FINE MARKETING

House of Testing Machine

FINE MARKETING offers widest choice of material testing equipment under one roof.

We offer Metal, Rubber, Plastic, Paper, Textile, Paint, Metallurgical, Sand Testing, Profile Projector & various NDT Equipment. We offer complete package right from selection, application, supply of equipment, installation, Service after sales & smooth maintenance of the machine throughout.

We are marketing & manufacturing following

1. Metal Testing Equipment
2. Rubber Testing Machine
3. Paper, Tape, Board, Box Testing Equipment
4. Plastic Testing Machine
5. Textile Testing Equipment
6. Paint, Coating Thickness Gauge
7. Profile Projector
8. Metallurgical Equipment
9. Sand Testing Equipment
10. NDT Testing Equipment

METAL TESTING MACHINE

1] Hardness Testing Machine

A) Rockwell Hardness Tester

B) Brinell Hardness Tester

C) Vickers Hardness Tester

D) Dynamic Hardness Tester / Portable Hardness Tester / Poldi

2] Tensile Testing Machine

3] Universal Testing Machine

4] Broaching Machine

5] Spring Testing Machine

6] Impact Testing Machine

7] Torsion Testing Machine

8] Erichsen Cupping Tester

9] Compression Testing Machine

10] End Quench Test Apparatus

11] Fatigue Testing Machine

12] Chain & Rope Testing Machine

13] Dynamic Balancing Machine

14] Proving Ring

15] Extensometer

Principals of Rockwell, Brinell & Vickers Test

1. **Rockwell Hardness Test : The Rockwell Hardness test was developed in the US by Wilson co in the early 1920s.**

In Rockwell Hardness test an indentor is used to apply an initial minor load and a zero datum position is established. The major load is then used for a specified period and remove leaving the minor load applied. The difference in depth from the zero datum position as a results of the application as a major loads gives the Rockwell Hardness values expressed as HR (Hardness Rockwell) followed by another letter (A, B or C).

2. **Brinell Hardness Test : The Brinell Hardness Test was introduced by J A Brinell in 1900**

In Brinell Hardness test a steel ball is used as a indentor. This is pressed smoothly into a well-prepared surface of the test metal under known load, which is maintained for a period of 15 seconds and then removed. The two diameters at right angles to each other, of the resulting indention are measured by means of a microscope and averaged. The hardness is expressed on the load in kg divided by the curved area of the indention in mm.

Brinell hardness $HB = \dfrac{2P}{\prod D\,(D - \sqrt{D^2 - d^2})}$

Where P is the load in kg, D is the ball diameter in mm,d is the diameter of the indention in mm. It is not necessary to do the calculation each time as standard tables are available.

This test gives a good measure of the average hardness over a large area covering many grains, and the deep indentation provides a good indication of area characteristics. The test is little affected by the surface condition. However, it has limited application on thin parts. It is suitable for a large parts and section of porous materials such as casting, forging & structural shapes.

3. **Vickers Test : The Vickers Hardness test (HV or DPH [Diamond Pyramid Numbers]) was first introduced in 1925 by Vickers Armstrong Ltd.**

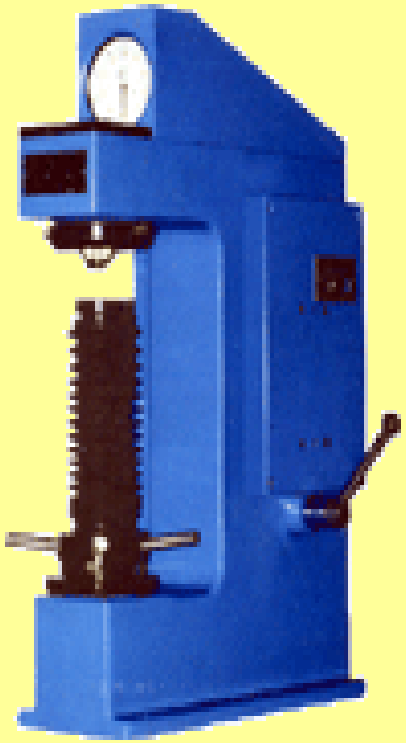
The Vickers hardness number (HV or DPH) is the ratio of the load applied by the indentor to the surface area of the indention.$HV = 2\,P\,\mathrm{Sin}\,(\varnothing)$

Where P is the applied load kg, D is the mean digonal of the indention in mm, and $\varnothing$ is the angle between the opposite face of diamond. The test load in the Vickers ranges from 1 kg to 120 kg and the load is applied for 15 seconds.

