ibertest
ADVANCED TESTING SOLUTIONS

Electromechanical Testing Machines
TESTCOM Series

▶ Capacity: 5 - 100 kN

TESTCOM-100
www.ibertest.com
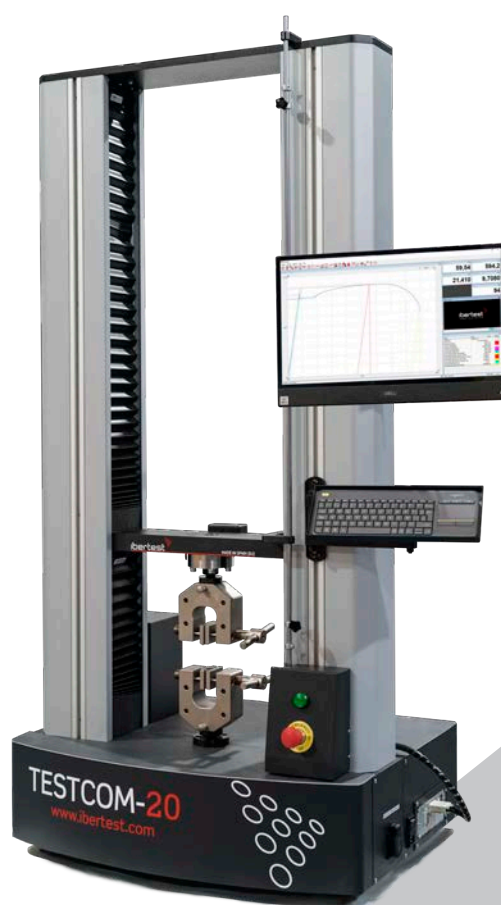
TESTCOM-20
www.ibertest.com

INTRODUCTION

New design of tabletop universal testing machines manufactured by IBERTEST. The TESTCOM series offers state-of-the-art performance combined with an ergonomic design and modern look.

Maintenance-free, electric servomotor drive for smooth and precise operation.

MODEL	CAPACITY
TESTCOM-5	5 kN
TESTCOM-10	10 kN
TESTCOM-25	25 kN
TESTCOM-50	50 kN
TESTCOM-100	100 kN

If you need machines with higher force capacity, please consult our range of electromechanical machines **EUROTEST (up to 2000 kN)**
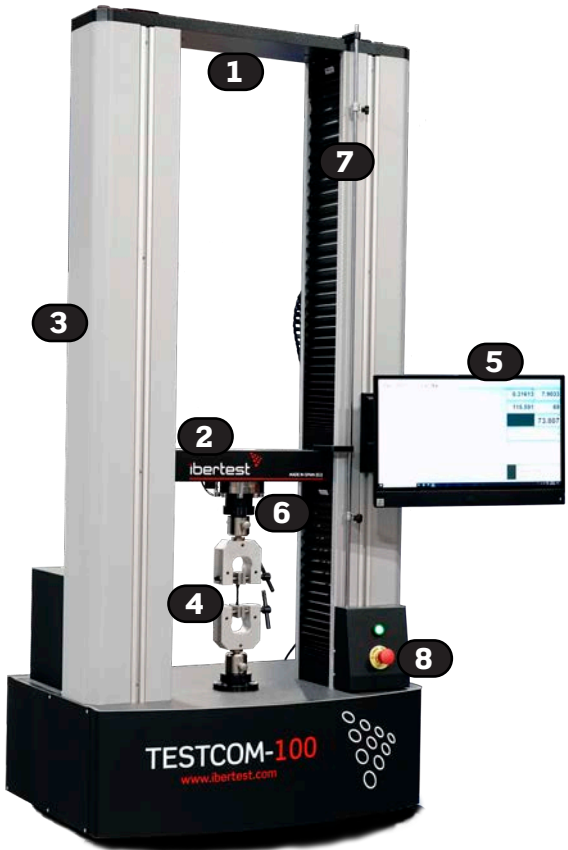
Advantages

› Its **compact and ergonomic** design saves space in the user's premises.

› Testing area **dimensions are adaptable** to specific customer requirements: scalable height, width and depth.

› **Specific** load cells, testing fixtures and transducers for each type of test.

