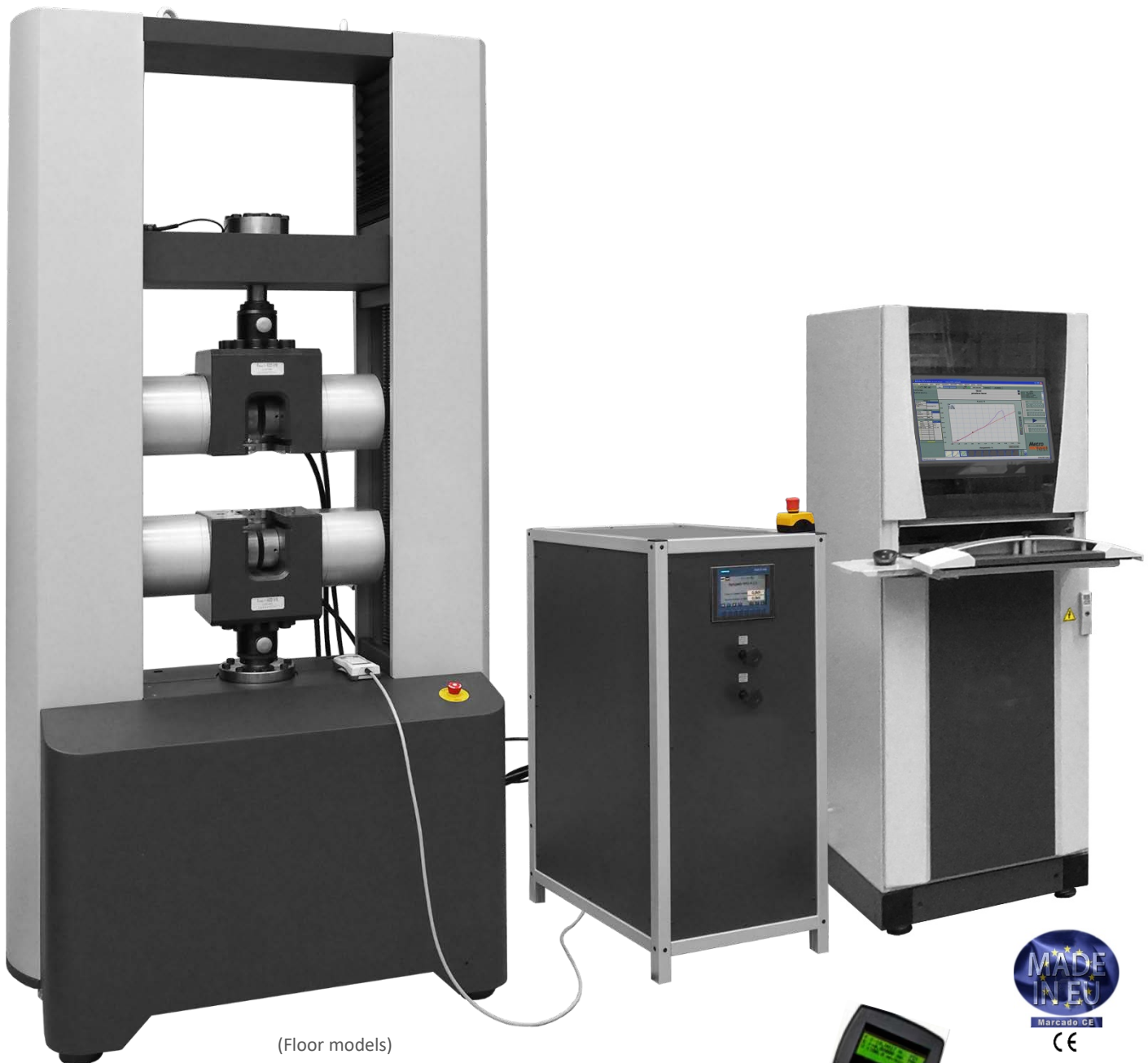# TECHLABSYSTEMS

ELECTROMECHANICAL MATERIAL TESTING MACHINES
MTE-400/500/600/750/1000 models

(Floor models)

