic system and the PC, allowing the control of all functions, including load application and jaws opening/clamping.

Hardware

- 131.000 points effective resolution
- Control frequency 250 Hz
- Sampling rate 500 Hz
- Closed-loop P.I.D.control
- 6 channels (one dedicated to crosshead displacement) to measure elongation/displacement/strain with potentiometric, conditioned LVDT and magnetostrictive transducers
- 4 channels for strain measurements with strain gauges
- 2 channels for load sensors: load cell and load cell/pressure transducer of possible second frame
- Simple multi-sensors connection and calibration file selection
- Digital linearization of the calibration curve. (multi-coefficient)

Hydraulics

- Dual stage pump: centrifugal low pressure for fast approach (max. flow rate 9 l/min) automatically switching to radial multi- piston high pressure (max. flow rate 3.2 l/min) for loading
- Oil flow control by servo-controlled proportional valve
- AC motor 3000 W
- Maximum working pressure 700 bar
- Oil temperature controlled by air cooling system
- Console cabinet lined with soundproofing material for operator's comfort.
- Tank capacity: 30 liters

Upgrading options

70-T10/2F

Hydraulic valve system to control a second frame. To be specified at time of order. Frame selection via software.

Software

See page 311

Accessories

See page 312

Extensometers

See page 315

Model	HPT-1000	HPT-1200 HPT-1500	HPT-2000
Code	**70-T10H02[2]**	**70-T12H02[2]** **70-T15H02[2]**	**70-T20H02[2]**
Capacity	1000 kN	1200 kN 1500 kN	2000 kN
Set of grips for rounds up to 50 mm dia., mm	8 to 18 12 to 30 25 to 38 38 to 50	8 to 18 12 to 30 25 to 38 38 to 50	8 to 18 12 to 30 30 to 42 42 to 54 54 to 66
For flats, mm	0 to 20 x 90 20 to 40 x 90 40 to 60 x 90	0 to 15 x 100 15 to 30 x 100 30 to 45 x 100 45 to 60 x 100	0 to 18 x 100 18 to 36 x 100 36 to 54 x 100 54 to 72 x 100
Piston travel, mm	250	250	300
Max adjustable tensile daylight, mm	50-850	50-850	50-850
Max daylight between jaws, mm[1]	600	600	550
Max compression daylight (without accessories), mm	0-850	0-850	0-850
Horizontal daylight, mm	750	750	850
Maximum piston speed (no load condition), mm/min	190	100	100
Crosshead adjustable speed, mm/min	360 @ 50 Hz 430 @ 60 Hz	275 @ 50 Hz 330 @ 60 Hz	225 @ 50 Hz 275 @ 60 Hz
Load resolution, kN	0,01	0,02	0,02
Crosshead displacement resolution, mm	0,01	0,01	0,01
Machine class 1 range (EN ISO 7500-1)	10-1000 kN	12-1200 kN 15-1500 kN	20-2000 kN
Overall dimensions: Frame, l x d x h, m Console, l x d x h, m	 1,3 x 1,2 x 3,0/3,25 0,8 x 0,9 x 1,55	 1,5 x 1,5 x 3,25/3,5 0,8 x 0,9 x 1,55	 1,8 x 1,7 x 3,7/4,0 0,8 x 0,9 x 1,55
Weight approx.: Frame, kg Console, kg	 3700 180	 6000 180	 8000 180
Power supply[2]	380 V, 50 Hz, 3 Ph	380 V, 50 Hz, 3 Ph	380 V, 50 Hz, 3 Ph

[1] Max distance between grips to exploit the full piston travel
[2] Other voltages: For 380 V, 60 Hz, 3 ph, change the last number of the code from 2 to 3. For 220 V, 60 Hz, 3 ph, from 2 to 4

Universal testing machines

UTM HPT SERIES

AUTOMAX-T

1000 KN CAP., CONTROLLED BY THE AUTOMAX-T CONTROL CONSOLE

This model is controlled by the AUTOMAX-T control console featuring almost the same performances of the HPU 200 Series, but at a more affordable price thanks to the application of the AUTOMAX T technology. Supplied with PC, upper and lower hydraulically operated jaws, complete set of grips for rounds and flats, transverse test attachment and high precision load cell providing high accuracy from the very beginning of the load scale. Automatically performs steel tensile testing, compression, splitting tests, Elastic Modulus and Poisson's ratio determination on concrete specimens. PC and software enable remote control of the complete system. The frame is identical to the HPU 200 series. See page 308

AUTOMAX T Power and Control Console

It features space-saving ergonomic design with small footprint housing the hydraulic power unit, the electronic systm and the PC, allowing the control of all functions, including load application and jaws opening/clamping. The jaws are operated by a separate hydraulic system.

Hardware

- 131.000 points effective resolution
- Control frequency 250 Hz;
- Sampling rate 500 Hz;
- Closed-loop P.I.D.control
- 6 channels (one dedicated to crosshead displacement) to measure elongation/displacement/strain with Potentiometric, conditioned LVDT and magnetostrictive transducers
- 4 channels for strain measurements with strain gauges
- 1 channel for load cell
- Simple multi-sensors connection and calibration file selection
- Digital linearization of the calibration curve. (multi-coefficient)

MAIN FEATURES

» Rugged high stiffness four column frame with large vertical clearance suitable for tension and compression tests

» Front open crosshead for easy insertion of tensile specimens.
The jaws and grips can be easily removed by just pulling from the front.
The tensile jaws are operated by a separate Hydraulic Gripping System with dedicated a push-button panel.

» Load measurement by high precision load cell, providing high accuracy from the very beginning of load scale.

» Full range of accessories available to perform various tests

» PC controlled for completely automatic test execution

» Software packages included to perform a wide range of tests on steel, concrete and other construction material.

