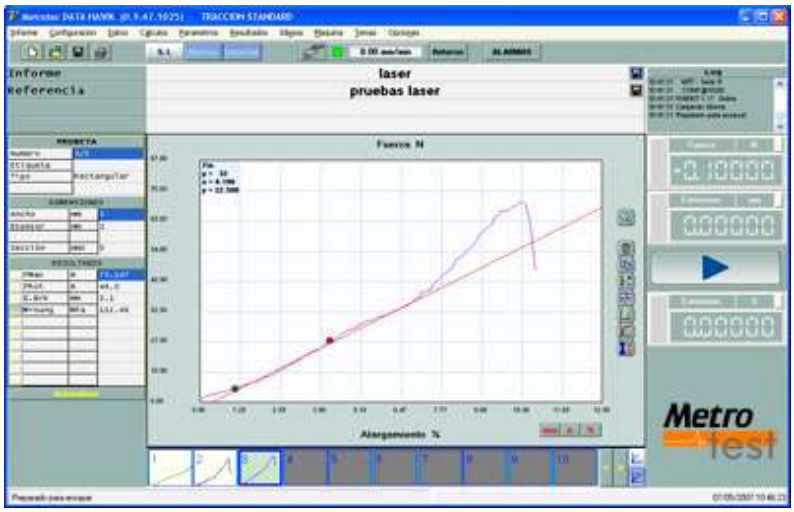
SERVO-HYDRAULICS

HIGH CAPACITY MATERIALS TESTING MACHINES STH/CS series

Hydraulic cylinder drive in
Superior Testing Frame
BASIC LINE



With control system and data acquisition by All in One
Touch Screen PC and advanced testing software

METROTEST

Metro test

MADE IN EU

CE

- **Tensile – Compression – Bending – Shear... tests**
- **Servo-hydraulic Close Loop Control**
- **Force capacity : 400 to 2000 kN capacity models**
- **Load Measurement Accuracy : +/- 0,5 % (EN ISO 7500 :2004 Class 0.5 ASTM E4)**

The standard delivery includes :

- Equiped with 1 Load Cell Tension/Compression of (**400 – 600 – 1000 o 2000 kN** according model)
- Set of **HYDRAULIC** Tensile Grips, including:
- - Flat wedge jaws for testing flat specimens (see capacity table on page 4)
- - **V**-notch faces jaws for testing round specimens (see capacity table on page 4)
- Round Compression Plates (see dimension table on page 3)
- Each Machine is supplied with a **ENAC Calibration** Certificate (equivalent to NIST-UKS-DKD Certified)
- 1 All in One 22” PC Touch Screen and Printer
- 1 **METROTEST** Universal Testing Software – Multilingual (English, French, German and Spanish)
  1 Statistic software pack: Barr graphs, Gauss bell diagram and Comparative of References

OPTIONALS: Flexural Tools – Extensometers… *Consult METROTEC and / or our Local Agent*

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General Information: The **servo hydraulic controlled** Universal Testing Machines STH/CS series are mainly used for tensile, compression, bending of metal materials. And accessories supplied with standard test devices can also be used for testing wood, concrete, cement, rubber ..., is very suitable for testing different metals or nonmetallic materials of extreme hardness and toughness with very high load resistance.

This line of Universal Testing Machines has been designed specifically for quality control testing and simple development applications.

Standards: Based and exceeding the requirements of the ISO 6892

Load frame type: The hydraulic cylinder is in the upper loading frame. The TENSILE space area is between the mobile crosshead travel and working platform, and for COMPRESSION and BENDING (optional) space testing between the mobile crosshead travel and the upper hydraulic cylinder base.

The load application is through the hydraulic unit acting on the hydraulic cylinder piston and which provides the biasing force. Spaces each zone tests are adjusted by moving the crosshead easily from the control panel with a sample clamped between the hydraulic grips, once determined the position of the fixed lower crosshead, is attached to the main columns that have holes through fixation pins supplied.