FORCE CAPACITY ACCORDING TO THE MODEL: 100 - 200 & 300 kN

- ❑ **Tensile - Compression - Flexion – Shear - Tests**
- ❑ **Accuracy: +/- 0,5 % (EN ISO 7500:2004 Class 0.5 ASTM E4)**
- ❑ **Elecro-mechanical drive system**
- ❑ **Standard delivery components:**

INCLUDED: Remote Control Digital Control of Positioning

  - ❑ 1 Load Cell for Tension / Compression
  - ❑ 1 **METROTEST** Materials Testing Software – Multilingual (English, French, German and Spanish)
  - ❑ 1 Statistic software pack : Barr graphs, Gauss bell diagram and Comparative of References
  - ❑ 1 "All-in-One" Touch Screen 22" PC
  - ❑ 1 ENAC Calibration Certificate of 1 Load Cell (equivalent to NIST - UKAS - DKD ...)

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ELECTROMECANICAL MATERIALS TESTING MACHINES, CONTROLATED BY PC

The Electromechanical Materials Testing Machine MTE-400/1000 models of METROTEC are designed and built based on solid and reliable testing frameworks electromechanical screw balls driving to a very low friction coefficient. The test frame is composed of dual column and screws with recirculation balls drive and with protectors, low friction coefficient and two guide columns, chromed and polished steel. Its system of closed loop control of parameters such as PC test force, deformation of the specimen and stroke, to perform tests with high accuracy over a wide range of materials. The system operates in real time making diagrams and test curves and facilitates the creation of test reports. The closed loop control through **METROTEST** test program makes automatically possible all kinds of tests, including low frequency cyclic tests.

Meets or exceeds the requirements of the following standards: ISO 7500-1, ASTM E4, EN10002-2, BS 1610, DIN51221, ISO 6892.

In the mobile crosshead, a tension/compression load cell is housed, to which the employed test tools are adapted (not including with the test frame). To configure the tests and complete the MTE-400/1000 Universal Testing Machines, we have optional a wide range of test accessories such as Grips, Extensometers, Bending Bridges, Special Test Devices, etc…

System has a travel limiting upper and lower independently adjustable by the user. Inside the inferior part of the frame includes transmission elements, transformer, electronic control board, servomotor, etc...

The **MATERIALS TESTING MACHINE MTE-400/1000**, is made up of a robust frame in which the test frame is located. The test frame consists of a low-coefficient of friction actuator and ball screw with a guiding spindle of chromed and rectified steel.

The force measurement is performed through a tensile-compression load cell placed on the movable crosshead. The necessary test tool (not included in the standard supply of the MTE-400/1000 Universal Testing Machines) are coupled to said load cell.

The test frame allows overloads of 120% of the nominal force without affecting its accuracy of measurement or operation, which gives the frame a great robustness and safety of correct operation in the face of intensive work.

It has a system of limiters of upper and lower travel independently adjustable by the user. Transmission elements, transformer, regulating electronics, servomotor, etc. are included inside the base box.
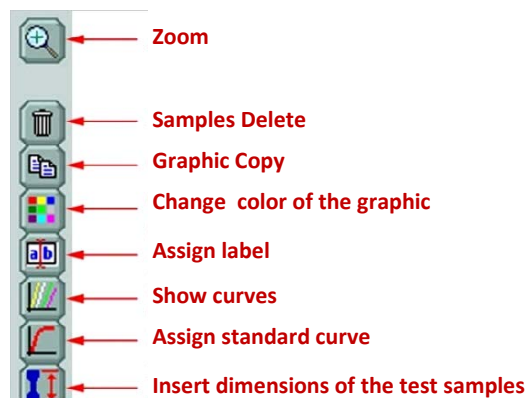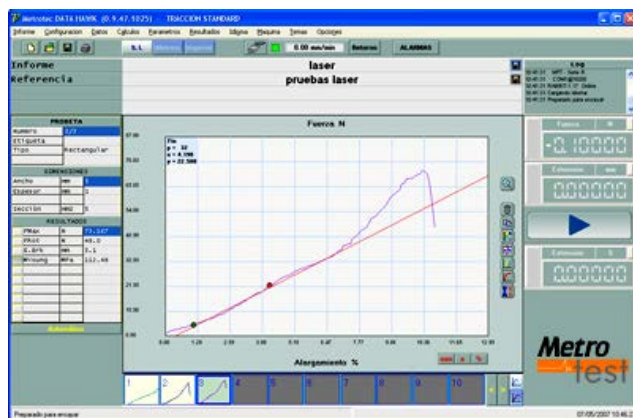
CHARACTERISTICS:

