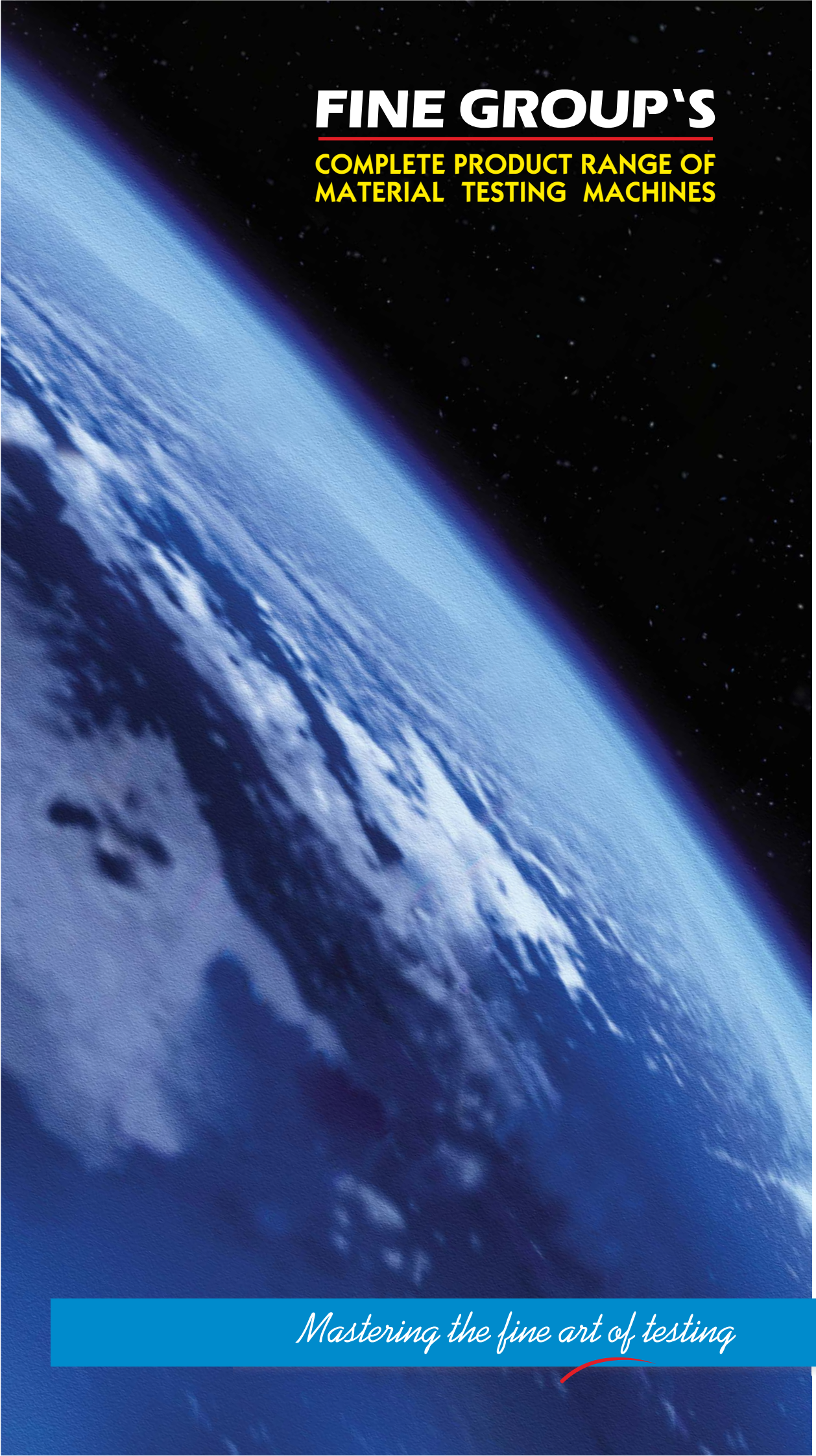


FINE GROUP'S

COMPLETE PRODUCT RANGE OF MATERIAL TESTING MACHINES

FSA

BIE

FASNE

Meta · Test

OPTO FINE

FINE IT

Mastering the fine art of testing

Manufacturers of Material Testing Machines

About Us -

- We are the leading manufacturers of Material Testing Machines in INDIA (Located in Miraj, Maharashtra State).
- "FINE GROUP" founded in 1977, Our designs are perfected. Over past 40 years we have supplied more then 40,000 machines all over India & abroad.
- We shall endeavor to achieve and maintain the quality standards and also improve upon embracing latest techniques, technologies and processes.
- Customers satisfaction is the ultimate motto of each member of our Organization. So the desired quality and prompt service shall remain point of one and all.
- Deep inside, we shall remain honest, transparent, welcoming state of art technologies and shall leave no stone unturned for satisfying our customers for a long time to come.
- We are proud to mention here that reputed companies in India and abroad are using our machines.
- We Manufacture special purpose machines to suit specific applications.

Infrastructure -

- Sufficiently large land area as well as factory and office buildings.
- Handling facility upto 10 Tons.
- Machine tools like Center lathes, Milling Machines, Shaping Machine, Boring Machine, Planning Machine, Surface Grinder, Cylindrical Drilling Machines, Radial drilling machine, etc.
- A number of Jigs, Fixtures, Templates and Test Rings.
- Inspection Equipments like large Surface plates, Vernier Calipers, Micrometers, Precision dial gauges, Height gauges, Cone gauges, Clinometers, Special gauges, etc.
- Proving Rings, Dynamometers and Load cells with NPL traceability for force calibration in various capacities.

Team and the Spirit -

- Highly qualified Engineers, Workers and the staff trained in their respective fields and having long experience.
- Well established, quality and work culture.
- In house product and software development enabling us to provide custom built machines.
- Over a long period of 40 years our designs are perfected and we have technical directors who have experience of m o r e

ANALOGUE - UNIVERSAL TESTING MACHINES (Model : TUN)

- Variety of tests like Tension, Compression, Transverse, etc are conducted.
- Continuous roll autographic "Load Vs Elongation" recorder.
- Suitable for testing a wide range of metallic materials.
- Extra (Optional) Accessories such as - Mechanical Extensometer, Load-Stabilizer, Attachment for - Brinell test, Tensile test for shouldered & threaded, Single & Double shear test, Bolts-Nuts & Washer test, Rope test, Flat Belt test, Bend-Rebend test, 180° Bend test, Pull-Out test, Chain testing, etc are available.
- Various Models - Capacities from 100 kN to 2000 kN are available.
- Loading accuracy well within ± 1%, conform to IS:1828 / BS:1610.

COMPUTERISED - UNIVERSAL TESTING MACHINES (Model : TUE-C)

- Automatic Data capture, storage & graphic display.
- Recording, storage & retrieval of results & details.
- On line display of load & extension.
- Fully automatic, on screen calculations based on the delivered data.
- Out put to digital printer of test data, test results & graphs.
- Auto detection of over load, over travel & specimen break, on detection of the above conditions, the machine is automatically switched off.
- Load resolution: 20000 counts
- Accurate and Users friendly software & all other facilities mentioned under Model : TUN.
- Various Models - Capacities from 100 kN to 2000 kN are available.
- Loading accuracy well within ± 1%, conform to IS:1828 / BS:1610.

ANALOGUE CUM COMPUTERISED - UNIVERSAL TESTING MACHINES (Model : TUE-CN)

- The DC valve is provided which directs oil flow either to analogue or computerized control panel. One can use one system at a time.
- Both Analogue & Computerized control panels are provided.
- Various Models - Capacities from 100kN to 2000kN are available.
- Loading accuracy well within ± 1%, conform to IS:1828 / BS:1610.

SERVO COMPUTERIZED - UNIVERSAL TESTING MACHINES (With Load & CHT rate controls) (Model : TUE-C-SERVO)

- Electronically controlled sophisticated imported pressure and flow control valves with dedicated controller and are controlled in closed loop with PID looping for getting desired load rate and CHT rate.
- Variable load rates and CHT rates can be selected through computer.
- DAS Panel is equipped with 32 bit Micro-Controller.
- Various control modes are available.
- DAS Panel can be connected to any new generation PC or Laptop with USB Port.
- Load accuracy as high as ± 1% from 2% to 100% of machine capacity.
- Load Resolution: 1 lac counts for Standard Machine. 5 lac counts (optional) can also be supplied at an extra cost
- Accurate and Users friendly software and all other facilities mentioned under Model : TUE-C.
- Various Models - Capacities from 100 kN to 2000 kN are available.
- Machines strictly conform to IS:1828 / BS:1610 standards.

COMPUTERIZED & ANALOGUE VERSIONS, 2000 kN CAPACITY, UNIVERSAL TESTING MACHINES (Models : TUE-C-2000 kN & TUN-2000 kN)

- This is a big size machine i.e. 2000 kN (200 Tons) capacity, with neck breaking height.
- Machine performance is excellent and even bars of size upto dia 50 or 60 mm are comfortably tested without jerks and shakes.
- Middle crosshead speed is 300 mm/min.
- Additional middle crosshead control push buttons on machine columns to facilitate ease of machine operation.
- Increased length and rigidity of jaws and inserts.
- Accuracy and other features as mentioned under Models : TUN & TUE-C.
- Machines strictly conform to IS:1828 / BS:1610 standards.

