PLOT NO. 1131 HARI ENCLAVE KIRARI SLEMAN NAGAR NEW DELHI-110086
2ND PLANT H-936 RIICO CHOPANKI INDUSTRIAL AREA ALWAR RAJSTHAN-301707

RESOTECH TENSILE TESTING PROPOSAL

Professional Manufacturer of Test Equipment

Type of Testing

- Tensile Test
- Elongation Test
- Strain Test
- Stress Test
- Bending

MAKE-RESOTECH
MODEL NO.RESOTECH DELTA-10007

MANUFACTURERS & SUPPLERS

SPECIAL PURPOSE MACHINE, MATERIAL TESTING MACHINE, LEAKAGE TESTING MACHINE, PACKIGING TESTING MACHINE, ENVIRONMENTAL TEST CHAMBER, ASSY. LINE EQUIPMENT, SOLUTION FOR ELECTRONIC AUTOMATION AND PRODUCT DEVELOPMENT, COMPUTERIZED CONTROL MACHINE , PLC HMI SCADA VISUAL BASIC SOFTWARE DEVELOPMENT SOLUTION AND OTHER SERVICES.

The mechanical properties of materials are determined by performing carefully designed laboratory experiments that replicate as nearly as possible the service conditions. In the real life, there are many factors involved in the nature in which loads are applied on a material. The following are some common examples of how these loads might be applied: UNIVERSAL, compressive and shear, just to name a few. These properties are important in materials selections for mechanical design.

TENSILE TESTING MACHINE
MAKE-RESOTECH
MODEL NO.RESOTECH DELTA-10007

Microprocessor Based Panel

Load Accuracy as high as +- 1%

Motor driven threaded columns for quick & effortless adjustment of lower cross-head –to facilitate rapid fixing of test specimen

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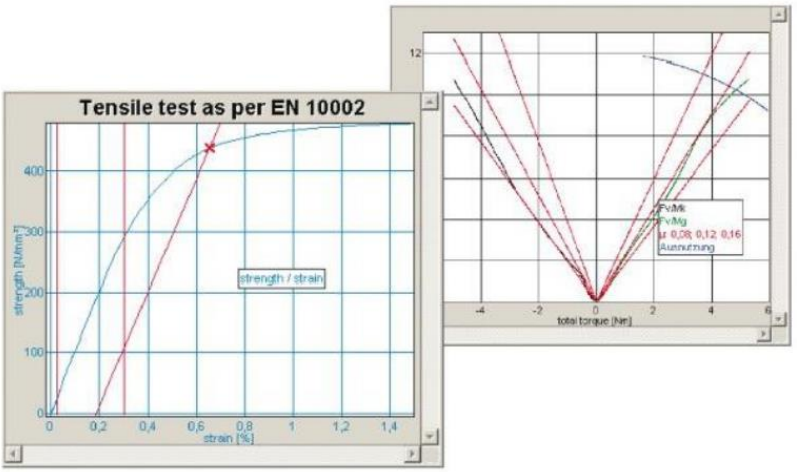
APPLICATIONS

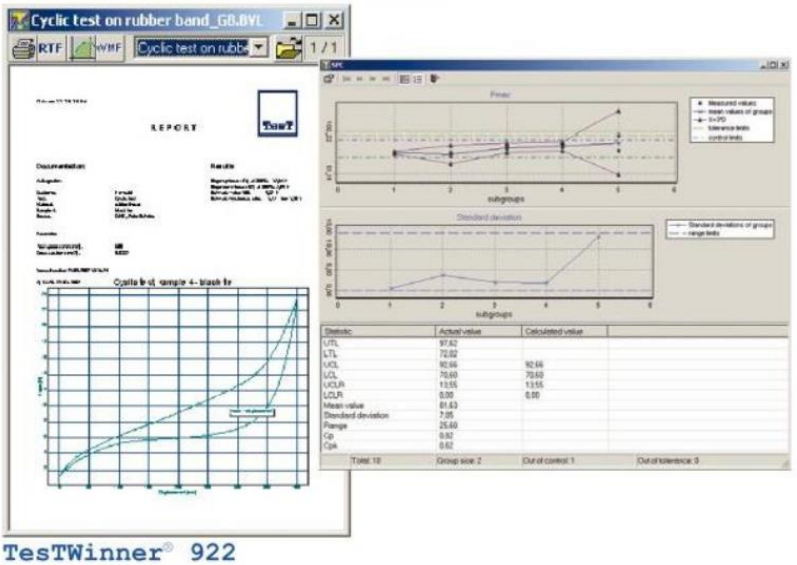
- Suitable for testing wood & allied products, timber, wires & ropes, Plastic, Rubber, FRP
Materials etc. in Tensile, Compression, Bend, Flexure Metallic
alloys, wires, fasteners, and non- metallic material such as Ceramics, Rubbers, Cables,
Fabrics, Tapes, Plastic, Polymers, Composites, flexure shear ,indetation , Elastomers,
Geo-synthetic (Geotextile, Geomembrane, Geogrid, Geonet etc.) etc. conforming to
testing procedure laid down in relevant ASTM/ ISO/IS & BS standards.

INTRODUCTION

The mechanical properties of materials are determined by performing carefully designed laboratory experiments that replicate as nearly as possible the service conditions. In the real life, there are many factors involved in the nature in which loads are applied on a material. The following are some common examples of how these loads might be applied: UNIVERSAL, compressive and shear, just to name a few. These properties are important in materials selections for mechanical design.

Tensile Testing Machines
Methodical component and materials testing





TesTWinner® 922

APPLICABILITY AND RANGE OF APPLICATION

Tensile Testing Machines ,designed for wide variety of testing ,such as **Tensile** testing machine of different Materials are having rigid construction .due to use of modern electronics in the mechanical machines, the machine features, higher productivity and it offers many facilities useful in the testing of various materials.

Operation of the Machine is by mechanical transmission of the load from test specimen to LOAD CELL where it is converted into electronic signal and processed for Digital load indication. The drive for the machine is obtained through chain and sprocket which are driven by A.C. SERVO motor .The variable traverse speed can be obtained by entering suitable as mm/min in Electronic panel which changing motor speed directly. The displacement is measured though rotary encoder and displayed on the Electronic panel.

DETAILED SPECIFICATIONS

TTM is electromechanical system with integrated digital closed-loop control, data acquisition
system with measurement of load, crosshead travel and extension (through extensometers). The
basic system comprises of Electromechanical Load frame, Signal conditioning and Control Unit,
Standard Computer, Software Package, Load Cells, Displacement Transducer and Grips/
Fixtures (As per requirement).

TECHNICAL SPECIFICATION

- Maximum Capacity : 1KN-100 KN
- Frame Capacity : 150 KN
- Test Speed :0.001mm to 500mm/minute or better.
- Measuring Range of testing force : 1% - 100%
  Of the max. Testing force
- Accuracy of testing machine : over +- 1% than
- The value display
- Accuracy of deformation measure: +- 1%
- Accuracy Of speed : 0.5 %
- Data Accusation: 25 Hz
- Accuracy of testing Force value display : over
- +-1% than the value display
- Measure range deformation : 2 – 100%
- Accuracy of large deformation : within +- 1%
- Of the value display
- Dimension of testing Space (mm) :
- 1100mm X 700mm X 2250mm
- Height of testing Space (mm) : 1000
  Structure Mild – Steel
- Servo Motor &Drive : Panasonic , Japanese MAKE
- Double Ball Screw
- Load Sensor
- Electrical Panel

UTM Software

- Interface Unit
- Indicator
- Load Cell – Make – MAXLOAD (Canada)
- Load Cell Capacity – 150 KN

Emergency Stop

- **Type of Testing**

1. Tensile Test
2. Elongation Test
3. Strain Test
4. Stress Test
5. Bending

- **Graphical Representation**

1. Load V/S Displacement
2. Stress V/S Strain
3. Load V/S Time
4. Displacement V/S Time

- **Report Format**

Excel
Pdf
word

SERVO CONTROL PANEL:

A.C. servomotor drives the gear box, rotates and gear box output shaft drives a belt which in turn lead screws. The gearbox & motor is mounted on a plate, which in turn is fixed to the bottom plate being a variable speed motor the middle cross head can be moved up and down at the required speed.