» Modulus of elasticity on concrete can be performed with the related software

Code	70-T10T02
Capacity	1000 kN
Set of grips for rounds up to 50 mm dia., mm	8 to 18 12 to 30 25 to 38 38 to 50
For flats, mm	0 to 20 x 90 20 to 40 x 90 40 to 60 x 90
Piston travel, mm	250
Max adjustable tensile daylight, mm	50-850
Max daylight between grippers, mm[1]	600
Max compression daylight (without accessories), mm	0-850
Horizontal daylight, mm	750
Maximum piston speed (no load condition), mm/min	55
Crosshead adjustable speed, mm/min	360 @ 50 Hz 430 @ 60 Hz
Load resolution, kN	0,01
Crosshead displacement resolution, mm	0,01
Machine class 1 range (EN ISO 7500-1)	10-1000 kN
Overall dimensions: Frame, l x d x h, m Console, l x d x h, m	1,3 x 1,20 x 3,0/3,25 0,8 x 0,9 x 1,55
Weight approx.: Frame, kg Console, kg	3700 180
Power supply[2]	380 V, 50 Hz, 3 Ph

[1] *Max distance between grips to exploit the full piston travel*
[2] *Other voltages: For 220 V, 60 Hz, 3 ph, from 2 to 4*

Hydraulics

- Dual stage pump: centrifugal low pressure for fast approach (max. flow rate 2.5 l/min) automatically switching to radial multi- piston high pressure (max. flow rate 0.9 l/min) for loading
- DC motor 1100 W
- Maximum working pressure 700 bar
- Flow sharing technology to perform loading and unloading cycles
- ES Energy saving technology to control the oil flow by regulating the DC motor speed
- Efficient noise reduction cabinet
- Oil tank capacity 9 l

Software
See page 311

Extensometers
See page 315

Accessories
See page 312

PC SOFTWARE

HPU-200 and AUTOMAX-T Universal testers are supplied complete with user interface environment allowing:

- Remote control of the complete system for automatic test execution graphical and numerical management of results
- Storage of single and multiple tests
- Printing of customized test reports for both single and multiple tests
- Real time and deferred management of tests data and results, either in numeric or in graphic format
- Language selection (Latin characters only)
- Units selection

The following Software packages are also included in the system:

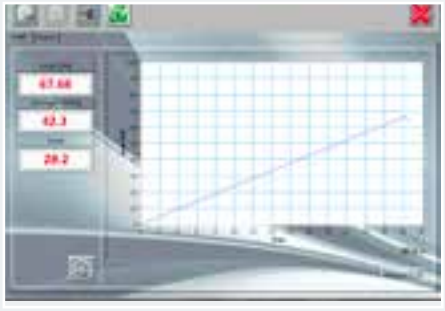
DATAMANAGER Software for compression, flexure and indirect tensile test on concrete, cement specimens and other construction materials allowing:

- Real time monitoring of test data and stress/time graph
- Automatic load detection failure and storage
- Cement testing to EN 196-1 guided test procedure
- Saving of batch file with automatic calculation of average and standard deviation.

UTS Software specifically designed for tensile testing under load/stress control and crosshead separation control (by using the displacement transducer supplied with the machine), allowing:

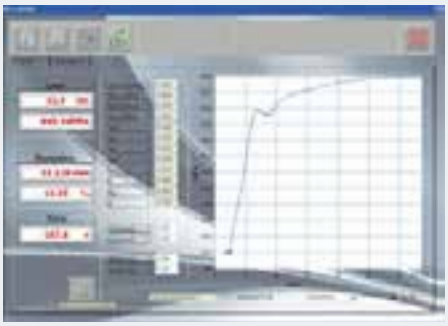
- Simultaneous display of stress/time, stress/elongation %, elongation/time and stress/elongation;
- Possibility to overlap two elongation/stress graphs: one obtained with the included displacement transducer measuring crosshead separation travel and the other obtained with an optional extensometer (coaxial or universal);
- Elaboration of tension test results: ReH, ReL or Rp (calculated at three different elongation percentages selectable by the user), A, Ag, At, Agt, Ae, Rt, Z, elastic modulus E, etc, conforming to EN ISO 6892-1 and EN 15630-1 for steel rebars.

Calibration menu



Compression test execution

Test data input



Tensile test execution

The following Software package is available as option:

82-SW/EM E-MODULE Software (optional)
for Poisson ratio and Elastic Modulus determination on concrete specimens allowing:

- Free unlimited programmable load/stress cycles to fulfil any kind of test procedure
- Real time monitoring of test data, stress/time, stress/axial strain, stress/lateral strain graphs
- Automatic verification of sample centering and sensors functionality, as per Standard requirements
- Automatic calculation of Initial and Final secant Elastic Modulus values

For HPU 200 control console, the above software package is available as option (code **82-SW/EM**) only when upgrading the machine with the hydraulic system for a second frame connection (see **70-T10/2F**).

For AUTOMAX-T control console, the above software package is available as option (code **82-SW/EM**).

UTM HPT

Accessories (Steel)

Electronic coaxial extensometers

See page 315

Universal extensometers

See page 315

Test accessory for big rounds

70-T10/2
Set of inserts for rounds dia. 50-60 mm (4 Pcs). Suitable for 70-T10H0x and 70-T10T0x models.

70-T15/2
Set of inserts for rounds dia. 50-60 mm (4 Pcs). Suitable for 70-T12H0x and 70-T15H0x models.

70-T20/2
Set of inserts for rounds dia. 66-78 mm (4 Pcs). Suitable for 70-T20H0x model.

Small and big diameter shear test accessory

70-T10/SH
Small and big shear test attachments including:
- Small double shear test with 5 sets of bushes for shear test of 5, 8, 12, 16 and 20 mm dia.
- Big double shear test with 5 sets of bushes for shear test of 25, 30, 35 and 40 mm dia.