Measuring system: The machine uses Load Cell transducer to measure the force and Photoelectric Encoder to measure the displacement. The PC (computer) collects timely essays parameters as the force load, travel... Our Advanced Testing Software and Windows-based system can display the load force, load peak value, deformation, testing curves ... very easily, and can automatically calculate the test results, ie Tensile Strength, Yield Strength (superior / inferior), non-proportional Tension Point ... The reporting function simply allows the preparation of the reports of the test results in the format you need.

Applications: Wide variety of uses both in Industrial Processes (Steelworks - Metal Processing - Areas of Engineering - Quality Control Departments) as technology centers, universities, and institutes...

Features:

- **Full Control** (closed-loop) testing process
- **Automatic Hydraulic Grips** can be operated from separate control panel (in the control cabinet)
- **The Material Testing and Analysis Software** will provide more testing methods to meet ASTM, ISO and other test standards
- **The report**, test report will create its simple and intuitive way
- METROTEST **Materials Testing Software**, which allows working in CLOSED LOOP and edited in 4 Languages (English - German - Spanish and French), with basic statistics Bars Graphics, GAUSS bells and Comparison of References
  The latest software solution from METROTEC "the easiest way to test and analyze the quality and performance of your raw material, semi-finished and finished components"
  - **Plug and Play**
  - **Easy learning for operators**
  - **Fast and accurate**
  - **Reliable**
  - **Microsoft Windows compatible**
  - **Auto scaling**
  - **Ability to export data**
  - **Multiple user password protection**

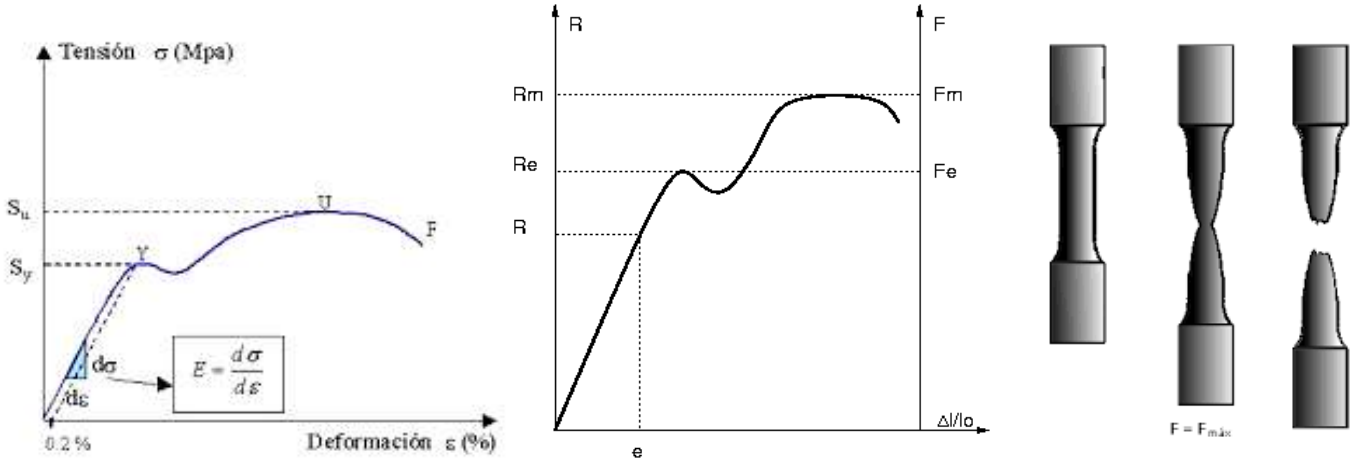
**Windows is a registered trademark of Microsoft Corporation*