Interface

User interface in an *All-In-One* computer with integrated touch screen, more modern, user-friendly and with improved performance.
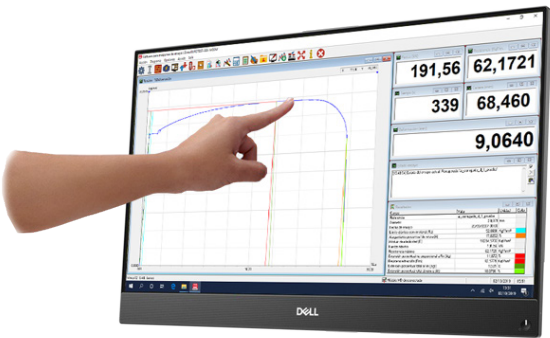
The *All-In-One* computer is attached directly to the test frame by means of an orientable support, which allows to save a considerable amount of space in the laboratory and offers the user an ideal ergonomic position for operating both the WinTest software and the testing devices.

PARTS IDENTIFICATION

1. **Fixed upper crosshead**: to increase test frame stiffness.
2. **Mobile crosshead**: powered by the screw drivers, it transmits the load to the test specimen.
3. **Frame housing**: to host and protect the screw drivers and guiding columns.
4. **Tensile gripping heads**: other testing devices available for compression, bending...
5. **Control interface** through WinTest software and the *All-In-One* computer with touch screen.
6. **Universal load cell** (tensile-compression) for measurement of the applied force.
7. **Adjustable end of stroke**.
8. **Emergency stop**.

Accessory

Support frame. To place the machine and improve its ergonomics. Very robust, made of welded steel tube, with a shelf for storing devices and accessories.

It has 4 levelling feet.

Testing frame

Designed to perform out all type of static strength tests on materials, according to **EN standards**, **ASTM standards** and equivalent.

By means of interchangeable devices, it is possible to carry out tensile, compression, bending, folding, shear, punching... tests on all types of materials and finished products.

It is also possible to carry out **tests at high and low temperatures**, by using thermal chambers or furnaces, and the accessories corresponding to each application.

The base of the machine hosts the lower crosshead, as well as the servomotor and the ball screw transmission mechanisms.

Two **high-precision ball screws** and two guiding columns with rust-proof hard chrome coating ensure an even distribution of load and a **completely linear displacement** of the mobile crosshead.

Adjustable end of stroke detectors and, optionally, visual positioning ruler along the frame.

Displacement measurement

By means of the high resolution **digital transducer**:

› Position control resolution: **0.002 μm**.

› Speeds: 0.001 up to 1000.00 mm/min, depending on the model. Other speeds on demand.

The displacement data are used for two applications: test results and for closing the control loop (MDi control system).

Load measurement

Universal strain gauge load cell (tension-compression) which ensures high precision and repeatability. S-type or low profile available.

The high quality of the load cell guarantees Class 0.5 according to ISO 7500-1 within the measuring range (1% to 100% of the nominal capacity).

Double function: measuring the forces applied on the specimen (kN) and sending the return for closed-loop control (MDi control system).

Additional load cells can be installed to extend the measurement range or for special applications.

Automatic load cell recognition system. The system detects the installed load cell and auto-configures the control based on the capacity and calibration of the load cell. This saves time for the user and improves safety against human configuration errors (avoiding possible overloads).

Compression test with square plates.
IBERTEST supplies circular, square and rectangular plates for any specimen size.

Single load bending/flexural test.
Two-point load test can be carried out with a double roller loading fixture.

Tensile test with a long-travel extensometer: to determine the yield strength and elongation at break of materials with a high percentage of elongation.

Technical specifications

MODEL	TESTCOM-5	TESTCOM-10
Capacity	5 kN	10 kN
Force measurement	Universal load cell (tension - compression), extensometric bands Additional load cells can be mounted	
Precision according to ISO 7500-1	Class 0.5	Class 0.5
Measuring range	1% to 100% of nominal capacity 50 to 5 000 N	100 to 10 000 N
Force resolution	24 bits	24 bits
Mobile crosshead	Driven by the ball screws and guided by the columns Automatic return to initial test position, defined by software	
Motor drive	Synchronous servomotor (brushless) with integrated reduction gears. Enables closed-loop control (servocontrol) in load (kN/s) and displacement (mm/min)	
Transmission	Via HTD precision teeth belt. Adjustable belt-tightening system	
Crosshead position measurement	High resolution digital transducer	
Position control resolution	0.002 µm	0.002 µm
Movement speed range	0.01 to 1000.00 mm/min [2]	0.01 to 1000.00 mm/min [2]
Load speed range	Programmable between 1/1000 and 1/10 of capacity, in kN/s [2] 0.0005 to 0.5 kN/s [2]	0.001 to 1 kN/s [2]
Columns	2 chrome-plated and grounded steel columns	
Ball screws	2 high-precision ball screws with scrappers	
Test zones	One (single space)	One (single space)
Horizontal free distance	420 mm [1]	420 mm [1]
Vertical free light with load cell (without testing devices)	0 - 1200 mm [1]	0 - 1200 mm [1]
Dimensions (height x width x depth)	1750 x 830 x 660 mm	1750 x 830 x 660 mm
Power supply	Single phase 220V with ground, 50/60 Hz (to be specified)	
Total power	500 W	500 W
Weight without testing devices	250 kg	250 kg
Safety	Emergency stop button on the front of the test frame, adjustable end of stroke, overvoltage protection, EMC filters... Complies with european safety standards, such as European Directive 2006/42/EC	