A rotary encoder is in-built in the servomotor to measure the middle cross head movement and in turn the elongation, displacement in the specimen

METHOD OF TESTING:

InitialAdjustment:-

Select suitable grips for the specimen to be tested various types of grips can be supplied to the customer depending on the requirement. the grips are designed in Such way that they can be mounted easily on the machine by inserting a pin or by tightening the threads in the joints. Adjust the cross head as per the specimen length and grips.

If load v/s Displacement, curve is to be recorded. Connect the printer to the interface circuit socket

ACServoDrive&Motor

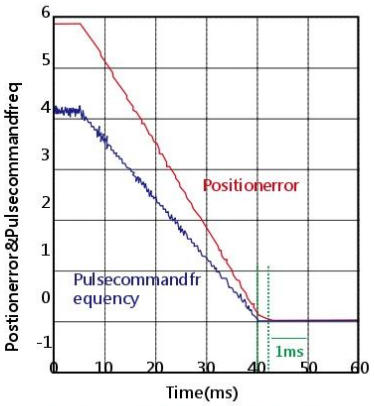
ECMAseriesservomotorsare permanentAC servo motors, capable ofcombining with200to 230VASDA-A2220VseriesACservodrivesfrom50Wto15kWand380Vto480VASDA-A2400Vseries ACservodrivesfrom750Wto7.5kW.

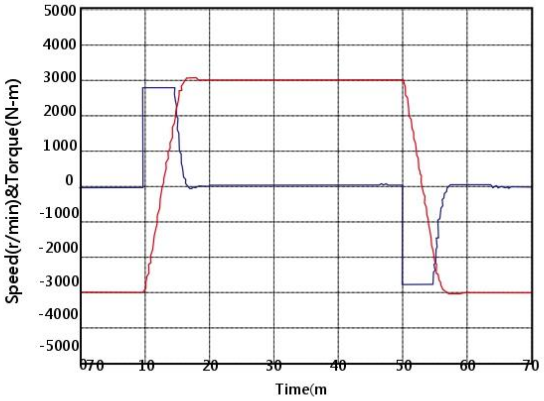
Forthe220Vseries,thereare40mm,60mm,80mm,86mm,100mm,130mm,180mm,and200mmeight kinds of frame sizes available. The motor speed is from 1000 r/min to 5000 r/min and the torqueoutputisfrom 0.477N-mto 224N-m.

For the 400V series, there are 60 mm, 80 mm, 86 mm, 100 mm, 130 mm, 180 mm,six kinds offramesizesavailable.Themotorspeedisfrom1500r/minto5000r/minandthetorqueoutputisfrom3.82 N-mto119.36N-mIntermsofoptionalconfigurations,ECMAseriesprovidesbrakeandoilsealtofullysupport our customers' needs. It also offers two different shaft selections, round shaft and keyway, forvariousapplications.

HighResponsiveness

- Upto1kHzfrequencyresponse.
- Settlingtimebelow1ms.
- 7msaccelerationtimeforspeedsfrom-3000r/minto3000r/minwithanemptyload!
  (Note:Thetestrecordofa400Wmotorwith60mmframe size)

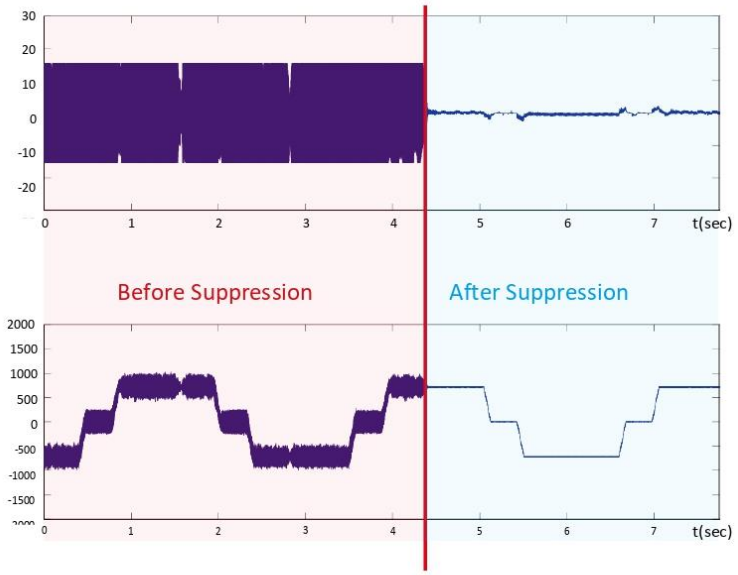




ExcellentSuppressionFunctions

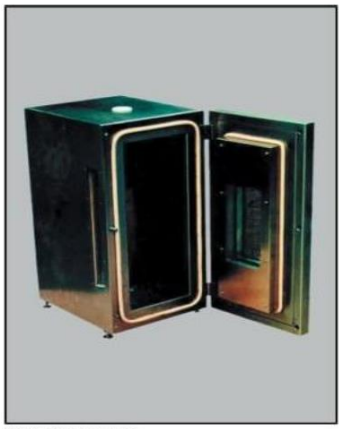
- VibrationSuppression(LowFrequency)
  Twovibrationsuppressionfiltersareprovide dforlongarmsystemtominimizethevibratio nat
  machineedgeseffectively.

Resonance Suppression(High Frequency) Twoautonotchfiltersa ndone manual notch filterare provided to suppressmechanical resonanceefficiently.



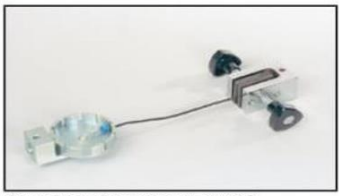
GRIPS


Longitudinal extensometer DA164


Climatic chamber


Manually applied extensometer MF


Bending jig SP 173


Chucks for crimped joints SP 189

Manually applied extensometer EP

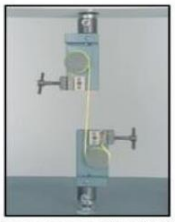

Eccentric roller grips SP 174


Screw grips SP 175


Foil grips SP 178


Scissors grips SP 179


Wedge grips SP 180


Wire and rope grips SP 183


Rope grips SP 184


Pull-off device SP 187

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LOADING FRAME:

The base has a AC Servo motor and two main ball screws at both ends. The middle cross head is mounted on screws through main nuts. The middle cross head can be moved up or down through chain transmission and geared motor to adjust the initial tensile/compression clearance. Inside base of machine rests an assembly of upper, lower cross head and two columns.

LOADING RATE / STRAINING RATE CONTROL

This is superfine controlling system which controls loading rate / straining rate as per commands from electronic machine control system. Software can send loading rate / straining rate to electronic system for fully automatic testing.

OPERATION

Tension test is conducted by gripping the test specimen in the upper and middle cross head. Compression, Bending, Transverse, Shear and Hardness tests are conducted between the middle and lower cross head by using appropriate fixtures. The rapid adjustment of middle crosshead facilitates easy fixing of tensile / Compression specimens of different lengths.

ACCURACY & CALIBRATION

Every machine is calibrated in accordance with procedure laid down in BS-1610-1964 IS 1828-1991. ' Computerized **TTM** Testing Machines comply with grade of BS 1610-1964 and Grade 1.0 of IS 1828-1991. An accuracy of ± 1% guaranteed from 2% to 100% of capacity of the machine. In the computerized **TTM** , the computer is an integral part of the entire system and not just on ADD ON feature. This puts a lot of power and versatility into the hands of the operator and makes the system much more self-contained than usual, as it includes many functions usually only available as additional (often expensive) optional features.