SERVO COMPUTERIZED - UNIVERSAL TESTING MACHINES (With Load & CHT rate controls, with front open crossheads and hydraulic grips) (Model : TUF-C-SERVO)

- Machine is Servo controlled i.e. with Load rate and CHT rate controls.
- Machine is electronically controlled with sophisticated imported pressure and flow control valves along with their dedicated controller are used and they are controlled in closed lop with PID looping.
- This machine is designed with Front end opening crosshead and hydraulic gripping.
- Accuracy of ± 0.5% of indicated load valve is guaranteed from 2% to 100% of machine capacity.
- All other specifications are as mentioned under Model : TUE-C-(SERVO).
- Various Models - Capacities from 200 kN to 2000 kN are available.
- Machines strictly conform to IS:1828 / BS:1610 standards.

SERVO COMPUTERIZED - UNIVERSAL TESTING MACHINES, 1200 kN CAPACITY (With Load & CHT rate controls, with front open crossheads and hydraulic grips) (Model : TUF-C-1200 kN-SERVO)

- Machine is 1200 kN (120 Tons) capacity, Servo controlled i.e. with Load rate and CHT rate controls.
- Machine is electronically controlled with sophisticated imported pressure and flow control valves along with their dedicated controller are used and they are controlled in closed lop with PID looping.
- This machine is designed with Front end opening crosshead and hydraulic gripping.
- The design is more suitable for easy fixing of flat or round samples, testing of round & TMT bars upto dia. 42 mm with less jerks during breaking of samples.
- Accuracy of ± 0.5% of indicated load valve is guaranteed from 2% to 100% of machine capacity.
- All other specifications are as mentioned under Model : TUE-C- (SERVO).
- Machines strictly conform to IS:1828 / BS:1610 standards.

COMPUTERISED & ANALOGUE VERSIONS - COMPRESSION TESTING MACHINES (Model : FCT, FCT-E & FCT-EC)

- Suitable for testing a wide range of materials.
- Wide range of standard & special (Optional) accessories are available.
- Various Models - Capacities from 100 kN to 3000 kN are available.
- Analogue, Digital & Computerized versions are available.
- Loading accuracy well within ±1%, conform to IS:1828 / BS:1610.

DIGITAL, HAND OPERATED, COIL SPRING TESTING MACHINES (Model : STM)

- The machine is table mounted, digital & hand operated.
- Load measurement by load cell & displacement by rotary encoder.
- LCD display on DAS panel for Load & Displacement.
- Standard load resolution is with 10,000 counts. Finer resolution (Optional) with 20,000 counts can also be offered at extra cost. Standard displacement resolution is 0.01 mm.
- Vertical day light is 300 mm.
- Tension Shackles & Compression plates are provided for Tension & Compression springs.
- It is possible to use a number of load cells, say two or three, to cover much wider range of load, to suit the application. Cost of one load cell is included in the price, but additional load cell will be at extra cost.
- Various Models -Capacities from 100 N to 2000 N are available.
- Loading accuracy well within ±1%, conform to IS:1828 / BS:1610.

COMPUTER CONTROLLED, SINGLE BALL-SCREW DRIVEN UNIVERSAL TESTING MACHINES (Models : M-1(S) & M-5(S))

- Single column with single ball screw driven machine.
- Variety of tests like Tension, Compression, Transverse, Peel off, Bend, Shear, etc are conducted
- Suitable for testing a wide range of materials like rubber, plastic, ferrous metals, non-ferrous metals, etc of various forms like round, flat thread, wire, dumb-bell, fabric, belt, strip, rope, etc.
- AC Servo motor for crosshead control with infinitely variable speed drive.
- Computerized crosshead control.
- Crosshead speed - 0.1 to 1000 mm/min (Closed loop)
- Load measurement by load cell.
- Throat - 100 mm & Maximum cross head traverse excluding grips - 800 mm.
- Over Load & Over travel safety.
- Latest windows based, Users friendly, Accurate, Menu driven software.
- On line display of Load, Elongation & Graph.
- Tare load & reset elongation facilities available.
- Built-in facility for printing of test results and the graph.
- Selectable units like N, kN, kgf, lbf, inch, mm, etc.
- Fully automatic on screen calculations like UTS, YS, Proof stress, etc.
- Electronic Extensometer (Optional) is available for proof stress evaluation.

- Standard load resolution is with 1,00,000 counts. Finer resolution (Optional) with 5,00,000 counts can also be offered at extra cost.
- Wide range of grips & accessories to suit different materials & tests.
- Models - M-1 & M-5 of Capacity 1 kN& 5 kN respectively are available.
- Loading accuracy well within ± 0.5%, conform to IS:1828 / BS:1610.

COMPUTER CONTROLLED, BALL-SCREW DRIVEN UNIVERSAL TESTING MACHINES (Model : M SERIES)

- Double columns with two ball screws driven machine.
- Variety of tests like Tension, Compression, Tranverse, Peel off, Bend, Shear, etc are conducted.
- Suitable for testing a wide range of materials like rubber, plastic, ferrous metals, non-ferrous metals, etc of various forms like round, flat thread, wire, dumb-bell, fabric, belt, strip, rope, etc.
- AC Servo motor for crosshead control with infinitely variable speed drive.
- Computerized crosshead control.
- Crosshead speed - 0.05 to 500 mm/min (Closed loop)
- Load measurement by load cell.
- Maximum working width - 400 mm & Maximum Crosshead traverse excluding grips - 1000 mm.
- Over Load & Over travel safety.
- Latest windows based, Users friendly, Accurate, Menu driven software.
- On line display of Load, Elongation & Graph.
- Tare load & reset elongation facilities available.
- Built-in facility for printing of test results and the graph.
- Selectable units like N, kN, kgf, lbf, inch, mm, etc.
- Fully automatic on screen calculations like UTS, YS, Proof stress, etc.
- Electronic Extensometer (Optional) is available for proof stress evaluation.

- Standard load resolution is with 1,00,000 counts. Finer resolution (Optional) with 5,00,000 counts can also be offered at extra cost.
- Wide range of grips & accessories to suit different materials & tests.
- Various Models - Capacities from 1 kN to 300 kN are available.
- Loading accuracy well within ± 0.5%, conform to IS:1828 / BS:1610.

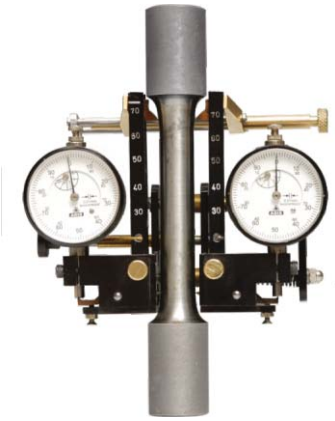
COMPUTERIZED LEAF SPRING TESTING MACHINES
(Model : FST-EC)

- The machine is used to test wide range of Leaf / Laminated Springs used for various types of vehicles, for load rate as per IS : 1135-1995.
- Large size tableof 330 x 2350 mm long, for wide range of springs.
- Load measurement by Load Cell
- Load Application by double acting hydraulic cylinder
- Standard load measurement with 20,000 counts. Finer optional at extra cost can also be supplied.
- Clearance for compressiontest is650 mm (max).
- Distance between trolleys adjustable range from 400 mm to 2000 mm.
- Ram Stroke of 400 mm.
- Displacement measurement by Rotary Encoder & Resolution is 0.01 mm.
- Wire mesh safety guard for 4-sides or loading unit, covering the sample testing area for safety purpose.
- Over load &Over travel safety provisions.
- Load stabilizer or Servo Control (Optional) is an extra attachment used to maintain a desired load constant at specific deflection enabling measuring it easily & accurately.

- We can also supply machines for Helical compression springs & Disc springs.
- Various Models - Capacities from 100 kN to 500 kN are available.
- Loading accuracy well within ± 1%, conform to IS: 1828 / BS: 1610 standards, from 2% to 100% of machine capacity.

MECHANICAL EXTENSOMETER
(Model : FXT - 3)

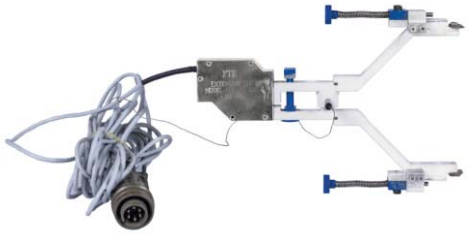
- It is an attachment to Universal Testing Machine and Tensile Testing Machines, used to find out the proof stress at the required % elongation.
- It measures the elongation of a test piece on load for the set gauge length.
- Least count of measurement 0.01 mm and maximum elongation measured upto 3 mm.
- Adjustable gauge length from 30 mm to 120 mm.
- Round specimen from 1 mm to 20 mm dia. & flat specimen from 1mm to 20 mm thickness can be accommodated.