Bend and re-bend test accessory

STANDARD
▸ ASTM A615 ▸ EN 10080

70-T10/BEN
Bend and Rebend Test attachment for bar up to 40 mm dia. Loading elements not included (to be ordered separately according to the specimen sizes).

70-T10/50
Loading element dia. 50 mm

Note: *For all loading elements to complete the accessory, from 16 to 320 mm dia. please visit our web site.*

Bare attachments

The bare test attachments are useful for wire ropes testing, shouldered and threaded specimens testing and nuts and bolts testing. See table for the selection of the correct code.

70-T10/BA
Bare attachment, suitable for 70-T10H0x and 70-T10T0x models

70- T15/BA
Bare attachment, suitable for 70-T12H0x and 70-T15H0x

70-T20/BA
Bare attachment, suitable for 70-T20H0x

70-T10/BA1
Bare attachment for Nut and Bolt test, suitable for 70-T10H0x and 70-T10T0x models

70- T15/BA1
Bare attachment for Nut and Bolt test, suitable for 70-T12H0x and 70-T15H0x

70-T20/BA1
Bare attachment for Nut and Bolt test, suitable for 70-T20H0x

Wire rope test accessory

STANDARD
▸ ISO 3108 ▸ ASTM A1023

70-T10/WRA
Wire rope tensile test attachment for wire ropes up to 10 mm dia. To be used with 70-T10/BA attachment.

Shouldered and Threaded specimens test accessory

STANDARD
▸ ASTM E8

Shouldered and Threaded specimens test attachment including:
- 1 Set of 2 split bushes with springs for dia. 20 and 22 mm shouldered specimen
- 1 Set of 3 threaded bushes for M12, M16 and M20 threaded specimen

70-T10/SAT
Shouldered and Threaded specimens test accessory. To be used with 70-Txx/BA attachment (see Table).

Nut and Bolt test accessory

STANDARD
▸ ASTM F606 ▸ ISO 898-1

70-T10/NAB
Nut and bolt test accessory for specimens from M6 to M33 (13 pcs) with standard pitches. Max bolt length 250mm or as per standard.
To be used with 70-Txx/BA1 attachment (see Table).

70-T20/NAB
Nut and bolt test accessory for specimens from M6 to M64 (18 pcs) with standard pitches. Max bolt as per standard.
To be used with 70-T20/BA1 attachment (see Table).

Accessory for electro-welded screen

70-C0901/20
Test accessory for electro-welded steel screen. Used with the standard grips for flat specimens.

Ordering table

Cap.	1000 kN	1200/1500 kN	2000 kN
Machine/ Test method	70-T10H0x 70-T10T0X	70-T12H0x 70-T15H0X	70-T20H0x
Wire ropes	70-T10/BA + 70-T10/WRA	-	-
Shouldered and Threaded specimens	70-T10/BA + 70-T10/SAT	70-T15/BA + 70-T10/SAT	70-T20/BA + 70-T10/SAT
Nuts and bolts	70-T10/BA1 + 70-T10/NAB	70-T15/BA1 + 70-T10/NAB	70-T20/BA1 + 70-T20/NAB

UTM HPT

Accessories (Concrete)

Compression test accessory

70-T10/CC
Set of compression platens 216 mm dia., with spherical seats, for compression tests on concrete cubes up to 150 mm and cylinders up to dia. 160 x 320 mm.

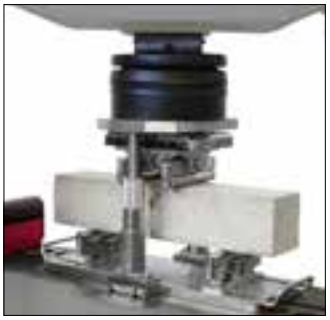
Elastic modulus test with compressometer (82-C0222/G) and compression test accessory. See page 208

Elastic modulus test with strain gauges and compression test accessory. See page 209

Flexural device for concrete beams

STANDARD
- EN 12390-5
- ASTM C78
- ASTM C293

50-C9010/C
Flexural test device for concrete beams 100x100x400/500 and 150x150x600/750 mm



For more details see page 201

Splitting tensile test devices for cubes, cylinders and block pavers

STANDARD
- EN 1338
- EN 12390-6
- ASTM C496

50-C9000/C
Splitting tensile test device for cylinders up to dia. 160x320 mm (6.3"x12.6").

50-C9000/A
Splitting tensile test device for cylinders dia. 250x500 mm (9.8"x19.7").

50-C9070/C
Splitting tensile test device for concrete block pavers and concrete cubes.

For more details see page 200

Compression devices for cement and mortars

STANDARD
- EN 196-1
- ASTM C109

50-C9030
Compression device to test portions of 40x40x160 prisms broken in flexure to EN 196-1.
Total height 195mm.

50-C9032
Compression device to test 50 mm and 2" mortar cubes to ASTM C109
Total height 195mm.

For more details see page 201

Universal automatic computerized 1000/2000 kN cap., for steel tensile and concrete compression tests

The ideal solution to suit the requirements of central and commercial laboratories of the construction industry and civil engineering in general

MAIN FEATURES

» 1000 kN capacity in tension and 2000 kN in compression

» Completely automatic test cycle at a press of a button up to the printout of the test certificate

» Strain gauge load cell incorporated in the piston, providing accurate load measurement

» Rapid vertical displacement of mobile frame by remote control

» Hydraulic gripping system controlled by remote control

» Three sets of grippers for round re-bars up to 40 mm dia. and flats up to 70x35 mm. Also suitable to test strends.

» Front loading of specimens for quick and easy operation

» Display of stress/strain diagram in real time

» Printout of stress/strain diagram and test results

» Optional second frame facility to control an additional frame up to 5000 kN capacity for concrete testing

To get more info visit
www.controls-group.com
or link directly to the QRCode

Extensometers

Universal extensometers

Used to measure the elongation of steel rebars and and flat steel specimens, they are available in two versions: 70-C0953 Mechanical and 70-C0954/C Electronic
They have to be removed before sample failure. Supplied in a carrying case.