[1] *Other dimensions on demand.*
[2] *Other speeds on request.*

IBERTEST reserves the right to change the specifications without prior notice

Technical specifications

MODEL	TESTCOM-25	TESTCOM-50	TESTCOM-100
Capacity	25 kN	50 kN	100 kN
Force measurement	Universal load cell (tension - compression), extensometric bands Additional load cells can be mounted		
Precision according to ISO 7500-1	Class 0.5	Class 0.5	Class 0.5
Measuring range	1% to 100% of nominal capacity		
	250 to 25 000 N	500 to 50 000 N	1 000 to 100 000 N
Force resolution	24 bits	24 bits	24 bits
Mobile crosshead	Driven by the ball screws and guided by the columns Automatic return to initial test position, defined by software		
Motor drive	Synchronous servomotor (brushless) with integrated reduction gears. Enables closed-loop control (servocontrol) in load (kN/s) and displacement (mm/min)		
Transmission	Via HTD precision teeth belt. Adjustable belt-tightening system		
Crosshead position measurement	High resolution digital transducer		
Position control resolution	0.002 µm	0.002 µm	0.002 µm
Movement speed range	0.001 a 500.00 mm/min [2]	0.001 a 500.00 mm/min [2]	0.001 a 500.00 mm/min [2]
Load speed range	Programmable between 1/1000 and 1/10 of capacity, in kN/s [2]		
	0.0025 to 2.5 kN/s [2]	0.005 to 5 kN/s [2]	0.01 to 10 kN/s [2]
Columns	2 chrome-plated and grounded steel columns		
Ball screws	2 high-precision ball screws with scrappers		
Test zones	One (single space)	One (single space)	One (single space)
Horizontal free distance	450 mm [1]	450 mm [1]	450 mm [1]
Vertical free light with load cell (without testing devices)	0 - 1200 mm [1]	0 - 1200 mm [1]	0 - 1300 mm [1]
Dimensions (height x width x depth)	1900 x 900 x 685 mm	1900 x 900 x 685 mm	2015 x 900 x 705 mm
Power supply	Single phase 220V with ground, 50/60 Hz (to be specified)		
Total power	500 W	500 W	750 W
Weight without testing devices	375 kg	375 kg	525 kg
Safety	Emergency stop button on the front of the test frame, adjustable end of stroke, overvoltage protection, EMC filters... Complies with european safety standards, such as European Directive 2006/42/EC		

[1] *Other dimensions on demand.*
[2] *Other speeds on request.*

IBERTEST reserves the right to change the specifications without prior notice

Examples of special versions of TESTCOM machines

The machines of the **TESTCOM** series are a versatile testing solution. The testing frame (width, height, stiffness...) as well as the other features of the machine can be adapted to the customer's needs.

TESTCOM 50 machine with climatic chamber (temperature and humidity control)

TESTCOM 50E machine (vertical testing space 1950 mm) with pneumatic tensile gripping heads and long travel extensometer

TESTCOM 20 machine equipped with alignment system and pneumatic tensile gripping heads

TESTCOM 10 machine with reduced vertical testing space

Examples of test possibilities with the TESTCOM series

The TESTCOM series machines, by means of the appropriate testing device, allows to perform any type of test on a wide range of materials with F_{max} up to 100 kN. Such as:
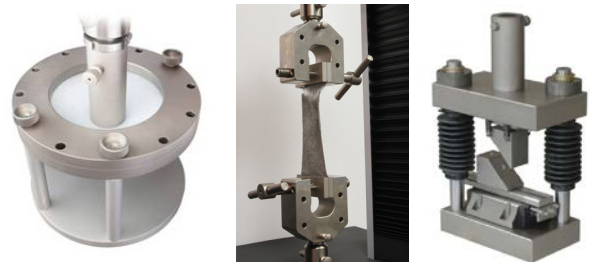
Polymers and adhesives

