

SANTAM

Universal Testing Equipment

STM-400

With Manual Wedge Grips



Universal Testing Machine

STM-Series
Floor Standing Models



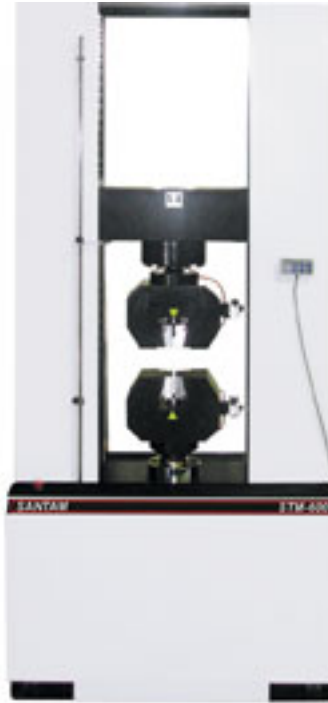
Low Cost, High Performance



STM-150
with High Temperature Furnace & Grips



STM-250 With Pneumatic Grips



STM-600 With Pneumatic Grips



STM-1000 With Hydraulic Grips

Features:

- High Accuracy and Repeatability
- Computer Control and Enhanced Software
- Easy to Use & Maintenance
- Wide Range of Materials Testing
- Enhanced Report
- Modular Design
- Interchangeable Load Cells, Grips and Fixtures\

Application:

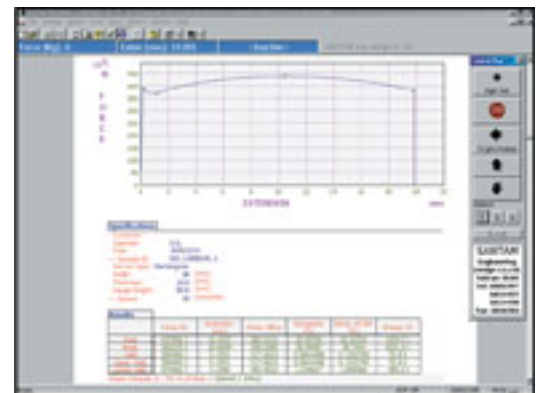
SANTAM Universal Testing Machine is used for industrial quality control laboratories and research centers.

The machine is able to test the mechanical properties of a wide range of the materials such as:

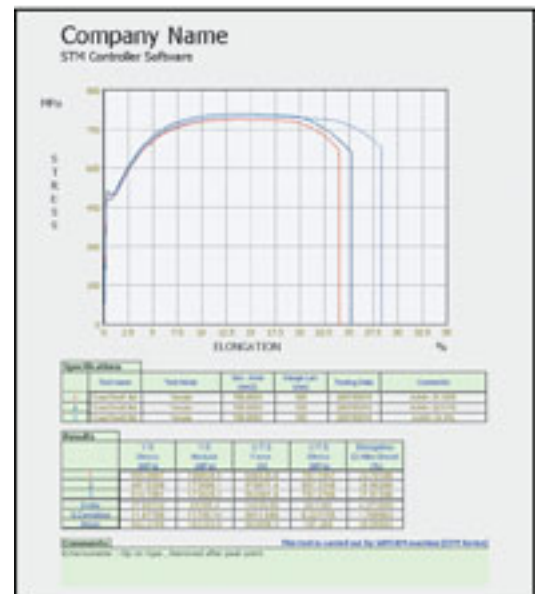
Metals	Casting	Sheet & Foils	Graphites
Plastics	Welding	Bars & Belts	Adhesives
Ceramics	Wire & Cable	Rubber	Automobile Components
Composite	Tube & Pipe	Timber	Finished Components

With additional accessories , the following test can be performed:

Tension	Shear	Ring Stiffness
Compression	Flexure	Foam Hardness
Bending	Stiffness	Creep
Peel	Buckling	Relaxation



Real Time Graph & Virtual Keyboard



Typical Report of Multiple Result Option

STM Materials Testing Machines:

STM Series Materials Testing Machine is designed to test the materials easily and accurately with Low Cost. Advanced technology and high quality engineering enables the operator to test the materials quickly with full reliability.