Force capacity:	**400 to 2000(KN)** (40 - 200 Tns.f)
Load Reading resolution:	1/200.000 points: (100.000 in Tensile y 100.000 in Compression)
Sampling Speed Force Data (internal):	30.000 S/second
Load range accuracy:	2 % -100% of FSD
Load measuring accuracy:	**class 0,5** (< 0,5 %)
Uniform Range Load Control:	1 – 100 N/mm2/s
Accuracy:	± 0,5%
Loading Speed Tolerance:	≤ ± 0,5 %
Control Loading Speed Uniform:	0,00025/s – 0,0025/s
Relative Error of the Displacement Speed:	≤ ± 0,5%
Fixing of the Test samples:	For Hydraulic Grips
Control Cabinet Dimensions:	500 x 750 x 1500mm (ancho x fondo x alto)
Compression Plates Dimensions:	200 mm diameter
Maximum Stroke of Hydraulic Piston:	300 mm
Environmental Condition Working:	10 ºC ~ 35 ºC - Relative Humidity: 20% -80%

* **Larger range of test speeds** - With a simple change to a higher capacity Hydraulics Group is possible to have a wider range of test speeds:

Code. 3148 - Hydraulic Group 9 liters / minute to speeds range 0-180 mm / min at 50Hz
Code. 3149 - Hydraulic Group 9 liters / minute to speeds range 0-220 mm / min at 60Hz
Code. 3150 - Hydraulic Group of 16 liters / minute to speeds range 0-300 mm / min at 50Hz
Code. 3151 - Hydraulic Group of 16 liters / minute to speeds range 0-360 mm / min at 60Hz

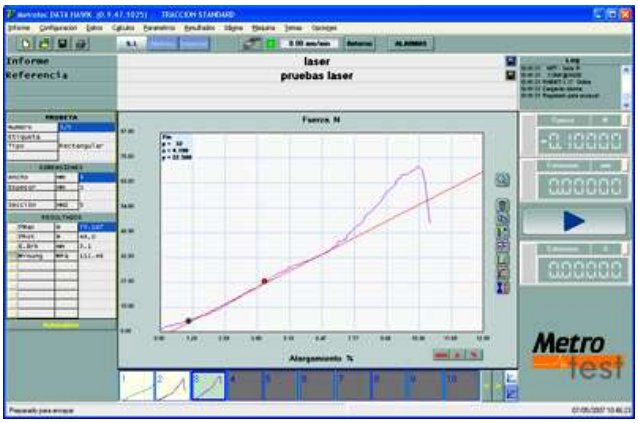
Technical Data STH/CS series (Superior Cylinder)				
Model	**STH-400/CS**	**STH-600/CS**	**STH-1000/CS**	**STH-2000/CS**
Capacity	400 kN	600 kN	1000kN	2000kN
Piston Stroke	250 mm	300 mm		
Velocidad ensayo	0-120 mm/min	0-100 mm/min		
Piston Return Speed	200 mm /min			
Driving	Electro-hydraulic			
Control	Automatic (PC)			
Tensile Zone				
Opening (between columns	540 mm		830 mm	890 mm
Separation between grips	25-775 mm	25-925 mm	50-800 mm	
Hydraulic clamps with flat wedges included (90 mm height) for thickness:	**Range 0 – 25 mm**		**Range 8-40mm** 0 - 25 mm 35 – 40 mm	**Range 8-40mm** 0 - 25 mm 35 – 40 mm
V profile Jaws includes (90 mm height) for Ø	**Range 8-40mm Ø** 8 – 25 mm Ø 25 – 40 mm Ø		**Range 8-60mm Ø** 8 – 28 mm Ø 28 – 45 mm Ø 45 – 60 mm Ø	**Range 8-60mm Ø** 8 – 28 mm Ø 28 – 45 mm Ø 45 – 60 mm Ø
Compression Zone				
Opening (between columns)	345 mm		440 mm	
Separation between plates	0-320 mm			
Compression plates	200 mm de Ø			
Flexural/Bending Area	(Testing Tools not includes)			
Increased height machine	+ 200 mm (since the flexion testing tool is placed in the compression zone)			
Roller diameter	50 mm Ø			
Support height	125 mm			
Separation between supports	500 mm			
Testing Frame Dimensions				
Minimum height grips in touch	2.380 mm	2.900 mm	3,100 mm	3.600 mm
Maximum height (extracted piston)	2.630 mm	3.200 mm	3.400 mm	3.900 mm
Width base	900 mm	900 mm	1.000 mm	1.000 mm
Depth	900 mm	9900 mm	1.000 mm	1.000 mm
Control Cabinet	500 x 700 x 1500 mm (200 Kg)			
Hydraulic Group	Built internally in the control cabinet			
Electrical Power	AC 380V ± 10%, Trifásica 50 ó 60 Hz			
Consumption	2,2 Kw		3, 8 Kw	
Net weight of the test frame	1.900 Kg	2.200 Kg	3.600 Kg	5.200 Kg