TENSILE TEST PACKAGE

Wedge Grips: A set customized collect that directly integrated with the universal grip pull rods to test flat specimens from 0.5 mm to 5mm in thick and 25mm wide and vee wedge for 4 to 6mm diameter round specimen.

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AXIAL EXTENSOMETER FOR TENSILE TEST

Gauge Length: 12.5 Measuring range: +6.25/-3.1mm Accuracy: +-0.5% of read out value as per ASTM E83 Excitation: 5 to 10 VDC sensitivity : 2 to 4 mv/V full bridge , 350ohms strain gauges design these extensometers should be designed for testing wide range of materials including metals composites ceramics and plastics these should work in both tension and compression dual fixture design makes them very rugged and insensitive to vibrations which permits higher frequency operation and should be supplied with standard quick attach kit for easy mounting on the specimen mechanical over travel limits in both directions

TENSILE & COMPRESSION TESTING

Software to perform Tensile & Compression test compatible with controller, machine and power pack etc. the user interface Contain Specimen description loading parameters pump control test run /stop graph display, numeric readout of multiple relevant test parameters.

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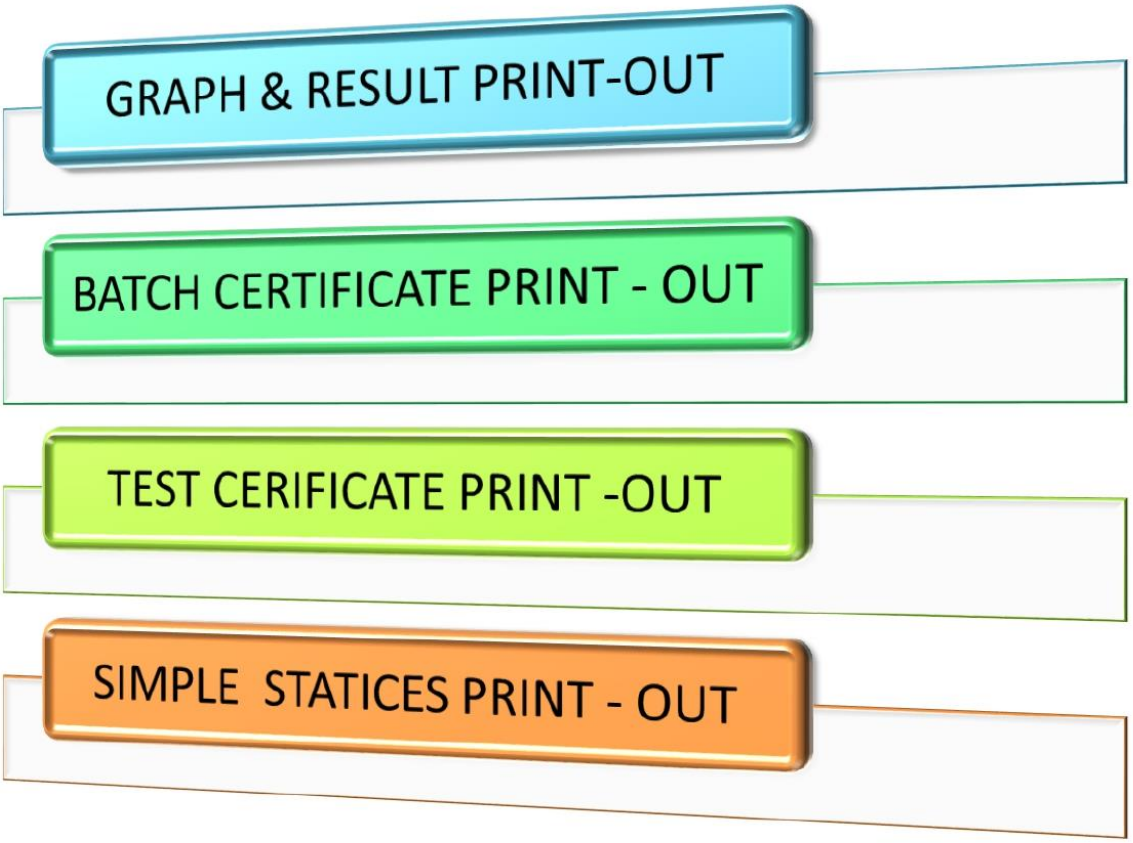
PRINTER PORT FOR PRINTER INTERFACE

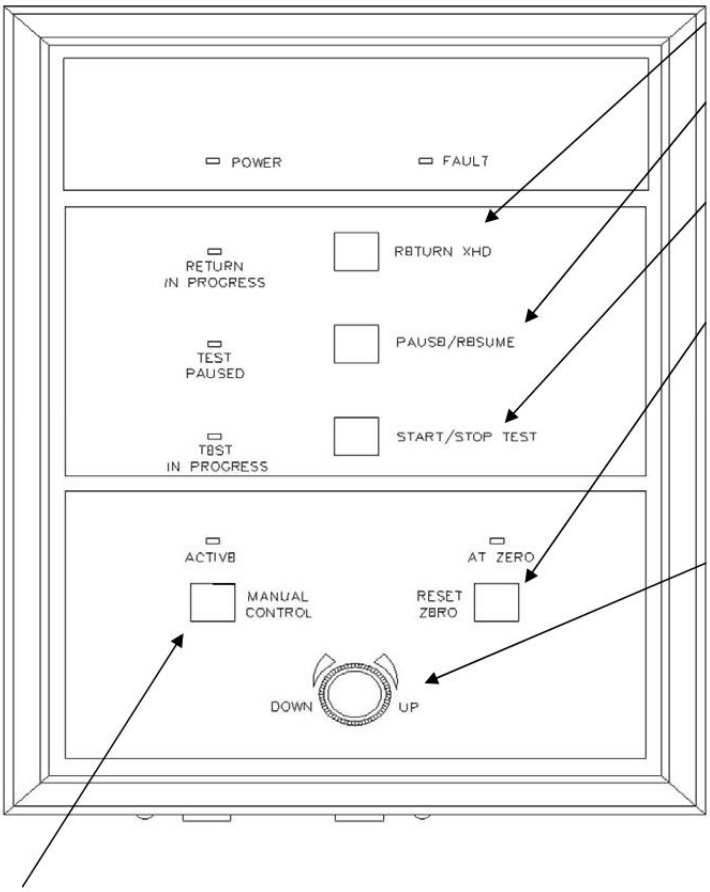


Section4. Controls

ManualControls

The Series Universal Testing Machine (UTM) is computer-controlled, but limited functions can becontrolled manually. The manual control station is mounted on the load frame and provides several testcontrolsatthisposition.Belowisalistofcontrolsusedduringoperation.RefertoFigure2.

NOTE:Inorderforthisequipmenttobecontrolledmanually,thesoftwaremustbeinoperation.