Standards: ASTM-D395, ASTM-D412, ASTM D429, ASTM-B571, ASTM-D1894, ASTM-D2861, ASTM-D2979, ASTM-D3330, ASTM-D4776, ASTM-D6252, ASTM-D6862, ISO813, ISO4074, ISO5893, ISO8295, ISO19671, DIN EN1939, GOST411, BS3704, EN28510, ISO 8510-1, etc.
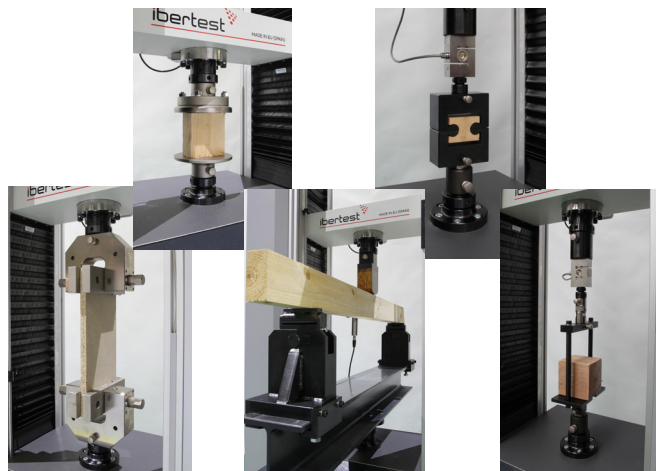

Woods and conglomerates

Standards: ASTM-D143, ASTM C297, ASTM-D905, ASTM D1037, ASTM D1623B, DIN 52187, DIN 52365, DIN 52367 EN 319, EN 1607, EN 12004, EN 392, ISO 6238, DIN EN 311, etc.

Construction and ceramic materials

Standards: ASTM C109, ASTM-B406, ASTM-C1452, ASTM-C1230, ASTM-C1550, ASTM-C1609, ASTM-C1812, EN 196-1, DIN488-5, DIN EN ISO15630-2, DIN EN10080, ISO3327, etc.

Textiles and geotextiles

Standards: EN ISO13936-1, ISO13936-2, EN14704, ISO 17697, ISO20932-2, ASTM-D1037, ASTM-D1683, ASTM-D6364, ASTM-D5034, ASTM D6241-B, GOST56335, DIN EN ISO12236, DIN EN ISO9836-1, etc.

Composites

Standards: ASTM D695, ASTM-B571, ASTM-D2344, ASTM-D2861, ASTM-D3330, ASTM D3410, ASTM D3846, ASTM-D5379, ASTM-D5528, ASTM-D6252, ASTM-D6484, ASTM D6641, ASTM-D6862, ASTM-D4255, ASTM-D7078, ISO 8510-1, DIN EN1939, GOST26246.0-89, EN ISO14125, EN ISO14126, EN28510, ISO8515, etc.

Metals

Standards: ASTM-E8, ASTM-A185, ASTM-A262, ASTM-A370, ASTM-A497, ASTM-C749, ASTM-A974, ASTM-C1452, ISO3651-2, EN ISO 898, DIN488-5, DIN EN ISO15630-2, EN10080, GOST 10922, etc.

ELECTRONIC DIGITAL MODULES
CONTROL SYSTEMS

MDi control module

External (independent from computer) digital control module for closed-loop control of load application rate depending on force, position and/or strain.

MDi modules are powerufl, high quality systems. These electronics are designed for the **industrial** environment: **accurate**, **reliable** and **robust**. It has high quality, dustproof electric safety enclosure that keeps the internal components in perfect condition.

MDi modules send the data received from the measurement transducers via the USB (or Ethernet) port to the PC supplied with the testing machine, which, by means of the WinTest software, performs real-time data acqusition to compose and display graphs and test results.

Thanks to the modular external configuration, the computer supplied as standard with the machine can be quickly and easily replaced by another compatible PC or laptop in the event of a malfunction or upgrade.

Static tests	Dynamic tests
Standard configuration: **MD2i**	Standard confgiuration: **MD5i**
Alternative for basic tests (without possibilty of extensometry): **MD1i**	Alternative with higher expansion possibilities: **MD7i**

## MD2i and MD5i modules for static, quasi-static and dynamic tests

The MD2i control module is designed for static testing machines, while the MD5i is specific for dynamic testing.

These modules include the following input channels:

- **Force channel**. For the connection of a load cell or a pressure transducer. This channel has a resolution of 24 bits.

- **Incremental position channel**. For the connection of an encoder (digital pulse sensor), resolver (encoder emulator), or linear transducers (wire, SSI type...).

- **3 expansion slots**. For data acquisition cards, allowing the connection of other transducers, e.g. strain gauges, LVDTs, linear transducers...