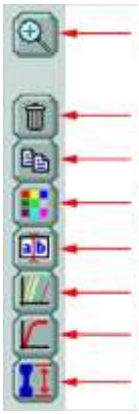


Stress-strain diagram of a typical steel of low yield strength

MATERIALS TESTING SOFTWARE METROTEST

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.

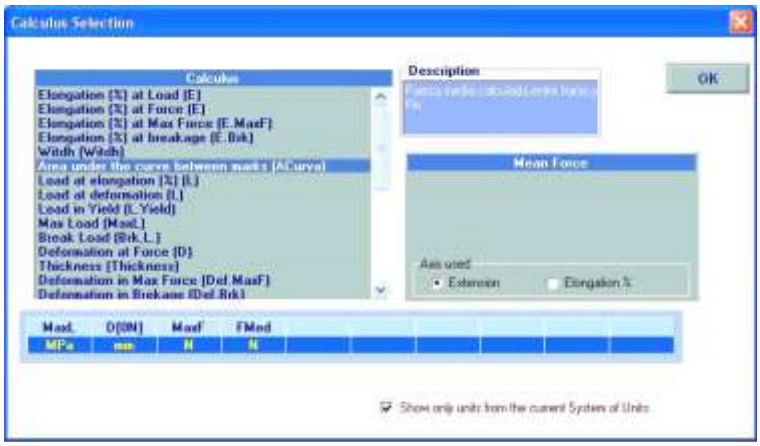




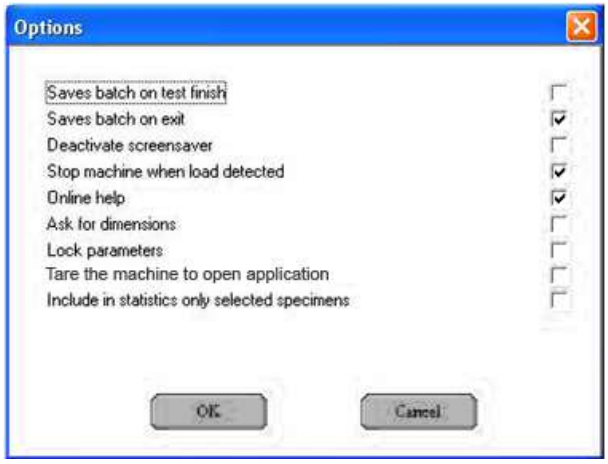
Zoom
Samples Delete
Graphic Copy
Change color of the graphic
Assign label
Show curves
Assign standard curve
Insert dimensions of the test samples

- ✓ 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.