Various of extensometers (Long travel or High resolution) can be connected to the machine to obtain more accuracy of strain measurement. Wide range of the crosshead speeds permits the operator to test materials in accordance with the international standards of ASTM, DIN, ISO, . .

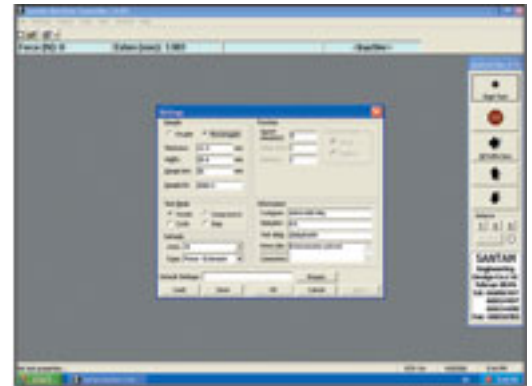
The machines has powerful software (STM Controller) which is able to control the crosshead and to indicate the instrument.

All test procedures such as Specimen input parameter, Test method, Test report, Control of load frame movement and Indication of measurement instruments are carried out by software.

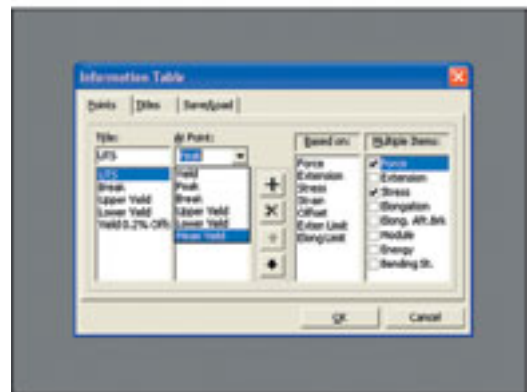
Some features of the software are:

- Indication & calibration of force, stress, extension & strain
- Stress-Elongation or Force - Extension graph
- Speed, position, force* & strain* control
- Virtual keyboard
- Defining test method (Tensile, Compression, Cyclic, Step, Creep*, Relaxation*, Foam Hardness*,, Customized method*)
- Defining test report (Classic points: Peak, Break, Yield, Upper Yield, Lower Yield, Mean Yield, Offset Yield - Filtered points: at specified force, extension, stress, strain & average zone limit - Click points: at any point on the graph)
- Changing units (MKS, SI, BS and Customized option)
- Multiple result comparison (Graph: Overlap or Offset graph Results: Max-Min, Mean & Standard deviation of each points)
- Transfer data to Microsoft Excel software

Interchangeability of Load cells, Extensometers, Grips and Fixtures will provide different kinds of materials testing.



Entering Shape & Dimensions of Sample and Test Parameters



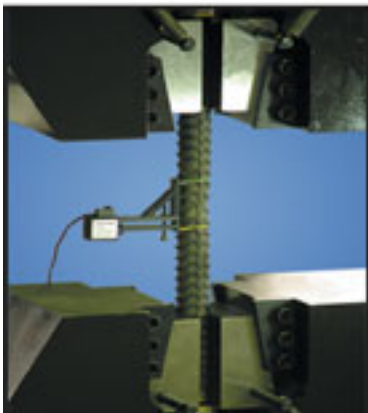
Defining of Data Points and Data Titles (Report Table)



