

Compression Testing Machines

High capacity compression Testing Machines
MEH-LC Series

▶ Cap. 2000 / 3000 / 5000 kN



Since 1970
Made in Spain (EU)

www.ibertest.com



Features

The testing machines MEH LC series have been designed and manufactured to meet all the requirements of standards UNE-EN 12390-4 and EN 722-1, paying special attention to the following characteristics:

- › Rigidity and stability of the test.
- › Ball-socket joint with autoblock system
- › Load axiality.
- › Self-aligning and upper plate locking.
- › Hardness, flatness and parallelism of the compression plates.

IBERTEST guarantees in writing, strict compliance with requirements of EN 12390-4 standard.

Each machine comes with a certificate issued by our Department of Metrology, conducted with calibrated equipment traceable to international standards.

IBERTEST guarantees class 0,5 or 1, as per ISO 7500-1 and EN 12390, in all MEH LC machines.

Applications

Using the suitable device (see optional accessories), and according to the maximum load capacity, the MEH LC machines allow to perform, among others, the following testings:

- › Compression strength of concrete, on cylindrical and cubic specimens, as per EN 12390-4, ISO 4012, ASTM C39, ASTM C683, etc.
- › Compression strength of bricks, precast concrete blocks and structural building materials, as per EN 772-1
- › Compression strength of stones and rocks (natural or artificial)
- › Compression elasticity of concrete: **YOUNG MODULUS and/or POISSON COEFFICIENT** determination (using additional optional software and devices)
- › Flexural strength, with one or two loading points, of concrete prismatic specimens, according to EN 12390-5, ISO 4013, ASTM C78, ASTM C293, ASTM C683, etc.
- › Indirect tensile of paving blocks, as per EN 1338.
- › Indirect tensile strength (Brazilian test) of concrete cylindrical specimens, as per EN 12390-6, ISO 4108, ASTM C496, etc.



MEH LC 2000 MD2 W - with WinTest32 software and desktop PC computer



Compression elasticity of concrete.
Young Modulus and Poisson Coefficient determination



Flexural strength of concrete as per
UNE-EN 12390-5

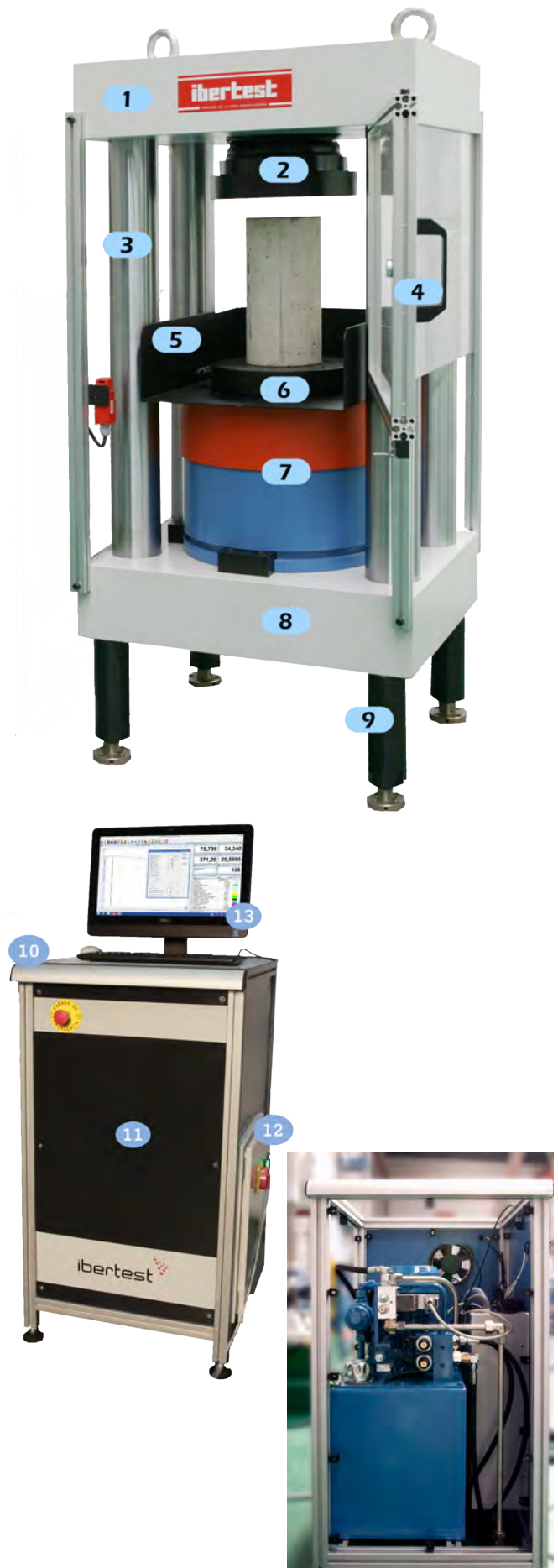
Indirect tensile of paver-bricks, as EN
1338