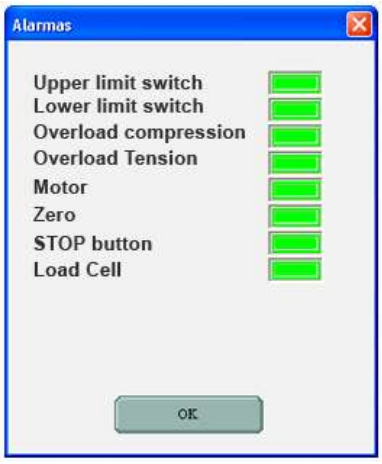
TEST PARAMETERS menu



CALCULATION SELECTION menu

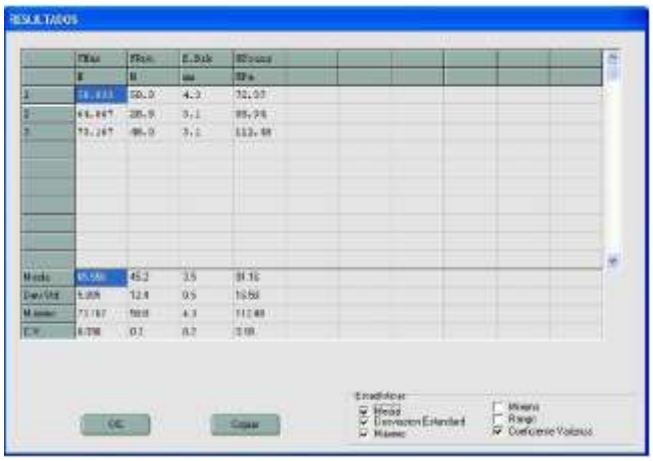


OPTIONS menu

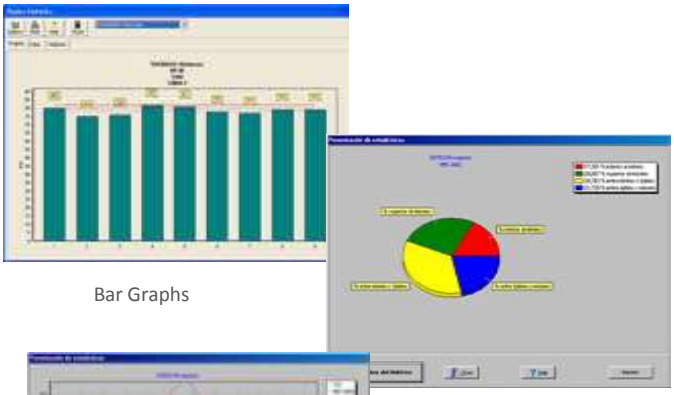


ALARMS menu

DATA menu

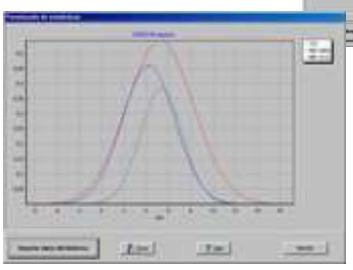


RESULTS menu

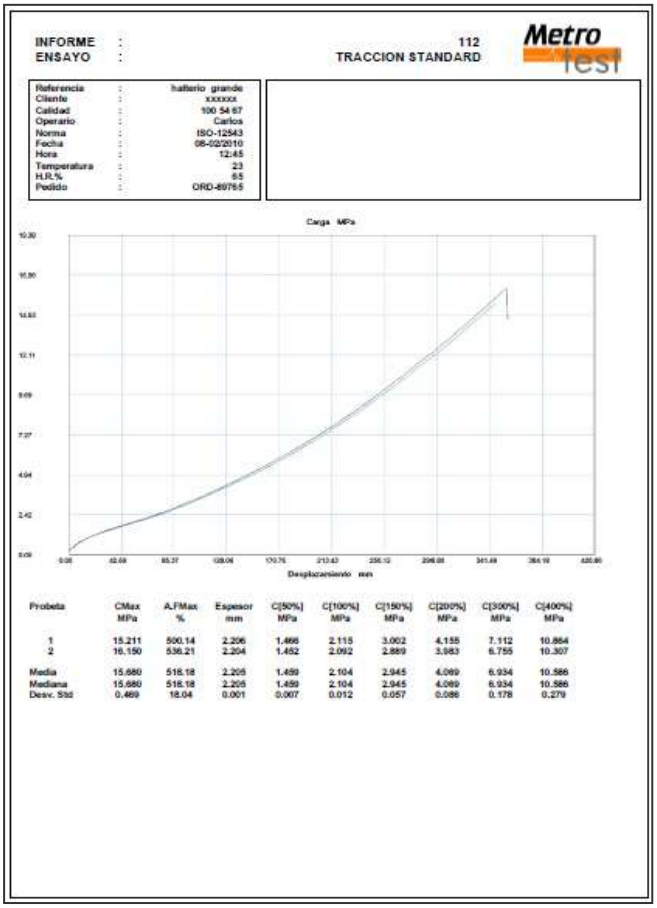


Bar Graphs

Tolerance Comparatives



Gaussen Bells



REPORT OF TESTS

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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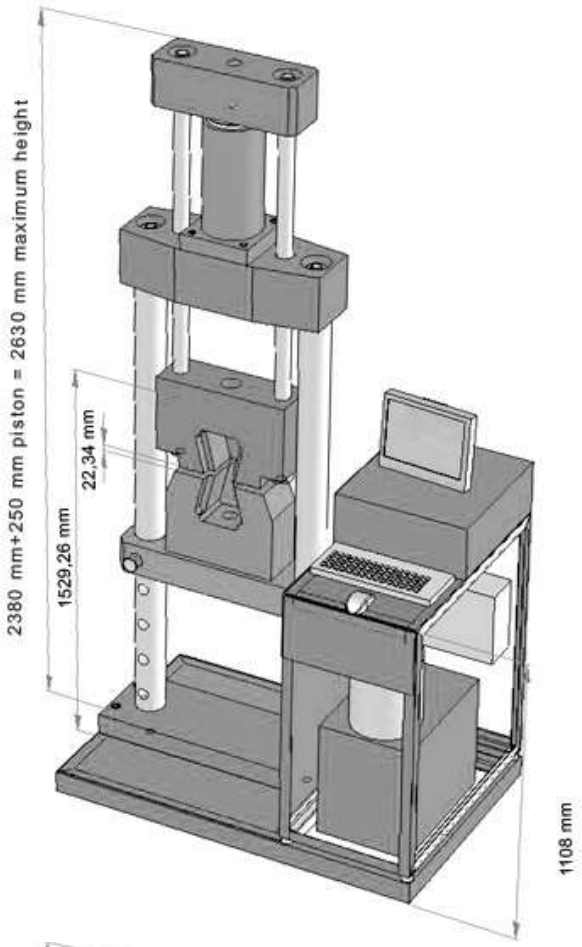
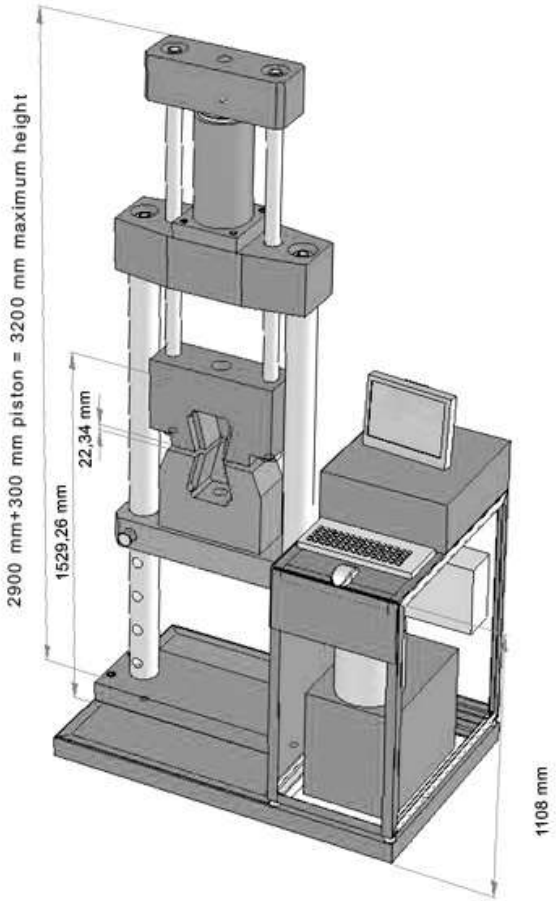
STH-400/CS model	
Packaging Material: In 2 Boxes of fumigated wood **Wooden Crate 01** Content: Testing Frame + Control Cabinet + Grips - Jaws… Net Weight: 1.900 kg Gross Weight: 2.300 kg Dimensions: 2900 x 1150 x 1300 mm Volume: 4,20 m^3 **Wooden Crate 02** Content: Hydraulic Power + Control + PC Net Weight: 400 kg Gross Weight: 550 kg Dimensions: 800 X 1000 X 1750 mm Volume: 1.40 m^3	**Total supply:** Quantity: 2 Wooden Boxes Total Gross Weight: 2.850 kg Total Volume: 5,60 m^3 * Weights and dimensions are approximate reference.

