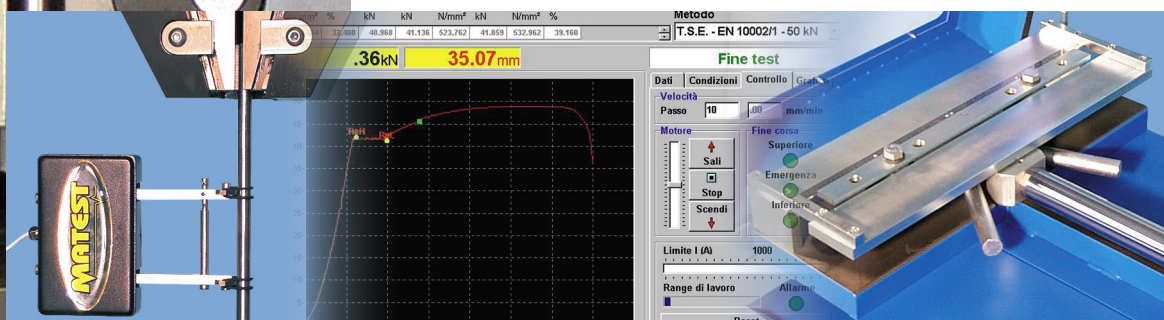


Section H STEEL

In this section Matest proposes a wide range of universal electromechanical and hydraulic machines to perform tensile, elongation, flexural, bending, resilience tests on metallic materials, with the possibility to extend these test applications on plastics, rubber, composed materials, wires, ropes, paper, textiles etc.

This range of machines satisfies both control tests on steel bars for reinforced concrete, and quality tests in the iron metallurgy, metals, plastics etc.



Index section

STEEL

	Mod.	Page		Mod.	Page
Accessories for electromechanical machines.....	H005-11/H008-44	217	Impact pendulum tester.....	H060	221
Bath, cooling for resilience tests.....	H052	223	License for tensile tests.....	H009	217
Bending machine.....	H065	224	Marking-off machines.....	H020	221
Bending test on metals, accessory.....	H003-12	213	Pendulum impact resilience tester.....	H060	221
Broaching machine.....	H057	221	Personal Computer for universal testing machines.....	H009-01	219
Charpy, pendulum impact tester.....	H060	221	Printer for universal testing machines.....	C128	219
Compression test on concrete, accessory.....	H003-21	213	Resilience test: pendulum impact tester.....	H060	221
Compression test on metals, accessory.....	H003-13	213	Software for on line support.....	H009-02	219
Cooling bath for resilience test.....	H052	223	Software for universal testing machines.....	H009	217
Cutting machine.....	C351	221	Tensile, universal testing machines.....	H003/H008	212/220
Dry-ice maker.....	H050	223	Universal electromechanical servocontrolled machines		
Electro-welded wire net test, accessory.....	H003-14	213	from 10kN to 600kN.....	H004/H008	214/220
Extensometers, electronic.....	H014	219/223	Universal hydraulic servocontrolled machine 600kN.....	H003	212
Flexure test on concrete, accessory.....	H003-22	213	Universal Tensile/Compression machine:		
Flexure test on metals, accessory.....	H003-11	213	500kN - 1500kN.....	H010	222
			Welded wire nets test.....	H003-14	213



H003

Universal hydraulic servo-controlled machine 600 kN capacity with computerized control system, to carry out static tensile tests on metallic materials

STANDARDS: EN 10002 - ASTM A370

It basically consists of:

- Strong loading frame with a reading cell built into the piston
- Hydraulic servo-controlled unit, for the data acquisition, control and processing. The whole is built in a console.

The frame is designed to carry out tensile tests using the grips placed in the clamping heads. In the upper part, between the head and traverse, it is possible to carry out flexion, compression, bending, hardness, dishing tests, according to the International Standards by using the suitable (see accessories) devices.

The hydraulic servocontrolled unit regulates the load rate by the Computer. An emergency device stops the machine in any moment as per the International Safety Standards.

A control pedal situated on the frame governs the movement of

the lower tensile head for an easier positioning of the specimen according to its length. The machine is supplied complete with loading frame, control console and bed frame, while the software (mod. H009, H009-02), the PC (mod. H009-01), the extensometer (mod. H014) the grips and the printer are options and must be ordered separately according to the needs of the user.

TECHNICAL FEATURES:

Capacity	600kN
Max. crosshead stroke	200 mm
Max. distance between the jaws	465 mm
Width flexion joke	190 mm
Max. distance between Flexion knives	1000 mm
Distance between Compression plates	235 mm
Load reading	Sensing by loading cell. Resolution 0,01% U.V.
Accuracy	Class I EN 10002/2 Only reading scale 1:1-1:20 U.V.
Stroke reading	Sensing by linear transducer Resolution 0,01 mm
Deformation reading	Sensing by electronic extensometer Resolution 0,001 mm
Accuracy	Class B 2 (B 1 for base up to 50 mm) ASTM E83
Needed height	3900 mm
Frame weight	2600 kg approx.
Rack dimensions	610x630xh.1600 mm
Power supply	400 V 3ph+Neutral+Earth 50 Hz 2 kW



H003 + H009-01

ACCESSORIES FOR MOD. H003:

ROUND AND FLAT GRIPS. One set consists of two double pairs that must be placed into the upper and lower tensile heads.

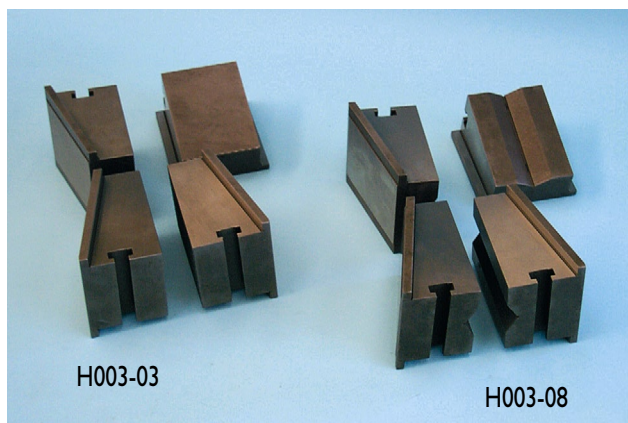
H003-03 Set of Grips for Flat specimens $2 \div 18$ mm and Round specimens dia $5 \div 12$ mm

H003-04 Set of Grips for Flat specimens $18 \div 36$ mm

H003-07 Set of Grips for Round specimens dia. $12 \div 24$ mm

H003-08 Set of Grips for Round specimens dia. $25 \div 40$ mm

C128 Graphic Printer A4 format, for the printing of the test Diagram or Certificate.