Indirect tensile (Brazilian test) as per EN 12390-6

Testing frame description

- 1 - Upper frame-plate** made in solid steel.
- 2 - Upper compression plate.** Made in ground hardened steel. Hardness of contact surfaces is more than 550 HV30. This plate has a specially designed ball-socket joint, with lubricating oil and autolocking system.
- 3 - Preloaded steel columns**
- 4 - Test zone with safety screen.** Made of impact-proof polycarbonate. The front door comprises a magnetic safety-switch.
- 5 - Shelf for collection and spill of debris:** To properly evacuate tested specimen remains.
- 6 - Lower compression plate.** The lower plate has centering marks for specimens correct placemen. The distance between compression plates is 340 mm, adjustable by inserting optional spacer blocks (see accessories).
- 7 - Piston-sleeve assembly.** With mobile flanges system, which allows to accurate centring of piston on the axis of the machine. The piston is solid steel, conveniently rectified. The perfect alignment of the piston is checked on each machine by means of a multi-component force transducer based in 4 strain-gauges, as specified in EN 12390-4
- 8 - Lower frame-plate.** In thick solid steel, which houses the piston-sleeve assembly.
- 9 - Levelling feet.**
- 10 - "All in One" computer, with touch-screen and WinTest32 software for test management.**
- 11 - Command desktop.** With main switch and push-button for emergency stop. The hydraulic unit is located inside the desktop and includes.
- › High performance servo-valve with close-loop control, allows excellent control of the load rate, even when unloading. This accurate control allows the user for making elasticity test with precision and confidence.
 - › Watertight oil tank with filter cover, drain valve, filling tap and oil level indicator.
 - › Fast-unload electro-valve, non-return suction filter, safety relief valve, hoses and high pressure racords.
- 12 - Electric board.** The electric board is located on the side of the desktop frame, the box comprises the ELECTRONIC MODULE MD2 and the motherboard for maniouvres control



SOFTWARE WINTEST32

WinTest32 software package, running on Windows, for concrete, blocks, bricks and building materials in general,

This system can be configured for any test standard, current or future (EN, ASTM, ISO, etc.).

LANGUAGE SELECTION: SPANISH, ENGLISH, FRENCH AND PORTUGUESE.

Test configuration and programming

- › Selection of type of test according to standard: compression, bending, Brazilian, charge and discharge cycles, etc.
- › Specimens identification, with the possibility of reading barcodes (optional).
- › Client identification.
- › Programming test series.