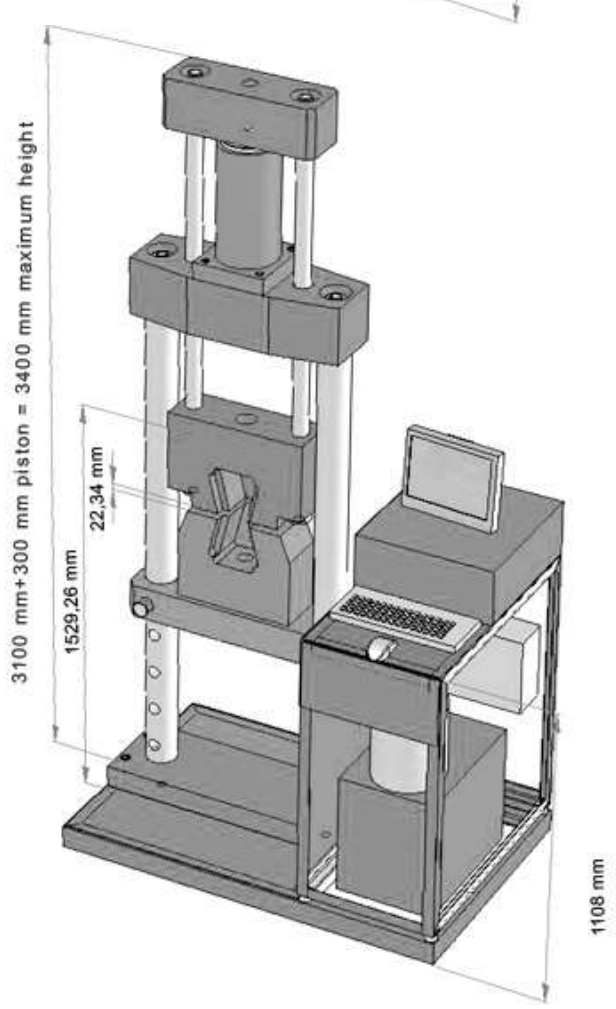
STH-600/CS model	
Packaging Material: In 2 Boxes of fumigated wood **Wooden Crate 01** Content: Testing Frame + Control Cabinet + Grips - Jaws… Net Weight: 2.200 kg Gross Weight: 2.800 kg Dimensions: 3300 x 1150 x 1300 mm Volume: 4,90 m^3 **Wooden Crate 02** Content: Hydraulic Power + Control + PC Net Weight: 450 kg Gross Weight: 600 kg Dimensions: 800 X 1000 X 1750 mm Volume: 1.40 m^3	**Total supply:** Quantity: 2 Wooden Boxes Total Gross Weight: 3.400 kg Toral Volume: 6,30 m^3 * Weights and dimensions are approximate reference.