The MD2i and MD5i modules have a ±10 V analog output channel for the control signal of a servomotor (electromechanical machines) or a servovalve (servohydraulic machines).

Depending on the machine model considered, the module can be integrated into the frame itself or in the electrical panel of the machine.

MD2i module, in its safety enclosure, to be integrated in the frame or the electrical panel of the testing machine
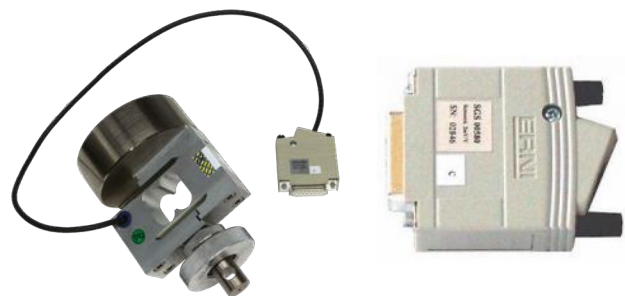
S-type load cell, universal (tensile/compression) of 500 N capacity and its connector with built-in EEPROM memory

Data acquisition card for connection to the expansion slots of the MDi modules

The transducers have connectors with a built-in EEPROM memory chip. The transducer calibration data (unit of measurement, range, zero position, linearisation...) is stored in the memory.

The electronics recognises the installed transducer automatically and configures the input channel when connected to the MDi.

PID control

The MDi control module uses a PID (proportional-integral-derivative) system for closed-loop control of the force application during the test.

The PID system calculates an error value as the difference between the measured variable (force-stroke-strain) and the desired setpoint.

The three signals from PID control are combined to generate a command signal to the servomotor to eliminate the deviation in a stable manner and in the shortest possible time.

The time it takes for the system to detect, evaluate and send the control signal is called the control loop closing time. The shorter the closing time, the faster the control.

Upper end of stroke
Load cell
Extensometer
Lower end of stroke
Ethernet / USB
Motor

Control scheme for electromechanical testing machines

3 types of control

The MDi electronics allows control of the test speed by closing the control loop in relation to the **applied load** (kN/s) [1], the **stroke** (mm/min) [1] or the **specimen strain** (mm/min) [1]:

1. Load control

The MDi module receives the signal from the machine load transducer and compares this return with the defined setpoint. This type of control is common when testing concrete, cement, ceramics, rocks, adhesives...
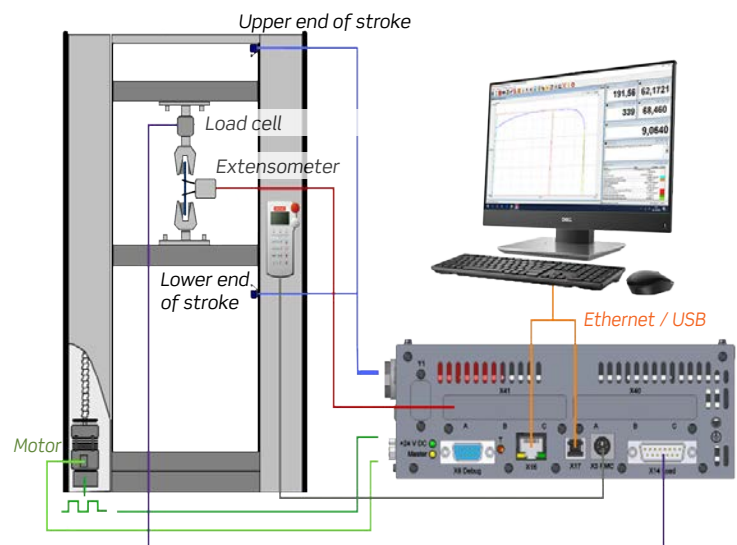
2. Stroke or position control

The MDi module receives the signal from the position transducer installed in the machine (encoder, resolver, LVDT...) and compares the speed of movement of the crosshead or hydraulic actuator with the programmed speed. The stroke control is often used in tests on soft plastics, elastomers, rubbers...

3. Strain control (optional)

This type of control is only possible when the electronics is equipped with an extensometry channel and the test is carried out using an extensometer. In this case, the MDi module receives the signal from a strain transducer (extensometer) which measures the strain of the specimen under test.

Built-in control module in a TESTCOM machine frame

Automatic control change

The WinTest software allows to define criteria for automatic control change (variation in the slope of the test curve, specific value of force and stroke...). This function is very useful in several applications such as in metal testing, to change from force control to stroke control when passing from the elastic to the plastic zone.