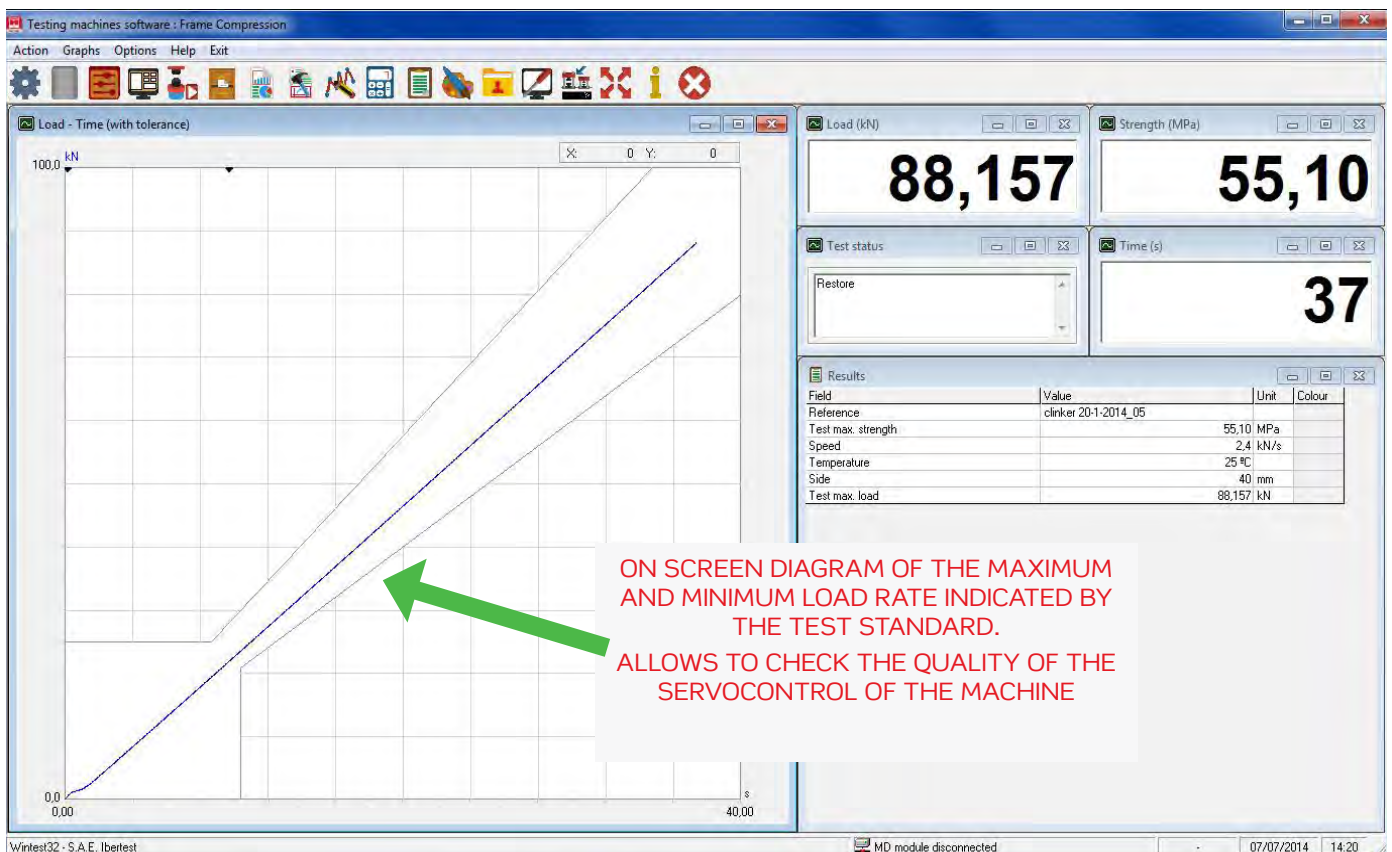
Real time direct visualization of

- › Test parameters
- › Load application speed
- › Instantaneous force (kN)
- › Maximum force (kN),
- › Strength (MPa),
- › Testing time (s)
- › Etc.



PC "All in one" User interface

Last generation computer, with LCD touch screen.