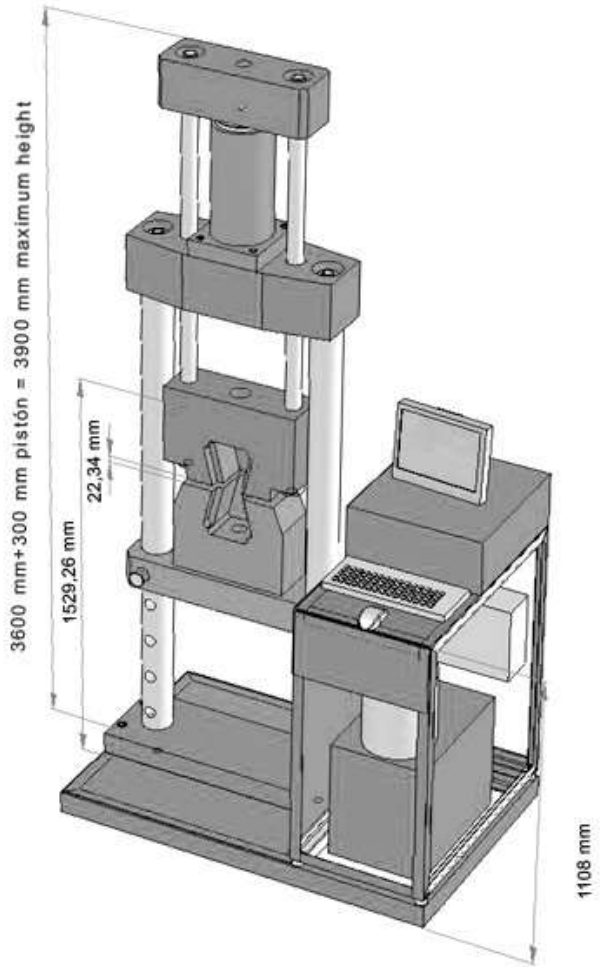
STH-1000/CS model	
Packaging Material: In 2 Boxes of fumigated wood **Wooden Crate 01** Content: Testing Frame + Control Cabinet + Grips - Jaws… Net Weight: 3.700 kg Gross Weight: 4.400 kg Dimensions: 3500 x 1250 x 1400 mm Volume: 6,15 m^3 **Wooden Crate 02** Content: Hydraulic Power + Control + PC Net Weight: 450 kg Gross Weight: 600 kg Dimensions: 800 X 1000 X 1750 mm Volume: 1.40 m^3	**Total supply:** Quantity: 2 Wooden Boxes Total Gross Weight: 5.000 kg Total Volume: 7,55 m^3 * Weights and dimensions are approximate reference.

STH-2000/CS model	
Packaging Material: In 2 Boxes of fumigated wood **Wooden Crate 01** Content: Testing Frame + Control Cabinet + Grips - Jaws… Net Weight: 5.200 kg y el modelo de 1500 kN = 4.400 Kg Gross Weight: 6.000 kg y el modelo de 1500 kN = 5.200 Kg Dimensions: 4100 x 1410 x 1400 mm Volume: 7,90 m^3 **Wooden Crate 02** Content: Hydraulic Power + Control + PC Net Weight: 450 kg Gross Weight: 600 kg Dimensions: 800 X 1000 X 1750 mm Volume: 1.40 m^3	**Total supply:** Quantity: 2 Wooden Boxes Total Gross Weight: 6.600 kg Total Volume: 9,30 m^3 * Weights and dimensions are approximate reference. -The Dimensions of wood packaging for the 2 models 2000 and 1500 kN are the same, solely changing the weights.


2380 mm+250 mm piston = 2630 mm maximum height
1529,26 mm
22,34 mm
1108 mm


2900 mm+300 mm piston = 3200 mm maximum height
1529,26 mm
22,34 mm
1108 mm


3100 mm+300 mm piston = 3400 mm maximum height
1529,26 mm
22,34 mm
1108 mm


3600 mm+300 mm pistón = 3900 mm maximum height
1529,26 mm
22,34 mm
1108 mm