✓ Fully computerized: The control and measurement system with specific electronic board used for testing machines, performing the zero tare, and adding a setting which is very reliable.

✓ It has a database manager for the test results which stores according to a standard format which facilitates analysis and transfer to other programs.

✓ Compliance with test requirements for all types of materials with all international testing standards.

✓ With a wide range of functions in the graphics, you can make color changes of the curves, magnifications (zoom), reductions, self-scaling of the curves (which facilitates and shortens the time of a test with a new one Material), displacement of the curves in the axis of deformations, designate standard curve, association of labels to each graph, indication of values digitally on the screen and printing all kinds of test curves.

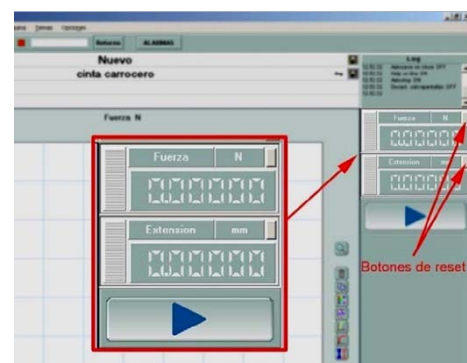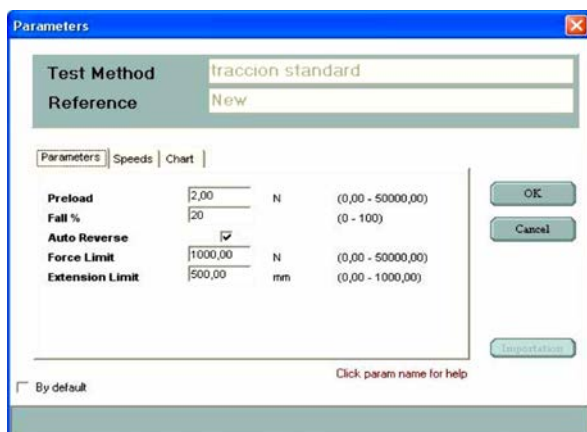✓ Modular design facilitates software upgrades in the future, etc.

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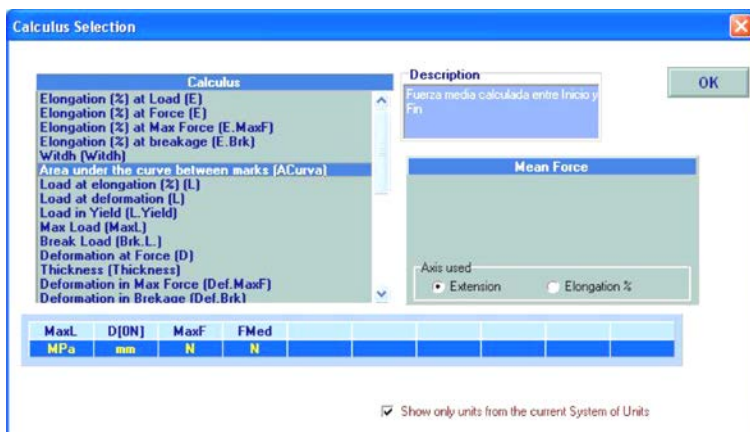**METROTEST** MATERIALS TESTING SOFTWARE

The **METROTEST** Testing and Analysis software is very easy and quick to use in order to achieve different functions, adaptable to most operators habits. With all the information in functions such as test sample, choice of sample, setting the test conditions, data processing, analysis of test results ..., very easy to use.