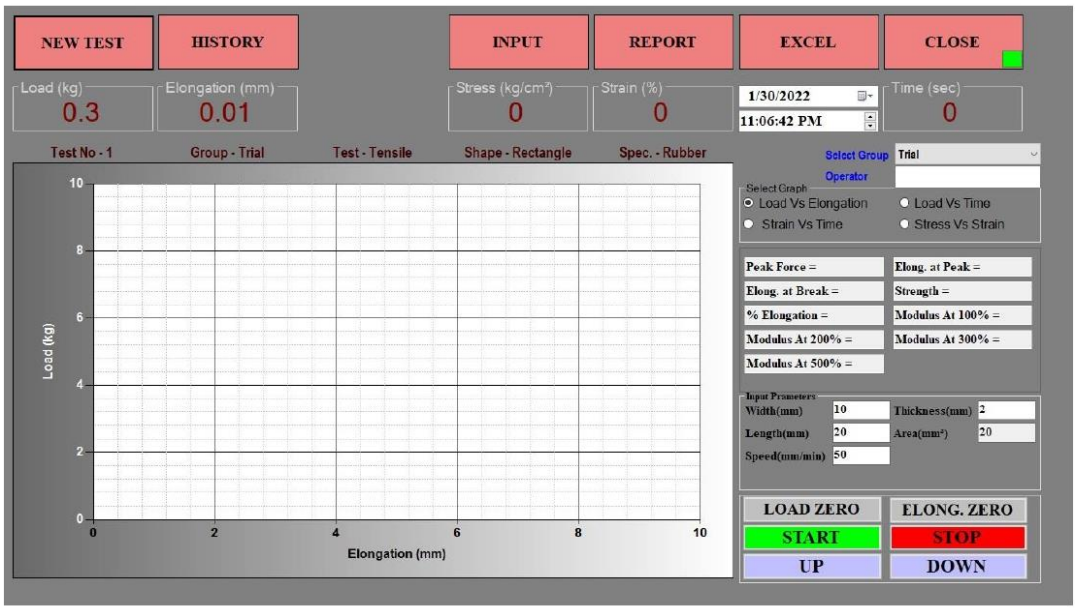
Return XHD - This pushbutton (withcorresponding LED) will return thecrossheadtothezeroposition.
Pause/Resume - This pushbutton(with corresponding LED) will hold atest in progress or resume a pausedtestwhenpressed.
Start/Stop Test - This pushbutton(with corresponding LED) willstart/stop the test from the loadframe.
Reset Zero - This pushbuttonresets the zero position of thecrosshead to its current locationwhen the button is pressed. TheACTIVEindicatorandtheManualControl Window on screen must bepresent for this function to operate.An LED indicator above the buttonwill indicate when the crosshead isatzero.
Jog Pot - This jog is a proportionalcontrol, permitting the user tomanually operate the up and downmovement of the loadingcrosshead.As the jog is turned ineither direction, the moveablecrosshead speed graduallyincreases.When the knob isreleased, the moveable crossheadmovement stops.The activeindicator and the Manual ControlWindow must be ON for thisfunctiontooperate.

Manual Control - This pushbutton will enable the manual controls, by pressing the button and holding for 3seconds. An illuminated LED indicator above the button shows when the manual control functions are active.When activated, the manual control window will appear on the computer screen. Manual control is accessedfromeitherttheloadframeorthecomputer.

Emergency Stop - This pushbutton is mounted on the base of the UTM and provides an instant stop of allmachine functions when depressed.The Emergency Stop function is available at all times when power isappliedtotheUTM.Whenpushed,thepushbuttonwilllockthepoweroff.Inordertorestorepower,turnthebutton.

ComputerControlFunctions

TheTensile Testing Machine is primarily computer-controlled using the software.Figure3showsa list ofthesoftwaremenu itemsavailablewithThismanualwillexplainhowto perform functions in all the menu items except for some items available in the SYSTEM menu, as they shouldbeaccessedbyresonancepersonnelonly.



Section5.Operation

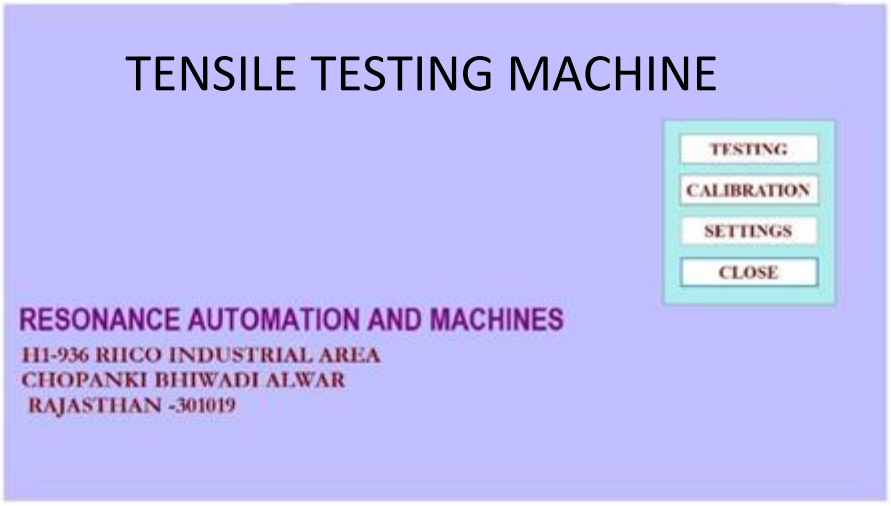
General

The purpose of this section is to describe procedures related to operating the Computer Controlled Testing Test Machine (TTM).Before a test can be conducted, Hardware Parameters andSoftwarePreferencesmustbeset.

- CreatingaTest
- PositioningtheSpecimen
- RunningaTest
- ManualOperation

WELCOME SCREEN

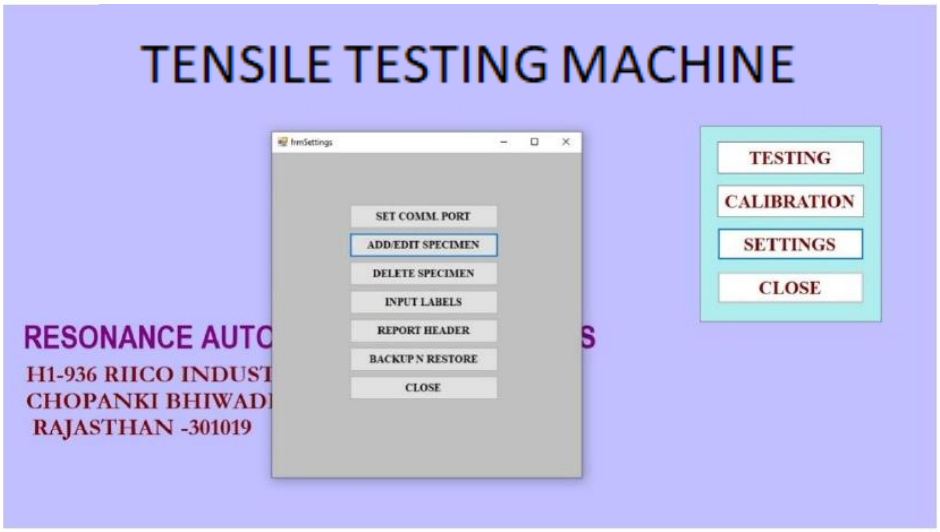
Here operator can choose whether he want to do samples testing or to do software settings,

