

## High capacity compression Testing Machines MEH-LC Series

▶ Load capacities: 2000 / 3000 / 5000 kN



## 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 placement. 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 records.

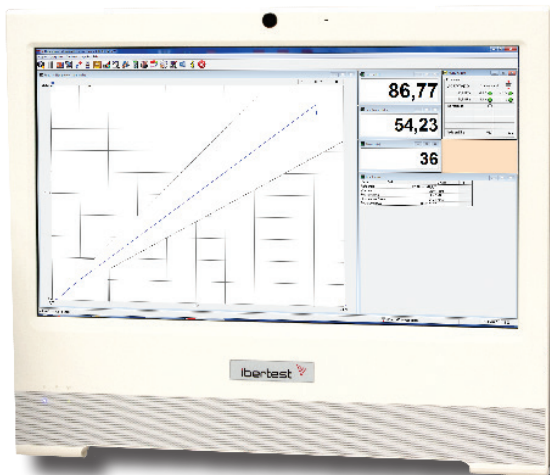
**12 - Electric board.** The electric board is located on the side of the desktop frame, the box comprises the ELECTRONIC MODULE MD2 and the motherboard for manoeuvres control



### PC “All in one” User interface

Based on a touch screen PC, integrated into a single slim module with adjustable support attached to the desktop.

Allows easily and comfortable data input through the touch screen to schedule the test, make machine's movements, start testings and, of course, obtain graphical and results of the test with all the WinTest32 software possibilities.



### All in one PC features.

- › Touch screen “All-in-One” computer 15 “
- › Processor dual core: 1,66 GHz.
- › RAM: 2Gb
- › Hard disk: 250 Gb
- › Outputs: VGA , 2 serial port, 1 parallel port,
- › 4 USB 2.0 ports for direct connection of external MC8 control electronics and optional peripherals (flash memory, keyboard, mouse, printer, etc.).
- › Integrated accessories: 4 in 1 card reader, webcam, microphone and speaker.
- › Wi-Fi connectivity and Ethernet networking for data exportation, remote control, etc.
- › Power consumption: 40 W
- › Fanless and silent cooling system.

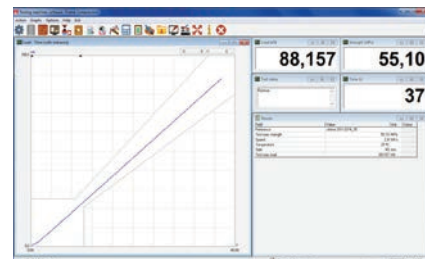
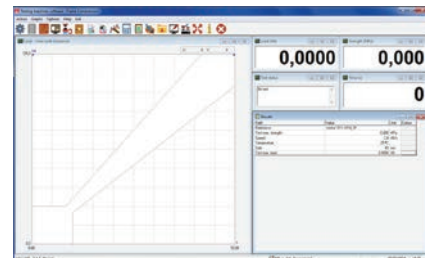
*On request, you can replace this PC Touch screen for a conventional desktop PC.*

*Please ask our Sales Dept.*

### Software WinTest32 - WINTEST.HOR® Version

32-bit WinTest32 software package, running on Windows, developed specifically for concrete, blocks, bricks and building materials in general, especially developed by IBERTEST to be used in facilities governed by computer with control in “closed loop”.

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.

### Automatic Test Development

With real time direct visualization, on the computer screen of test parameters, graphical load application speed, instantaneous force (kN), maximum force (kN), reached resistance (MPa), time of testing (s), etc.