- Zoom
- Samples Delete
- Graphic Copy
- Change color of the graphic
- Assign label
- Show curves
- Assign standard curve
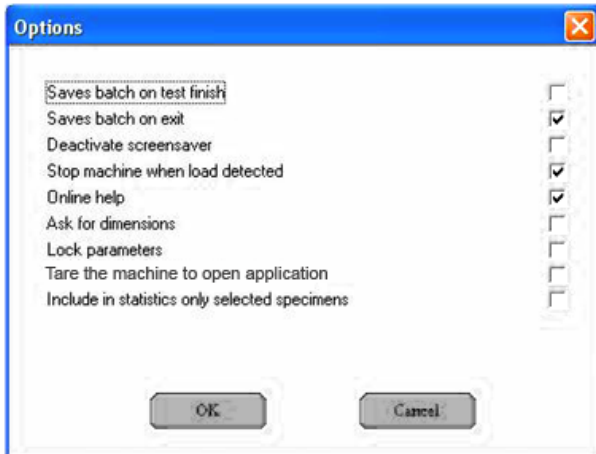- Insert dimensions of the test samples

- ✓ Interface designed very clearly, intuitive attractive and with plenty of information on the screen
- ✓ Election of different units for each result
- ✓ Travel of all the points in the graphic, Point by point
- ✓ Association of labels to each graphic
- ✓ Creation and management of patron curves
- ✓ Personalized reports
- ✓ Reports in PDF formats directly without any need of additional software
- ✓ Automatic Self scaling in the graphics
- ✓ Test limits independents to the limit graphics
- ✓ Self-save of the results, sample to sample
- ✓ Visualization of the curve individually or multiple
- ✓ Interface personalized
- ✓ Option of demanding for the dimensions of the sample in the beginnings of each test
- ✓ Information on the screen of all the actions that the software is making (log)
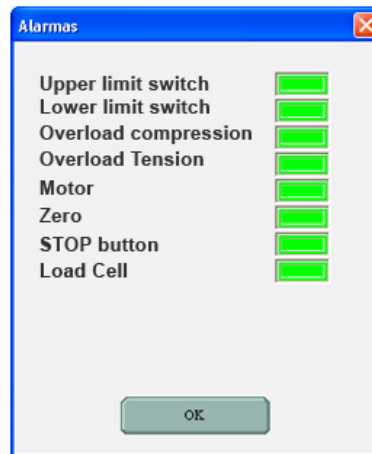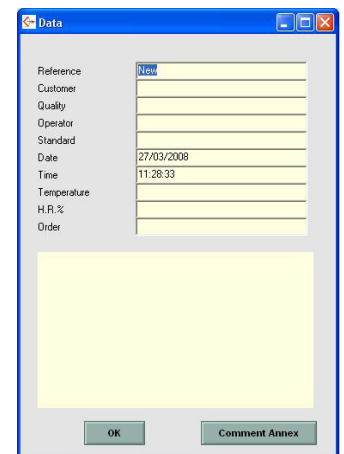- ✓ Visual parameterization of results.