The Vickers is the most sensitive of the production tests. Primarily surface test, it has a single continuous scale for all materials. The hardness number is virtually independent of the load, and the indention is easiest to measure accurately. The test is suitable for parts too thin and fragile for the Rockwell superficial test. When the test load(force) range 1-1000 kgf, it is know as micro hardness tester. Normally micro hardness produces an indentation depth less than 19 microns. The micro vickers tester is suitable for small parts, thin foils, wires, carburising, nitriding & plating etc.

Rockwell Hardness Tester model R-150

Automatic load selection with automatic zero setting dial gauge. Manual operation.



Technical Specification

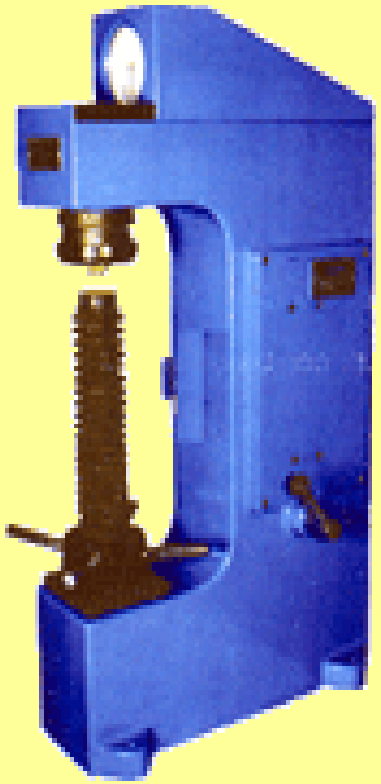
Model	Unit	R-150
Loads	kgf	60,100,150
Initial Load	kgf	10
Max. Test Height	mm	230
Depth of Throat	mm	133
Max Depth of leaving screw below base	mm	240
Size of base (Apprx)	mm	171 x 423
Machine height	mm	635
Net weight (Apprx)	kgf	75

Standard Accessories

Model	R-150
Testing Table 50 mm Ø	1 pc.
Testing Table 38 mm Ø with “V” groove for round jobes 6 to 45 mm dia	1 pc.
Diamond Indentor	1 pc.
Steel Ball Indentor	1 pc.
Test Block Rockwell C	1 pc.
Test Block Rockwell B	1 pc.
Test Block Rockwell Superficial N	Nil
Allen Spanners	5 pcs
Clamping Device	1 pc.
Dash Pot Oil	1 bottle
Rubber Below for elevating screw protection	1 pc.
Instruction Manual	1 book
Brinell Microscope	Nil
Steel Ball Indentor 2.5mm	Nil
Test Block HB 2.5 / 187.5	Nil
Steel Ball Indentor 5mm	Nil

Rockwell cum Brinell Hardness Tester model RB-250

Automatic load selection with automatic zero setting dial gauge. Facility to Brinell test with 187.5 kgf load with 2.5 mm ball indentor , additional load 250kg with 5 mm ball indentor for testing hardness of non-ferrous metal. Manual operation



Technical Specification

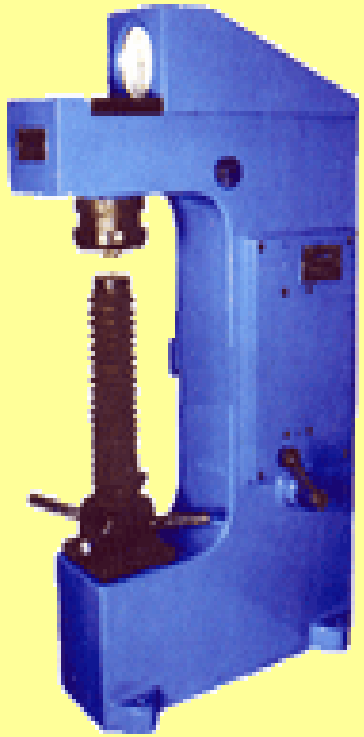
Model	Unit	RB-250
Loads	kgf	60,100,150, 187.5, 250
Initial Load	kgf	10
Max. Test Height	mm	295
Depth of Throat	mm	150
Max Depth of leaving screw below base	mm	310
Size of base (Apprx)	mm	210 x 470
Machine height	mm	845
Net weight (Apprx)	kgf	137

Standard Accessories

Testing Table 50 mm Ø	1 pc.
Testing Table 38 mm Ø with "V" groove for round jobes 6 to 45 mm dia	1 pc.
Diamond Indentor	1 pc.
Steel Ball Indentor	1 pc.
Test Block Rockwell C	1 pc.
Test Block Rockwell B	1 pc.
Test Block Rockwell Superficial N	Nil
Allen Spanners	5 pcs
Clamping Device	1 pc.
Dash Pot Oil	1 bottle
Rubber Below for elevating screw protection	1 pc.
Instruction Manual	1 book
Brinell Microscope	1 pc.
Steel Ball Indentor 2.5mm	1 pc.
Test Block HB 2.5 / 187.5	1 pc.
Steel Ball Indentor 5mm	1 pc.