NOTE: for the software (H009 and H009-02), the PC (H009-01) and the extensometer (H014) see next pages.

ACCESSORIES FOR TESTS ON METALS:**H003-11 Flexure test**

STANDARD: UNI 559

The equipment is composed by a couple of lower bearers with adjustable supports and an upper blade.

Maximum load: 200 kN

Maximum distance between the lower bearers: 1000 mm

Width of the bearers: 120 mm

Diameter of the bearers: 50 mm

Weight: 70 Kg

**H003-12 Bending test**

STANDARDS: UNI 564 - ASTM E290

The equipment is composed by a couple of lower bearers with adjustable supports and an upper blade.

Maximum load: 200 kN

Maximum distance between the lower bearers: 1000 mm

Width of the bearers: 120 mm

Diameter of the bearers: 50 mm

Weight: 70 Kg

Note: bearers with different diameters are available on request.

H003-13 Compression test

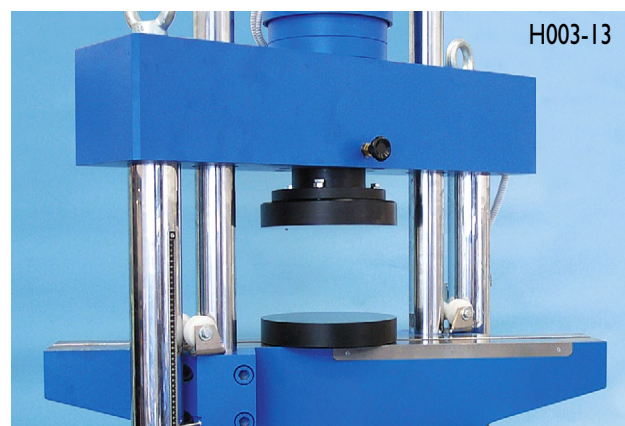
STANDARD: UNI 558

The equipment is composed by an upper plate with seat ball assembly and by a lower plate.

Maximum load: 600 kN

Diameter of the compression plates: 90 mm

Weight: 25 Kg

**H003-14 Test on electro welded wire nets**

Device for the seizing of electro welded wire nets; this equipment must be used with the grips for flat specimens.

Weight: 5 Kg

ACCESSORIES FOR TESTS ON CONCRETE:**H003-21****Compression test** on concrete specimens

The appliance is composed by:

An upper compression plate 287 mm. diameter complete with seat ball assembly. A lower compression plate 287 mm. diameter

Maximum distance between the compression plates: 185 mm.

Weight: 60 Kg

H003-22**Flexure test** on concrete beams with dimensions

100x100x400/500 mm. and 150x150x600/750 mm.

Composed by two lower and one upper bearers

Maximum load: 200 kN

Maximum distance between the lower bearers: 1000 mm.

Width of the bearers: 160 mm.

Weight: 40 Kg



Servo-controlled electromechanical universal testing machine

This appliance is designed to be used in Laboratories for Quality Control and Research on Metals, Plastics, Composed Materials, Wires, Ropes, Paper, Textiles etc.

The machine is suitable to make tensile and elongation tests on different materials following the EN 10002 and ASTM A370 Standards.

The machine is composed by a strong base containing the transmission components and the Hardware control instruments.

The base carries two columns that guide the cross-bar; they are made of high resistance steel with ground hard chrome surfacing.

The big diameter and the position where the columns are fitted grant a high lateral rigidity. The system is suitable to realise both tests with single direction or dual direction.

In order to grant no clearance, the transmission of the movement to the mobile cross-bar takes place through two re-circulating spheres screws with pre-loaded female screws.

High attention is given to the assembling system of the screws and their groups - bearings put in the base and in the upper head.

The mobile cross-bar with big section together with all other elements of the machine being properly dimensioned grant a very good "Rigidity of the machine" (see UNI ISO 5893 Standards).

The moving up and down of the cross bar on the columns happens

through sintered bushes with low friction coefficient.

On the mobile cross-bar there are some holes for the mounting of the load cells.

The Load Cell is made in stainless steel and reads both tensile and compression loads with a very high precision.

It is in conformity with the EN 10002/2 Standards.

Features of the load cell referred to ISO 376 Standards.

Accuracy class.....	I
Repeatability error	$\leq \pm 0.145\%$
Interpolation error	$\leq \pm 0.090\%$
Error on zero.....	$\leq \pm 0.03\%$
Reversibility error.....	$\leq \pm 0.240\%$
Non linearity error.....	$\leq \pm 0.04\%$
Maximum overload capacity.....	200%

In order to follow the specific needs of each single application, different load cells with different capacities within the nominal capacity of the machine can be installed on the frame.

Different connections for the installation of the seizing devices are on the mobile cross-bar and on the base (see accessories at following pages).

The machine is delivered with different safety devices limiting the maximum travel of the cross-bar. There is also an adjustable device that allows setting a personalised upper and lower travel limit following the used appliances.

The control section is made by a series of cards inside the base of the machine that are managing the control units and the reading units positioned on the machine.

The acquisition card, with a powerful microprocessor and converter AD 24 bits, takes all the working dates and through a RS232 connection it sends all these dates to the Personal Computer, which controls all the functions of the machine and makes the elaboration of all the calculations through the program UTM WIN.



H007 + H009 + H009-01

On the base there are:

A device which allows an easy and speedy positioning of the mobile cross-bar. A push button to interrupt the test execution at any time. A series of connectors for the connection to the control PC and to the auxiliaries appliances (extensometer; load cells etc.) General switch/Safety switch.

The frames protecting the columns and the screws are made of

anodised aluminium, the internal sides are closed with anti-dust bellows and all the outside and internal parts are properly treated against the corrosion.