Models and specifications

MODEL	MEH-2000 LC	MEH-3000 LC	MEH-5000 LC
Maximum capacity	2000 kN	3000 kN	5000 kN
Testing frame	High rigidity: Maximum frame deformation < 1 mm at full load.		
Columns	4 chrome-plated preloaded columns		
Free distance between columns	420 x 200 mm	475 x 250 mm	440 x 340 mm
Electrical end of stroke	Included in standard supply		
Cylindrical plates Standard supplied	Tempered, grounded steel. Hardness upper than 550 HV30 as per UNE-EN 12390-4		
Cylindrical plates dimensions	Ø 290 x 50 mm thickness	Ø 320 x 70 mm thickness	<i>See note</i>
Rectangular plates	Tempered, ground and hardeness upper than 550 HV30 as per UNE-EN 12390-4.		
Rectangulars plates dimensions <i>See note</i>	450 x 300 x 50 mm thickness	450 x 300 x 70 mm thickness	275 x 275 x 80 mm thickness
Distance between plates	340 mm. Adjustable by inserting spacer blocks (optional)		
Flatness tolerance	Less or equal 0.03 mm, as per EN 12390-4		
Roughness	Between 0.4 and 3.2 µm as per standards ISO/R 468 and UNE-EN 12390-4		
Piston stroke	60 mm	60 mm	80 mm
Ball and socket joint	Autolock type, oil lubricated, as per EN-12390-4		
Testing frame dimensions (mm)	550 x 550 x 1400 (h) mm	590 x 590 x 1425 (h) mm	800 x 700 x 1750 (h) mm
Testing frame weight	1400 kg	1500 kg	4500 kg
Control desktop dimensions	500 x 500 x 1200 (h) mm	760 x 650 x 1650 (h) mm	1050 x 1100 x 1200 (h) mm
Control desktop weight	170 kg	200 kg	200 kg

**Note: Optional 450 x 350 mm rectangular plates only available for MEH 2000 and MEH 3000
MEH-5000 plates are 275 x 275 mm**

Compression Testing Machines - MEH-LC Series

MD CONTROL UNITS . MODULAR SYSTEM

Electronic controller units MD are specially designed for data acquisition and close loop control of testing instruments.

Measuring transducers are plugged to the MD module and the measurement is exported to the computer via USB or Ethernet.

The IBERTEST software WinTest32 makes data collection and shows real-time for drawing graphs and test results calculation.

This new system, based in external modules, substitutes the old electronic cards mounted into the computer, improving the performance, reliability and data acquisition speed.

Due to the external module configuration, the computer can be fast and easily changed by any other suitable PC or laptop, without need to make adjustments or calibrations.

This is very useful in case of eventual breakdown of the computer, or when obsolete computer needs to be changed.



MD2 MODULAR CONTROL UNIT, FOR STATIC TESTS

MD2 unit has been designed for **static** machines. The MD2 can be used either in electromechanical or servohydraulic machines.

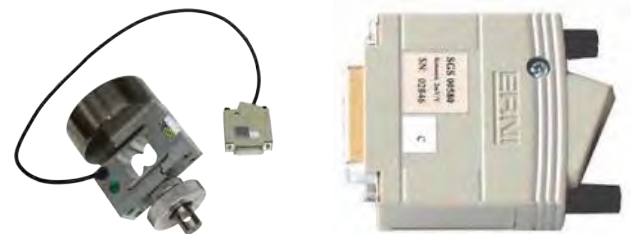
The MD2 unit has the following input channels:

- Load channel. With a resolution of ± 180.000 steps. For the connection of a load cell or pressure transducer.
- X-Head position channel. For connecting a digital incremental position transducer (encoder) or a resolver (encoder emulator) or position transducers (SSI, draw wire linear transducers, etc.)
- 2 Bus extension slots for data acquisition cards "plug-in" type, for connection of further load cells, extensometers, LVDTs, position transducers, etc.

The MD2 unit comprises an analogical $\pm 10V$ drive channel for a servovalve (hydraulic machines) or a servomotor (electromechanical machines).

MD2 features a high quality build-in electrical safety box, dustproof, ensuring the perfect state of the internal electronics.