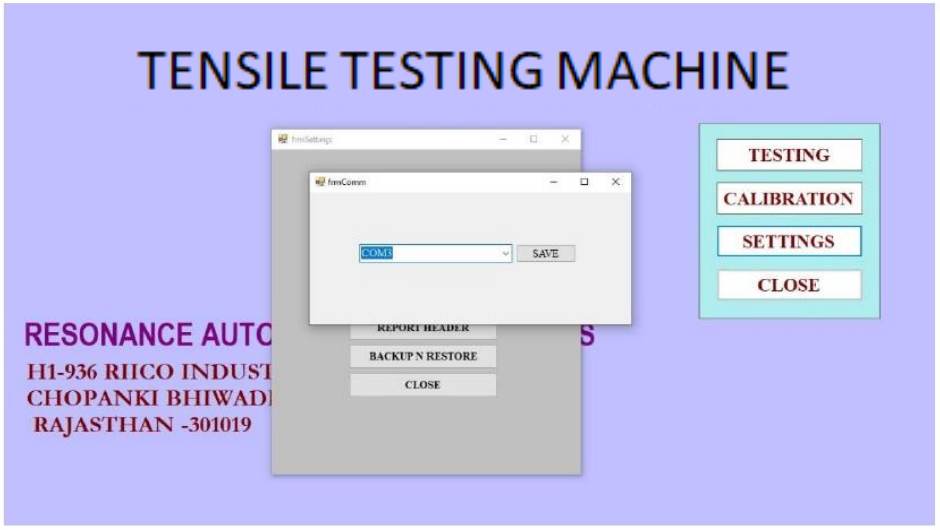


SETTINGS

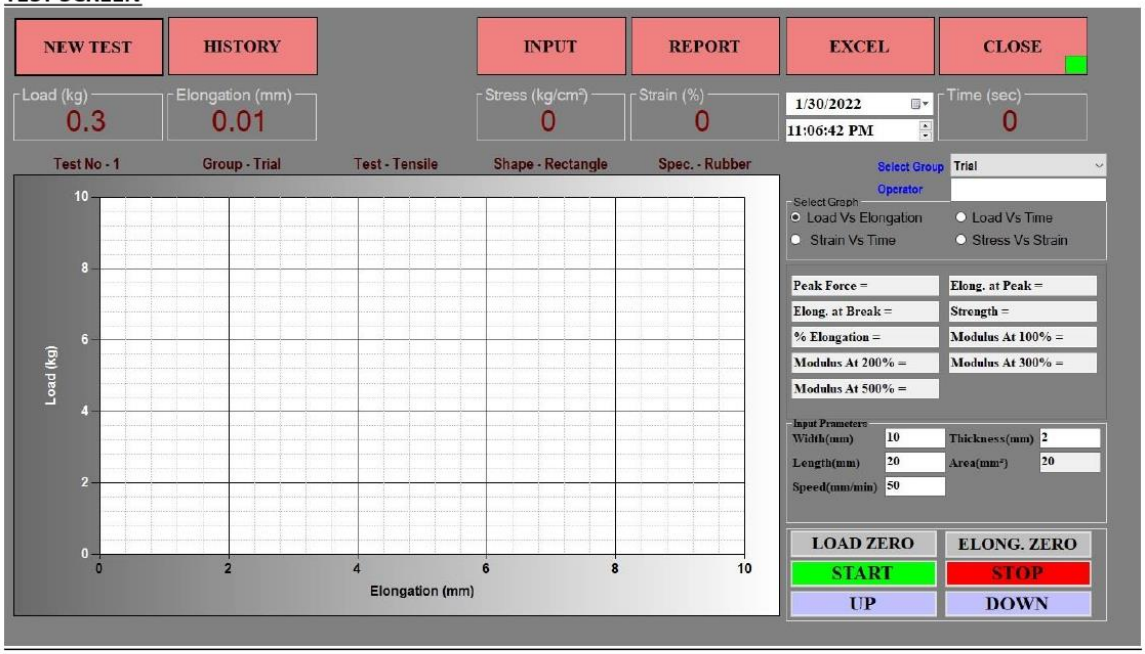
All software settings and backup options are here. A"admin"password is required to get in to this option. Settings menu shown below.

To set communication port click on 'SET COMM. PORT' option and then choose the port no on which the Interface unit is connected



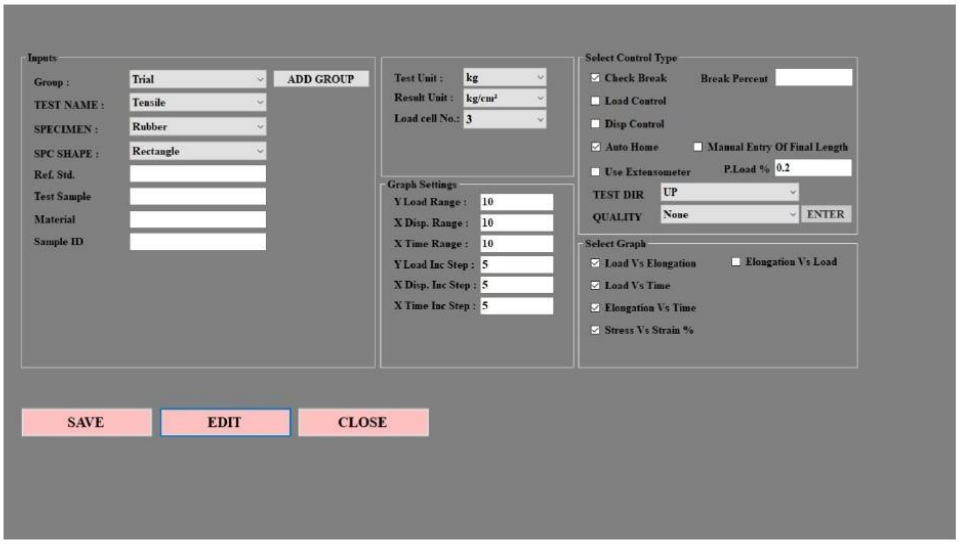


TEST SCREEN



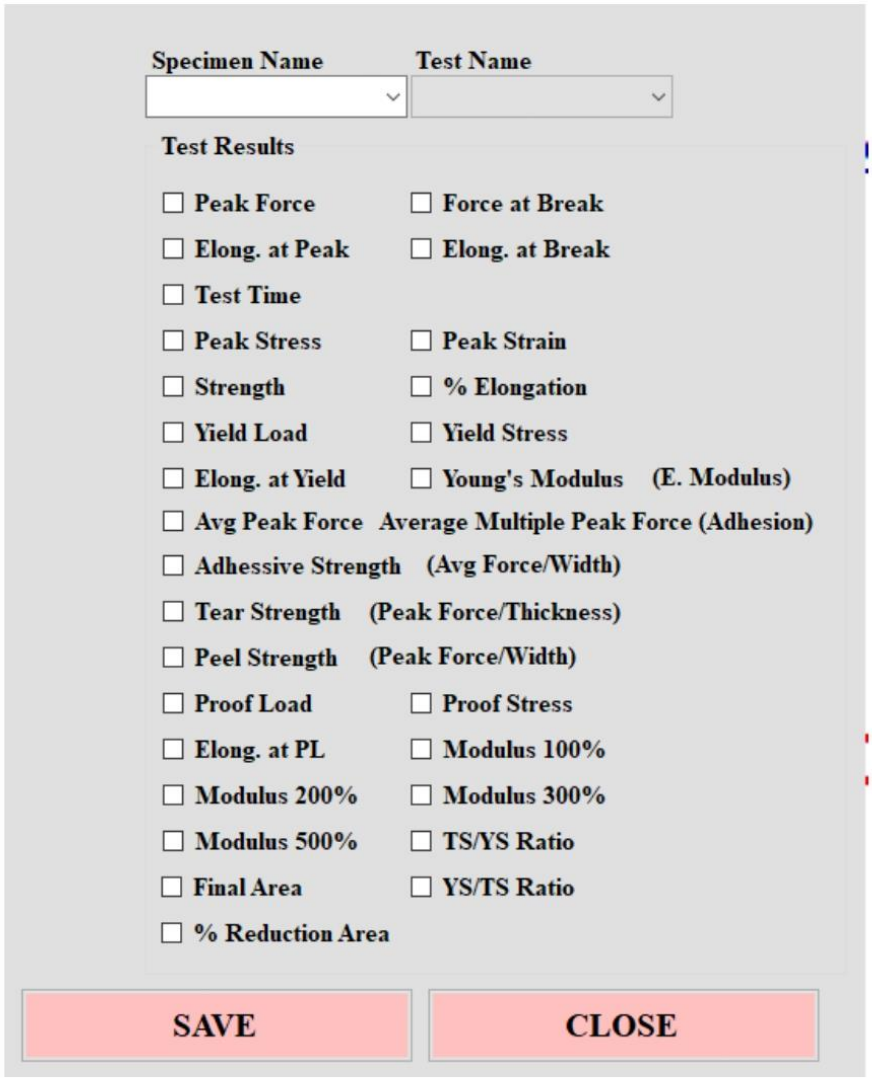
INPUTS

All input settings are set here. Test Unit, Result Unit, Break Checking, Set Load, and Set Disp., whether to use extensometer or not, if proof load required set percentage for proof load, Test Direction and all other input parameters like test type, specimen, shape etc. Graph range settings also here.



ADD EDIT SPECIMEN

Here the administrator can add new specimens like(Rubber, TMT Bar, Iron Rod, Door Hinge, Brake Hose etc) And assign test type(Tensile, Compression, Flexural, Elongation Test etc) also can select test results required For specified specimen.