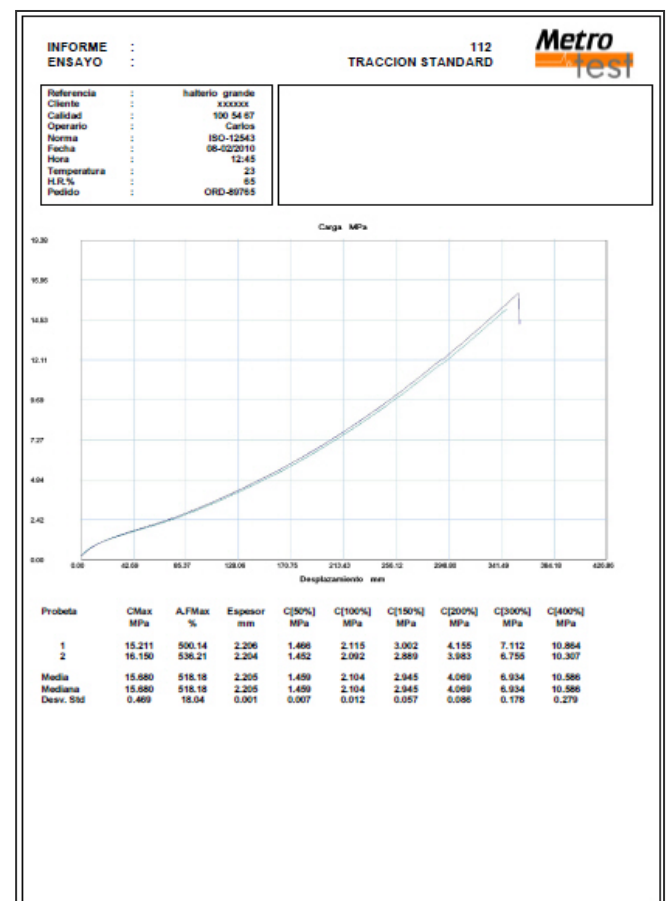**TEST PARAMETERS Menu**

CALCULATIONS SELECTION Menu

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OPTIONS Menu

ALARMS Menu

DATA Menu

RESULTS Menu

REPORT OF TESTS
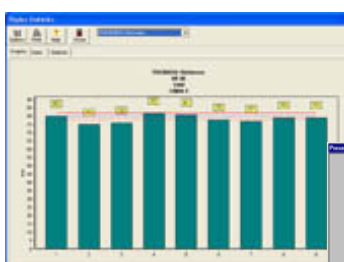
Bar Graphs
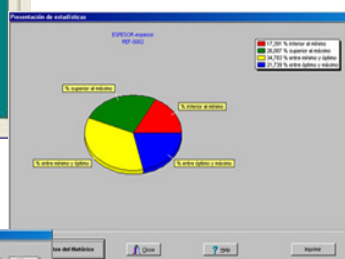
Tolerance Comparatives

Gaussen Bells

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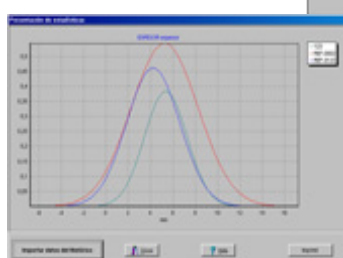
CONTROL SOFTWARE

Specific Testing Software with control module (operation):

- Control in **closed loop** of force, displacement, deformation, or time
- Selection and **automatic change of work scales**
- **Detection of the rupture** of probe with automatic stop, adjustable by user.

You can create as many control tokens as you want. These tokens can be assigned to a "test tube" so that when testing a test piece is performed using its assigned control card. Possibility of independent zeroing in F and L, after one step.

- ✓ **Setpoint Type**: It is the action that will perform the control of the machine.
- ✓ **F** Force (N / s).
- ✓ **R** Resistance (N / mm2 / s).
- ✓ **V** Speed (mm / min). In open loop (without control of the PC).
- ✓ **L** Displacement (mm / min). In closed loop (PC will regulate speed).