This compact box allows to integrate the module within the frame of the machine itself (TESTCOM model) or within the electric panel of the machine (machines EUROTEST, IBMT4, UMIB, IBMU4).



The transducers comprises connector-plugs with built-chip EEPROM memory.

The transducer calibration data (unit of measure, range, zero position, linearization, etc.) are stored in the EEPROM memory. Thus, the transducer is automatically recognized as input channel when plugged to the by MD

PID CONTROL

The MD module uses PID (proportional-integral-derivative) for control loop feedback of the application of force to the test specimen.

The PID controller calculates an error value as the difference between the measured process variable (force, position or strain) and the desired setpoint.

The three signals coming from the PID are combined to generate a new command signal, which is sent to the servovalve or servomotor to eliminate the deviation as fast as possible and assuring the stability of the process.

The process of detection, evaluation and new signal generation is repeated again and again. The time consumed is the **closed loop control** time and the lower the time, the faster the controller.

3 CONTROL OPTIONS

MD electronics allows to close the control loop with the applied load (control in kN/s) or with the position (control in mm/s) or with the material deformation (control in mm/s):

1. Load control

The MD module receives the signal from the load cell and compares this feedback value with the command value (N/s or kN/s).

2. Position control

The MD module receives the signal from machine's position transducer (encoder, resolver, LVDT, etc.) and compares this feedback value with the command value (mm/min).

3. Strain control

The MD module receives the signal from machine's deformation transducer (extensometer) and compares this feedback value with the command value (mm/s or mm/min)

Applications of each type of control

Load control is normally used on low load resistance tests materials which undergo deformation just before fracture, such as concrete, cement, ceramics, rocks, adhesives, etc. as well as in metals test on material elastic zone.

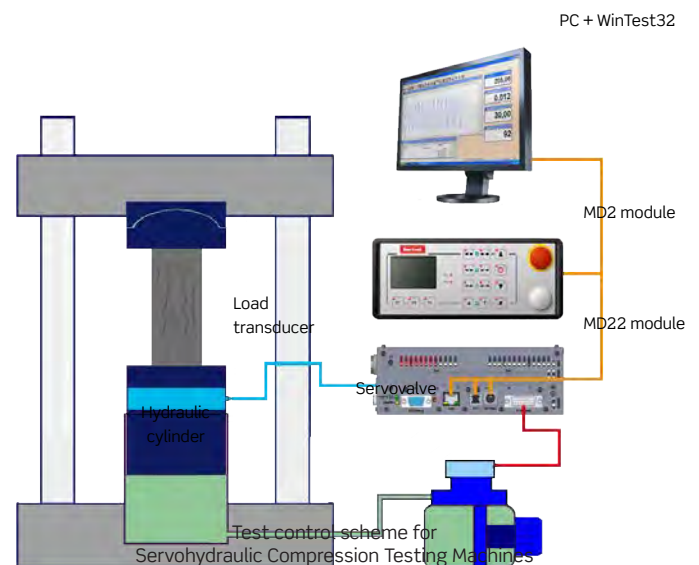
Position control is used in materials with high deformation, as rubers, elastomers, etc as well as on metals after elastic range.

Strain control is used in fracture tests and for research applications.

Automatic and programmable control change.





The IBERTEST WinTest32 testing software allows to define several criteria for changing control automatically (defined variation in the slope of the graphic, certain value of strength, load, position or deformation).

This feature is used in several applications as in metals testing, to allow the control change among behaviour regions of the material (change from elastic to plastic behaviour)