- Linearity: better than ±1% (Electronic version)
- Maximum travel: 10 mm
- Weight: 1 kg (approx.) (both models)

70-C0953/C
Standard mechanical extensometer, dial gauge 10 x 0.01 mm, measuring base 50 to 200 mm. Complete with case.

70-C0953/C

70-C0954/C1
Standard electronic extensometer, measuring base 50 to 200 mm. Complete with case.

70-C0954/C1

Accessories

70-C0954/C5
Extension for electronic extensometer 70-C0954/C1, to extend the measuring base to 600 mm.

Note *Extensometers can also be supplied complete with traceable calibration certificate when purchased along with the tensile machine. In this case add to the code a final "C". Examples: 70-C0954/C1C, 70-C0961/EC, 70-C0961/HC, 70-C0961/GC.*

Coaxial extensometers

Introduction

Most extensometers used for measuring the extension of specimens in traction, particularly in the case of steel strands and brittle materials, are only able to detect strain during the first stage of the test (while the brittle materials still have their elasticity) and have to be disconnected before failure.

These simple and economic versions exceed these limitations because:

-they are applied directly to the specimen
-they remain connected until steel failure
-they measure steel elongation with high precision of both elastic and plastic stage
-It is not necessary to mark the test piece
-Also available for strands (see model 70-C0961/E)

70-C0961/G

The extensometers are basically made from two separate aluminium tubular sections, joined telescopically to one another. The middle section determines the measuring base which is fixed to 200 mm for rebars testing and to 600 mm for strands testing. On the two ends there are the mechanisms for specimen clamping, one carries the displacement transducer, the other the reference plate.

Models	70-C0961/E For Strands	70-C0961/H	C0961/G
Measuring range Dia min/max mm	6.35/15.2	4/26	16/40
Measuring base	600	200	200
Transducer travel	75	50	75
Weight approx. kg	3	3	4

70-C0961/E

Marking off machine

70-C0980/M
This simple and useful machine is used to mark off steel specimens before tensile testing. It is operated by rotating the handle. The carriage holding the specimen moves laterally by 5, 10 or 20 mm steps and the tool marks off the specimen at the desired intervals.
Overall dimensions: 600 x 300 x 360 mm (approx.)
Weight: 40 kg (approx.)

70-C0980/M

Cut off machine

70-C0974
Used to cut the steel specimens to a suitable length for tensile testing. The cutting blade is not part of the machine and has to be ordered separately. (See 70-C0974/1).
Power: 750 W
Max. blade dimaeter: 225 mm
Overall dimensions: 660x570x600mm
Weight: 32 kg (approx.)
230V, 50 Hz, 1 Ph

70-C0974/1
Cutting blade 225 mm dia. Weight

Cold bend-testing machine

STANDARD

▸ EN ISO 15630-1 ▸ EN ISO 7438 ▸ ASTM A615

This machine is used for bending and straightening steel reinforcing bars and can perform two types of test:

-Bending the specimen through 90° and then straightening it again up to a minimum of 20°.
-Bending through 180°

The machine consists of a hydraulic jack with a cylindrical mandrel-stem, mounted horizontally within a strong steel frame which also holds two fixed reaction rollers. Two 50 and 100 mm diameter rollers are supplied with the machine but mandrels and mandrel holders have to be ordered separately. (Mandrels larger than 96 mm diameter do not need mandrel holders because they fit directly onto the stem.)

ASTM specifications require 100 mm diameter rollers only and bending only up to 90°.

Technical specifications

- Maximum loading capacity: 120 kN
- Maximum piston travel speed: 90 mm/min
- Power: 750 W
- Dimensions: 1500 x 665 x 1050 mm
- Weight: 210 kg (approx.)

70-C0977

Detail of bending

Detail of straightening

Ordering information

70-C0977
Cold bend testing machine, 120 kN capacity. 230 V, 50 Hz, 1 ph.

Accessories

Mandrel holders

70-C0977/61
Mandrel holder for mandrels from 24 to 50 mm diameter.

70-C0977/62
Mandrel holder for mandrels from 54 to 96 mm diameter.

MANDRELS

Mandrels conforming to EN ISO 15630-1

Mandrel product code	Mandrel diameter (mm)	Re-bar diameter (mm)	Mandrel holder product code
70-C0977/16	24	4 - 6	
70-C0977/19	32	7	70-C0977/61
70-C0977/21	40	8	
70-C0977/27	56	10	
70-C0977/29	64	12	70-C0977/62
70-C0977/33	96	14	
70-C0977/37	112	16	
70-C0977/39	128	18	
70-C0977/40	132	20	
70-C0977/41	140	22	
70-C0977/46	180	24 - 26	Not necessary
70-C0977/47	200	28	
70-C0977/49	224	30 - 32	
70-C0977/54	320	34 - 38	
70-C0977/55	336	40	

Mandrels conforming to ASTM A615 & A615M

Mandrel product code	Mandrel diameter (mm)	Re-bar diameter (mm (in.))	Mandrel holder product code
70-C0977/19	32	9.5 (3)	70-C0977/61
70-C0977/23	44	12.7 (4)	
70-C0977/27	56	15. 9 (5)	70-C0977/62
70-C0977/33	96	19.0 (6)	
70-C0977/37	112	22.2 (7)	
70-C0977/39	128	25.4 (8)	
70-C0977/47	200	28.7 (9)	Not necessary
70-C0977/49	224	32.2 (10)	
70-C0977/50	250	35.8 (11)	