STANDARD ELECTRONIC EXTENSOMETERS
(Model : FEE-5)

- This instrument is to be used on Tensile or Universal testing machines to find out Proof stress & Young's modulus values.
- In case of many brittle materials such as high carbon steels, alloy steels, light aluminium & magnesium alloys, it is difficult to get yield values. For such materials stress corresponding to a certain allowable amount of plastic deformation is termed as proof stress say 0.1% or 0.2% proof stress.
- The measuring range is upto 5mm & resolution is 0.001mm.
- Standard two fixed gauge lengths of 25 & 50 mm is provided. Different sizes gauge lengths of 10 & 25 mm can also be given at an additional cost.
- If this extensometer is ordered with a computerized UTM, then a special menu driven application software is provided, which accepts load & extension values & evaluates proof stress values.
- The measurement accuracy satisfies all requirements of Class-1 as per IS:12872-1990.

VARIOUS SPECIAL ELECTRONIC EXTENSOMETERSFOR COMPUTERIZED TENSILE / UNIVERSAL TESTING MACHINES



1) % Agt Electronic Extensometer (Model : FEE-25-100 & FEE-25-200)

- Extensometer used to calculate % Agt (Extension at maximum force).
- With 100 mm & 200 mm fixed gauge length.
- Maximum Extension upto 25 mm & least count of 1 Micron.
- This parameter is calculated particularly for TMT Bars (Rebars or Torsteel).
- Accuracy – Class 2 as per ISO : 15630-1 : 2002 (E).

2) Electronic Extensometer for Stranded Wires (Model : FEE-25-600)

- With 600 mm fixed gauge length.
- Maximum Extension upto 25 mm & least count of 1 Micron.
- Used for measuring extension of Stranded Wires as per IS : 14268-1995 & ASTM – A416 / A416M – 12a.
- Supplied with one set each holding knife edges for stranded wire samples sizes dia. 6.35, 7.95, 9.5, 11.1, 12.7 & 15.2 mm.

3) High Elongation Electronic Extensometer (Model : FG-13/1)

- Suitable for conducting tensile test of softer materials like rubber, plastics etc.
- Distance between knife edges is 0 to 800 mm& Resolution of 0.01 mm.
- It is to be used with our M-Series machines (Ball Screw driven with Servo drive).

4) Electronic Extensometers for r& n Values /Poisson's Ratio :

- Epsilon, USA make, Axial & Transverse Extensometers for calculating the r & n Values / Poisson's Ratio. Confirming to ASTM-E-517 & ASTM-E-646 Standards.

DIGITAL FATIGUE TESTING MACHINES (Model : MFT-8-D)

- This machine is light, compact & simple in design used to test the fatigue strength of materials & to draw S-N diagram, used for research institutes, laboratories, material manufacturers & various industries.
- Machine is table model, no need of civil foundation.
- Rotating beam type machine in which load is applied in reversed bending fashion.
- Standard 8 mm diameter specimen is held in special holders at its ends & loaded such that it experiences a uniform bending moment. The specimen is rotated at 4200 rpm by a motor. A complete cycle of reversed stresses in all fibres of the specimen is produced during each revolution.
- The bending moment is applied with a lever system and can be easily changed by moving a weight over the lever.
- Maximum bending moment of 200 kgcm is applied & adjustable from 25 to 200 kgcm.
- Total number of revolutions at which the specimen fails is recorded by a digital counter.
- The total number of digits of digital counter is eight.
- An interlocking system puts off the motor immediately after specimen fails.

- Accuracy of applied bending moment ± 1%.
- Optional - Machine with maximum bending moment upto 400 kgcm can also be offered.
- Machine meets requirements of IS: 5075-1969.

COMPUTERSIED HORIZONTAL CHAIN & ROPE TESTING MACHINES (Model : FCR-EC)

- Machines are designed to test chains, ropes & any long specimens for proof test or destructive tensile test.
- High loading accuracy & infinitely variable straining speeds to suit a wide range of materials.
- Robust loading frame, Simple controls & easy to operate.
- Adequate safety devices for safe operation.
- Load Vs CHT is in digital display & printout of results can be taken.
- Both the ends, where the grips & fixtures (Optional) are fixed are of yoke & pin type arrangement.
- Optional Accessories like - Extra Bed length, Extra Ram stroke, Safety Guard, Calibration Fixture, Various special grips / attachments / fixtures as per sizes / shapes of specimens, Load-stabilizer or Servo Control can be provided to suit special application at extra cost.
- Various Models - Capacities from 100 kN to 3000 kN are available.
- Loading accuracy well within ±1% from 4% to 100% of machine capacity, conform to IS:1828 / BS:1610.

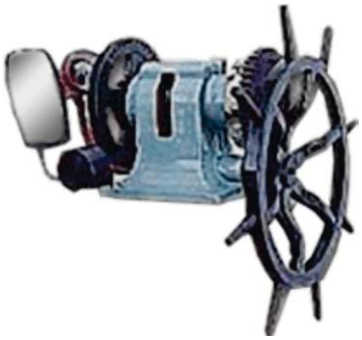
DIGITAL / COMPUTERISED MICRO VICKERS HARDNESS TESTING MACHINES (Models : FMV-AD-AT, FMV-MD-AT, FMV-AC-AT, FMV-MC-AT)

- Suitable for finish components like thin sheets, fine wires, etc. Watch parts like springs, pivot bearings, gears, cutting edge of Razor blades, drills, file teeth, etc. Metallic foils, surgical needles, pen points & so on.
- To determine hardness on - surface coatings (like electroplating, etc.), extremely thin case hardened parts, anodized castings of alluminium, shot blasted or rolled faces, etc.
- A range of test loads can be used to suit particular application. Test loads from 10 grams to 1000 grams.
- Magnifications - 100X (for Observation) & 400X (for Measurement) available.
- X-Y stage is provided with least count of 0.01mm, which can move the job as per the requirements.
- A precision Diamond Indentor (136° Pyramid) is used to make sharp indentations on the specimens / samples.
- Maximum Test height x Throat : 70 x 110 mm.
- Load accuracy well within ± 1% of nominal load value.
- Machine conform to IS:1754

- Extra (Optional) accessories like - Knoop Indentor, Knoop test block, Precision vice, Thin specimen holding device, V-shape anvil, Vertical & Horizontal fine specimen holding device, Rotary table, etc are available at an extra cost.

ERICHSEN CUPPING TESTING MACHINES (Model : MET-20)

- This machine is designed to reveal the cupping qualities of metal sheets & strips and also to test the adhesion, elasticity & porosity of coats of paints or varnish by way of comparison.
- Testing sample length and width required for this machine will be 70 x 90 mm.
- This machine is used to test maximum thickness of sample upto 2 mm. Optional upto 3 mm is also supplied at an extra cost
- This machine conform to IS : 10175-1982.



AUTOMATIC OPTICAL BRINELL HARDNESS TESTING MACHINES (Model : OPFA-3000)

- The machine has a robust, C-type load frame, designed for production testing of cast or forged components like leaf springs, cam shafts, etc for Brinell Hardness value. This machine is suitable for foundries, engineering industry on production line.
- Since most of the operations are fast and automatic, the test speed is high with less operator fatigue.
- The cycle time (except job loading / unloading) is about 12 seconds per test.
- Load stages - 750kgf & 3000kgf (Optional loads-500kgf & / or 1000kgf).
- Optical measuring equipment with 14 X magnification.
- Machine Test height x Throat is 365 x 200mm.
- Size of supporting table with fixing slots – 260 x 400mm.
- Load capacity of table (which can withstand) – 150 kg.
- Job loading / unloading, on/off the machine table, pushing cycle start & de-clamp buttons, impression measurement are the only manual operations & rest all are automatic.
- A push button is pressed for cycle start & hydraulic operations. After cycle time, impression is visible on screen, which (Diameter) is to be measured with the help of microscope of least count of 0.01mm
- Heavy duty Model : OPFA-3000 (SPL) with height x throat of 650 x 350mm, heavy supporting table of size 600 x 600mm with loading capacity of 200kg can also be offered.
- The machine accuracies conform to IS:2281-2005 & BS:240.