Following equipments are not delivered with the machine and have consequently to be ordered separately (see following pages):

- Personal computer model H009-01 (indispensable for the working of the machine).
- Standard UTM 2 software model H009 (indispensable for the working of the appliance).
- Software model H009-02 for the connection to the telephone net and the servicing through it.
- Special personalised programs (following the customer demand)
- Accessories for the seizing of the specimens.
- Printer model C128
- Extensometer model H014
- Other accessories



H008 + H009-01 + H009



H004 + H009-01 + H009



H005 + H009-01 + H009





AVAILABLE MODELS:

MODEL	H004	H005	H006	H007	H008
LOAD CAPACITY kN	10	50	100	200	600
TEST SPEED mm/min					
Minimum	0,01	0,01	0,01	0,01	0,01
Maximum	500	500	500	480	300
POSITIONING SPEED mm/min.					
	500	500	500	480	300
CROSS BAR TRAVEL (*) mm	1130	1130	1180	1150	1500
OPENING OF THE TESTING CHAMBER					
Vertical mm (**)	1253	1251	1310	1280	1510
Horizontal mm	421	421	600	600	713
MAXIMUM DISTANCE BETWEEN THE TENSILE HEADS mm (***)	630	612	510	480	550
DIMENSIONS mm					
height	1708	1845	2340	2340	3000
width	550	810	1370	1370	1465
depth	683	670	700	700	930
WEIGHT Kg	250	370	1000	1150	2600
POWER SUPPLY	230V 1ph 50 Hz	230V 1ph 50 Hz	400V 3ph 50 Hz	400V 3ph 50 Hz	400V 3ph 50 Hz
ABSORBED POWER W	1000	1200	2000	3000	3000

(*) The cross bar travel is referred to the distance between the upper surface of the base and the lower surface of the cross bar and it doesn't include the load cell, the seizing devices, the different equipments etc.

(**) The vertical opening of the testing chamber is the distance between the upper surface of the base and the lower surface of the crossbar, without load cells, seizing devices and other devices.

(***) The maximum distance between the tensile heads is the distance between the grips when the crossbar is at its upper dead point (load cell is installed). Practically it is the free length of the specimen between the tensile heads.

- The voltage must not have peaks of tension, over-tensions and transitory over-currents or drops of voltage higher than 10% of the nominal voltage.
- Working temperature from +10° C. up to +38° C.
- Humidity range from +10% up to +90%, without condensation.

H005-01

Servo-controlled electromechanical universal testing machine (special model)

Load Capacity: 50 kN

This machine has same technical specifications of the standard model H005 except:

- Cross bar travel is: 1780 mm
- Vertical opening of the testing chamber is: 1904 mm
- Maximum distance between the tensile heads is: 1200 mm
- Overall height dimension is: 2450 mm

This machine has been expressly produced to test materials having very high tensile elongation percentage (ex. plastics, rubbers etc.).

The machine complies with the Standards on Plastics: EN-ISO-UNI 527, 1, 2, 3.



H005-01 + H009 + H009-01

ACCESSORIES FOR MOD. H003 TO H008

H009 LICENSE FOR UTM2 SOFTWARE



STANDARDS: EN 10002-1, ISO 527, 178, 604, 10113, 12275, ASTM A370.

This Software, that has been developed following the UTM2 described in full details at page 14, has been realised following the way of working of Microsoft windows operating system. The software has been conceived realised in an interactive way and is the ideal solution for an effective and complete management of the material testing. It is composed by many test procedures in conformity with the International Standards for metal, plastic, cement, wood and composed materials.

Profilo

Prova | Macchina | Calcoli | Grafico | Certificato

Dati:

Data: 11/11/2003

Certificato n°: 111103

Lotto di consegna: 111103/1

Campione: Acciaio al C

Posizione prelievo: Centro barra

Direzione Prelievo: Longitudinale

Temperatura: 25 °C

Provetta:

Tipo: Tondo

Diametro: 10 mm

Sezione: 78,54 mm²

Screen example of test data introduction

The conception of this software supports a wide range of calculation needs and tensile, compression, flexure test profiles. The user can realise new personalised test profiles: definition of the test data as the date of the test, the certificate number, the lot of the material delivered, the origin of the specimen, the test temperature... and definition of the specific dates of the specimen as type, dimensions measuring unit...

Profilo

Prova | Macchina | Calcoli | Grafico | Certificato

UNI EN 10002/1 | ASTM D 1559 | CNR N.30 | UNI 6132 | UNI 6133 | ASTM C 633 | UNI EN ISO 178 | U < >

☐ Lunghezza base di misura: Le mm

☒ Sezione iniziale: So mm²

☒ Sezione finale: Su mm²

☒ Allungamento dopo rottura: A %

☒ Stizione: Z %

☒ Carico massimo: Fm kN

☒ Carico unitario di rottura: Rm kN/mm²

☒ Carico unitario di snervamento superiore: ReH kN/mm²

☒ Carico unitario di snervamento inferiore: ReL kN/mm²

Selection of the test Standards with the possibility to select the dimensions for the personalisation of the calculation algorithm

The user can select and set the calculation corresponding to the activated standard. As an example for the Standard EN 10002/1 he can select the initial length, the initial section of the specimen, the calculation of the maximum load, the unit load, the elastic limits (ReH, ReL, Rp%), the restriction, the Young's Modulus... For some calculations the end user can set the test execution parameters corresponding to the calculation algorithms as an example for the deviation of the Rp proportionality he can introduce the percentage %.

The software allows a speedy and easy management of all the machine parameters as the management of the load acquisition by means of a load cell, the specimen deformations by means of an extensometer and the crossbar displacement. For each one of the analogical channels the user can set the calibration and visualisation measuring unit, the limits of use: alarm, value of starting of the test calculation...

The test setting happens by dividing the process in different phases or speed charts, for each one of these charts the user can set the required kind of control (pace rate, load/time, deformation/time), the tare and the zero option, the limits and the phase or speed changes.

The end of test mode or the breaking limit can also be selected. The software allows personalising and setting the visualising parameters of the test graph as the colour, the title of the Cartesian axis, the colours of the load/deformation limits and the certificate parameters as titles, margins...

Anteprima

11/11/2003 **RAPPORTO DI PROVA** UNI EN 10002/1

Dati:

Data: 11/11/2003

Certificato n°: 111103

Lotto di consegna: 111103/1

Campione: Acciaio al C

Posizione prelievo: Centro barra

Direzione Prelievo: Longitudinale

Temperatura: 25 °C

Provetta:

Tipo: Tondo

Diametro: 10 mm

Sezione: 78,54 mm²

Risultati

Lunghezza iniziale:	Lo	50	mm
Lunghezza calibrata:	Lc	100	mm
Lunghezza finale:	Lu	82	mm
Sezione iniziale:	So	78,54	mm²
Sezione finale:	Su	75,26	mm²
Allungamento dopo rottura:	A	24	%
Stizione:	Z	4,178	%
Carico massimo:	Fm	59,884	kN
Carico unitario di rottura:	Rm	762,46	N/mm²
Carico unitario di snervamento superiore:	ReH	701,809	N/mm²
Carico unitario di snervamento inferiore:	ReL	691,782	N/mm²