Specimen Name
Test Name
Test Results
Peak Force
Force at Break
Elong. at Peak
Elong. at Break
Test Time
Peak Stress
Peak Strain
Strength
% Elongation
Yield Load
Yield Stress
Elong. at Yield
Young's Modulus (E. Modulus)
Avg Peak Force Average Multiple Peak Force (Adhesion)
Adhessive Strength (Avg Force/Width)
Tear Strength (Peak Force/Thickness)
Peel Strength (Peak Force/Width)
Proof Load
Proof Stress
Elong. at PL
Modulus 100%
Modulus 200%
Modulus 300%
Modulus 500%
TS/YS Ratio
Final Area
YS/TS Ratio
% Reduction Area
SAVE
CLOSE

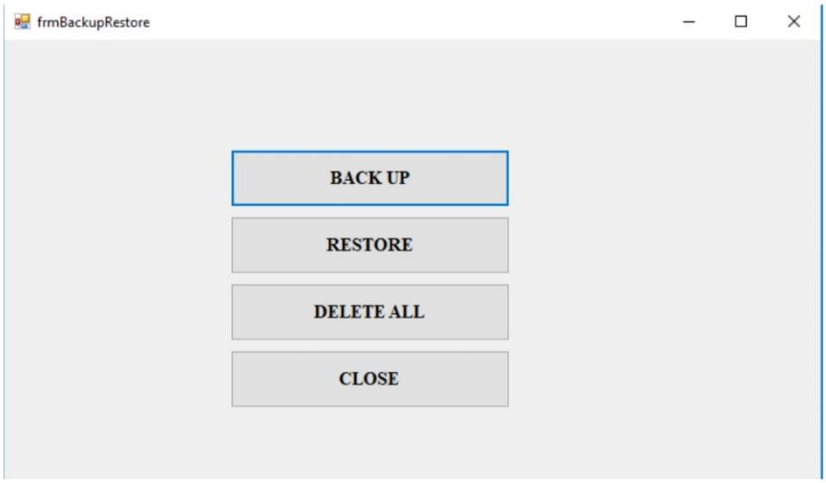
BACKUP & RESTORE

Backup

Administrator can take backup of all test and settings here. It is advised to take back in regular intervals.

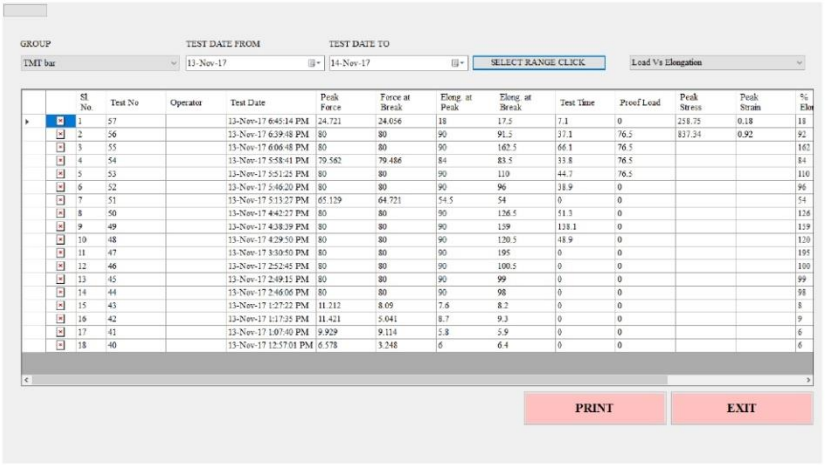
Restore

Any time if your software get corrupted or loss of data, administrator can restore back data back to system using this option. Care should be taken while restoring the data, by clicking delete all data administrator has to clear all current then use restore.(Note : only the data till backup date will be restored).

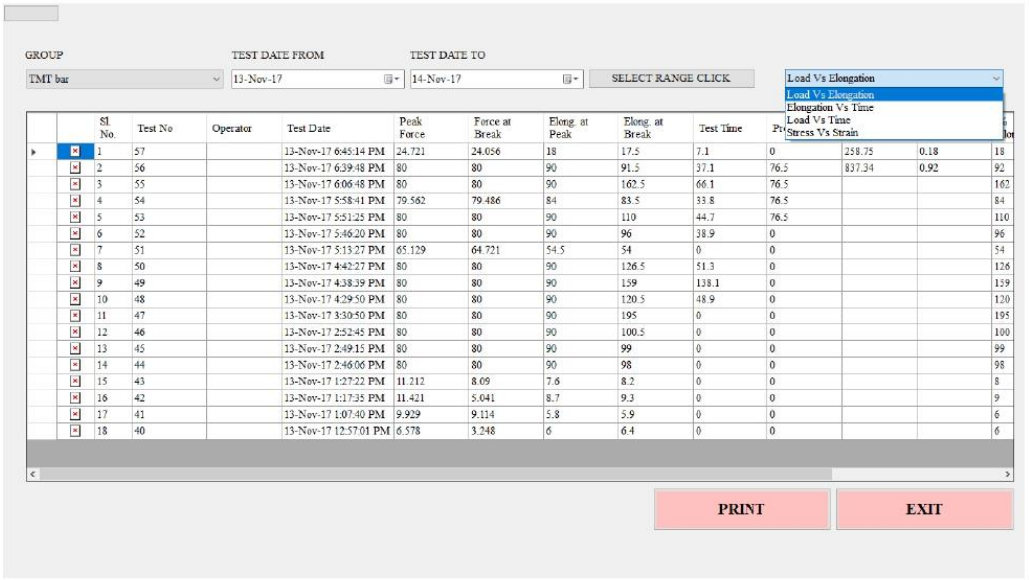


HISTORY

Here user can see all previous test and take print out from here.



Sl No	Test No	Operator	Test Date	Peak Force	Force at Break	Elong. at Peak	Elong. at Break	Test Time	Proof Load	Peak Stress	Peak Strain	% Elo
1	57		13-Nov-17 6:45:14 PM	24.721	24.056	18	17.5	7.1	0	258.75	0.18	18
2	56		13-Nov-17 6:39:48 PM	80	80	90	91.5	37.1	76.5	837.34	0.92	92
3	55		13-Nov-17 6:06:48 PM	80	80	90	162.5	66.1	76.5			162
4	54		13-Nov-17 5:58:41 PM	79.582	79.486	84	83.5	33.8	76.5			84
5	53		13-Nov-17 5:51:25 PM	80	80	90	110	44.7	76.5			110
6	52		13-Nov-17 5:46:20 PM	80	80	90	96	38.9	0			96
7	51		13-Nov-17 5:13:27 PM	65.129	64.721	54.5	54	0	0			54
8	50		13-Nov-17 4:42:27 PM	80	80	90	126.5	51.3	0			126
9	49		13-Nov-17 4:38:39 PM	80	80	90	139	138.1	0			139
10	48		13-Nov-17 4:29:50 PM	80	80	90	120.5	48.9	0			120
11	47		13-Nov-17 3:30:50 PM	80	80	90	195	0	0			195
12	46		13-Nov-17 2:02:45 PM	80	80	90	100.5	0	0			100
13	45		13-Nov-17 2:49:15 PM	80	80	90	99	0	0			99
14	44		13-Nov-17 2:46:06 PM	80	80	90	98	0	0			98
15	43		13-Nov-17 1:27:22 PM	11.212	8.09	7.6	8.2	0	0			8
16	42		13-Nov-17 1:17:35 PM	11.421	5.041	8.7	9.3	0	0			9
17	41		13-Nov-17 1:07:40 PM	9.929	9.114	5.8	5.9	0	0			6
18	40		13-Nov-17 12:57:01 PM	6.578	3.248	6	6.4	0	0			6