Bolt & Nut Fixtures



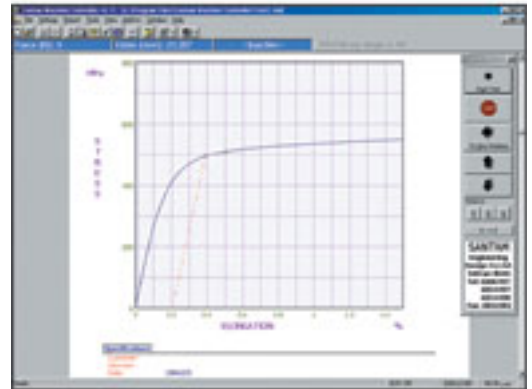
Compression Fixtures



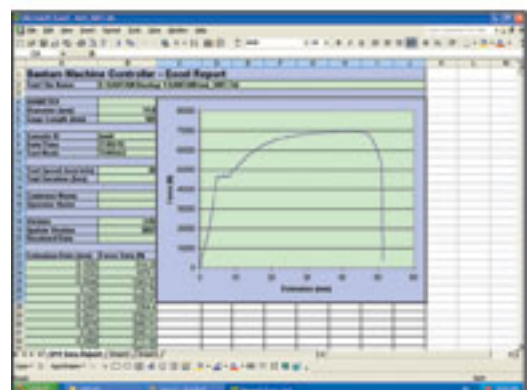
Wedge grips with High Resolution extensometer



3 Points Bending Fixtures



Detect of Yield points based on 0.2% Offset & at 0.5% of Strain



Transfer data to Microsoft Excel software

Technical Specifications

Model Specifications	STM-150	STM-250	STM-400	STM-600	STM-1000
Capacity (kN , kgf)	150 , 15,000	250 , 25,000	400 , 40,000	600 , 60,000	1000 , 100,000
Space between columns (mm)	500	600	550	600	730
Total grips distance ¹ (mm)	690	610	710	850	700
Vertical test space travel ² (mm)	100-1280	150-1320	150-1330	150-1610	150-1560
Speed (mm/min)	0.001 - 500 (1000*)	0.001 - 250 (500*)	0.001 - 250	0.001 - 200	0.001-180
Extension resolution (µ m)	0.1	0.05	0.04	0.03	0.03
Dimensions (Width x Depth x Height) (mm)	1070 x 700 x 2430	1100 x 700 x 2400	1180x 700 x 2500	1240x 730x 2800	1500 x 800 x 2800
Weight ¹ (Approx.) (Kg)	750	1000	1400	2000	2600
Power ^{3,4,5} (Single phase) (VAC ,Hz , Amp)	220±10% , 50-60 , 8	220±10% , 50-60 , 10	220±10% , 50-60 , 12	220±10% , 50-60 , 20	220±10% , 50-60 , 25

Common Specifications

Load Frame:

- Fully computerized system (Instrument Measurement and Control)
- RS-232 (USB*) communication between machine & computer
- Include load cell (with load frame capacity) and measurement electronic boards
- Universal (Tension & Compression), without grips
- Servoelectrical drive system and precision AC Servo motor
- Precision ballscrews (Pre-Loaded)
- Speed accuracy: 0.5% of speed set (No load or constant load)
- Data sample rate: 100 (500*) Full Sample / Sec (Full sample include Force , Extension & Strain data)
- Crosshead support columns
- Mechanical crosshead limit switches
- Emergency stop switch
- Four bolts for level of machine
- Crosshead control keyboard (Up, Down, START, STOP & RETURN Keys)

Force Measurement:

- Load cell: Tension & Compression operation
- Standard: ISO 7500, EN 10002.2, DIN 51221, ASTM E-4
- Accuracy 6: 0.5% of reading down to 1/50 of load cell capacity (0.5% of reading down to 1/250 of load cell capacity *)
- Resolution: 1/100 000 (1/300 000*) of load cell capacity (in Tension & in Compression)
- Load indication and unit: On the monitor based on kgf or N or lbf (selectable)
- Over load protection
- Interchangeable load cell (up to load frame capacity)
- Automatic identification of load cell

Extension Measurement:

- Crosshead displacement measuring by encoder
- Capacity: All of the crosshead travel
- Accuracy: Better than 0.03mm (on 300 mm)
- Extension indication and unit: On the monitor based on mm or in (selectable)

Strain Measurement *:

- Connection of different extensometers types : Strain Gauge , Potentiometer , Analogue Output & Encoder
- Standard: ISO 9513, EN 10002-4 , BS 3846 , ASTM E83
- Electronic instrument specifications :
- Accuracy: 0.5% of reading
- Resolution: 1/100 000 (1/300 000*) of extensometer capacity (Analogue types)
- Strain Indication and Unit: On the monitor based on % (mm/mm * 100) of gauge length
- Automatic identification of extensometer

Grips , Fixtures & Accessories *:

- Wedge, Clamp, Pneumatic, Hydraulic, Bollard & ... Grips
- Compression, Bending, Bolt & Nut, T Slots & ... Fixtures
- Other Grips, Fixtures & Safety Guard are available on request
- Furnace & Environment Chamber are available on request

Computer Hardware *:

- Industrial or commercial computer
- Pentium P4 CPU (or higher), Min. 512 MB RAM, Min. 120 GB HDD, DVD ROM, FDD
- One Serial, one parallel & one USB ports
- SVGA monitor

Software:

- Operating system **: Microsoft Windows 95,98,2000,NT,XP, Win 7
- Fully control of crosshead by computer
- Speed, Position, Force* & Strain* control
- Virtual crosshead control keyboard on the monitor and on the computer keyboard (Up, Down, START, STOP & RETURN of Crosshead and zero of Force, Extension & Strain value)
- Selectable units as SI, MKS & BS. Ability to define customized unit
- Save & Load of test data
- Batch Save & Load Option for storage of same tests samples
- Calibration option: Force & Strain (Extensometer)
- Test graph:
 - Real Time Force - Extension or Stress - Elongation graphs
 - Indication of each points on the graph (mouse online indication)
 - Zoom and Pan of the graph
 - Multiple Graph Option (Overlay Option)
 - Adjustable Grid, Scales, Colors & Layout (Automatic & Manual)
- Test setting:
 - Selection of test mode: Tensile, Compressive, Cyclic, Step, Creep*, Relaxation*
 - Digitally set of test speed (and test parameters)
 - Two selectable crosshead Jog Speed (slow & fast)
 - Selection of extensometers
 - Use extensometer (Strain) at initial of the test and continue the test with crosshead measuring (Extension)
 - Automatic Saving and/or Printing the test after test termination
- Test programming *:
 - Ability to define special tests based on Process Technique (i.e. Test with specified Pre-load, Change speed after specified Strain, ...)
- Sample setting:
 - Input Name, Code, Sample ID, Date, Operator's Name & Comments zone
 - Input Gauge Length & Area (Diameter or Width-Thickness or Weight-Length*)
- Reports:
 - Enhanced reports of the test
 - Detection of wide range of the data points:
 - a) Classical Points: Peak, Break, Yield, Upper Yield, Lower Yield, Mean Yield & Offset Yield Points and Average of Displacement Between two limit points
 - b) Click Points: Each point of test graph which specify by mouse
 - c) Filtered Points: At the specified points based on Force, Extension, Stress & Elongation parameters
 - Information of each Data Points parameters (Data Titles):
 - Force, Stress, Extension, Elongation, Elongation After Break, Modulus, Energy & Bending Stress
 - Determination of Elastic Module
 - Rename, Delete, Add and arrange of the Data Points
 - Delete and replace of the Data Titles
 - Comparison between graphs and results for each Data Point (Max-Min, Standard Deviation and Mean)
 - Storage of Reports format
 - Copy to Clipboard Option of results
 - Transfer test data and graph to Microsoft Excel Software
- Print Setting:
 - Full result printing (Different colors and zones)
 - Print of selection zones together (Title, Graph, Specification, Results & Comment zones)

Environment Conditions:

- Humidity: 10% - 90%, non-condensing
- Temperature: 10 - 38 °C (Operation)
- No dust

Notes:1- With standard wedge grips and load cell 2- Without grips and load cell

3- Power must be free of spikes and surges exceeding 10% of the nominal voltage

4- 110 VAC, 50-60 Hz on request 5- The power must have standard Earth wire 6- Incremental loading

* Optional , on request

** Windows Operating System Software is not included and must be supplied by customer (or with additional cost)



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Agent

All of the specifications shown in this brochure are subject to change without notice.