Mandrels conforming to Italian D.M. January 14th, 2008			
Mandrel product code	**Mandrel diameter (mm)**	**Re-bar diameter (mm)**	**Mandrel holder product code**
70-C0977/16	24	6	70-C0977/61
70-C0977/19	32	8	
70-C0977/21	40	10	
70-C0977/24	48	12	70-C0977/62
70-C0977/28	60	12	
70-C0977/30A	70	14	
70-C0977/31A	80	16	
70-C0977/42	144	18	Not necessary
70-C0977/44	160	20	
70-C0977/45	176	22	
70-C0977/46A	192	24	
70-C0977/47	200	25	
70-C0977/50A	260	26	
70-C0977/52	280	28	
70-C0977/54	320	32	
70-C0977/55A	340	34	
70-C0977/55B	360	36	
70-C0977/56A	400	40	

Flexure test on clay block portions

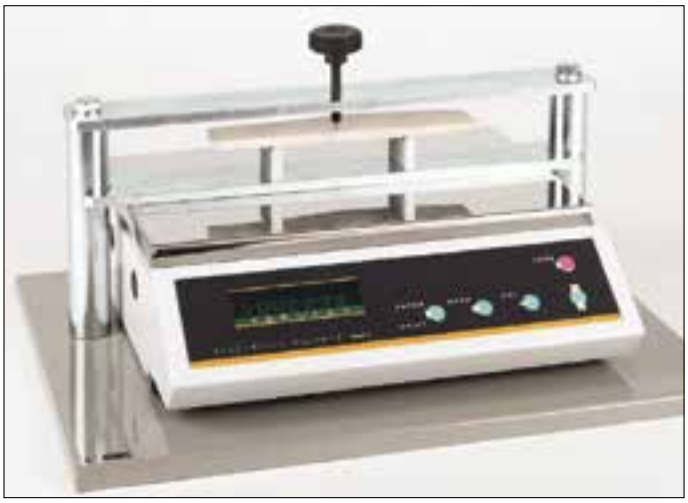
STANDARD

▸ UNI 8942-3 ▸ UNI 9730

FLEXURE TESTING DEVICE FOR CLAY PORTIONS

70-C0002/A

This device is used to perform flexure tests on strips obtained from the internal walls of clay blocks.
It consists of a top loading digital balance, 20 kg capacity with 0.1 g resolution, fitted with a flexure device.
The load is applied by rotating a knob and is read directly on the balance display which retains the value of the load failure.
Weight: 15 kg (approx.)



70-C0002

UNIFRAME

Electromechanical Universal Testers, 50 and 100 kN capacity suitable for any kind of test that requires load and/or displacement control.

They are proposed in different versions, all suitable for compression and flexural tests, plus some individual feature as specified:

70-T1082
Standard series, 50 kN cap.

70-T1082 with CBR accessories

COMMON FEATURES

- Stand-alone automatic digital load frame
- Automatic failure detection
- Universal machine suitable for a wide range of tests. See page 320
- Closed-loop displacement/load control
- Four onboard channels for data acquisition
- CBR and Marshall test automatic execution
- Infinitely variable speed from 0.5 to 51 mm/min
- Large touchscreen display for displaying real-time graph and test data
- Rapid approach and return functions ensure time saving

These models feature a robust and compact two-column frame which is fitted with an upper crossbeam that can be set at various heights depending on the accessories to be used. The jack is driven by a DC motor controlled by the microprocessor.

The load jack, DC motor and controls are housed in the ergonomic base cabinet, the front panel of which is fitted with an emergency button for prompt stopping of the machine, conforming to CE requirements

Closed-loop control ensures reliable test execution both with displacement and load applications. No external transducer is required for displacement measurement. Sample failure is detected automatically and stops the test. Alternatively, this feature can be disabled and a travel, load or time limits can be set instead.

The user-interface is a large graphic touch-screen display allowing the setting of test speed, test data, real time display of test graph and saving of pre-set test procedures (up to 10 profiles can be saved in the internal memory of the machine). The firmware allows performance of up to four transducer calibrations (two load cells and two potentiometric linear transducers), saving data onboard.

Test data can be stored on a USB pen drive or downloaded through a LAN communication port in Controls, txt or ASCII format.

All accessories have to be ordered separately (see page 320).

Technical specifications

Models 70-	T1082	T1182	T1182/T	T1192
Capacity kN	50	50	25/50	100
Testing speed range:	0.5 to 51 mm/min			
Load rate:	1 to 1000 N/s			
Type of control:	Displacement and load			
Max speed approach	40 mm/min			
Max ram travel:	100 mm			
Max vertical span, mm	730	800	800	1040
Horizontal span, mm	270	380	380	456
Overall dimensions (w x d x h), mm	392x 495x 1213	500x 570x 1300	500x 570x 1300	600x 520x 1830
Weight approx., kg	65	110	130	165

LOAD CELLS

UNIFRAME testers can be fitted with the following load cells, depending on the test to be performed. See page 412

82-P0370
Load cell 2.5 kN capacity

82-P0373
Load cell 10 kN capacity

82-P0374
Load cell 25 kN capacity

82-P0375
Load cell 50 kN capacity

82-P0376
Load cell 100 kN capacity

70-T1182
Large series, 50 kN cap.
Suitable for tests requiring up to 380 mm distance between columns

70-T1182 with accessories to perform the Marshall test

70-T1182 with accessories for flexural test on cement prism

70-T1182/T
25 kN cap. in tension and 50 kN cap. in compression/flexural tests

70-T1182/T with accessories for tensile test on steel wires

70-T1192
Standard series, 100 kN cap.