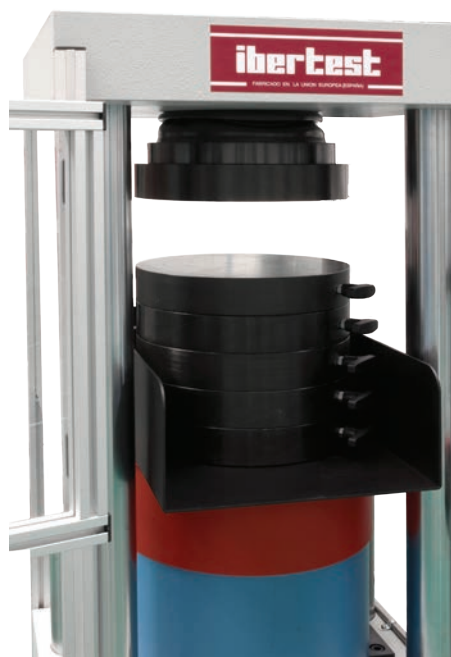


### Optional equipment:

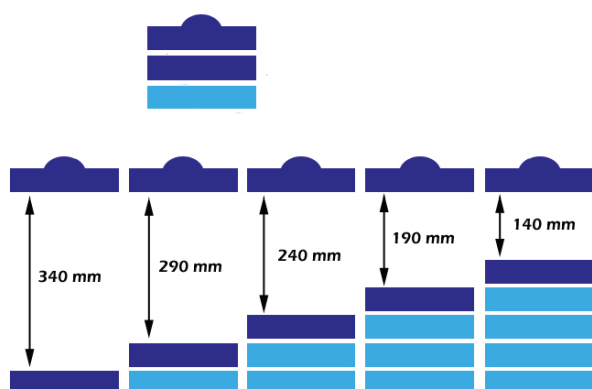
#### SPACER BLOCKS

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

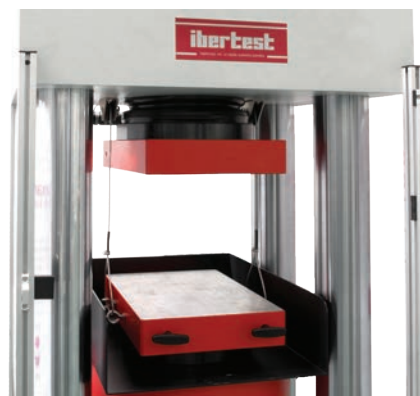


SPECIMEN HEIGHT	REQUIRED SPACERS
200 mm	2
150 mm	3
100 mm	4

#### RECTANGULAR COMPRESSION PLATES 450 X 300 MM

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

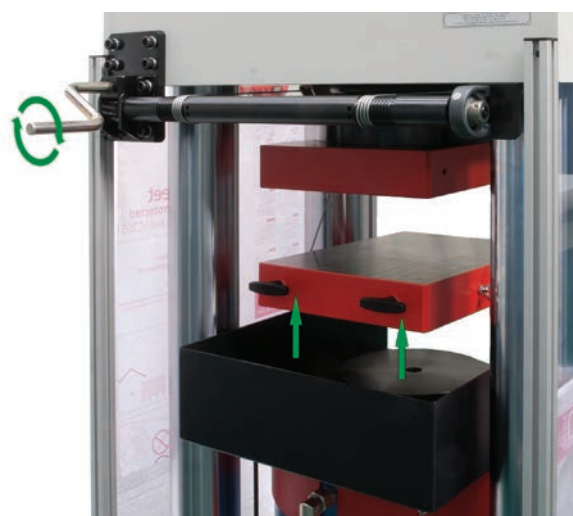
The rectangular plates can enhance test surface available to test other elements such as concrete blocks, bricks, vaults, etc).



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.



## 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	See note
Rectangular plates	Tempered, ground and hardness upper than 550 HV30 as per UNE-EN 12390-4.		
Rectangular plates dimensions See note	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**

## MD CONTROL ELECTRONIC

Modular and computer independent electronic system. Based on last generation microprocessors and designed specifically for closed loop control and data reading on high performance testing solutions.

Maximum performance in accurate and real time variables reading, close loop control and data sending to external processing on WINTEST software.