COMPUTERISED - TWIN SCREW AUTOMATIC BRINELL HARDNESS TESTING MACHINES (Model : OPFA-3000-TS-PC-SERVO)

- The machine has a robust, C-type load frame, designed for production testing of cast or forged components. This machine is suitable for foundries, engineering industries on production line.
- Since most of the operations are fast & automatic, the test speed is high with less operator fatigue.
- The cycle time (except job loading / unloading) is about 12 seconds per test.
- Machine is provided with Two screws and table for heavy jobs.
- Machine Test height x Throat is 365 x 200mm.
- Size of support table with fixing slots – 900 x 380 mm.
- Load capacity of table – 200kg
- Job loading / unloading, on / off the machine table, pushing cycle start & de-clamp buttons, impression measurement are the only manual operations & rest all are automatic.
- Fully computerized system for indentation measurement & display.
- Window based software system.
- Accurate measurement of Brinell hardness through matched Optics, CCD camera, Hardware & Software using advanced image processing technology.
- A push button is pressed for cycle start & hydraulic operations. After cycle time & on removal of load the optics will transfer the image of indentation to CCD. The image is further digitalized and processed by PC for measurement. The diameter of the image can be measured automatically / manually to give Brinell hardness value. Results printout can be taken.
- The optical device magnification is 16 X & least count of measurement is 0.01mm.
- Two modes of measurement – Manual & Auto.
- In Auto mode, the image is scanned for measurement & hardness is displayed automatically.
- Verification facility is provided for clear indication of measured impression by encircling the same.
- Windowing facility is provided which encircles the blurt images for better accuracies.
- Macro & Micro adjustment facilities are provided in manual mode for fast & accurate encircling of the image to be measured.
- Batch testing facility is provided.
- Statistical Analysis report can be generated.
- Calibration mode is provided with password protection.
- Heavy duty Model : OPFA-3000-TS-PC-SERVO (SPL) with height x throat of 500 x 200 mm, heavy supporting table of size 900 x 380 mm with loading capacity of 200kg can also be offered.
- The machine accuracies conform to IS:2281-2005 & BS:240.

COMPUTERISED TRANSVERSE RAIL TESTING MACHINES (Model : FCT-EC-SPL)

- This machine is designed to conduct Transverse test of Rail.
- Machines of capacities 2000 kN (200 Tons) & 2500 kN (250 Tons), with Load Cell based, Hydraulic operated Servo Controlled (With Load rate & C.H.T rate Controls) are available.
- Machine is Rigid with 4 Column Construction.
- Loading by double acting hydraulic cylinder down stroking.
- Maximum size of test piece tested – 200mm wide x 200mm height.
- Bending span - 1 mtr& 1.25 mtr. Dia. of support rollers - 40mm. Dia. of bending pane - 45mm. Width of roller - 200mm.
- Ram stroke of 100mm, with maximum straining speed (at no load) is 50mm/min.
- On line display of load & deflection.
- Load measurement by load cell & displacement measurement by Rotary Encoder.
- Rigid guards are provided at both the ends to take care of flying of specimen upon breaking.
- Load measuring accuracy of ± 1% from 4% to 100% of capacity of the machine Conform to IS : 1828 / BS : 1610.

DEEP THROAT BRINELL HARDNESS TESTING MACHINE WITH FIXED TABLE (Model : WOM TYPE)

Common Features:

- This Semi-Automatic,Load cell based with Servo load controlled Brinell Hardness testing machine is an inline production machine highly suitable for batch testing of heavy jobs.
- The machine has “C” type heavy & big loading frame with a deep throat ranging from 250mm to 600mm & test height ranging from 425mm to 1815mm.
- Load stage of 750 kgf & 3000 kgf (Optional loads of 500 kgf & / or 1000 kgf)
- Machine is provided with a large & fixed table ranging from 650mm x 1200mm to 1200mm x 2400 mm.
- Load capacity of table ranging from 500 kg upto 3000 kg.
- Ram stroke ranging from 400mm to 1800mm.
- Test blocks of desired hardness ranges are available (Optional)
- Special test fixtures for odd jobs / production testing are available (Optional)
- Accuracy conform to IS:2281& BS:240.

Specific Features:

Model :WOM-3000 (STANDARD):

- This model is provided only with single hydraulic cylinder piston assembly for application & removal of test load.
- After taking impression on job the measurement will be done outside with the help of hand held 25 X magnification microscope.
- Brinell Impression Measuring System (BIMS) can also be supplied (Optional)at an extra cost for measuring the impression.

Model :WOM-3000 (OPTICAL):

- This model is provided with two hydraulic cylinder piston assembly, One for clamping & declamping of the job & another for application of test load and for viewing the image. Inbuilt indentor indexing arrangement is provided for optical view of the impression on screen.

Model :WOM-3000(PC):

- This model is provided with two hydraulic cylinder piston assembly, One for clamping & declamping of the job & another for application of test load and for viewing the image. Inbuilt CCD System is provided for view of the impression on monitor.

DEEP THROAT BRINELL HARDNESS TESTING MACHINE WITH MOVABLE TABLE
(Model :TEXMACO TYPE)

Common Features:

- This Semi-Automatic, Load cell based with Servo load controlled Brinell Hardness testing machine is an inline production machine highly suitable for batch testing of heavy jobs.
- The machine has “C” type heavy & big loading frame with a deep throat of 400 mm & test height ranging from 500 mm to 750 mm.
- Load stage of 750 kgf& 3000 kgf (Optional loads of 500 kgf& / or 1000 kgf)
- Machine is provided with a large &movable table size of 1100 mm x 600 mm with rollers for moving the job in XX direction of 1000 mm (500 mm on either sides) & YY direction of 200 mm (100 mm on either sides).
- Load capacity of table ranging from 200 kg upto700 kg.
- Ram stroke ranging from 200 mm to 700 mm.
- Test blocks of desired hardness ranges are available (Optional)
- Special test fixtures for odd jobs / production testing are available (Optional)
- Accuracy conform to IS:2281& BS:240.

Specific Features:

Model :TEXMACO-3000 (STANDARD):

- This model is provided only with single hydraulic cylinder piston assembly for application & removal of test load.
- After taking impression on job the measurement will be done outside with the help of hand held 25 X magnification microscope.
- Brinell Impression Measuring System (BIMS) can also be supplied (Optional) at an extra cost for measuring the impression.

Model :TEXMACO-3000-OPTICAL :

- This model is provided with two hydraulic cylinder piston assembly, One for clamping & declamping of the job & another for application of test load and for viewing the image. Inbuilt indentor indexing arrangement is provided for optical view of the impression on screen.

Model :TEXMACO-3000-PC :

- This model is provided with two hydraulic cylinder piston assembly, One for clamping & declamping of the job & another for application of test load and for viewing the image. Inbuilt CCD System is provided for view of the impression on monitor.

DROP WEIGHT IMPACT TESTING MACHINES
(Model : FDW-1650 J)

- To conduct fracture toughness test as per ASTM-E-208.
- Energies are 350, 400, 450, 550, 800, 1100, 1350, 1650 J.
- Drop weight is 136 kg & height of fall is 1237mm (max.) adjustable to get the desired energies. Striker tip radius is 25.4mm and hardness is 50 HRC (min.).
- Striker lifting arrangement is moterised driven by electrical motor & speed of lifting is 0.9 mtr/min. (appx.)

BEND & RE-BEND TESTING MACHINES
(Models : FBR-100 kN, FBR-150 kN & FBR-200 kN)

- To conduct testing of carbon steel bars upto 42 mm diameter for reinforcement of concrete.
- C- frame design & hydraulically operated.
- Maximum load capacities available are 100 kN, 150 kN & 200 kN.
- Dia. of support rollers is 100mm & distance between support rollers is 400mm.
- A common attachment for testing bend re-bend & 180° is supplied with the machine.
- Different sizes of formers (tools) are available from diameter 6 to 400mm.
- Suitable common re-bending tools supplied which will be incorporated in the machine.
- Hinged grilled safety doors at front is provided for safety.
- Accuracy conforming to BS:4449, IS:1786 & ASTM:A 615.

MOTORIZED ASTM & ISO PENDULUM IMPACT TESTING MACHINES
(Models : AIT-300-ASTM-MA / MD / MAD Series, AIT-300-ISO-MA / MD / MAD Series,
Combined ASTM / ISO Models : AIT-300-ASTM / ISO-MA / MD / MAD Series)

- ASTM Pendulum Impact Testing Machine strictly conform to ASTM-E-23-2007 specifications.
- ISO Pendulum Impact Testing Machine strictly conform to BSEN-ISO : 148-2-2008 specifications.
- These machines are suitable for Charpy test only on various materials.
- Basically the design of both the machines are same except the striker radius. We can also supply combined model i.e. ASTM & ISO with an extra striker (Optional)
- Motorized Impact Testing machines are widely recognized as the most accurate with super & sturdy design, with testing accuracy and repeatability.
- The complete operation of the machine is automatic.
- The entire machine is encased in an attractive enclosure, with aluminium frame work & bullet proof procarbonate covers in order to prevent accident during test.
- Impact Energy absorbed by specimen after test, can be indicated on various versions like Analogue or Digital or Analogue cum Digital, depending upon the models selected.
- Easy machine operations by push buttons, easy fixing of samples, easy closing & opening of doors.
- Safety interlocks are provided for the doors.
- The high stressed and wearing parts like support blocks and strikers are of special alloy steels duly heat treated.
- Various capacities like 300 Joules, 400 Joules & 450 Joules are available.
- Special software for digital version can be given (Optional)
- NIST & ISO Standard sample sets, Gauges, Tongs, Sub-Zero bath, Templates, V Notch milling cutters are available (Optional).