Sl. No.	Test No	Operator	Test Date	Peak Force	Force at Break	Elong. at Peak	Elong. at Break	Test Time				
1	57		13-Nov-17 6:45:14 PM	24.721	24.056	18	17.5	7.1	0	258.75	0.18	18
2	56		13-Nov-17 6:39:48 PM	80	80	90	91.5	37.1	76.5	837.34	0.92	92
3	55		13-Nov-17 6:06:48 PM	80	80	90	162.5	66.1	76.5			162
4	54		13-Nov-17 5:58:41 PM	79.562	79.486	84	83.5	33.8	76.5			84
5	53		13-Nov-17 5:51:25 PM	80	80	90	110	44.7	76.5			110
6	52		13-Nov-17 5:46:20 PM	80	80	90	96	38.9	0			96
7	51		13-Nov-17 5:13:27 PM	65.129	64.721	54.5	54	0	0			54
8	50		13-Nov-17 4:42:27 PM	80	80	90	126.5	51.3	0			126
9	49		13-Nov-17 4:38:39 PM	80	80	90	159	138.1	0			159
10	48		13-Nov-17 4:29:50 PM	80	80	90	120.5	48.9	0			120
11	47		13-Nov-17 3:30:50 PM	80	80	90	195	0	0			195
12	46		13-Nov-17 2:52:45 PM	80	80	90	100.5	0	0			100
13	45		13-Nov-17 2:49:15 PM	80	80	90	99	0	0			99
14	44		13-Nov-17 2:46:06 PM	80	80	90	98	0	0			98
15	43		13-Nov-17 1:27:22 PM	11.212	8.09	7.6	8.2	0	0			8
16	42		13-Nov-17 1:17:35 PM	11.421	5.041	8.7	9.3	0	0			9
17	41		13-Nov-17 1:07:40 PM	9.929	9.114	5.8	5.9	0	0			6
18	40		13-Nov-17 12:57:01 PM	6.578	3.248	6	6.4	0	0			6

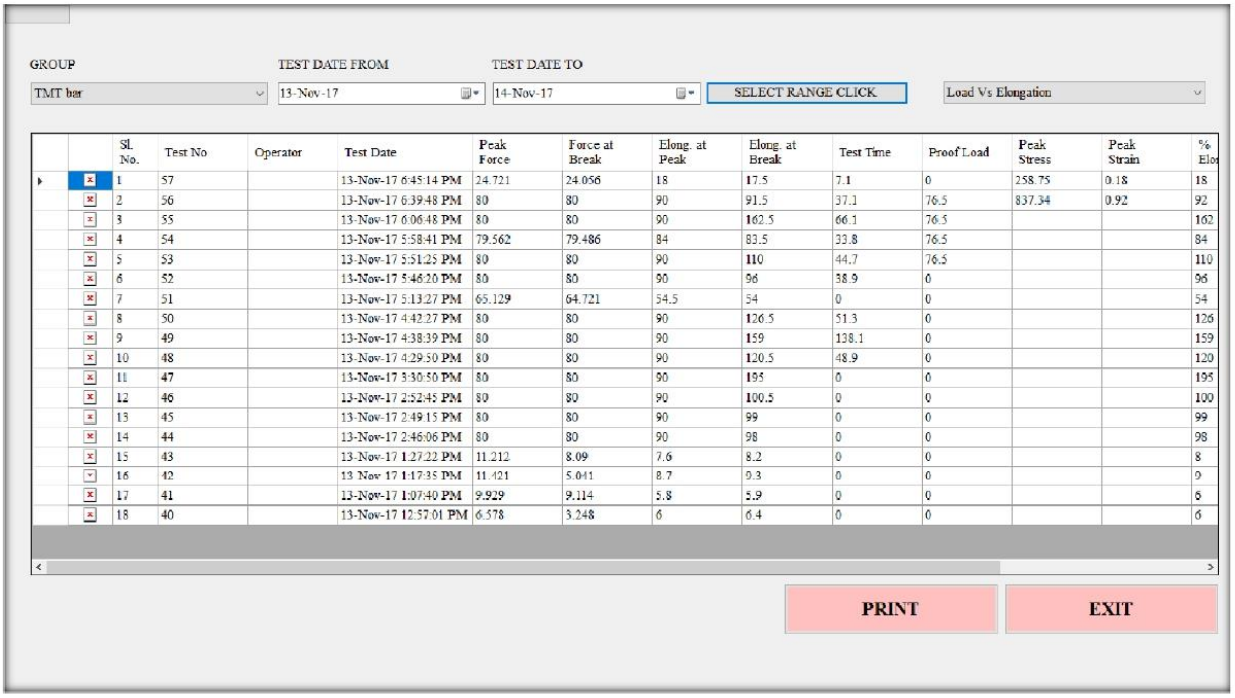
TESTING

New Test – Old Test data and graph get cleared and ready for new test.
User has to select the group in which he want to do testing. When user select a group all settings get loaded.
Click Start to start test. Input details given below.

HISTORY

HISTORY

Here user can see all previous test and take print out from here.

