

# SANTAM

Materials Testing Equipment



STM-20

With Manual Wedge Grips &  
Extensometer & Safety door

## Universal Testing Machine

STM-Series

Bench Models





STM-50 with Manual Wedge Grips & Safety door



STM-20 with Manual Wedge Grips & Safety door



STM-5 with Roller Grips & Extensometer



STM-1 with Clamp 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	Graphits
Plastics	Welding	Bars & Belts	Adhesives
Ceramics	Wire & Cable	Rubber	Automobile Components
Composites	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



STM-20M1 Chamber 1500°C



STM-20M1 Chamber -20 Up +80°C



STM-20 Chamber +200°C



STM-50 Chamber 1100°C



EHR10



ECF10



EHR10-B



EHR10-C



ELT-500

Extensometers



## 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, ...

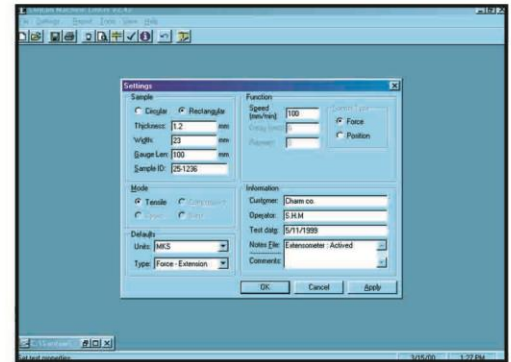
The machines has powerful software (STM Controller) which is able to control the crosshead and to indicate the instrument.

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.

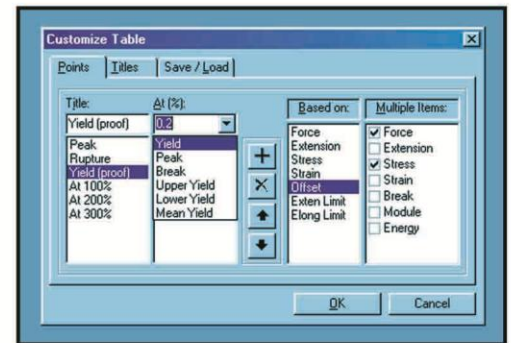
### Some features of the software are:

- 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

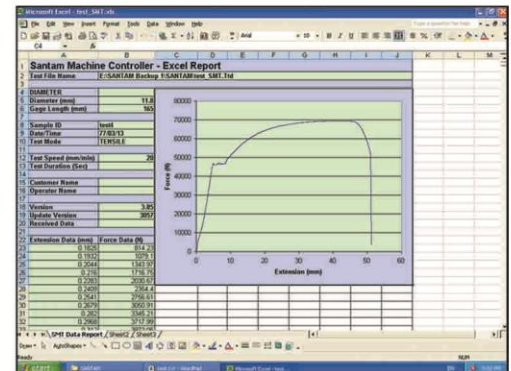
Interchangeability of Load cells, Extensometers, Grips and Fixtures will provide different kinds of materials testing.



Entering Shape & Dimensions of Sample and Test Parameters



Defining of Data Points and Data Titles (Report Table)



Transfer data to Microsoft Excel software



CGB2-T040 Clamp Grips

CG2-T05 Clamp Grips

CGD1-T05 Clamp Grips



WG-20F Manual Wedge Grips

RCG2-25 Roller Grips

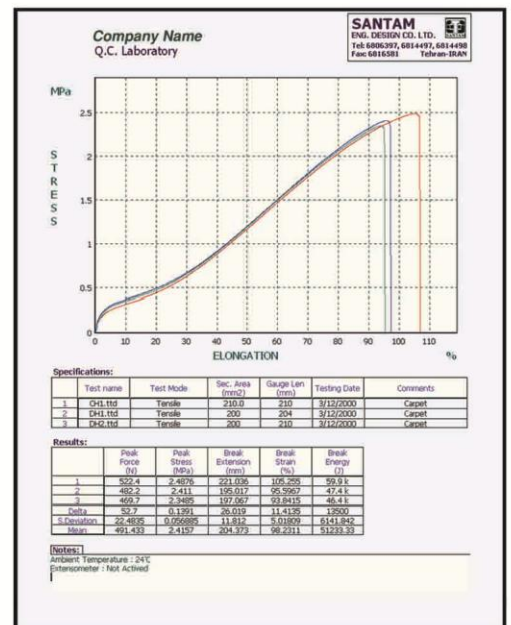
PBG05 Pneumatic Yarn Grips



BF20-4PB 3&4 Bending Fixture

CF20-RS Ring Stiffness

CF20-100 Compression Platens



Typical Report of Overlayer Option



## Technical Specifications

Model Specifications		STM-1	STM-5	STM-20	STM-50
Capacity	(KN , Kg)	1 , 100	5 , 500	20 , 2000	50 , 5000
Space between columns (To center)	(mm)	infinite (100)	infinite (70)	380	420
Total grips distance <sup>1</sup>	(mm)	550	900	800	700
Vertical test space travel <sup>2</sup>	(mm)	100~869	220~1280	60~1200	80~1300
Speed	(mm/min)	0.001~2000	0.001~1500	0.001~1000	0.001~1000
Extension resolution	$\mu$ ( m)	0.1	0.1	0.03	0.05
Dimensions (Width x Depth x Height)	(mm)	450 x 390 x 1250	610 x 500 x 1650	650 x 500 x 1620	750 x 540 x 1740
Weight <sup>1</sup> (Approx.)	(Kg)	45	130	220	330
Power <sup>3,4,5</sup> (Single phase)	(VAC, Hz, Amp)	220 $\pm$ 10% , 50~0,3	220 $\pm$ 10% , 50~60,3	220 $\pm$ 10% , 50~60,4	220 $\pm$ 10% , 50~60,5

### 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 <sup>6</sup>: 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 HD, 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 (Overlayer 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:
    - Classical Points: Peak, Break, Yield, Upper Yield, Lower Yield, Mean Yield & Offset Yield Points and Average of Displacement Between two limit points
    - Click Points: Each point of test graph which specify by mouse
    - 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 )



MADE IN IRAN



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#### Agent



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