Compression Testing Machines - MEH-LC Series

Specifications of MD2 and MD22 modules, for static tests

MODULE	MD2	MD22
Front View		
Rear View		
Application purposes	Static tests	
Microprocessor	CPU 133 MHz	
Channels	Up to 4	
Resolution	± 180.000 steps per channel	
Max sampling frequency	1 kHz 1000 reading per sec per channel	
Sincronization	All channels fully synchronous and simultaneous	
Closing loop time	1 milisecond (1000 times per second)	
Drive interface	$\pm 10V$ -Command-Output (generated with ± 15 Bit resolution) I/O's and relays for safety functions	
Expansion possibilities	Up to 8 modules can be connected. 32 total synchronous channels	
PC communication	USB 2.0 full speed and/or Ethernet 10 / 100 Mbit	
Digital Inputs (24 V)	8	
Digital outputs (24 V)	8	
Serial sensor interface	COM1 (internal)	
Debug interface	COM2: 115 kB	
Slot for safety shield	YES	
Power supply	DC. 24 V	
Remote control UCRD-7	YES	NO

Optional equipment:

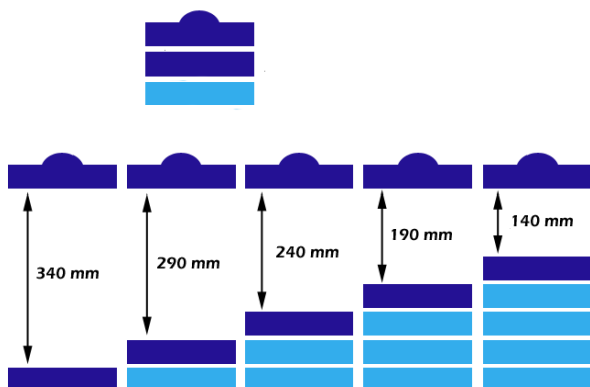
SPACER BLOCKS

Spacer blocks are placed over the loading piston of the machine, under the lower compression plate, and are necessary in case of testing specimens under 300 mm height (see configuration table).

They are made of steel, 50 mm thick (100 mm also available), and feature self-centering system to the piston and to the lower compression plate.



Assembly scheme for blocks spacers



SPECIMEN HEIGHT	REQUIRED SPACERS
200 mm	2
150 mm	3
100 mm	4

RECTANGULAR COMPRESSION PLATES 450 X 300 MM

NOTE: This option must be specified in the purchase order, to be mounted in our factory.

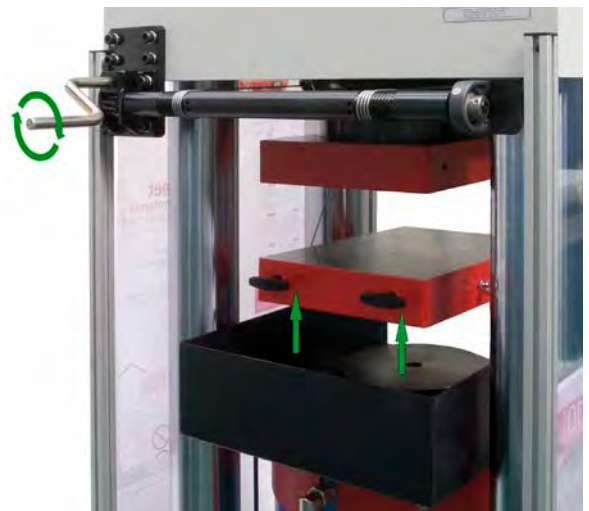
The rectangular plates can enhance test surface available to test other elements such as concrete blocks, bricks, vaults, etc).



These plates fulfill all the requirements of the standards EN 12390-4 and EN 772-1. They have trim marks in diagonal and circular, to locate any type of test specimen perfectly. The upper plate has ball and socket joint.

LIFTING DEVICE FOR LOWER COMPRESSION PLATE

A crank-handle system, located in the rear of the frame, allows to lift the heavy lower compression-plate for introduce or withdraw the spacer blocks under the plate.



**FLEXURAL STRENGTH OF
CONCRETE** *(UNE-EN 12390-5)*



"TECHNICAL SUPPORT HAS NEVER BEEN EASIER"

TELEDIAGNOSIS is a remote diagnostic service and maintenance support, available for all IBERTEST equipment and testing machines equipped with data acquisition system by computer.

The immediate attention of TELEDIAGNOSIS service for customers located worldwide, minimizes downtimes and avoids delays in the work of laboratory, while reducing or eliminating the overhead of moving the IBERTEST technicians.