[1] *Other units of measurement included in the WinTest software*

Remote control units available

Technical specifications - MD1i / **MD2i**, for static tests

VERSION	MD1i	MD2i
Side view		
Rear view		
Application	Static and quasi-static tests	
Maximum frequency of system and control loop	1 kHz (1000 readings per second, per channel)	2.5 kHz (2500 readings per second, per channel)
Control loop closing time	1 ms	0.4 ms
CPU frequency	800 MHz	800 MHz
Maximum test frequency	2 Hz	5 Hz
Resolution	24 bits	24 bits
Channel synchronization	All channels are synchronous and simultaneous.	
Types of control	In load and stroke	Default: In load and stroke Optional strain control by means of extensometry channels in the empty extension slots
Expansion slots	0	3
Inputs and outputs	Universal interface for 8 digital inputs and 8 digital outputs (at 24 V)	
Loop closure	Analog ±10 V control output or various digital interfaces	
Remote control option	Yes. Compatible with emergency stop on remote control	
Communication with PC	Ethernet 100/100 MBit	USB 2.0, Ethernet 100/100 MBit
Expansion possibilities	Synchronisation of multiple MDi for applications with multiple load axes	
Connector for USB memory stick	Yes	Yes
Dimensions (width x height x depth)	190 x 42 x 200 mm	190 x 67 x 200 mm

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REMOTE CONTROL UNITS UCRD-6i and UCRV

Features

1. Operation via function keys and digital control potentiometer *DigiPoti*.

2. OLED graphics display, 128 x 64 pixels.

3. Dimensions (width x height x depth): 65 x 220 x 30 mm.

4. UP/DOWN/STOP keys and programmable keys (machine control) for a total of 15 function keys to control the piston or the crosshead. More precise movements are possible with the *DigiPoti* potentiometric control.

5. Magnetic base, which allows the control to be placed on the machine or other metal support.

UCRD-6i remote control

NEW UCRV: Remote control unit with virtual version

Wired remote control for cros-shead movements. Independent opening and closing of hydraulic gripping heads(*) and piston movement.

(*) For machines with this feature.

Its ergonomic shape allows for a comfortable and safe grip, making it easier to use IBERTEST machines in a more precise and user-friendly way.

In addition to the wired remote control, the UCRV includes a **virtual version** that can be installed on a mobile phone or tablet (Android or iOS) for wireless operation via the built-in WiFi network (terminal not included).

The virtual version, in addition to the basic functions of the wired version, includes the following functions:

› **Real-time display** of load and stroke data.
› **Start and stop** the test.

Examples of menu screens of the virtual version of the UCRV

WinTest
SOFTWARE FOR MATERIALS TESTING

Introduction

WinTest (for Windows®) is the software developed by IBERTEST to operate our universal testing machines.

Thanks to its great flexibility and power, WinTest can be efficiently adapted to every testing need.

The software allows the user to configure the tests according to the main international standards used in materials engineering (UNE, EN, ASTM, ISO...). Nevertheless, for a small supplement, IBERTEST can adapt WinTest software to the particular or special needs of your laboratory.

During the design phase of WinTest, IBERTEST has paid special attention to its ease of use, so that it can be used even by inexperienced users.

The main screen of WinTest includes a simple selection menu and an intuitive icon bar, so that it is possible to use the software without consulting the user manual.

WinTest shows the user the options available at any time (as well as the setting and configuration possibilities), guiding the user step by step, interactively, until the test configuration is completed.

In this way, WinTest allows to get the maximum performance from the IBERTEST testing machine, both in the execution of the tests and in the analysis of results.
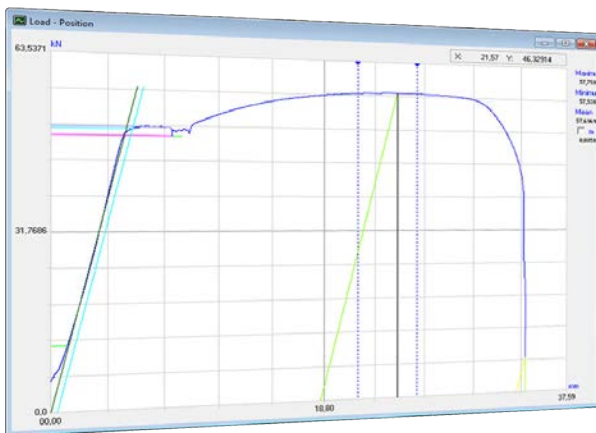
Graphical visualisation of results

Complete information during the test

Using WinTest on an All-In-One touch scren computer

WinTest SOFTWARE PROVIDES COMPLETE CONTROL BEFORE, DURING AND AFTER THE EXECUTION OF THE TEST

1. PRE-TEST CONFIGURATION

To configure tests at your convenience, the software offers many options, such as:

› **Control of the testing machine:** safety limits, speed, preload, automatic return...