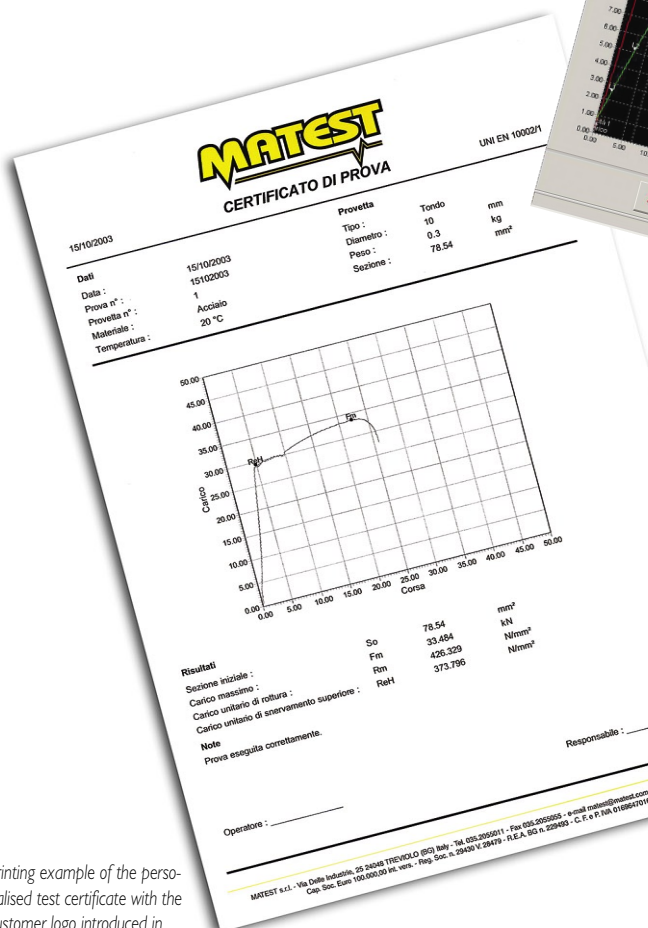
Example of test certificate

At the end of the test the user can decide if the selected calculations must be effected and/or if he wants to save the test in the file. In any moment all the tests made are available to make an analysis of the results or to print their certificate. Graphic analysis of the test can be made by means of the zoom function.

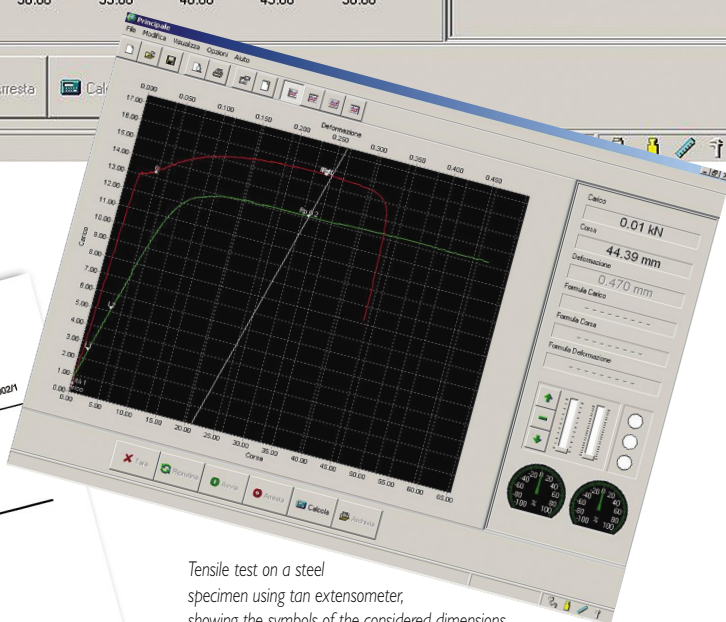




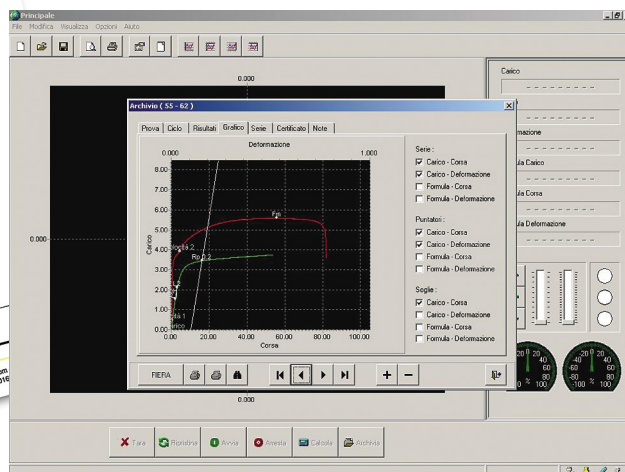
Tensile test on a steel specimen without extensometer; it visualises the starting of the specimen breaking with the possibility to increase the dimensions of the area of the graph by means of the zoom function.



Printing example of the personalised test certificate with the customer logo introduced in the file (JPG, BMP, TIFF etc).



Tensile test on a steel specimen using tan extensometer, showing the symbols of the considered dimensions and the relative tracing in different colours selectable by the user.



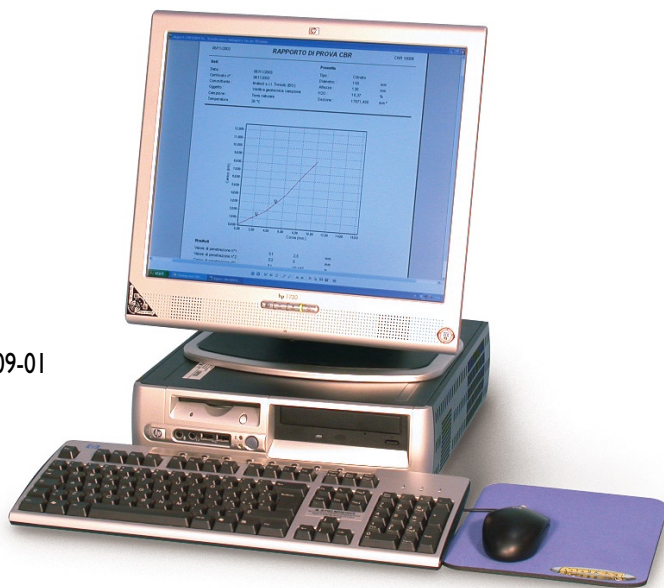
Practical example of saving a test graph where the user can select which traces have to be shown, modify the sales or personalise the colours and give a new name to the axis.

ACCESSORIES FOR MOD. H003 TO H008**H009-01**

PERSONAL COMPUTER complete with LCD monitor 17", keyboard, mouse, connection cables.

The supply of the PC includes the installation of the purchased software.