To run TELEDIAGNOSIS a link program is used which establishes a remote connection to control the computer of the machine, quick and safe, ensuring IBERTEST services even at facilities with distant locations.

Thereby, an easy and effective intervention from our Technical Service is possible regardless of the location of the machine, as long as an access to INTERNET is available.

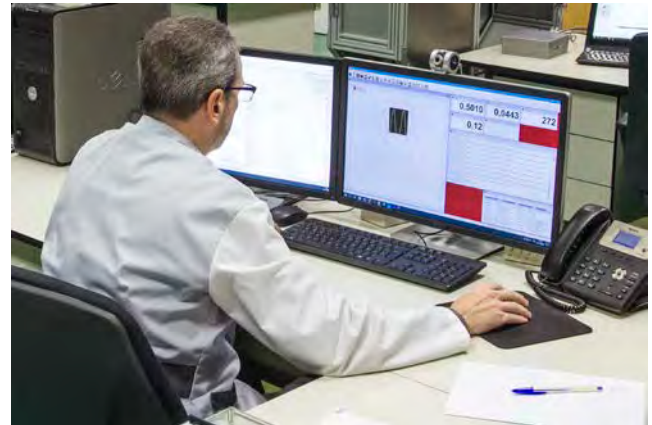
Even on those occasions when the Technical Service must act "in situ", the TELEDIAGNOSIS is helpful to clearly identify the problem in advance and improve first-visit resolution rates.

During a TELEDIAGNOSIS session, the following actions can be performed:

- › **Software revision and correction.** IBERTEST technicians can inspect the software file system, looking for wrong configurations, lost files and directories, corrupted files, viruses or others. Once the errors are detected, only the appropriate libraries and changes are transferred, without reinstalling complete programs.
- › **Remote handling.** IBERTEST technicians can operate the remote machine in real time to perform maneuvers, tests of mechanical movement, installation of testing transducers and accessories, verification of electrical and electronic systems, on/off alarm and security systems, etc.
- › **Videoconference.** Through webcam a videoconference between client and our technicians can be maintained, thus we can get visual-information about the correct operation of the machine's mechanical and hydraulic systems. Also, by written or voice messages, it is possible to exchange views and comments, and give appropriate instructions to the user, when necessary, to perform some physical action in the machine.
- › **Updates.** The software can be easily updated to its latest version, which allows enjoying the advantages resulting from the continuing work of review and program development.
- › **Factory reset.** All machines have a backup, stored in our servers in Madrid, which allows you to restore the original configurations when necessary.

TELEDIAGNOSIS

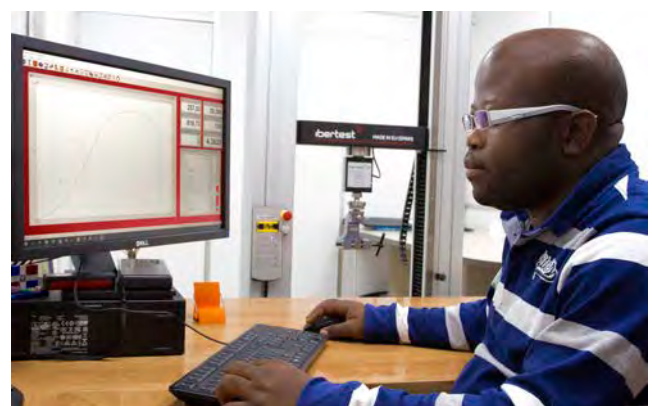
REMOTE DIAGNOSIS SERVICE



IBERTEST Spain - Madrid Technical Services



Real time TELEDIAGNOSIS link



End-user laboratory (anywhere in the world)

Remote diagnostic service by TELEDIAGNOSIS is free during the first year and during the warranty period.

After the guarantee period, many of our customers require the Annual Telediagnosis Pass, which covers interventions of up to 5 hours a year.

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ibertest



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