› **User management**, with custom options for each user. Provides security to the system and prevents unauthorized use.

› Type of test: **tensile, compression, bending, cycles**... The configuration changes automatically according to the chosen type of test.

› Working method: **pre-configured** by IBERTEST (according to a test standard) or **free configuration** according to the own criteria of the user (always within the physical and mechanical limitations of the machine, testing devices and sensors).

› **Individual or serial testing**. Serial tests are very suitable for repetitive tests on machines intended, for example, for production Quality Control.

› Control mode selection: in **load, stroke** or **strain** (with appropriate optional transducers).

› Activation of **additional sensors** located on the machine or on the specimen, such as: extensometers, temperature probes... [1]

› Selection of the **type of diagram** (load-time, load-stroke, load-stroke...) for the **graphical representation** of the test.

› **Results to be presented** on screen (in real time) or in the report.

› Automatic execution of calculations derived from the test results (strength, elastic modules...) by means of a **programmable calculator integrated** in the software.

› Design of **test reports.** The reports are fully customisable and are essential for documentation of results in laboratories under GLP (Good Laboratory Practices) or Quality Assurance systems (as per ISO EN 17025).

And many more options.

[1] *For sensors previously registered in the system*

Testing machine setting-up

Configuration of Tests

Auxiliary window "traction parameters"
Available when selecting a tensile test.

2. IDENTIFICATION FOF SPECIMENS

Using the window: "Specimen Parameters", the user has multiple options to identify each test.

› Physical parameters: geometry, dimensions, mass, density, curing age...

› Identification: name of the test/probe/sample, material, origin, customer, number, date...

In addition, there are "free text fields" where any other information not reflected above can be entered.
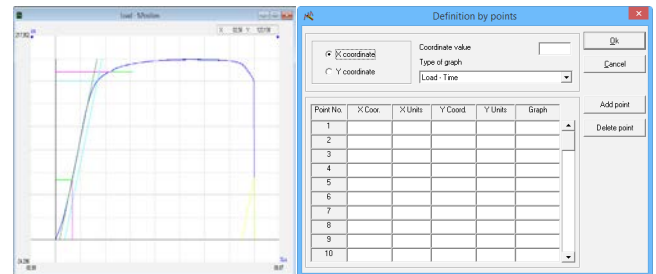
3. TEST DEVELOPMENT

The software performs the test acording to the method and parameters entered in the pre-configuration. To allow you to follow the development of the test, the following elements are displayed on the screen (in real time):

› Graphical representation: load-stroke, load-strain, stroke-strain...

› Numerical values coming from the sensors connected to the system (force, stroke, strain...).

› Results of calculations previously programmed with the formula calculator.

If desired, the user can stop the test at any time during its execution.

4. ANALYSIS AND MANAGEMENT OF RESULTS

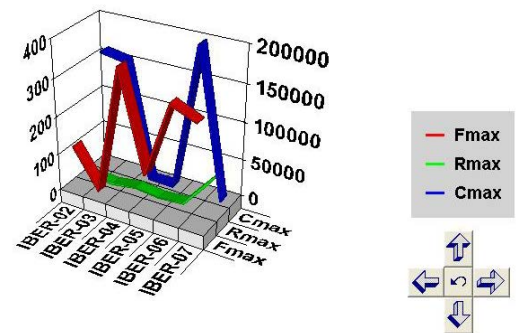At the end of the test, the final results and the complete graphical representation are displayed on the screen.

Before validating the test, it is possible to do the following actions:

› Enlarge areas of the graph (zoom).

› Change the type of diagram.

› Search and locate significant points.

If the user discards the test, the results will not be stored.

The included statistical program allows to compare several consecutive tests, superimpose curves, create 2D and 3D bar and line diagrams, generate BMP images...

Los archivos de resultados pueden ser convertidos a formatos XML, ASCII o CSV para exportación a otros sistemas tales como Excel, LIMS, etc.
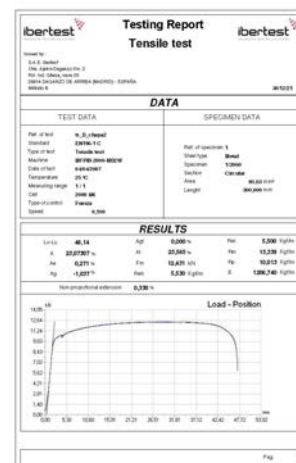
TEST SIMULATION MODULE

Additional module that allows to extract data from the machine (real tests) and analyse them in other equipment. The test can be simulated again as if it were carried out in real time, without the need to connect to the machine. Main features:

› Local or network test retrieva.