Rockwell cum Superficial Hardness Tester model RS-15-150

Manual load selection with automatic zero setting dial gauge. Manual operation Diamond holder is guided in a set to two ball cage which enables testing of small pins having dia less than 6mm(upto3mm)



Technical Specification

Model	Unit	RS-15-150
Loads	kgf	15,30,45 (Rockwell Superficial) 60,00,150 (Rockwell),
Initial Load	kgf	3 (Rockwell Superficial) 10 (Rockwell)
Max. Test Height	mm	295
Depth of Throat	mm	150
Max Depth of leaving screw below base	mm	310
Size of base (Apprx)	mm	210 x 470
Machine height	mm	845
Net weight (Apprx)	kgf	126

Standard Accessories

Model	R-150
Testing Table 50 mm Ø	1 pc.
Testing Table 38 mm Ø with "V" groove for round jobes 6 to 45 mm dia	1 pc.
Diamond Indentor	1 pc.
Steel Ball Indentor	1 pc.
Test Block Rockwell C	1 pc.
Test Block Rockwell B	1 pc.
Test Block Rockwell Superficial N	1 pc.
Allen Spanners	5 pcs
Clamping Device	1 pc.
Dash Pot Oil	1 bottle
Rubber Below for elevating screw protection	1 pc.
Instruction Manual	1 book
Brinell Microscope	Nil
Steel Ball Indentor 2.5mm	Nil
Test Block HB 2.5 / 187.5	Nil
Steel Ball Indentor 5mm	Nil

Brinell Hardness Tester model B-3000(J)

Simplest model of Brinell Hardness tester with mechanical design, loading, unloading manual, best suitable for testing batch quantities.

Technical Specification

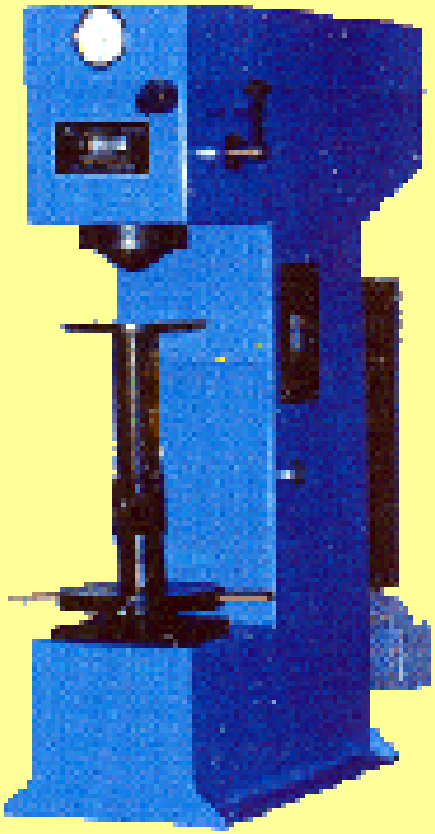
MODEL	UNIT	B-3000 (J)
Loads		500 to 3000 in stages of 250
Initial Load	kgf	Nil
Max. test height	mm	254
Depth of Throat	mm	150
Max. depth of elevating screw below base	mm	0
Size of base	mm	255 X 495
Machine Height	mm	860
Net Weight (Approx)	kg	210
Drive Motor	HP	Nil

Standard Accessories

MODELS B - 3000	B-3000 (J)
Testing table 200 mm	1pc.
Testing table 70 mm. with 'V' groove for round jobs - 10 to 18 mm dia.	Nil
Ball holder 5 mm.	1pc.
Ball holder 10 mm.	1pc.
Test Block HB - 5 / 750	Nil
Test Block HB - 10 / 3000	1pc.
Brinell Microscope	1pc.
Allen Spanner	4pcs.
Telescopic cover for elevating screw protection	Nil
Instruction Manual	1 book

Brinell Hardness Tester model B-3000(H)

Machine designed with a hydraulic power pack & control circuit for effortless loading unloading operation. A dial gauge in front measures depth of ball penetration. This facilitates production testing within tolerance limits by compression method.