H009-01

**H009-02**

Software for on line technical support. It allows maintaining the software without physical intervention of an After Sale specialist. Also gives the possibility to the customer to receive programs upgrading.

C128

PRINTER, A4 format, for the printing of the test diagram or Certificate.

C128

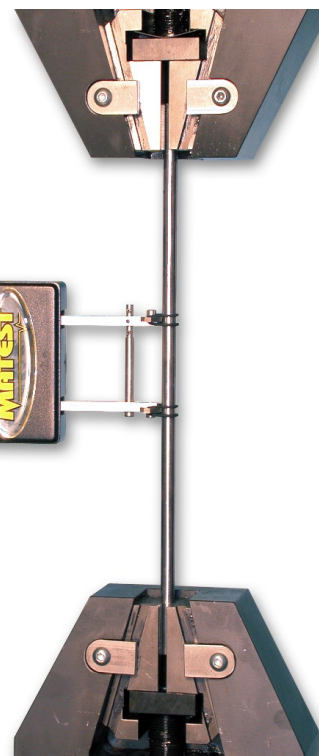
**H014****Electronic extensometer**

Measuring base 50 mm, Deformation range $+1 \text{ mm} / -0.2 \text{ mm}$

Maximum percent measurable deformation: $+2\%$

It gives the possibility to take the longitudinal deformations of the specimen during the tensile test. A graph load/deformation is obtained and from this graph the coefficient of elasticity together with the loads $RP0.1$ - $RP0.2$ - $Rt1$ can be identified even on materials that are not presenting a yield point that can be clearly identified. The appliance is delivered complete with connection cables.

H014



To grant a better and complete service to the Customer, Matest can supply all the Universal Testing Machines, both Hydraulic and Electromechanical, Calibrated by an Official Calibration Institute (SIT Centre), with relevant Calibration Certificate.

H009-10

Calibration Certificate for One Cell, issued by an Official Calibration Institute (SIT Centre)

ACCESSORIES FOR:

MACHINE CODE	H004	H005	H006	H007	H008
CAPACITY	10 kN	50 kN	100 kN	200 kN	600 kN
Couplings for installation of the tensile heads or the devices	H005-40	H005-40	H007-40	H007-40	H008-40
Tensile heads	H005-11	H005-11	H007-11	H007-11	H008-11
Flat seizing grips for specimens as follows:					
Flat spec. thickness 0 ÷ 10 mm					
Width max 25 mm					
Round specimens Ø 3 ÷ 5 mm	H005-21	H005-21			
Flat spec. thickness 0 ÷ 10 mm					
Width max 50 mm					
Round specimens Ø 3 ÷ 10 mm			H007-21	H007-21	
Flat spec. thickness 11 ÷ 22 mm					
Width max 50 mm			H007-22	H007-22	
Flat spec. thickness 0 ÷ 12 mm					
Width max 70 mm					
Round specimens Ø 3 ÷ 10 mm					H008-21
Flat spec. thickness 12 ÷ 24 mm					
Width max 70 mm					H008-22
Flat spec. thickness 24 ÷ 36 mm					
Width max 70 mm					H008-23
"V" shape seizing grips for round specimens:					
Dia. 5 ÷ 12 mm	H005-31	H005-31			
Dia. 11 ÷ 18 mm			H007-31	H007-31	
Dia. 18 ÷ 25 mm			H007-32	H007-32	
Dia. 25 ÷ 32 mm			H007-33	H007-33	
Dia. 11 ÷ 22 mm					H008-31
Dia. 23 ÷ 34 mm					H008-32
Dia. 35 ÷ 45 mm					H008-33
Dia. 45 ÷ 55 mm					H008-34
Compression device	H005-41	H005-41	H007-41	H007-41	H008-41
Knurled roller clamping device	H005-42	H005-42			
Device for test on wire and ropes	H005-43	H005-43			
Flexural and bending device in three spots	H005-44	H005-44	H007-44	H007-44	H008-44
Device to centre the specimens	H005-51	H005-51	H005-51		

H005-11 - H007-11 - H008-11

Couple of tensile heads with different capacities. They are made of treated steel carefully worked and have a shape, which is granting an auto-tightening of the seizing grips on the specimen. A screw device allows the right operation of the seizing grips and grants a right blocking of the specimen starting from the lowest loads and reducing at the top the moving of the crossbar during the penetration of the knurling on the specimens.

Each couple of tensile Heads is delivered complete with:

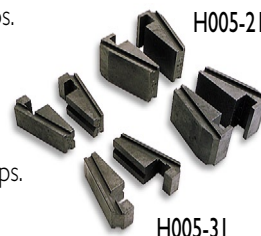
- Spanner for the assembling and the disassembling of the seizing Grips
- Pack of special grease for lubrication

**H005-21**

Flat Grips - Thickness 0 ÷ 10 mm
Width max 25 mm and Round Grips dia. 3 ÷ 5 mm
One set consist of a double pair of grips.

H005-31

Round Grips with Section "V"
dia. 5 ÷ 12 mm
One set consists of a double pair of grips.

**H005-41**

Compression Device
Consisting of an articulated upper plate and a lower fixed one.

H005-42

Knurled Roller Clamping Device
Consisting of a pair of grips with max. capacity 20kN suitable for test on plastic films with a considerable thickness and hardness and similar materials.

H005-43

Device for tests on wires and ropes
Consisting of a pair of self-aligned rollers for tensile tests on wires and ropes of thin section with max. load capacity of 20 kN.

H005-44

Flexural and Bending test device in three spots
Suitable for flexural and bending tests on round and flat specimens.

H005-51

Device to centre the specimens
This device is composed by a pair of rollers installed on settable supports screwed on the tensile heads. By setting the supports in relation with the dimensions of the specimen, the user will obtain a stop that allows a rapid and right positioning of the specimen in the flat grips. This accessory can be used only on machine with 50 kN, 100 kN and 200 kN capacity (models H005, H006, H007).



H020**Marking-off machine**

Automatic, motorised

STANDARD: UNI 556

Used to mark off specimens with round, square shape and with improved bond for the measurement of the percentage elongation after their breaking, in accordance with the Standards.

The machine can mark specimens as follows:

- Round from 4 mm up to 50 mm. diameter.
- Flat from 4 mm. up to 50 mm thickness.
- Square from 4 mm. to 45 mm. side.

Useful length 300 mm.