70-T1192 with accessories to perform flexure test on glass-fibre reinforced cement to EN 1170-5

Ordering information

70-T1082
UNIFRAME bench stand-alone automatic compression tester, 50 kN capacity, 4 channel built-in data acquisition for load/displacement-controlled testing. 230 V, 50-60 Hz, 1 ph

70-T1084
as above but 110 V, 60 Hz, 1 ph

70-T1182
UNIFRAME stand-alone automatic compression tester, 50 kN capacity, 4 channel built-in data acquisition for load/displacement-controlled testing. 230 V, 50-60 Hz, 1 ph

70-T1184
As above but 110 V, 60 Hz, 1 ph

70-T1182/T
UNIFRAME stand-alone automatic tension/compression tester, 25/50 kN capacity, 4 channel built-in data acquisition for load/displacement-controlled testing. 230 V, 50-60 Hz, 1 ph

70-T1184/T
As above but 110 V, 60 Hz, 1 ph

70-T1192
UNIFRAME stand-alone automatic compression tester, 100 kN capacity, 4 channel built-in data acquisition for load/displacement-controlled testing. 230 V, 50-60 Hz, 1 ph

70-T1194
Same as above but 110 V, 60 Hz, 1 ph

PC Software

70-SW/CMU
Software for Marshall, CBR, Indirect Tensile, Compression, flexure tests

Accessories

See page 320

The UNIFRAME series also include:
70-T2502 UNIFRAME 250, 250 kN capacity, suitable for tension, compression and flexural tests (see page 322)

70-T0108/MINI UNIFRAME-MINI, 250 N capacity, particularly suitable for transverse deformation testing. See page 284

UNIFRAME accessories

UNIFRAME testers are suitable for a wide range of tests on different kinds of materials. Each test requires different accessories depending on the type of test and the reference Standard. A selection of tests and their relevant accessories are listed below.

ROAD BASE AND SOIL MECHANICS

All tests are performed under displacement control.

CBR

STANDARD

▸ EN 13286-47 ▸ ASTM D1883
▸ AASHTO T193 ▸ BS 1377:4
▸ NF P94-078 ▸ UNI CNR 10009

34-V0107/CBR
Test set for performing CBR tests in digital mode, comprising:
82-P0375 Load cell, 50kN capacity
82-P0375/C Adapter to fit load cell (two pieces)
82-P0322 Displacement transducer, 25mm travel
34-T0104/81 Adjustable transducer holder
34-T0103/1 Adjustable CBR penetration piston

Unconfined compression

STANDARD

▸ ASTM D2166 ▸ AASHTO T208
▸ BS 1377:7

Accessories

82-P0370 Load cell, 2.5kN capacity
82-P0373 Load cell, 10 kN capacity (as alternative)
82-P0375/C Adapter to fit load cell
82-P0322 Displacement transdducer, 25mm travel
34-T0104/81 Adjustable transducer holder
70-T0108/5 Load cell extension
34-T0104/4 Platens for unconfined compression

Uniaxial compression

STANDARD

▸ ASTM D1633

Accessories

82-P0370 Load cell, 2.5 kN capacity
82-P0373 Load cell, 10 kN capacity (as alternative)
82-P0375/C Adapter to fit load cell (two pieces)
70-T0108/5 Load cell extension
34-T0104/3 Compression platens with spherical seat

Quick triaxial

STANDARD

▸ ASTM D2850 ▸ BS 1377:7

Accessories

28-WF0370/T
Load cell, 3.5 kN capacity
28-WF0373/T Load cell, 10 kN capacity (as alternative)
28-WF6208 Displacement transducer, 25 mm travel

For triaxial cells and related accessories see page 71 and 79

Flexural test on Soil-cement specimens

STANDARD

▸ ASTM D1635

Accessories

82-P0370 Load cell, 2.5 kN capacity
82-P0373 Load cell, 10 kN capacity (as alternative)
70-T0108/5 Load cell extension
70-T0108/7 Flexure testing device for soil-cement specimens

ASPHALT

All tests are performed under displacement control.

Marshall

STANDARD

▸ EN 12697-34 ▸ ASTM D1559
▸ ASTM D5581 ▸ ASTM 6927-06
▸ AASHTO T245 ▸ BS 598-107
▸ NF P98-0251-2 ▸ DIN 1996
▸ CNR 30

34-V0107/MAR
Test set for performing Marshall tests in digital mode, comprising:
82-P0375 Load cell, 50kN capacity
82-P0375/C Adapter to fit load cell (two pieces)
82-P0322 Displacement transducer, 25mm travel
34-T0104/81 Adjustable transducer **holder**
34-T0104/13 Compression device extension
34-T0104/10 Compression device
76-B0033/4 Stability mould for dia. 4" (100 mm) specimens [1]

CBR and Marshall

(To avoid duplications when both tests must be performed)

34-V0107/CM
Test set for performing CBR and Marshall tests in digital mode, comprising:
82-P0375 Load cell, 50kN capacity
82-P0375/C Adapter to fit load cell (two pieces)
82-P0322 Displacement transducer, 25mm travel
34-T0104/81 Adjustable transducer holder
34-T0103/1 Adjustable CBR penetration piston
34-T0104/13 Compression device extension
34-T0104/10 Compression device
76-B0033/4 Stability mould for dia. 4" (100 mm) specimens [1]

[1] For 6" (150 mm) sample ask for the 76-B0033/6

Indirect tensile on bituminous mixtures

STANDARD

EN 12697-12 ▸ EN 12697-23
ASTM D6931 ▸ AASHTO T283
ASTM D8225

Accessories

82-P0375 Load cell, 50kN capacity
82-P0375/C Adapter to fit load cell (two pieces)
82-P0322 Displacement transducer 25mm travel
34-T0104/81 Adjustable transducer holder
34-T0104/13 Compression device extension
34-T0104/10 Compression device
76-B0078/F Frame for tensile splitting device
76-B0078/F1 Pair of loading strips for 100 mm dia. sample
76-B0078/F2 Pair of loading strips for 150 mm dia. sample
76-B0078/F3 Pair of loading strips for 160 mm dia. sample

Interlayer bonding / Shear bond test (Leutner test)