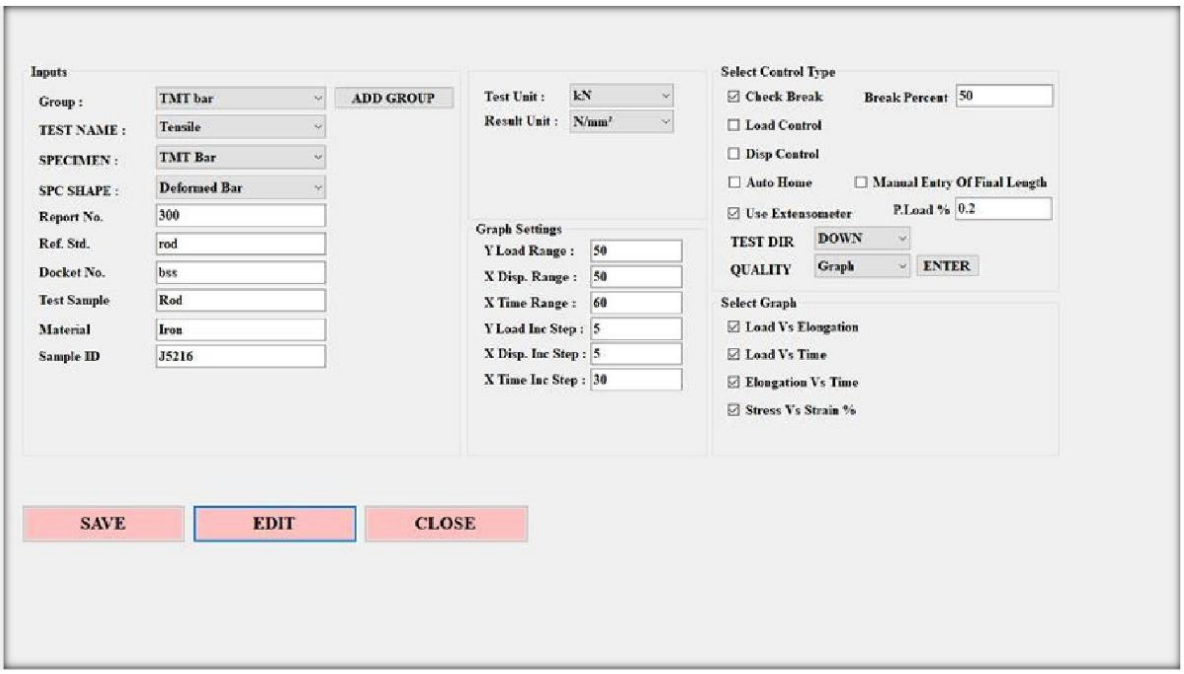


Sl. No.	Test No	Operator	Test Date	Peak Force	Force at Break	Elong. at Peak	Elong. at Break	Test Time	Proof Load	Peak Stress	Peak Strain	% Elo
1	57		13-Nov-17 6:45:14 PM	24.721	24.056	18	17.5	7.1	0	258.75	0.18	18
2	56		13-Nov-17 6:39:48 PM	80	80	90	91.5	37.1	76.5	837.34	0.92	92
3	55		13-Nov-17 6:06:48 PM	80	80	90	162.5	66.1	76.5			162
4	54		13-Nov-17 5:58:41 PM	79.562	79.486	84	83.5	33.8	76.5			84
5	53		13-Nov-17 5:51:25 PM	80	80	90	110	44.7	76.5			110
6	52		13-Nov-17 5:46:20 PM	80	80	90	96	38.9	0			96
7	51		13-Nov-17 5:13:27 PM	65.129	64.721	54.5	54	0	0			54
8	50		13-Nov-17 4:42:27 PM	80	80	90	126.5	51.3	0			126
9	49		13-Nov-17 4:38:39 PM	80	80	90	159	138.1	0			159
10	48		13-Nov-17 4:29:50 PM	80	80	90	120.5	48.9	0			120
11	47		13-Nov-17 3:30:50 PM	80	80	90	195	0	0			195
12	46		13-Nov-17 2:52:45 PM	80	80	90	100.5	0	0			100
13	45		13-Nov-17 2:49:15 PM	80	80	90	99	0	0			99
14	44		13-Nov-17 2:46:06 PM	80	80	90	98	0	0			98
15	43		13-Nov-17 1:27:22 PM	11.212	8.09	7.6	8.2	0	0			8
16	42		13-Nov-17 1:17:35 PM	11.421	5.041	8.7	9.3	0	0			9
17	41		13-Nov-17 1:07:40 PM	9.929	9.114	5.8	5.9	0	0			6
18	40		13-Nov-17 12:57:01 PM	6.578	3.248	6	6.4	0	0			6

INPUT

INPUT

All input settings are set here. Test Unit, Result Unit, Break Checking, Set Load, and Set Disp., whether to use extensometer or not, if proof load required set percentage for proof load, Test Direction and all other input parameters like test type, specimen, shape etc. Graph



REPORT

After each testing the report will be auto generated and saved into specified folder. User can generate a report directly from testing window and from history. range settings also here.

COMPANY NAME

Address

Contact number

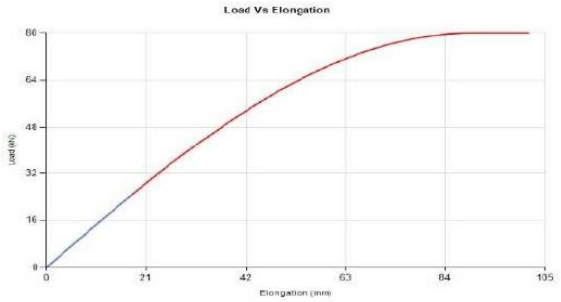
COMPONENT CERTIFICATION LAB

TEST REPORT

Test Report No.: 300 **Test Date:** 14-Dec-17 12:03:02 AM

TEST PARAMETERS

1. Reference Standard :	ROD
2. Docket No. :	Bas
3. Test Speed (mm/min) :	50
4. Test Sample :	SAMPLE ROD
5. Material :	MILD STEEL
6. Title of Test :	TENSILE
7. Sample ID No. :	J5216
8. Area (mm²) :	



TEST RESULTS

Sample No	Max. Load (N)	Max. Displacement / Stroke(mm)	Tensile Strength (N/mm²)	Elongation (%)	Measured Value of Test Piece		
					Thickness (mm)	Width (mm)	Length (mm)
1	80 kN	101 mm		101			
2	24.721 kN	17.5 mm		18			

Tested By,	Checked By,

EXCEL

EXCEL

User save raw test data into excel file using this option. TEST

REPORT FORMAT

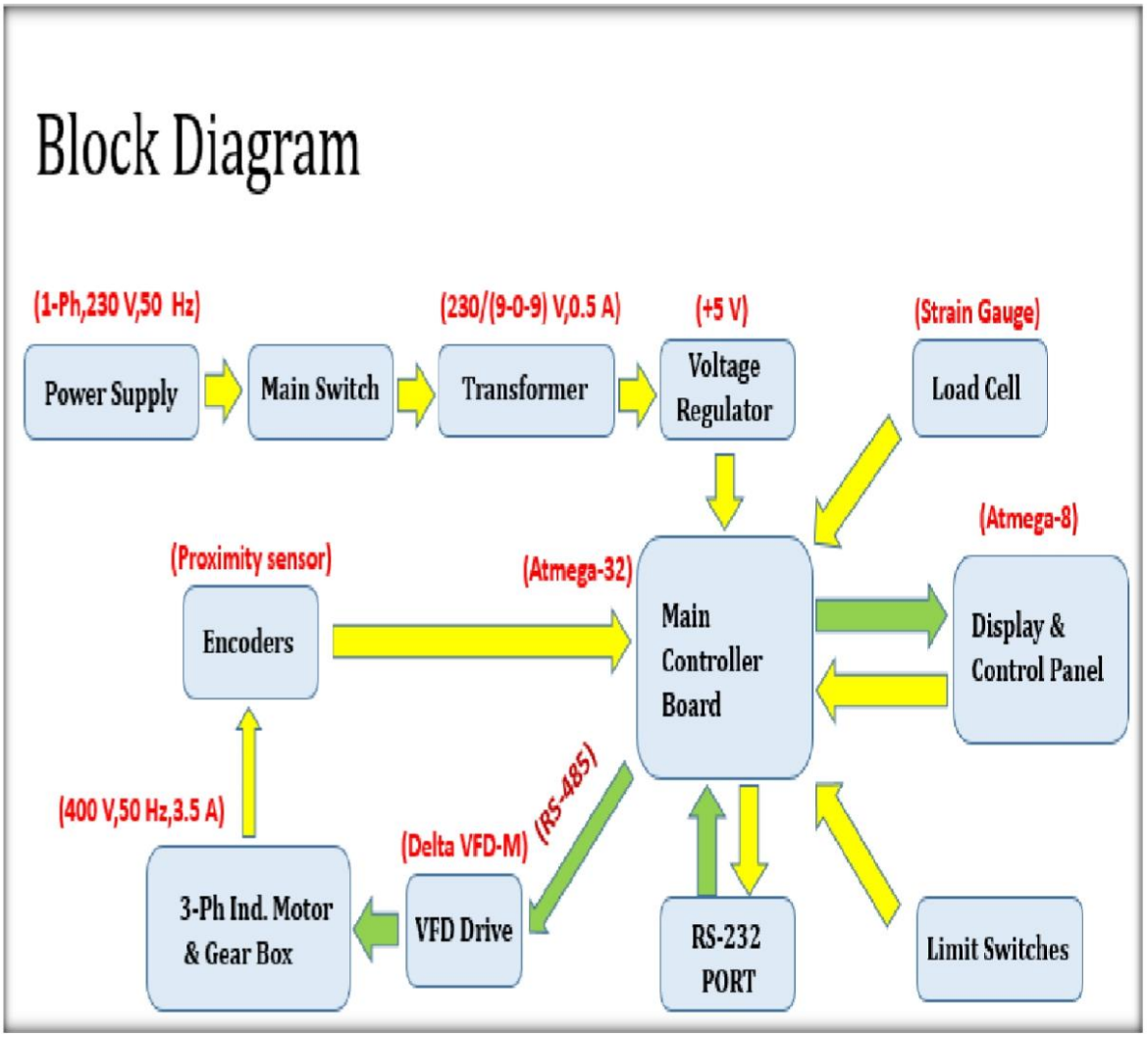
EXCEL ,PDF, WORD.

Test can be done in stroke or strain control. Online graphs of stress vs strain load vs displacement. Option to save the test profiles. Auto data acquisition settings, option to view multiple test graph in one plot. Option to run test in dual rate.Option to remove the extensometer and continue the test in stroke control.Option to stop the test after specified percentage load drop. Limit Settings on stroke, strain and load channels, offline post processing program to analyze the results in MS excel PDF and word.

COMPRESSION PLATENS

A set customized platens that directly integrated with the universal grip pull

CONTROL PANEL



Resonance Automation and machines Universal testing machine is closely controlled for sensitivity, accuracy and calibration during every stage of manufacture. Machine is calibrated over each of its measuring range in accordance with the procedure laid down in as per tender specifications.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