SERVO COMPUTERIZED NUT-BOLT TESTING MACHINES, 3000 kN CAPACITY (Model : NBT-LC-3000)

- Machine is 3000 kN (300 Tons) Capacity, Load Cell based, Hydraulic operated Servo Controlled (With Load rate & C.H.T rate controls).
- Tension-Compression testing machine designed for ascertaining the strength of all kinds of Nuts, Bolts & Studs up to M64.
- Tensile Clearance of 10 to 700 mm &Compression clearance of 0 to 600 mm.
- Piston Stroke of 700mm (Double acting hydraulic cylinder).
- Following tests can be performed on the machine with suitable fixtures-
  - Tensile testing of Bolts& Studs for proof load and ultimate load
  - Proof load testing of Nuts.
  - Wedge load tensile test for Bolts & Studs.
- Special Software for Nut, Bolt & Stud testing.
- Load measuring accuracy of ± 1% from 60 kN to 3000 kN.
- Nut-Bolt & Stud testing is carried out according to ISO : 898-1 Standard.

DIGITAL WIRE TORSION TESTING MACHINES (Models : MTW-5 & MTW-10)

- Suitable for testing steel wires ranging from dia. 0.1 to 10 mm. Special grips to cover this range shall be provided.
- Test speed for Model : MTW-5 is from 6 to 60 RPM (Variable) & for Model : MTW-10 is from 10 to 100 RPM (Variable). Speed variation by VFD.
- Maximum reading rotating cycle (No. of test cycles) is 999.9
- Display of number of cycles at failure is on Digital panel.
- Distance between grips is 300 mm.
- Automatic switching off motor after specimen failure.
- Measurement of number of rotations by proximity switch.
- Machines strictly conform to IS: 1717-2012 & ISO: 7800 standards.

DIGITAL TORSION TESTING MACHINES (Model : MTT-E)

- Suitable for Torsion and Twist tests on various metal rods & flats.
- Torque measurement by Torque cell & Angle of twist measurement by Rotary encoder.
- Geared motor is to apply the torque to specimen through gear box.
- Display of Torque & Angle of twist on LCD display provided on Data Acquisition System.
- Torque resolution - 0.01% of machine capacity for entire range.
- Angle of twist resolution is 0.1 Degree.
- Accuracy of Torque measurement ± 1% in the range from 4% to 100% of machine capacity.
- Torque speed & direction - 1.5 rpm Reverse.
- Provision to conduct test slowly by a handle which facilitates finding Modulus of rigidity "G"
- Facility for connecting the DAS Panel to Computer.
- Optional - Special comprehensive software for torsion test to give Torque Vs Angle of Twist graph & also calculate various parameters like Torsional shear strength, Modulus of Rigidity, etc.
- Various Models - Maximum Torque Capacity from 100 Nm to 3000 Nm are available.

ASTM & ISO
PENDULUM IMPACT TESTING MACHINES
(Models : AIT-300-ASTM & AIT-300-ISO)

- ASTM Pendulum Impact Testing Machine strictly conform to ASTM-E-23-2007 specifications.
- ISO Pendulum Impact Testing Machine strictly conform to BSEN-ISO : 148-2-2008 specifications.
- These machines are suitable for Charpy test only on various materials.
- Basically the design of both the machines are same except the striker radius. We can also supply combined model i.e. ASTM & ISO with an extra striker (Optional).
- Single stand design for easy & quick testing.
- Rigid design of machine frame and other parts assure minimum energy absorption during fracture which results in improved test accuracies.
- The high stressed and wearing parts like support blocks and strikers are of special alloy steels duly heat treated.
- Safety guard for the operator is provided.
- Pendulum drop angle is 140°.
- Unique spring loaded braking system for smooth and jerk free braking.

- Initial potential energy for Charpy is 300 Joules with a least count of 2 Joules for analogue model and 0.5 Joule for digital model.
- Digital versions are also available. Special software for digital version can be given (Optional).
- NIST & ISO Standard sample sets, Gauges, Tongs, Sub-zero bath, Templates, V notch milling cutters are available (Optional).

PENDULUM IMPACT TESTING MACHINES
(Models : AIT-300-N, AIT-300-EN & AIT-300-D)

- Suitable for Charpy & Izod Impact Tests on various materials. Works on Pendulum principle.
- Rigid designs of machine frame & other parts assure minimum energy absorption during fracture which results in improved test accuracies.
- The highly stressed & wearing parts like support blocks & strikers are of special alloy steels duly heat treated.
- Direct indication of Impact energy absorbed by specimen on large dial for Models : AIT-300-N, AIT-300-EN & on digital panel display for Model : AIT-300-D.
- Safety guard for the operator is provided.
- Initial potential energy for Charpy is 300 Joules & for Izod is 170 Joules with a L.C. of 2 Joules (for Analogue models) & resolution of 0.5 Joules (for Digital model).
- Pendulum drop angle for Charpy is 140° & for Izod is 90° .
- Gauges, Tongs, Sub-zero bath, Templates, U & V notch milling cutters are available (Optional).

- Accuracy conform to IS:3766-2003, IS:1598-1977, IS:1757-1999, IS:1499-2003, BS:131-Part- I, II, III, IV & BSEN-10045-1993 (for Charpy).

CONTACTLESS MEASURING SYSTEM FOR 'U' & 'V' NOTCH OF IMPACT SPECIMENS
(Model : OPTON-UV-NOTCH)

- Computerized inspection system for Impact Samples.
- This Equipment is designed & developed to accurately measure all dimensions of test samples (Impact Samples) of Charpy (UV-Notches and UV-Notches Sub-Sizes).
- Multiple Magnification Optics.
- Easy operation & user friendly software interface.
- Easy changeable fixtures for different samples.
- Measurement conform to ASTM : E-23, BS-131 & ISO-148 Standards.

BRINELL HARDNESS TESTING MACHINES
(Model : AKB-3000-N)

- Semi-Automatic Brinell Hardness Testing machine is designed for Brinell hardness measurement on steel & other ferrous materials & also on non-ferrous materials like Brass, Bronze, Aluminium, etc. The material can be cast, forged or rolled & the shape can be flat, round or irregular.
- This machine is specially used in production testing. Its stability & unique design of a floating fulcrum lever system ensures high accuracy & dependability.
- Operation of the machine is by push buttons. Operation cycle is fully automatic with adjustable load holding time.
- The load application system is of dead weight type combined with mechanical lever system. The supporting hydraulic system is for initiallifting of load before each test & damping the load application system for smooth application of load.
- Test loads from 500 to 3000 kgf in steps of 250 kgf.
- Test height x Throat is 380 x 200 mm.
- Indentation measurement by Brinell Microscope of 25X Magnification.
- Special Test fixtures for odd jobs / production testing can be supplied (Optional).
- Computerized Brinell impression measurement system (BIMS) is available (Optional).

- Manual / Optical / Computerised type Brinell Hardness testing machines are also available.
- Accuracy conform to IS:2281-2005 & BS:240.

OPTICAL BRINELL HARDNESS TESTING MACHINES
(Model : OPAB-3000-N)

- Semi-Automatic Brinell Hardness Testing machine is designed for Brinell hardness measurement on steel & other ferrous material & also on non-ferrous material like Brass, Bronze, Aluminum etc. The material can be cast, forged or rolled & the shape can be flat, round or irregular.
- Operation of the machine is by push buttons. Operation cycle is fully automatic with adjustable load holding time.
- This machine is a modified version of AKB-3000 which is provided with an inbuilt optical system of 14X magnification.
- An Automatic indenter index system is provided which tilts the indenter after the impression and the magnified image is visible on the screen for measurement with a 0.01 mm least count (Direct indentation measurement system).
- Thus this machine gives fast and accurate results with less operator fatigue.
- This model is mainly useful for production testing in Auto Shops, Foundries, Forge shops and Heat treatment units, etc. Its stability and unique design of a floating fulcrum lever system ensure high accuracy & dependability.
- The load application system is of dead weight type combined with mechanical lever system. The supporting hydraulic system is for initial lifting of load before each test and damping the load application system for smooth application of load.
- Test loads from 500 to 3000 kgf in steps of 250kgf.
- Machine Test height x Throat is 380 x 200 mm.

- Special test fixtures for odd jobs / production testing can be supplied (Optional).
- Computerized Brinell Impression measurement system (BIMS) is available (Optional).
- Manual / Computerized type Brinell hardness testing machines are also available.
- Aaccuracy conform to IS:2281-2005 & BS:240.