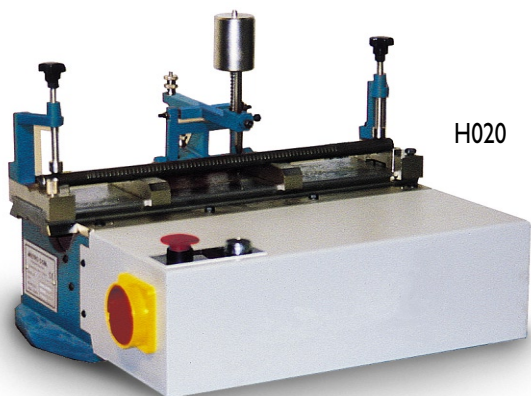
Marking steps: 5 or 10 mm. selectable with lateral graduation.

Marking speed: 60 marks per minute.

Power supply 400V 3ph 50 Hz

Dimensions: 530x480x445 mm.

Weight: approx. 58 Kg



H020

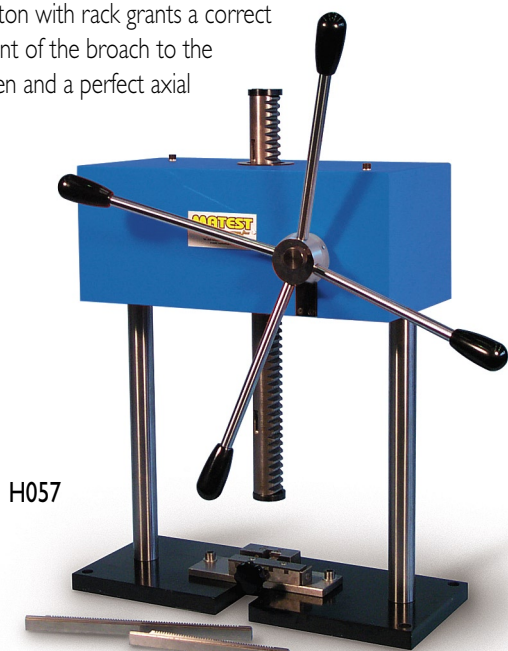
H021

Marking-off machine, same to mod. H020, but hand operated by rotating the handle.

H057**Broaching machine**

Used to make notchings on impact test bars for resilience tests.

The piston with rack grants a correct alignment of the broach to the specimen and a perfect axial thrust.



H057

H057-10

H057-11

ACCESSORIES:

H057-01

Broaching device for clamping and centering the specimen

H057-10

Broach for "V" notchings on specimens with square section 10x10 mm

H057-11

Broach for "U" notchings on specimens with square section 10x10 mm

Note: Available on request a large number of broaches to make Charpy, Izod, Mesnager, DVM both V and U notches.

H060**Pendulum impact Charpy tester for resilience tests**

STANDARDS: ASTM E23 - EN 7-55 - UNI 4431, 4714 - ISO TC/7

The tester is equipped with a falling pendulum hammer; able to break, with a single blow, a sample carved in the middle and positioned on two supports.

The test is carried out on a CHARPY sample in order to check the energy absorbed during the impact, which is measured in JOULE.

The value stands for the impact strenght of the material (resilience).

- Cast iron frame
- Pendulum with hardened knife
- Brake device to stop the pendulum
- Impact energy 300J with 2J Graduation
- Falling angle: 140°
- Real weight Kg. 21,300
- Impact speed: 5,182 m/s

Dimensions mm

450x900x1700

Weight: 470 Kg



H060

ACCESSORIES:

H060-01

SAFETY PROTECTION CAGE, to 89/392/CEE Directive.

H060-02

KNIFE-EDGE to perform resilience tests according to BS 131 Standards.

C351**Specimen cutting machine**

It accepts blades up to dia. 350 mm

Shear capacity: 120 mm

Power supply:

220-240V 1F 50 Hz 2000W

Dimensions: 560x460x390

Weight: 20 Kg

ACCESSORY:

C350-03 DIAMOND BLADE having dia. 350 mm



C351

UNIVERSAL TENSILE/COMPRESSION MACHINE

- **Tensile tests on steel reinforced bars, up to 500 kN max. Capacity load.**
- **Compression tests on concrete cube and cylinder specimens up to 1500 kN max. Capacity load.**

STANDARDS: BS 1610 - ASTM C39, E4 - NF P 18-411 - DIN 51220 - AASHTO T22

This machine of compact design, is utilized to carry out tensile tests on steel reinforced bars from dia. 6 to 25 mm. and flat max. 25x15 mm. It can also carry out compression tests on concrete cube specimens max. side 150 mm. and cylinders max. dia. 160x320 mm.

The four columns loading frame is overdimensioned to assure high rigidity and stability. The loading piston, double action, is rectified and lapped. The piston is foreseen of an hydraulic maximum and minimum piston stroke's security device, by avoiding any damage risk due to wrong manipulations of the unit. An analogic device is foreseen to visualize, pre-select and adjust the applied speed rate.

Also a fast ram approach is foreseen to avoid losses of time. The hydraulic pump is multipiston, so to insure continuity of oil delivery.

A displacement device visualizes instant by instant the piston's excursions during the tests.

An hydraulic selector allows to select the tensile or the compression test. The heads holding the jaws are obtained from only one block of high tungsten steel, while the jaws are hardened over 65 HRC. The "V" autoclamping form allows a quick and practical churking of the specimen. A calibration certificate is supplied along with the machine.

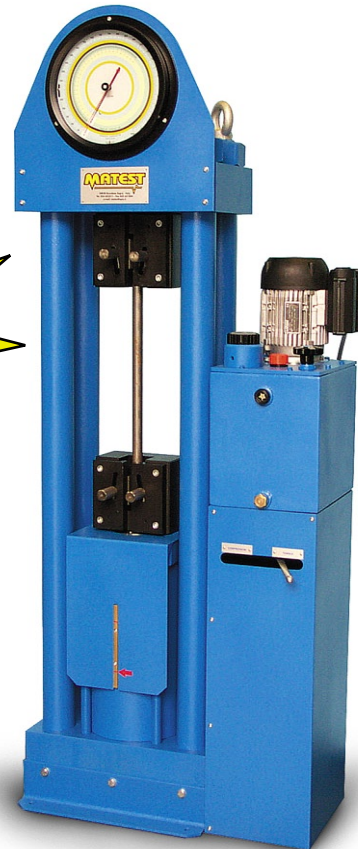
The machine is supplied complete with pair of jaw-holders, but without accessoires for the tensile and compression tests, which must be ordered separately (see accessories).