› Real test simulation

› Real-time graph visualization

› Calculation

› Report generation

Setting parameters for the test specimen

Location of significant points on the graph of the test

Test comparison - 3D representation

Example of test report

TELEDIAGNOSIS
REMOTE DIAGNOSTIC SERVICE

"TECHNICAL SUPPORT HAS NEVER BEEN EASIER"

TELEDIAGNOSIS is a remote Technical Assistance and Maintenance service, available for all IBERTEST machines and testing equipment equipped with a computer data acquisition system.

The immediate support of TELEDIAGNOSIS service for customers located worldwide, minimises downtime and avoids delays in the work of laboratory, while reducing or eliminating the IBERTEST technician's travel expenses.

To run TELEDIAGNOSIS, a link program is used which establishes a fast and secure, ensuring our service even at facilities located at great distances (minimum connection speed required: 5 MB/s).

In this way, an easy and effective intervention from our Technical Service is possible regardless of the location of the machine, as long as there is an access to the INTERNET.

Even on those occasions when the Technical Service must act on-site, TELEDIAGNOSIS is helpful in detecting problems in advance and solving them during the first visit.

During a TELEDIAGNOSIS session, the following actions can be carried out:

› **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 mantained, 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.
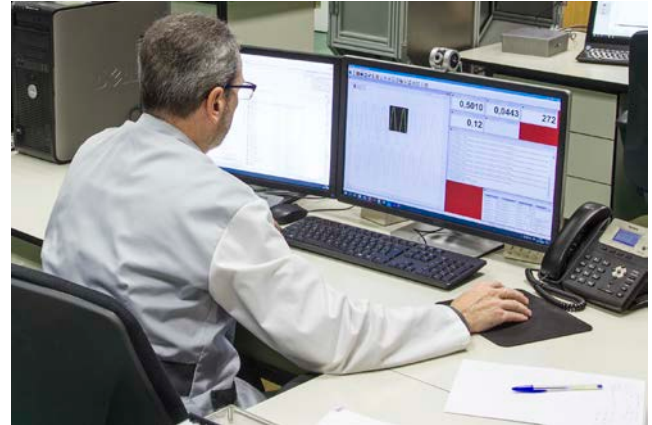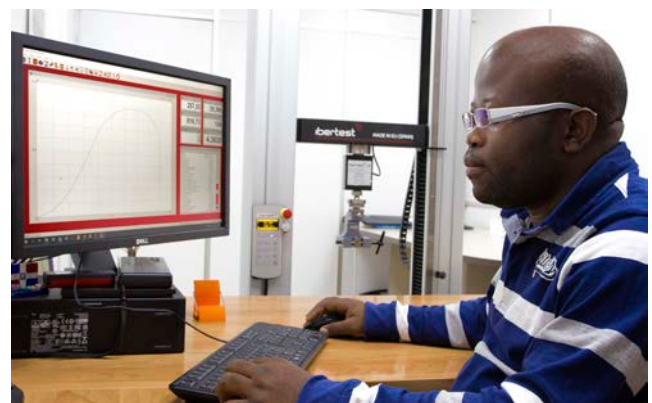

IBERTEST Spain - Madrid Technical Services
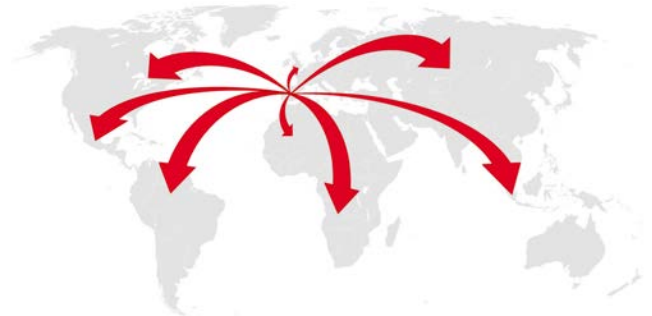
Real time TELEDIAGNOSIS link

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 for preset periods of time (number of connection hours).

V-24-0.1-EN

ibertest

C/ Ramón y Cajal, 18-20

28814 Daganzo de Arriba

Madrid - Spain

Tel. +34 918 845 385

Fax. +34 918 845 002

E-mail: info@ibertest.es

www.ibertest.com