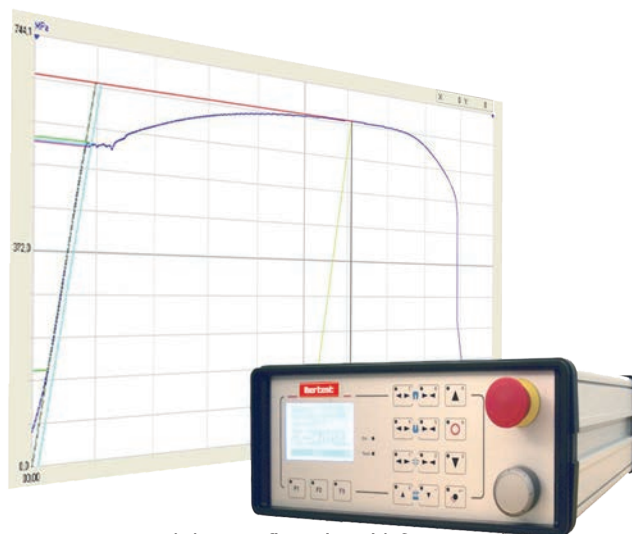
The MD system replaces the conventional PC-internal control boards. It widely improves control performance, reliability (not subject to PC failures) and data acquisition speed.

Data received from transducers is sent via full speed USB (or Ethernet) connection to a computer to be processed by the WINTEST 32. The information received by WINTEST software is managed in real time to perform graphics, calculate formulas and show test results.

Due to PC independent and external configuration, the computer provided with the machine can be easily replaced.

Highly useful when computer fails due to hardware (component) or software (virus) problems.

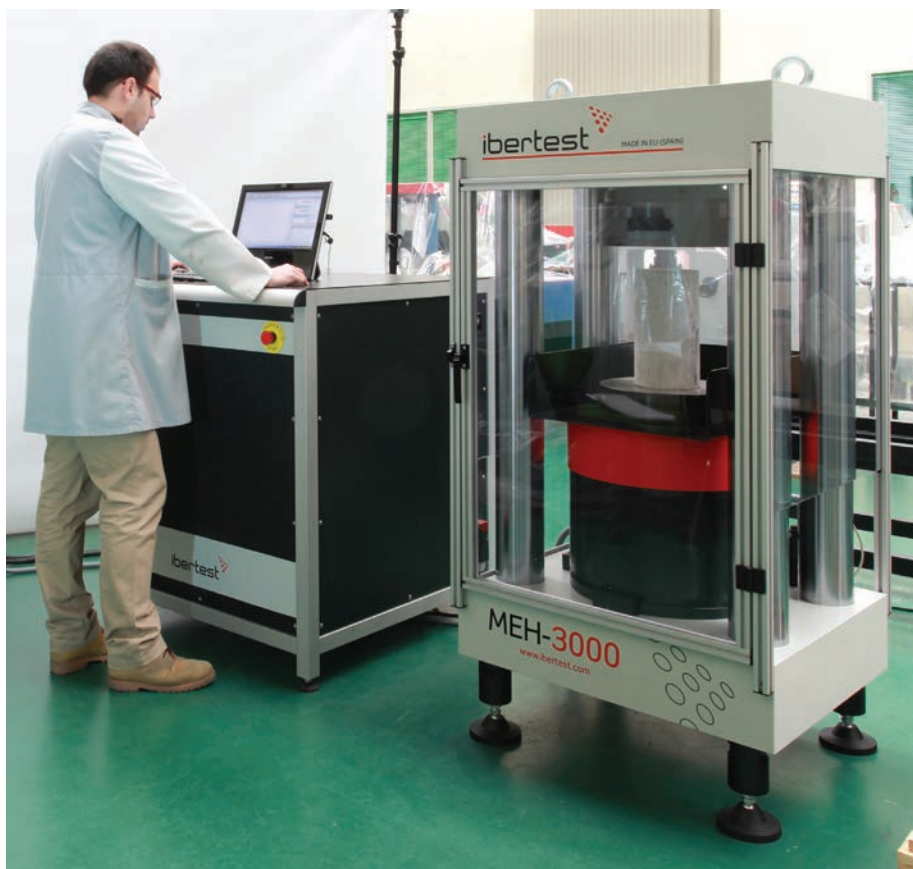
Machine configuration, calibration, transducers information, etc won't be affected as all the information is stored in the MD module.