COMPUTERISED OPTICAL BRINELL HARDNESS TESTING MACHINES
(Model : OPAB-3000-N-SW)

- Automatic Brinell Hardness Testing machine is designed for Brinell hardness measurement on steel & other ferrous materials & also on non-ferrous materials.
- Operation of the machine is by push buttons. Operation cycle is fully automatic with adjustable load holding time.
- This machine is a modified version of AKB-3000 & OPAB-3000, which is provided with an inbuilt optical system (CCD) of 16X.
- An Automatic indenter index system is provided which tilts the indenter after the impression and on removal of load. The optics will transfer the image of indentation to CCD. The image is further digitalized & processed by PC for measurement. The diameter of the image can be measured automatically / manually to give Brinell hardness value.
- Thus this machine gives fast and accurate results with less operator fatigue.
- This model is mainly useful for production testing in Auto Shops, Foundries, Forge shops and Heat treatment units, etc. Its stability and unique design of a floating fulcrum lever system ensure high accuracy & dependability.
- Test loads from 500 to 3000 kgf in steps of 250kgf.
- Machine Test height x Throat is 365 x 200 mm.
- Fully computerized system for indentation measurement and display.
- Windows based software system.
- Accurate measurement of Brinell hardness through matched Optics, CCD Camera, Hardware & Software using advanced image processing technology.
- Two modes of measurement - Manual & Auto.
- In Auto mode the image is scanned for measurement & hardness is displayed automatically.
- Verification facility is provided for clear indication of measured impression by encircling the same.
- Windowing facility is provided which encircles the blurt images for better accuracies.
- Macro & Micro adjustment facilities are provided in manual mode for fast & accurate encircling of the image to be measured.
- Batch testing facility is provided.
- Statistical Analysis report can be generated.
- Calibration mode is provided with password protection.
- Special test fixtures for odd jobs / production testing can be supplied (Optional).
- Accuracy conform to IS:2281-2005 & BS:240.

SINGLE / TWIN SCREW COMPUTERIZED BRINELL HARDNESS TESTING MACHINES
(Models : OPAB-3000-N-PC & OPAB-3000-N-TS-PC)

- Automatic Brinell Hardness Testing machine is mainly useful for production testing in Auto shops, Foundries, Forging Shops and Heat treatment units, etc.
- Operation of the machine is by push buttons. Operation cycle is fully automatic with adjustable load holding time
- Load application system is of dead weight type.
- Test Loads from 500 to 3000 kgf in steps of 250 kgf.
- Machine Test height x Throat is 365 x 200 mm.
- A separate hydraulic power pack, positioned in the bottom part of the machine adds to the machine stability.
- Our unique design of a floating fulcrum lever system ensures high accuracy and repeatability.
- This machine saves a lot of cycle time, improved accuracy of measurement and gives fast and accurate results with less operator fatigue.
- An Automatic index system is provided which lifts the indenter after the impression and the magnified 16X image is visible on the inbuilt industrial touch screen PC with direct BHN values.
- Some features like : Batch testing facility, Statistical analysis, Test report, Certificate printing facilities are available.
- We can also supply optional loads from 187.5, 250, 500 to 3000 kgf in steps of 250 kgf. In this case our Machine Model will be OPAB-3000-N-PC (SPL).
- Special test fixtures for odd jobs / big flat table for heavy & big jobs for production testing can be supplied (Optional).
- Machine strictly conform to IS: 2281-2005 & BS: 240.
- Model: OPAB-3000-N-TS-HD (Heavy Duty) can also be supplied with table size 580 x 200 mm (750 x 320 mm - Optional).
- **We can also offer Twin Screw design machine for heavy job lifting. With table size of 380 x 900 mm to withstand load capacity of 200 kg.**

COMPUTERIZED - TENSILE TESTING MACHINES (Model : TKG-EC)

- Latest Windows based, Users friendly, Accurate, Menu driven software.
- Fully automatic, on screen calculations based on the delivered data.
- Automatic Data capture, storage & graphic display.
- Recording, storage & retrieval of results & details.
- Build in facility for printing of test results and the graph.
- Load measurement by load cell.
- Over Load & Over travel safety.
- On line display of Load, Elongation & Graph.
- Tare load & reset elongation facilities available.
- Selectable units like N, kN, kgf, lbf, inch, mm, etc.
- Fully automatic on screen calculations like UTS, YS, Proof stress, etc.
- Electronic Extensometer (Optional) is available for proof stress evaluation.
- It is possible to use a number of load cells, say two or three, to cover much wider range of load, to suit the application. Cost of one load cell is included in the price, but additional load cell will be at extra cost.
- Standard load resolution is with 20,000 counts. Finer resolution (Optional) with 50,000 counts can also be offered at extra cost.
- Standard displacement resolution is 0.1 mm.

- Types of tests, testing materials, grips, attachments, fixtures, straining speed as like Analogue version, Model : TKG.
- Various Models- Capacities from 200 N to 50 kN are available
- Loading accuracy well within ±1%, conform to IS:1828 / BS:1610.

DYNAMIC BALANCING MACHINES - HORIZONTAL TYPE (Model : FBM-D)

- Hard bearing type horizontal end driven two plane machines with processor based or DSP based measuring panel.
- Suitable for balancing of different types of rotors like rotor of electrical machines, fly wheels, crankshafts, submersible pump rotors, etc.
- Measures & stores the unbalance in gms along with the angle for two selected correction planes on digital display.
- Additional bed length with or without gap bed arrangement can be provided at extra cost for extra-long rotors.
- Additional center height arrangement is also possible to accommodate bigger diameter rotors
- Minimum achievable unbalance upto 0.5 microns shift in c.g
- Various Models suitable for rotors from 0.5 kg to 10,000 kg.
- Horizontal belt driven hard bearing two plane machines are also supplied for rotors weighing from 0.1 kg upto 3000 kg.
- Unbalance indication either by stroboscopic method or photo scanning method sensitivity upto 0.5 micron.
- Computerized / Electronic versions with printer facility & special machines to suit customers requirements, can also be supplied.
- Machines conform to IS : 13277-1992 / ISO : 2953.

Features of DSP Panel :

- Compact design. No external hardware.
- Higher accuracy, increased reliability.

- Auto calibration.
- RS232 Serial Interface (Computer connectivity)
- Adjustable auto cycle.
- Auto Ranging from 0.1 grams & upto kilograms.
- Auto tolerance indicator in gm & in gm.mm.
- Actual RPM Indicator(Resolution ± 1 RPM).
- Very less power consumption (Less than 50 mA)

Optional Accessories :

We can provide new DSP Panel / Computerized Conversion kit for old balancing machines with customized computer software.

VERTICAL DYNAMIC BALANCING MACHINES - VERTICAL TYPE (Model : FVBM-D)

- Vertical type hard bearing machines for single plane balancing of rotors like clutch plates, fan blades, fly wheels, magnetos, grinding wheels, impellers, pulleys, etc.
- Processor based or DSP based measuring panel with auto compensation facility.
- Minimum achievable unbalance upto 0.5 micron shift in c.g.
- Various Models suitable for rotors from 0.3 kg to 300 kg.
- Computerized / Electronic versions with printer facility & as per customers requirements, can also be supplied.
- Machines conform to IS : 13277 - 1992/ ISO : 2953.

Features of DSP Panel :
- Compact design. No external hardware.
- Higher accuracy, increased reliability.
- Auto calibration.
- RS 232 Serial Interface (Computer connectivity)
- Adjustable auto cycle.
- Auto Ranging from 0.1 grams & upto kilograms.
- Auto tolerance indicator in gm & in gm.mm.
- Actual RPM Indicator (Resolution± 1 RPM).
- Very less power consumption (Less than 50 mA)

Optional Accessories :
We can provide new DSP Panel / Computerized Conversion kit for old balancing machines with customized computer software.

BELT DRIVEN DYNAMIC BALANCING MACHINES - HORIZONTAL TYPE (Model: FSBM-D)

- Horizontal hard bearing type two plane dynamic balancing machine with overslung type belt drive arrangement.
- Most suitable for the rotors, where end drive cannot be used or where variety of rotors is more and number of adapters required are more for end drive machine.
- Typical application are balancing of bomb shells for ordnance factories, pipes, printing machine rolls, etc.
- Machines are available from 10 kg to 3000 kg capacity in various models.
- Measuring control panel is processor based or DSP based, indicating amount of unbalance in grams along with degree, by using photo scanning arrangement for generating reference signal.
- Speed range is from 200 rpm to 3000 rpm.
- Balancing accuracies achievable up to 0.5 microns for maximum rotor weight.
- Machines are more suitable for repair workshops, where variety of rotors to be balanced is more.
- Machines conform to IS : 13277 - 1992 / ISO : 2953.

Features of DSP Panel :
- Compact design. No external hardware.
- Higher accuracy, increased reliability.
- Auto calibration.
- RS 232 Serial Interface (Computer connectivity)
- Adjustable auto cycle.
- Auto Ranging from 0.1 grams & upto kilograms.
- Auto tolerance indicator in gm & in gm.mm.
- Actual RPM Indicator (Resolution ± 1 RPM).
- Very less power consumption (Less than 50 mA)

Optional Accessories :
We can provide new DSP Panel / Computerized Conversion kit for old balancing machines with customized computer software.