SOFTWARE MEASUREMENT included

Specially prepared for static testing of metals, which allows the Data acquisition from a machine with MBC3200 measurement electronics, using the PC communications port (RS232) or through a USB (using commercial adapters RS232C -> USB).
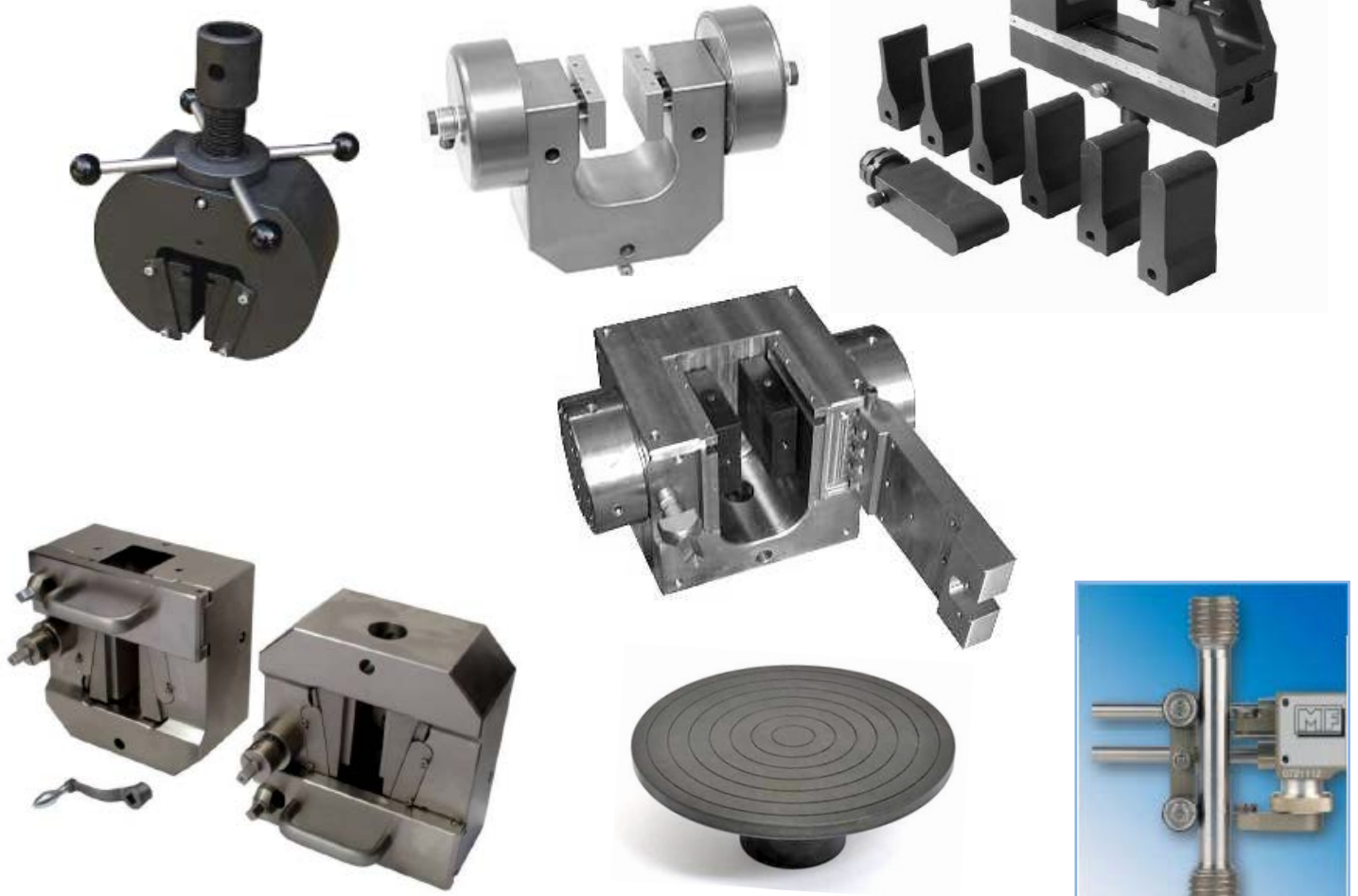
Features:

- Selection tab control (speed, etc.)
- Specimen Selection tab to:

  - *Reference or name of the specimen*
  - *Type Rectangle / Circle / Tubular / Displays*
  - *Lo What long. initial specimen*
  - *a, b / D / So   sectional dimensions*
  - *n%   % to calculate the Rpn*
  - *Any desired value (0.01% -0.2% -1%)*

- Scale test graphics automatically or manually
- Real-time representation units' force-deformation "
- User selectable units
- Simultaneous digital display with graphic
- Ability to zoom into any area, from the mouse.
- Ability to manually choose the scales and units.
- Automatic File XY graph values in file security for retrieval.
- Possibility to compare graphics on screen.
- Ease of calculation and presentation of limits:

  - **ReH, ReL**   (apparent in mild steels)
  - **Rpn** (n = 0.2% or any value entered)
  - **E** modulus of the material
  - **Rm**   Maximum resistance.
  - **A** elongation and other test parameters (**Ag, E, N, R**, ...)
  - **Z** restriction coefficient