Stand alone configuration with front pannel.  
Models MD22 y MD58



MD2 module, bulk-in configuration. With protective case to be placed in machines' electric cabinet.



## 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):

### Load control

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

### 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/s or mm/min).

### Deformation control

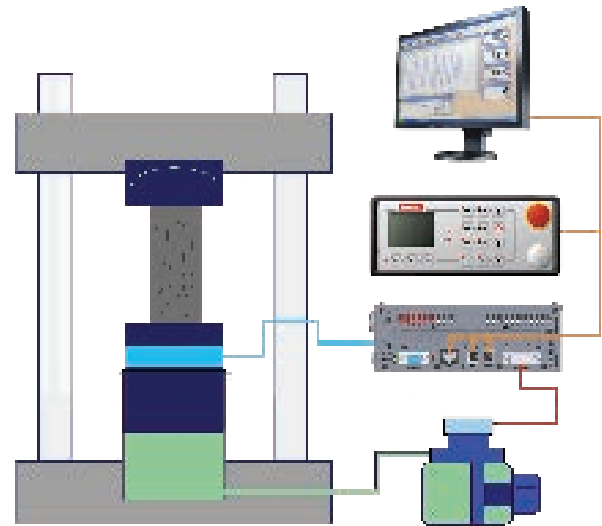
The MD module receives the signal from machine's deformation transducer (extensometer) and compares this feedback value with the command value (mm/s or mm/min).

### Deviation correction

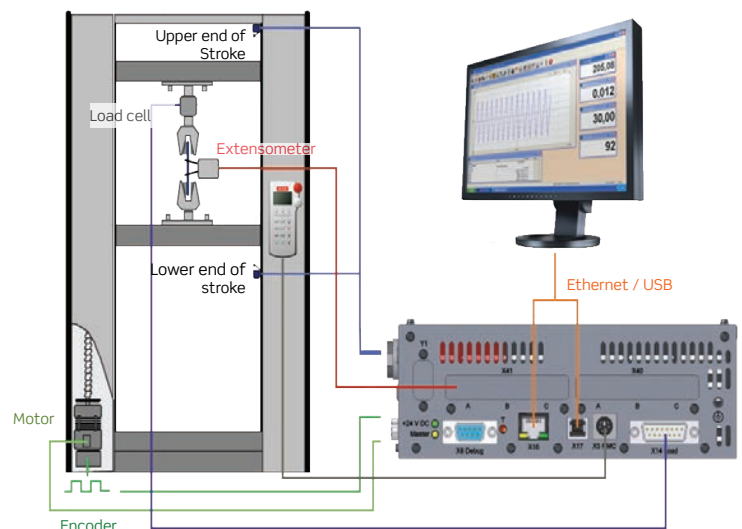
The error (deviation between command and feedback) is processed with a PID

The three signals coming from the PID are combined to generate a new command signal, sent to the servovalve or servomotor to eliminate, in the minimum possible time and with stability, the deviation.

The time used in this process (detection, evaluation and new signal generation is called, closed loop control time.



Scheme of load control for servo-hydraulic testing machines



Scheme of load control for electromechanical testing machines

## 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.





**Deformation control** is used in fracture tests and for research applications.

## Automatic control change

WINTEST 32 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). Widely used in several applications as in metals testing to allow the control change among materials regions (elastic to plastic)



Specifications of MD2 and MD22 modules, for static tests

MODULE	MD2	MD22
Front View		
Rear View		
Application purposes	Static tests	
Microprocessor	CPU 800 MHz	
Channels	Up to 4	
Resolution	$\pm 180.000$ 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 $\pm 15$ 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

### TELEDIAGNOSIS (Optional Service)

TELEDIAGNOSIS is a remote diagnostic service and maintenance support, available for all IBERTEST testing machines equipped with the "W" system for control, programming and data-acquisition by means of computer.