Technical Specification

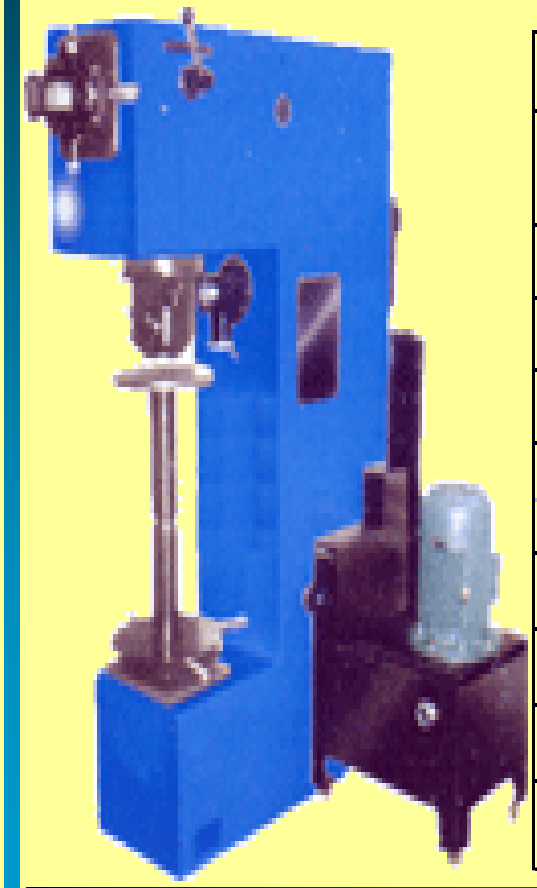
MODEL	UNIT	B 3000 (H)
Loads		500 to 3000 stages of 250
Initial Load	kgf	250
Max. test height	mm	410
Depth of Throat	mm	200
Max. depth of elevating screw below base	mm	180
Size of base	mm	370 X 670
Machine Height	mm	1127
Net Weight (Approx)	kg	450
Drive Motor	HP	0.33 - 415 v/p

Standard Accessories

MODELS B - 3000	B 3000 (H)
Testing table 200 mm	1pc.
Testing table 70 mm. with 'V' groove for round jobs - 10 to 18 mm dia.	1pc.
Ball holder 5 mm.	1pc.
Ball holder 10 mm.	1pc.
Test Block HB - 5 / 750	1pc.
Test Block HB - 10 / 3000	1pc.
Brinell Microscope	1pc.
Allen Spanner	7pcs.
Telescopic cover for elevating screw protection	1set
Instruction Manual	1 book

Brinell Hardness Tester model B-3000(O)

Basic Machines design & operation similar to B-3000(H). In addition, an 'optical device' with 14x magnification provided in front to project dia of ball impression on glass screen with a micrometer measuring system with 0.01 mm accuracy. The indenter swivels and projects dia of ball impression immediately after unloading operation which avoids additional time for measurement of ball impression. This gives real Brinell number on production testing.



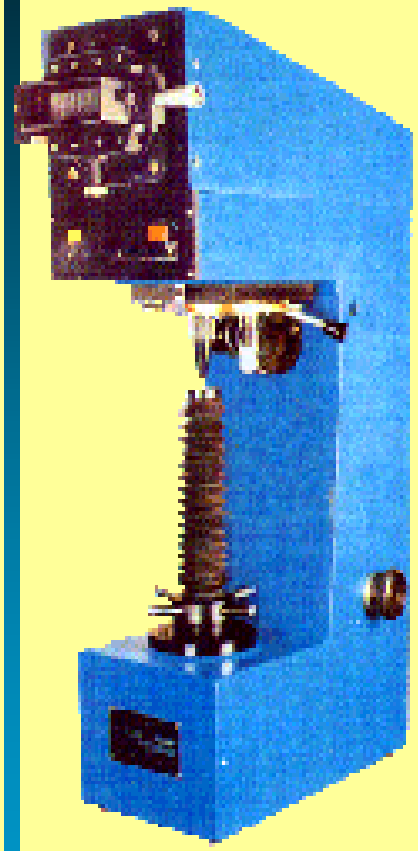
Technical Specification

MODEL	UNIT	B-3000 (O)
Loads		500 to 3000 in stages of 250
Initial Load	kgf	Nil
Max. test height	mm	380
Depth of Throat	mm	200
Max. depth of elevating screw below base	mm	180
Size of base	mm	370 X 670
Machine Height	mm	1185
Net Weight (Approx)	kg	500
Drive Motor	HP	033 - 415 v/p