STANDARD

EN 12697-48

82-P0375 Load cell 50 kN capacity
82-P0375/C Adapter to fit load cell (two pieces)
82-P0322 Displacement transducer, 25mm travel
34-T0104/81 Adjustable transducer holder
34-T0104/13 Compression device extension
34-T0104/10 Compression device
76-B0033/E Shear bond test apparatus, 150mm
76-B0033/E1 Adapter to test 100mm dia. samples with shear bond test apparatus 76-B0033/E

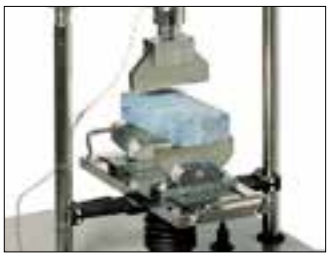
ROCKS

All tests are performed under load rate control

Modulus of rupture of natural building stones

STANDARD

ASTM C880 ▸ ASTM C99
ASTM C120 ▸ EN 12372



Accessories

82-P0375 Load cell, 50kN capacity
82-P0375/C Adapter to fit load cell (two pieces)
70-T1180/3A Flexure testing device. Consisting of a lower beam with two adjustable (from 50 mm to 500 mm) bearing rollers and a ball seating upper beam with two adjustable (from 50 mm to 200 mm) loading rollers, one of each can be removed and placed in the middle for centre point testing.
Rollers: dia. 25 x 160 mm, rocker type (except one which is fixed).

Note: *load cells with small capacities may be more suitable for low strength materials. 82-P0370, 2.5 kN model is available and can be used instead of 82-P0375.*

Splitting tensile test of intact core specimens

STANDARD

ASTM D3967 ▸ ISRM

Accessories

82-P0375 Load cell, 50kN capacity
82-P0375/C Adapter to fit load cell (two pieces)
34-T0104/10 Loading rod
50-C9032/H Compression/splitting Device
Or, alternatively:
32-D9032/NX Compression device for indirect tensile test on rock specimens NX type (dia. 54.74 mm). Conforming to ISRM specifications.

CEMENT, CONCRETE AND MASONRY BUILDING UNITS

All tests are performed under load rate control

Flexural test on mortar prisms 40x40x160 mm

STANDARD

EN 196-1 ▸ ASTM C348

Accessories

82-P0375 Load cell, 50kN capacity
82-P0375/C Adapter to fit load cell (two pieces)
34-T0104/10 Loading rod
65-L0019/B EN flexure testing device for mortar prisms
Or, alternatively:
65-L0019/C ASTM Flexure testing device for mortar prisms

Compression on low strength mortar mixes

STANDARD

EN 196-1 ▸ ASTM C109

Accessories

82-P0375 Load cell, 50kN capacity
82-P0375/C Adapter to fit load cell (two pieces)
34-T0104/10 Loading rod
50-C9030 EN Compression device to test portions of 40x40x160 mm mortar prism broken in flexure.
Or, alternatively:
50-C9032 ASTM Compression device for mortar cubes

Tensile test of cement briquettes

Accessories

82-P0375 Load cell, 50kN capacity
82-P0375/C Adapter to fit load cell (two pieces)
65-L0015/6 Tensile testing attachment for cement briquette specimens.

Flexural tests on concrete beams, concrete and clay tiles

STANDARD

EN 12390-5 ▸ EN 491 ▸ EN 538
ASTM C78 ▸ ASTM C293
BS 1881:118 ▸ NF P18-407
UNE 83-305 ▸ UNI 6133

Accessories

82-P0375 - Load cell, 50kN capacity
82-P0375/C – Adapter to fit load cell (two pieces)
70-T1180/1A – Flexure testing device. Consisting of a lower beam with two adjustable (from 60 mm to 500 mm) bearing rollers and un upper loading roller for centre point testing.
Rollers: dia.30 x 210 mm, rocker type (except one which is fixed).

Note: *for concrete and clay tiles testing wooden bearers, conforming to the shape of tiles, shall be provided by the users. Bearers with increased length available on request*

Punching and bending test on clay and concrete blocks for flooring

STANDARD

UNI 9730-3 ▸ EN 15037-2
EN 15037-3

Accessories

82-P0375 - Load cell, 50kN capacity
82-P0375/C - Adapter to fit load cell (two pieces)
70-T1180/6 - Punching and bending test device. Consisting of two adjustable bearing rollers (from 150 mm to 500 mm), an upper wooden puncher 50 x 50 mm and a central loading device having 20 mm width x 310 mm length. Rollers: dia. 20 x 310 mm, rocker type (except one which is fixed). Not suitable for model 70-T1082.

UNIFRAME250

Electromechanical Universal Tester 250 kN capacity, to perform tests under load/strain-elongation control

Suitable for:

Tensile tests conforming to EN and ASTM

Tests under displacement and strain control on FRC, FRP and Shotcrete

CBR and Marshall tests to EN and ASTM

Duriez tests conforming to EN and NF

Compression tests on cement, mortar and other materials

Flexural and tension tests on various materials

Elastic modulus determination on mortar and cement

The machine consists of a robust two column high stiffness frame (200 kN/mm) with an upper crosshead and of a lower bi-directional crosshead driven by an electromechanical system with a single recirculating ball screw and powered by a brushless servomotor.

The machine features an advanced closed loop PID control system assuring very fast reaction time and extremely accurate test control, particularly important for FRC and FRP testing. The stress is measured by a load cell incorporated in the upper crosshead and the displacement by a high-resolution encoder.

The machine is fitted with two limit switches working at upper and lower full travel and two additional limit switches adjustable by the client in the desired position, according to the specific accessory in use. A remote push-button is used to quickly position the lower crosshead.