TECHNICAL SPECIFICATIONS:

- Maximum tensile load: 500 kN
- Maximum compression load: 1500 kN
- Distance between the jaws: min. 300 mm - max. 400 mm
- Distance between the compression platens: 340 mm
- Distance between the columns: 270 mm
- Piston's stroke: 100 mm
- Precision and repeatability: $\pm 1\%$ of read value
- Power supply: 220-240 V 1 ph 50 Hz 750 W
- Dimensions: 780x420x1700
- Weight: 800 Kg



H011



H010



MODELS:

H010

Universal tensile/compression machine, motorized, measuring system with precision monometer dia. 250 mm. Bourdon type, double reading range, foreseen of max. load pointer.

H011

Universal tensile/compression machine, motorized, measuring system with "Cybertronic", electronic digital display unit with microprocessor, to measure the load and the deformation (through the extensometer mod. H014), with graphic display of large dimensions, and possibility to be connected to PC by RS232 link (remote control). See accessories at next page.

ACCESSORIES:

FOR TENSILE TESTS ON ROUND AND FLAT STEEL SPECIMENS:

H012-01

Set of 4 Jaws, upper and lower, for round steel specimens from dia. 6 to 15 mm., and flat specimens from 6 to 15 mm. thickness (max. width 25 mm).

H012-02

Set of 4 jaws upper and lower for round specimens from dia. 15 to 25 mm

FOR COMPRESSION TESTS ON CONCRETE CUBE AND CYLINDER SPECIMENS:

H013-01

Upper compression platen foreseen of seat ball, fixing device, lower compression platen and distance pieces test cylinders max dia. 160x320 mm. and cubes 150 mm. max side.

The platens have dia. 216 mm. and are hardened and rectified as requested by Standards.

H013-02

Set of Safety Guards for mod. H010 and H011 machines, to 89/392/CEE Directive.

ACCESSORIES (only for mod. H011):

C127

Graphic printer on thermal paper

H009

Software UTM2* (Universal Testing Machine 2) Developed for the management and the remote control through PC of Matest testing machines.

Managing License: visualisation in real time of Load/Deformation, graphic, Test Certificate etc.

Technical details: see page 217

C109-10

SOFTWARE UTM2* (Universal Testing Machine 2). Developed for the managing and the remote control of the MATEST Testing machines from a PC. License for COMPRESSION tests on concrete.

Standards : EN 12390-3, EN 679, UNI 6686, 6132, BS 1881, UNE 83304, DIN 51220, ASTM C39, NF P18-411, etc.

*Technical details of UTM2: see page 14

H009-01

Personal Computer, complete with LCD monitor 17", keyboard, mouse, connection cables. The supply of the PC includes the installation of the purchased Software.

H009-02

Software for on line technical support. It allows maintaining the software without physical intervention of an After Sale specialist. Also gives the possibility to the customer to receive programs upgrading.

**H014****Electronic extensometer**

(only for mod. H011)

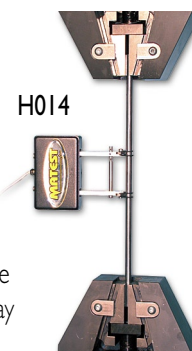
MEASURING BASE 50 mm

Deformation range + 1 mm / - 0,2 mm

Max measuring deformation percentage: + 2%

This device records the longitudinal deformations of the steel specimen during the tensile test. It is connected to the digital display of the machine mod. H011, and through the software H009 it supplies a load/deformation graphics from which it is possible to obtain the elastic modulus and the loads: Rp 01-Rp 0,2-Rt1 for the materials that do not show a clearly visible yield load stress.

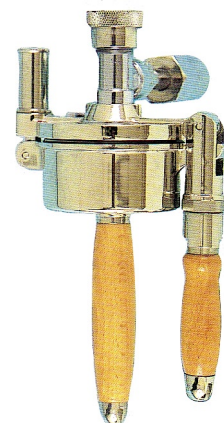
Supplied complete with cables and connectors.

**H050****Dry-ice maker**

This device instantaneously produces the quantity of dry ice (solid CO2) required to reach temperatures down to -80 °C.

The dry-ice maker must be connected to a liquid CO2 bottle with connecting pipe and it produces 100 g. dry-ice tablets, having mm. 75 diameter and mm. 25 thickness.

Weight: 3 Kg



H050

H052**Cooling bath for resilience tests**

This apparatus is meant for Charpy tests to be carried out at low temperatures.

It is made from double chambered stainless steel with isolating cavity wall from foamed polyurethan, 65 mm. thick.

Complete with double chambered cover and specimen rack.

Internal dimensions:

mm. 125x125xh 180

Weight: 12 Kg



H052



H054

H054

Pliers, special-shaped, pliers to take cooled specimens from the bath and place them directly into the Charpy Pendulum.

H065

Bending machine

STANDARDS: 5.11.71 N° 1086 - D.M. 26.3.80 - ASTM A615 - 89

The mandrels, the mandrel-holders and the brackets are not included in the standard supply and have to be ordered separately. (see table).

SPECIFICATIONS:

- Max. piston load: 16.000 Kg
- Max. piston stroke: 550 mm
- Power supply: 400V 3F 50 Hz 1500W
- Dimensions: mm 1540x800xh 1300
- Weight: 350 Kg

ACCESSORIES:

H065-01

Safety guards to 89/392/CEE Directive.

section H



H065

This equipment has been studied and designed to carry out bending tests on steel bars for reinforced concrete.

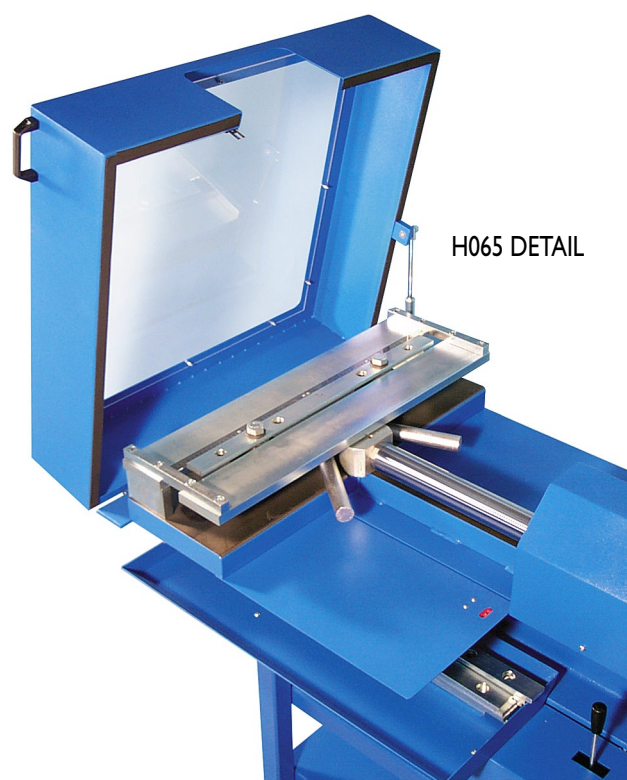
The test consists in bending the bar at 180° or to bend the same at 90° and then straighten it if of at least 20°.