- Database (result tabs) (MS-Access compatible)

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Accessories and Testing Devices - OPTIONAL:

✓ Different types of Grips for testing all types of materials

Contact Extensometers

Safety/Security Cabinets

Environmental Testing Chambers

Furnaces for High Temperatures Testing
(between 1100 y 1500 ºC)

FUNCTIONAL TECHNICAL CHARACTERISTICS

UNIT CONTROL
- ✓ PC Control and **METROTEST** Material Testing Software
- ✓ Sample breaking level (% force drop at end of test)
- ✓ Force and Extension Peak Maintenance in Tension or Compression
- ✓ Selection of units of force and deformation
- ✓ External control mode for "All-in-One" Touch Screen 22" PC
- ✓ RS-232 serial port

FORCE MEASURE
- ✓ Range: 2% to 100% - Accuracy 0.5% of applied force
- ✓ Force Accuracy: Class 0.5 (accuracy ± 0.5%)
- ✓ Load Reading resolution: 1/200.000 points
    - o 1/100.000 in Tension
    - o 1/100.000 in Compression
- ✓ Sampling Speed Force Data (internal): 30.000 S/second
- ✓ Units Selection: **Kg - N or Lb**
- ✓ Overload protection (Load Cell)
- ✓ Programmable pre-load
- ✓ High speed converter A/D of 18 bit

STROKE MEASURE
- ✓ Direct measurement from screw balls driving
- ✓ Single measurement range (1 scale)
- ✓ Reading resolution: 0,001 mm
- ✓ Self-return accuracy, better than 0.05 mm
- ✓ Selectable Units: Millimeters and Inches
- ✓ Programmable extension limits

SPEED TEST CONTROL
- ✓ Variable speed range (see table)
- ✓ Variable speed return within range (see table)
- ✓ Preset speed Resolution: < ± 0.02 mm / minute
- ✓ Speed accuracy: < ± 0.5%
- ✓ Pre-load speed variable within the range (see table)
- ✓ Power Protection System
- ✓ Drive by servo motor

MODEL	MTE/400	MTE/500	MTE/600	MTE/750	MTE/1000
Capacities	400 KN (90000 lb)	500 KN (112500 lb)	600KN (135000 lb)	750KN (168707 lb)	1000KN (225000 lb)
Resolution in Force with 400-1000kN load cell	4 N (0,90 lb)	5 N (1,13 lb)	6 N (1,35 lb)	7,5 N (1,69 lb)	10 N 2,25 lb)
Load measurement accuracy	≤ ± 0,5%			≤ ± 1 %	
Displacement resolution	0,001 mm				
Displacement measure accuracy	≤ ± 1%)				
Mobile crosshead stroke	1100 mm			1000mm	
Standard separation between columns	600 mm				
Speed Range	0,05 – 250 mm /min.			0,01 – 125 mm /min.	
Maximum distance between fixings test useful	1100 mm			2.000 mm	
Power supply	380V / 50Hz - 400V / 60Hz Trifásica.				
Consumption	4 Kw	4,5 Kw	4,5 Kw	5,5 Kw	6,5 Kw
Environmental Working Condition	10 ºC ~ 35 ºC 20% -80%				
Approximate Frame Dimensions	1200x800x2700mm (W x D x H)	1200x800x2700mm (W x D x H)	1200x800x2700mm (W x D x H)	1250x850x2700mm (W x D x H)	1250x850x2800mm (W x D x H)
Net Weight approx.	2270 Kg	2450 Kg.	2640 Kg	3600 Kg	4300 Kg
Wooden Box for Transport	1450x1200x3000mm (W x D x H)	1450x1200x3000mm (W x D x H)	1450x1200x3000mm (W x D x H)	1550x1300x3100mm (W x D x H)	1550x1300x3200mm (W x D x H)
Gross Weight Approx.	2800 Kg	2950 Kg.	3150 Kg	4200 Kg	4900 Kg

* TECHLAB SYSTEMS, S.L. reserves the right to do any technique modification without advance notice

Doc. : MTE400/1000-1-CAT-I-R8