To run TELEDIAGNOSIS a link program is used which establishes a remote connection to the control computer of the machine

When connected, our technicians are able to take control of the testing machine, as if they were in front of it, to act on the problem quickly and effectively, without displacements to your laboratory.

So, intervention from our Technical Service is possible regardless of the location of the machine, as long as an access to a fast Internet (ADSL or similar) is available..

Even on those occasions when the Technical Service must act "in situ", the TELEDIAGNOSIS is helpful to clearly identify the problem and choose the best solution to fix it.

In short, the immediate attention of TELEDIAGNOSIS service minimizes downtimes and avoids delays in the work of laboratory, while reducing or eliminating the overhead of moving the IBERTEST technicians.

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

- › **Software correction and review:** IBERTEST technicians can inspect the file system software WINTEST32 test, wrong configurations, lost files and directories, corrupted files by viruses, etc. Once detected errors, only the appropriate libraries and changes are transferred, without reinstalling complete programs..
- › **Remote handling:** IBERTEST technicians can handle 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:** Via web-cam a videoconference between client and our technicians can be maintained, thus we can get invaluable 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 WINTEST32 software can be easily updated to its latest version (as long as the computer are able to support it). This allows enjoying the advantages resulting from the continuing work of review and program development.



IBERTEST Spain - Madrid Technical Services



Real time TELEDIAGNOSIS link

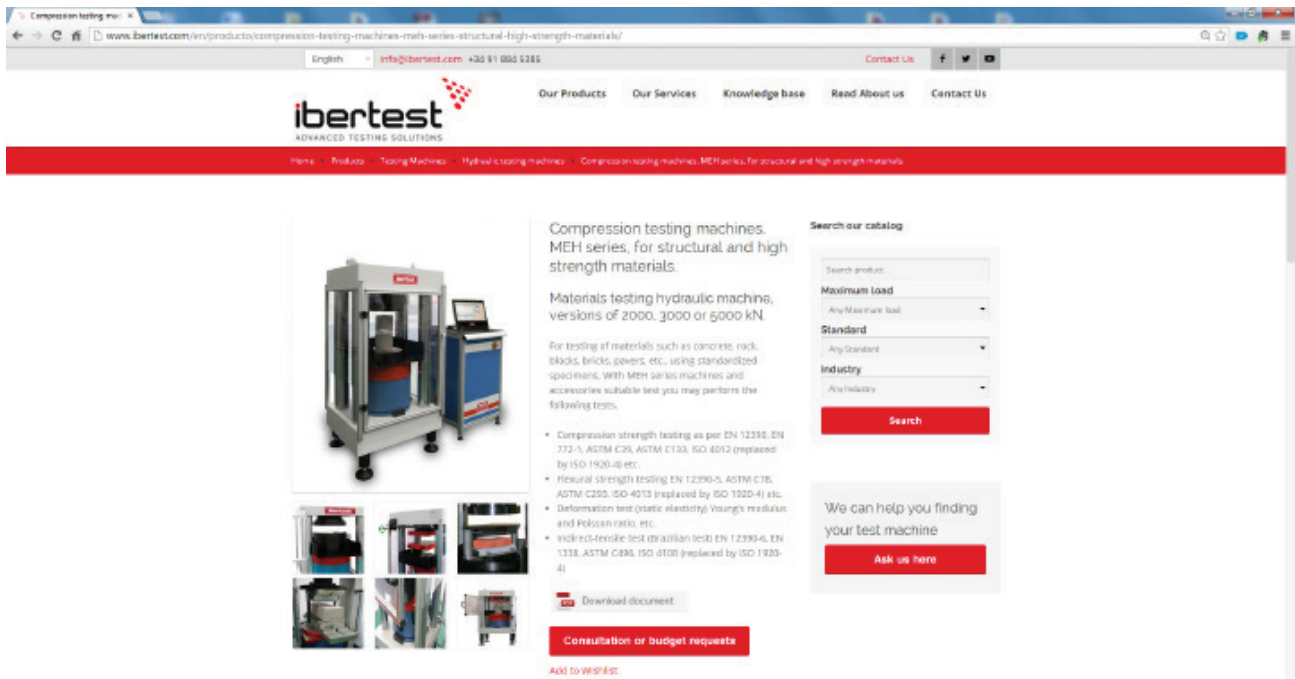


End-user laboratory (anywhere in the world)

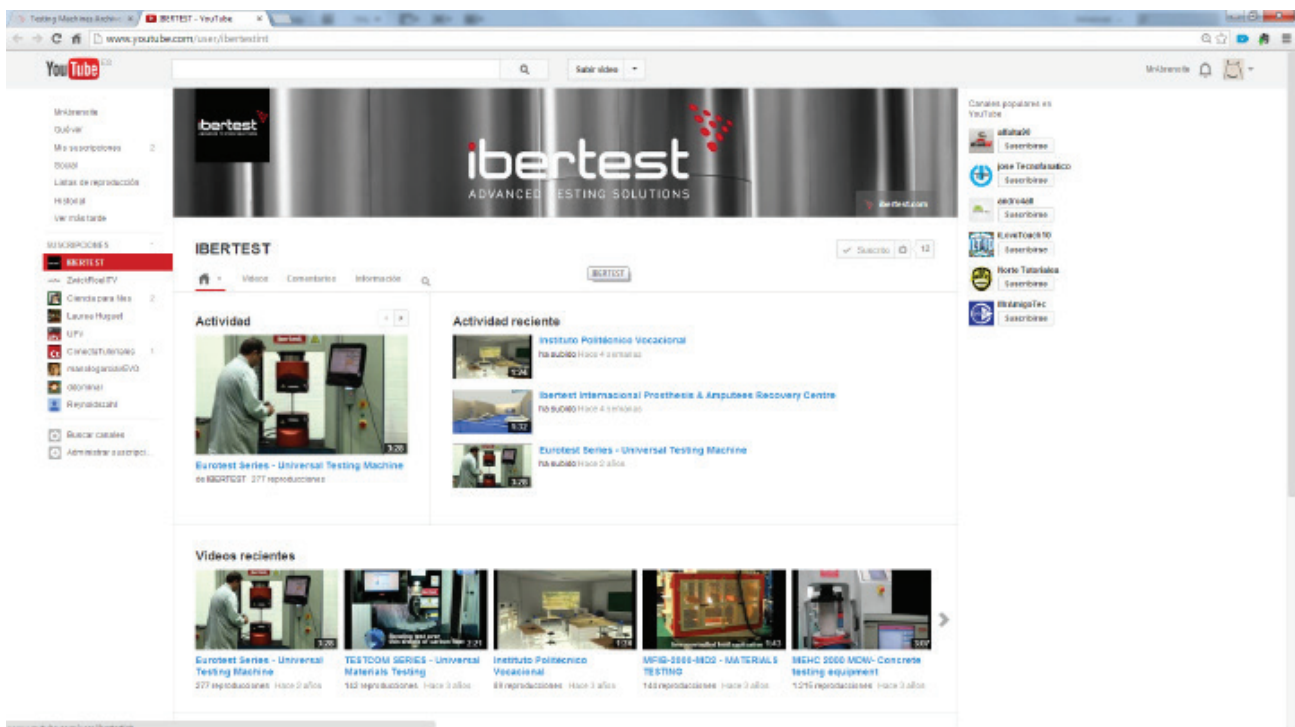
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