Standard outfit

The machine is supplied complete with:

- Load cell 250 kN capacity (up to three other cells of lower capacity for tests on low strength materials can be connected)
- All-in-one PC
- DATAMANAGER Software for compression, flexure and indirect tensile tests allowing remote control of the whole system

Tensile jaws, extensometers, compression platens and test accessories are not included and have to be ordered separately. See accessories.

MAIN FEATURES

» Brushless servomotor

» Advanced closed loop control system

» Very fast reaction time and accurate load regulation essential for FRC-FRP tests

» Load measurement by 250 kN high precision load cell

» Up to three other cells of lower capacity can be connected for tests on low strength materials

» Extended range of accessories to perform all tests listed above and other special tests on requests

Technical specifications

- Maximum load (compression), kN: 250
- Maximum load (tension), kN:150
- Max. vertical clearance, without access., mm: 930
- Distance between columns, mm: 650
- Crosshead travel, mm: 400
- Crosshead displacement resolution, mm: 0.001
- Test speed range, mm/min: 0.0001 to 175 (105 at full load)
- Load rate range, N/sec:1 to 9999
- Power, kW: 1
- Overall dimensions (hxlxd), mm: 2100 x 960 x 800
- Weight approx., kg: 600

Hardware

- 131.000 points effective resolution
- High frequency closed-loop P.I.D. control
- Control frequency 500 Hz
- Sampling rate 500 Hz
- 4 channels for load sensors (pressure transducers and load cells)
- 6 channels to measure strain values with transducers (LVDT, magnetostrictive, potentiometric)
- 4 channels for strain measurement with strain gauges
- High resolution encoder (0.001 mm)
- Memorization of the calibration curve enables sensors to be connected and used immediately
- Digital linearization of the calibration curve (multi-coefficient)

Ordering information

70-T2502
UNIFRAME 250, Electromechanical Universal tester 250 kN cap.
230 V, 50-60 Hz, 1 ph.

70-T2504
Same as above but 110 V, 60 Hz, 1 ph

Accessories

See next page

PC Software packages

70-T2502/EM
Software for the determination of the Modulus of Elasticity

82-T2502/CMU
Software for Marshall, CBR, Indirect Tensile, SCB, Duriez and Custom tests

70-T2502/DC
Software for testing FRC and Shotcrete

82-T2502/UTS
Software for steel tensile testing conforming to ASTM, EN and ISO standards

Accessories

STEEL TENSILE TESTING

70-T2502/H Upper and lower tensile heads to be completed with grips for rounds and/or flat specimens 70-T2502/Gx

70-T2502/G1 Grips for round specimens 7 to 14 mm dia.

70-T2502/G3 Grips for flat specimens 0 to 8 mm.

70-T2502/G4 Grips for flat specimens 8 to 15 mm.

Coaxial extensometers (see page 315)
Universal extensometers (see page 315)

82-T2502/UTS Software for steel tensile testing conforming to ASTM, EN and ISO standards

COMPRESSION TESTS

70-T2502/2 Compression platens dia.165 mm complete with spherical seat

CONCRETE FLEXURE TESTS

70-T2502/FL Lower support beam for flexural bearers. Rollers not included.

50-C1500/1 Rollers dia. 30 x210 mm for 4- and 3-points flexure tests.

Tests under displacement control
STANDARD
▸ ASTM C1609 ▸ EN 14488-3
Requires support beam and rollers (see above)

50-C1500/5 Auxiliary testing frame for the measurement of deflection of FRC beams (EN 14488-3, ASTM C1609)

82-P0331/C High accuracy displacement transducer 10 mm travel (2 pieces needed)

70-T2502/DC Software for testing FRC and Shotcrete

CMOD test
STANDARD ▸ EN 14651
Requires support beam and rollers (see above)

82-P0331/E High accuracy displacement transducer 10m travel (2 pieces needed)

70-T2502/DC Software for testing FRC and Shotcrete

ELASTIC MODULUS DETERMINATIONS

Elastic modulus on mortar and cement
STANDARD ▸ EN 13412

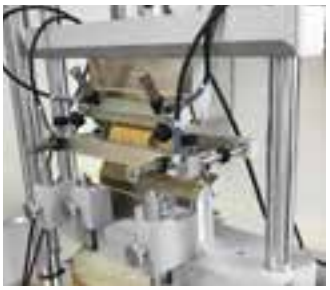
70-T2502/2 Compression platens dia.165 mm complete with spherical seat

70-T2502/EM Software for the determination of the Modulus of Elasticity

Compressometer-extensometers (see page 208)

Strain gauges (see page 209)

Elastic modulus on hydraulically-bound mixtures
STANDARD ▸ EN 13286-43



70-T2502/H Test accessory for elastic modulus determination by indirect tensile test. Two displacement transducers included.

70-T2502/K Software for the determination of the Modulus of Elasticity by indirect tensile test

ASPHALT TESTING

SCB - Semi-Circular Bend test
STANDARD
▸ EN 12697-44 ▸ ASTM D8044
▸ AASHTO TP124

34-T0104/10 Loading rod

Semi-Circular Bend Jigs (see page 370)

82-T2502/CMU Software for Marshall, CBR, Indirect Tensile, SCB, Duriez and Custom tests

Duriez compression test
STANDARD
▸ NF P98-251-1/4

70-T2502/2 Compression platens dia.165 mm complete with spherical seat

Test set for 80 mm and 165 mm dia. specimens (see page 344)

82-T2502/CMU Software for Marshall, CBR, Indirect Tensile, SCB, Duriez and Custom tests

Accessories for:

- Marshall
- CBR
- Indirect tensile on bituminous mixtures
- Unconfined compression
- Uniaxial compression
- Quick triaxial
- Flexural strength of soil-cement
- Splitting tensile rock testing
- Modulus of rupture of buiding stones
- Flexural strength of mortars
- Compression test on mortars
- Etc

The accessories are the same used with the other UNIFRAME testers.
See page 320
For more detailed information please visit our web site.