This bending machine is composed of a rugged frame supporting a beam having a cylinder with relevant load piston fixed on it, being activated by an hydraulic cell complete with speed adjuster for the piston, direction control valve, max. pressure valve, control gauge. The whole is cased to protect every single component from the dust, and the operator from any possible danger. A small bowl has been fitted under the beam, where the steel bar is bent. Two contrasting rollers are fitted on the beam. They may easily be adjusted in distance to be in accordance with the Standards concerning bars having diameter between 6 and 32 mm.

Fixing and changing the mandrels on top of the thrust cylinder is easy and practical and grants the operator a perfect interchangeability of the same.

A device prevents the unlocking of the bar under test from the relevant rollers and the contrasting mandrel both during the bending and the straightening operation.

The machine accepts bars up to Ø 32 mm. and is supplied complete with two series of rollers, having respectively Ø mm. 50 and 100.



H065 DETAIL



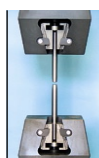
DIAMETERS TABLE OF THE AVAILABLE MANDRELS AND BARCKETS FROM Ø 5 TO Ø 40

Ø SPECIMEN mm	MATERIAL	SURFACE L=plain AD=adherence	Ø MANDREL mm MOD.	BRACKET MOD.	Ø SPECIMEN mm	MATERIAL	SURFACE L=plain AD=adherence	Ø MANDREL mm MOD.	BRACKET MOD.		
5	Fe B 22 K	L	10	H066-01	H068-11	22	Fe B 22 K	L	44	H066-14	H068-02
	Fe B 32 K	L	15	H066-03	H068-12		Fe B 32 K	L	66	H066-21	H068-05
	Fe B 38 K	AD	15	H066-03	H068-12		Fe B 38 K	AD	176	H066-36	H068-05
	Fe B 44 K	AD	20	H066-06	H068-13		Fe B 44 K	AD	220	H066-39	H068-10
6	Fe B 22 K	L	12	H066-02	H068-12	24	Fe B 22 K	L	48	H066-15	H068-03
	Fe B 32 K	L	18	H066-05	H068-14		Fe B 32 K	L	72	H066-48	H068-07
	Fe B 38 K	AD	18	H066-05	H068-14		Fe B 38 K	AD	192	H066-49	H068-07
	Fe B 44 K	AD	24	H066-07	H068-16		Fe B 44 K	AD	240	H066-50	H068-01
8	Fe B 22 K	L	16	H066-04	H068-15	25	Fe B 22 K	L	50	H066-16	H068-04
	Fe B 32 K	L	24	H066-07	H068-17		Fe B 32 K	L	75	H066-22	H068-08
	Fe B 38 K	AD	24	H066-07	H068-17		Fe B 38 K	AD	200	H066-38	H068-08
	Fe B 44 K	AD	32	H066-10	H068-19		Fe B 44 K	AD	250	H066-41	H068-02
10	Fe B 22 K	L	20	H066-06	H068-18	26	Fe B 22 K	L	52	H066-51	H068-09
	Fe B 32 K	L	30	H066-09	H068-20		Fe B 32 K	L	78	H066-52	H068-10
	Fe B 38 K	AD	30	H066-09	H068-20		Fe B 38 K	AD	260	H066-53	H068-03
	Fe B 44 K	AD	40	H066-12	H068-21		Fe B 44 K	AD	312	H066-54	H068-09
12	Fe B 22 K	L	24	H066-07	H068-11	28	Fe B 22 K	L	56	H066-18	H068-06
	Fe B 32 K	L	36	H066-11	H068-13		Fe B 32 K	L	84	H066-23	H068-02
	Fe B 38 K	AD	36	H066-11	H068-13		Fe B 38 K	AD	280	H066-43	H068-04
	Fe B 44 K	AD	48	H066-15	H068-15		Fe B 44 K	AD	336	H066-46	H068-06
14	Fe B 22 K	L	28	H066-08	H068-12	30	Fe B 22 K	L	60	H066-19	H068-08
	Fe B 32 K	L	42	H066-13	H068-15		Fe B 32 K	L	90	H066-55	H068-03
	Fe B 38 K	AD	84	H066-23	H068-19		Fe B 38 K	AD	300	H066-56	H068-09
	Fe B 44 K	AD	112	H066-28	H068-21		Fe B 44 K	AD	360	H066-57	H068-07
16	Fe B 22 K	L	32	H066-10	H068-14	32	Fe B 22 K	L	64	H066-20	H068-01
	Fe B 32 K	L	48	H066-15	H068-17		Fe B 32 K	L	96	H066-24	H068-04
	Fe B 38 K	AD	96	H066-24	H068-20		Fe B 38 K	AD	320	H066-45	H068-05
	Fe B 44 K	AD	128	H066-30	H068-12		Fe B 44 K	AD	384	H066-47	H068-08
18	Fe B 22 K	L	36	H066-11	H068-16	34		AD	340	H066-58	H068-22
	Fe B 32 K	L	54	H066-17	H068-18			AD	360	H066-57	H068-23
	Fe B 38 K	AD	108	H066-26	H068-11			AD	380	H066-59	H068-22
	Fe B 44 K	AD	144	H066-33	H068-13			AD	400	H066-60	H068-23
20	Fe B 22 K	L	40	H066-12	H068-01	40		AD			
	Fe B 32 K	L	60	H066-19	H068-03						
	Fe B 38 K	AD	160	H066-35	H068-09						
	Fe B 44 K	AD	200	H066-38	H068-06						

All mandrels have been produced from quality steel and cadmium plated for rust protection, and from Ø 10 mm. up to Ø 96 mm. included have been hardened to make them wearproof

All mandrels have been produced from quality steel and cadmium plated for rust protection, and from Ø 10 mm. up to Ø 96 mm. included have been hardened to make them wearproof.

section H



225

AVAILABLE MANDREL-HOLDERS

H067-01 Mandrel-holder Ø 10 a 12 mm**H067-02** Mandrel-holder Ø 15 a 20 mm**H067-03** Mandrel-holder Ø 24 a 50 mm**H067-04** Mandrel-holder Ø 54 a 96 mm

From Ø 100 to 400 mm. the mandrel is directly fitted to the piston without using a mandrel-holder.

NOTE:

Mandrels and brackets for steel bars to ASTM Standards are available upon request.