STROBO-DYNAMIC BALANCING MACHINES (Model : SSBM - 3)

- Small & compact machine with high accuracy for balancing of small rotors like textile spindles, electric power tool armature, etc.
- Special electrodynamic pickups are used for sensing minute vibration due to imbalance in the rotor.
- Machine is provided with electronic measuring control panel with digital panel meter for amount indication & xenon flash tube with brilliant white light for locating position of unbalance.
- Machine is very sensitive & accuracies of the order of 0.2 micron.
- Suitable for rotors from 0.1 kg to 3 kg.
- Balancing speed range is 800 to 3000 rpm.

VICKERS CUM BRINELL HARDNESS TESTING MACHINES (Model : BV)

- Suitable for finding out Vickers / Brinell hardness of metals from soft to very hard.
- Auto loading through push button selection.
- A range of test loads for Vickers / Brinell from 1 kg to 250 kg.
- Optical Magnifications of 35X, 70X &140 X available.
- A precision Diamond Indenter (136° Pyramid) is used to make sharp indentations on the specimens / samples.
- Maximum Test height x Throat : 250 x 150 mm.
- Load accuracy well within ± 1% of nominal load value.
- Machine conforms to IS : 1754

COMPUTERIZED VICKERS/ BRINELL HARDNESS TESTING MACHINES (Model : BV-PC)

- Fully Computerized system for indentation measurement and display on PC automatically & then results printout can be taken.
- Suitable for finding out Vickers / Brinell hardness of metals from soft to very hard.
- Auto loading through push button selection.
- A range of test loads for Vickers / Brinell.
- Vickers hardness is measured by using image processing techniques.
- Auto / Manual measurement modes.
- Active CMOS sensor, which contains photo detector and an active amplifier offers sharper image than a normal CCD camera.
- Optical Magnifications of 75X & Least count of measurement 0.0005 mm.
- A precision Diamond Indenter (136° Pyramid) is used to make sharp indentations on the specimens / samples.
- X-Y stage with micrometer L.C = 0.01 mm (Optional) can be supplied.
- Maximum Test height x Throat : 165 x 150 mm.
- Load accuracy well within ± 1% of nominal load value.
- Machine conforms to IS : 1754.

DIGITAL ROCKWELL / ROCKWELL CUM BRINELL HARDNESS TESTING MACHINES (Models : TRS-DN, TRB-DN, TRB-250-DN & TRS-DN-P)

- These machines are designed for measuring hardness of metals and alloys of all kinds, hard or soft, whether round, flat or irregular in shapes.
- Semi-Automatic motorized digital microprocessor based panel. We can get hardness value in digital version.
- Easy to read, large size LCD display.
- These modes of operation viz. Motorized automatic mode, Semi-automatic mode & Manual mode.
- Automatic weight selection by thumb wheel.
- Indenter is guided in linear bearings facilitates to test small diameter jobs.
- Test height x Throat is 290 x 133 mm
- Serial Interface (RS-232 Port) is provided for connecting it to Computer. Thus results printout can be taken. Computer & Printer (Optional) can be provided at an extra cost.
- Standard Software CD is provided which consists of Serial Number, Hardness values & limits.
- Least Count for Rockwell scale is 0.1 HR.
- For Rockwell cum Brinell Hardness Testing Machine additional Brinell loads in addition to Rockwell loads &Brinell Microscope of 25X magnification are provided.
- Machines strictly conform to IS : 1586-2000, BSEN-ISO-6508-2, ASTM-E-18 for Rockwell tests are IS : 2281-2005, BS-240, ASTM-E-10 for Brinell tests.
- **We can also offer Twin / Three Screw design machine in Digital or Touch screen PC, for heavy jobs & for accurate readings. With Test height of 210 mm & Throat of 130 mm (Optional 153 mm).**

DIGITAL ROCKWELL CUM ROCKWELL SUPERFICIAL HARDNESS TESTING MACHINES (Model : TSM-DN)

- This machine is designed for measuring hardness of metals and alloys of all kinds, hard or soft, whether round, flat or irregular in shapes.
- Semi-Automatic, motorized, digital, microprocessor based panel. We can get hardness value in digital version.
- Easy to read, large size LCD display.
- Three modes of operation viz. Motorized automatic mode, Semi-automatic mode & Manual mode.
- Automatic weight selection by thumb wheel.
- Indenter is guided in linear bearings facilitates to test small diameter jobs.
- Test height x Throat is 290 x 145 mm
- Serial Interface (RS-232 Port) is provided for connecting it to Computer. Thus results printout can be taken. Computer & Printer (Optional) can be provided at an extra cost.
- Standard Software CD is provided which consists of Serial Number, Hardness values & limits.
- Least Count for Rockwell scale is 0.1 HR & Rockwell cum Superficial scale is 0.2 HR
- Machines strictly conform to IS : 1586-2000, BSEN-ISO-6508-2, ASTM-E-18 for Rockwell tests and 1586-2000 & ASTM-18 for Rockwell superficial tests.

ROCKWELL / ROCKWELL CUM BRINELL HARDNESS TESTING MACHINES WITH SCREEN TOUCH DISPLAY (Models : TRS-DS, TRB-DS, TRB-250-DS & TRS-DS-P)

- Designed for measuring hardness of metals and alloys of all kinds, hard or soft, whether round, flat or irregular in shapes.
- Semi-Automatic motorized machine.
- Automatic weight selection by thumb wheel.
- Indenter is guided in linear bearings facilitates to test small diameter jobs.
- Test height x Throat is 290 x 133 mm
- Least Count for Rockwell scale is 0.1 HR.
- For Rockwell cum Brinell Hardness Testing Machine additional Brinell loads in addition to Rockwell loads &Brinell Microscope of 25X magnification are provided.
- Machines strictly conform to IS : 1586-2000, BSEN-ISO-6508-2, ASTM-E-18 for Rockwell tests are IS : 2281-2005, BS-240, ASTM-E-10 for Brinell tests.

Extra Features of Screen Touch Display

- Machine is provided with screen touch large display. Easy to read.
- Three Separate dwell times for major / minor loads & display.
- Simultaneous display for Vickers & Brinell conversion with tensile strength.
- Thermal Printer Optional accessory can be given at an extra cost.
- RS232 facility is by default provided.
- Auto cylindrical correction facility by default provided.

ROCKWELL CUM ROCKWELL SUPERFICIAL HARDNESS TESTING MACHINES WITH SCREEN TOUCH DISPLAY (Model : TSM-DS)

- This machine is designed for measuring hardness of metals and alloys of all kinds, hard or soft, whether round, flat or irregular in shapes.
- Semi-Automatic motorized machine.
- Automatic weight selection by thumb wheel.
- Indenter is guided in linear bearings facilitates to test small diameter jobs.
- Test height x Throat is 290 x 145 mm
- Least Count for Rockwell scale is 0.1 HR & Rockwell cum Superficial scale is 0.2 HR
- Machines strictly conform to IS : 1586-2000, BSEN-ISO-6508-2, ASTM-E-18 for Rockwell tests and 1586-2000 & ASTM-18 for Rockwell superficial tests.

Extra Features of Screen Touch Display

- Machine is provided with screen touch large display. Easy to read.
- Three Separate dwell times for major / minor loads & display.
- Simultaneous display for Vickers & Brinell conversion with tensile strength.
- Thermal Printer Optional accessory can be given at an extra cost.
- RS232 facility is by default provided.
- Auto cylindrical correction facility by default provided.

LATEST STANDARD - ROCKWELL HARDNESS TESTING MACHINES (Model : MRS-N)

- It has many unique features over the standard hardness tester (Model: MRS).
- Powder coated, Rigid steel fabricated body with better aesthetic looks.
- The indentor is guided in liner motion bearing which reduces the frictional losses and enables checking of hardness of very small diameter pins also.
- The main screw is toughened for wear resistance and is protected by a bellow against dirt & dust.
- The entire loading system design is with a single reference with no scope for any manual adjustment which results in high accuracies and reliability.
- The dial indicator is of large size and is located at the front end of machine which results in better readability with higher resolution and accuracy.
- Very easy for repair and maintenance if required.

- Test height x Throat is 220 x 133 mm.
- Colour is Siemens Gray powder coated.
- Motorized versions are also available.
- Machines strictly conform to IS:1586-2000.

PORTABLE ROCKWELL HARDNESS TESTERS (Model : MRP-1)

- This hardness tester is very light in weight, able to test parts where bench type hardness tester model is not useful.
- Hardness tester is quite handy for product testing of crank shafts, cylinder blocks, liner & assemblies.
- Can also be used for testing the hardness of both inside & outside of surface testing of pipes, bushings, ball bearing rings or other complicated parts.
- The model can be used in any direction without affecting the accuracy.
- Maximum Test height x Throat is 110 x 55 mm.
- Rockwell hardness scales such as HRA, HRB, HRC, etc is obtained by using different types of indentors (Diamond / Ball).
- Machines strictly conform to IS:1586- 2000 for Rockwell test.

STANDARD - ROCKWELL HARDNESS TESTING MACHINES (Model : MRS)

- This machine is designed for measuring hardness of metals & alloys of all kinds, hard or soft, whether round, flat or irregular in shapes.
- This machine is ideally suitable for laboratories, tool rooms, Heat treatment shops, R&D departments, inspection departments, foundries & educational institutions.
- Automatic weight selection with automatic zero setting dial gauge.
- Rockwell test minor load is 10 kgf & major loads are 60,100,150 kgf.
- Rockwell hardness scales such as HRA, HRB, HRC, etc is obtained by using different types of indentors (Diamond / Ball).
- Test height x Throat is 215 x 132 mm.
- Extra test height & throat of 295 x 148 mm, Model : MRS-150 is also available.
- Motorized versions are also available.
- Machines strictly conform to IS:1586- 2000.

ROCKWELL CUM ROCKWELL SUPERFICIAL HARDNESS TESTING MACHINES (Model : MSM)

- This is a combined hardness testing machine used to measure hardness of metals & alloys of all kinds, hard or soft, whether round, flat or irregular in shapes.
- This machine is ideally suitable for laboratories, tool rooms, Heat treatment shops, R&D departments, inspection departments, foundries & educational institutions.
- Rockwell superficial method is used for checking hardness of very thin sheets. Surface hardness can also be easily checked.
- Automatic weight selection with automatic zero setting dial gauge.
- Superficial test minor load is 3 kgf & major loads are 15, 30, 45 kgf. Rockwell test minor load is 10 kgf & major loads are 60,100,150 kgf.
- Superficial hardness scales such as HRN, HRT, etc. Rockwell hardness scales such as HRA, HRB, HRC, etc is obtained by using different types of indentors (Diamond / Ball).
- Test height x Throat is 295 x 148 mm
- Motorized versions are also available
- Machines strictly conform to IS:1586- 2000.

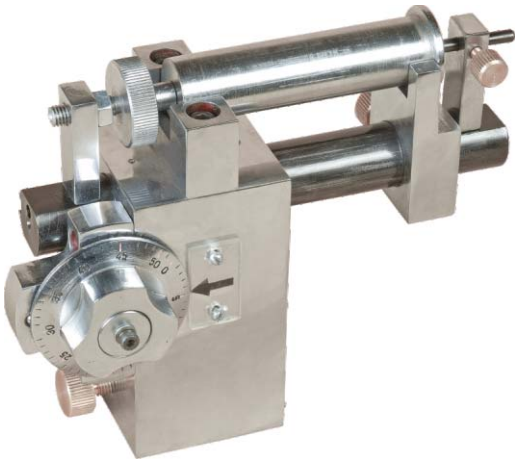
ROCKWELL CUM BRINELL HARDNESS TESTING MACHINES (Models : MRB, MRB-250)

- This is a combined hardness testing machine used to measure hardness of metals & alloys of all kinds, hard or soft, whether round, flat or
  Irregular in shapes.
- This machine is ideally suitable for laboratories, tool rooms, Heat treatment shops, R&D departments, inspection departments, casting & forging industries, educational institutions.● Rockwell & Brinell method is used for checking hardness on metals & alloys of all kinds.
- Brinell hardness is also checked on non-ferrous materials like Cast iron, Alluminium, etc.
- Automatic weight selection with automatic zero setting dial gauge.
- Rockwell test minor load is 10 kgf & major loads are 60,100,150 kgf. Brinell test for Model : MRB major load is 187.5 kgf. and for Model: MRB-250 are 187.5, 250 kgf.
- Rockwell hardness scales such as HRA, HRB, HRC, etc.
- Brinell hardness scale such as HB is obtained by using different types of indentors (Diamond/ Ball).
- For Model : MRB, Test height x Throat is 215 x 132 mm. For Model : MRB-250, Test height x Throat is 295 x 148 mm.
- Motorized versions are also available.
- Machines strictly conform to IS:1586- 2000 for Rockwell test, IS:2281, BS:240 & ASTM-E-10 for Brinell test.

END QUENCH TEST APPARATUS
(Model : MEQ-25)

- This apparatus is useful for determining the harden ability of steels by end quench test.
- The test consists of heating a standard size specimen to a given temperature for a specific period of time, followed by a water quenching of one end under specified conditions and measuring the hardness at various points from quenched end along the length of test piece.
- After heating, the test specimen is kept on the specimen support, where it is automatically centered with respect to water jet. The quick action valve starts impinging the water jet on the specimen end instantly. The elaborate arrangement of pump, tank, pipe etc, enables to obtain desired correct water head for the nozzle.
- The electrical controls and safety devices for pump and motor are provided and the entire apparatus is totally enclosed.
- Test piece - Total length is 100 ± 0.5 mm & diameter is 25 (+0.5 ; -0.0) mm.
- Inside diameter of vertical water supply pipe 12.5 ± 0.5 mm.
- Height of the free water jet (without test piece in position) 65 ± 10 mm.
- Distance from Tip of nozzle to the bottom of test piece 12.5 ± 0.5 mm.
- This apparatus conform to IS:3848-1981 & ASTM : A255.

JOMINY TEST FIXTURES
(Model : MJOM-25)



- The most commonly used method for determining harden ability is the end quench test developed by Jominy & Boegehold.
- In this test a normalized 25 mm diameter & 100 mm length test sample of steel to be evaluated is heated uniformly to its austenitizing temperature. The specimen is then removed from the furnace & placed in the end quench test apparatus & immediately end quenched by a jet of room temperature water.
- After end quenching, longitudinal flat surfaces are ground on opposite sides of the test piece as per dimensions. This grinding is very important for correct positioning of the sample in the fixture and also for accurate repeatable and reliable test results.
- Jominy Test Fixture is to be positioned on the main screw of the hardness tester for checking hardness of the test sample. Hardness at equal intervals (1 mm or 1/16") to be checked and noted. Plot the resulting data on graph paper with hardness value as ordinate (Y axis) and distance from the quenched end as abscissa (X axis). By comparing the curves resulting from end quench tests of different grades of steels, their relative harden ability can be established. Thus the flatter the curve, the greater the harden ability.
- The details of the test are covered in IS : 3848-1981 & ASTM : A255.

PORTABLE DYNAMIC HARDNESS TESTING MACHINES (Model : DHT-6, DHT-7 & DHT-8)

Model: DHT-6

- Sleek & handy design, comes in a slim briefcase, for carrying the machine.
- Mainly used to check hardness in confined spaces, on large & heavy components, permanently installed parts with low test expenditure.
- The machine has built in conversion facility for given material to convert 'D' value to Vickers (HV), Rockwell (HRB,HRC), Brinell (HB), UTS scales which can be selected by pressing arrow keys
- The model operates on two numbers of pencil cells.
- 30 hardness scales for different probes selectable by feather touch keys.
- Alpha numeric display - 16 characters x 2 lines LCD with improved electronics, micro controller circuity & user friendly software. Display indicates selected material & scale combination & hardness value.
- Five numbers of probes D, G, SH, EX & C can be given in different combinations.
- Facility to connect dot matrix printer through centronics parallel port.
- Upto 999 readings can be stored in memory of the machine for printing purpose.
- Serial interface is possible with RS 232 port at an additional cost.
- Automatic calibration facility of probe is available through keyboard.
- Extra (Optional) Accessories such as Standard test blocks, support rings, printer, serial interface, different types of probes are available

Model: DHT-7 - Additional features than DHT-6.

Model: DHT-8 - Wireless D probe (WTM) connection is possible through Blue tooth Technology.

MANUAL & MOTORISED - CHARPY & IZOD NOTCH BROACHING MACHINES (Models : BMF & BMF-M)

- Robustly constructed machine cuts the notches (V or U) very accurately upto 30 HRC hardened material by means of specially designed multi-toothed broach, which is drawn across the specimen by self-push of rotating hand wheel.
- This machine is a really cost effective solution for cutting Impact notches. Accurately cuts the desired notches as per respective standard
  in just a single pass within few seconds.
- A simple hand-vice for holding the specimen.
- The tooling includes the adjusters and end stops necessary to ensure notch-depth and position are correctly set.
- Motorized Notch Broaching Machines are also available.
- Optional upto 38 HRC hardened material can be supplied at an extra cost

DIGITAL BRINELL MICROSCOPES (Model : BIMS)

- This is an accessory of Brinell hardness tester.
- It can be connected to computer to get display of impression on computer.
- The special software is provided with it can calculate the Brinell hardness value automatically.
- Accuracy strictly conform to IS:2281.

We can also supply -

- Heavy duty conveyor type Brinell Hardness Tester.
- Pull off load tester.
- Custom built machines to suit specific applications.
- Conversion kit for converting Analogue Machines to Computerised & Servo Computerised.
- Full range of spares & accessories of Hardness Testers.
- Testing Fixtures for specific applications.
- Manhole Cover Testing Machine of 100 Ton & 200 Ton Capacity.

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