Standard Accessories

MODELS B - 3000	B-3000 (O)
Testing table 200 mm	1pc.
Testing table 70 mm. with 'V' groove for round jobs - 10 to 18 mm dia.	1pc.
Ball holder 5 mm.	1pc.
Ball holder 10 mm.	1pc.
Test Block HB - 5 / 750	1pc.
Test Block HB - 10 / 3000	1pc.
Brinell Microscope	Nil
Allen Spanner	4pcs.
Telescopic cover for elevating screw protection	1set
Instruction Manual	1 book

Vickers Hardness Tester model V-50



Vickers Hardness Tester is simple & accurate in design. It is suitable for measuring the hardness of precision metallic parts with wide testing range - from soft to hard & their accurate results are widely acclaimed. These testers strictly conform to IS :1754 Part 1 & Part 11-1986

Features :

- Wide testing range, from soft metal such as lead, up to the hardest, like hardened steel.
- Tiny indentation allows testing of a precision finished parts.
- Thin sheet metal are perfectly tested. Because applied load is very small.
- Same Hardness number is obtained on the same specimen, regardless of the load applied.
- Motorized loading and unloading cycle.
- Built-in projection screen to get accurate results.

Construction :

To accommodate the high precision loading system & an optical projection screen the machine frame is designed sturdy Specimen is placed on testing table. The test cycle is fully automatic. The accurate load is applied on a diamond penetra by means of micrometer screw of the projection screen.

Applied objective with 70-fold magnification length of diagonal of indentation 632 micron=0.632 mm.

Technical Data :

Vickers Hardness Tester Models :	V-50 5,10,20,30,50 kg. V-50Sp 1,2,5,10,20,30,50 kg.
Magnification of optical projection	70X
Max. Test Height (mm)	200
Scale least count (mm)	0.001
Depth of throat (mm)	133
Dimensions of machine (mm)	L585 X W290 X H860
Weight (Approx)	73Kg.
Power Supply	220v AC, 50Hz, 1-phase

Standard Accessories :

1. Standard Test Block	1 pc.
2. Diamond Penetrator	1 pc.
3. Weights	1 Set.
4. Flat Anvil	1 pc.
5. Vee-type Anvil (Small & Big)	1 pc. each
6. Spanners	1 Set.
7. Electric cord	1 pc.
8. Instruction Manual	1 book

Vickers cum Brinell Hardness Tester

Models	VB-50	VB-50-S	VB-120	VB-120-S	VB-250
Loads (kgf)	5,10,15,20,30,40 & 50 (Loads for Vickers) 15.625, 31.25 (Loads for Brinell)	1, 2, 5, 10, 15, 20, 30, 40 & 50 (Loads for Vickers) 15.625, 31.25 (Loads for Brinell)	5,10,15,20,30,40, 50,60,100 & 120 (Loads for Vickers) 15.625, 31.25 (Loads for Brinell)	1, 2, 5, 10, 15, 20, 30, 40, 50, 60, 100 & 120 (Loads for Vickers) 15.625, 31.25 , 62.5 (Loads for Brinell)	5, 10, 15, 20, 30, 40, 50, 60, 100 & 120 (Loads for Vickers) 15.625, 31.25 , 62.5, 187.5, 250 (Loads for Brinell)
Optical Magnification	70X, 140X	70X, 140X	70X, 140X	70X, 140X	35x, 70X, 140X
Maximum Test Height (mm)	250	250	250	250	250
Sweep of machine Frame (mm)	150	150	150	150	150
Weight Apprx (kgs)	180	180	180	180	180
Dimension L x W x H (mm) Apprx	660 x 320 x 990	660 x 320 x 1130	660 x 320 x 990	660 x 320 x 1130	660 x 320 x 990
Connected Load	0.1 KVA, 1 phase AC, 220V, 50Hz				

Loads can be supplied in Newtons also Least count of optical system 0.0005mm

These Brinell Loads can be used by purchasing suitable ball indentors and test blocks

Measuring Range	1	0 - 3.2 mm	on 35X Magnification
Possible w.r.t Selected	2	0 - 1.6 mm	on 70X Magnification
Optical Magnification	3	0 - 0.8 mm	on140X Magnification

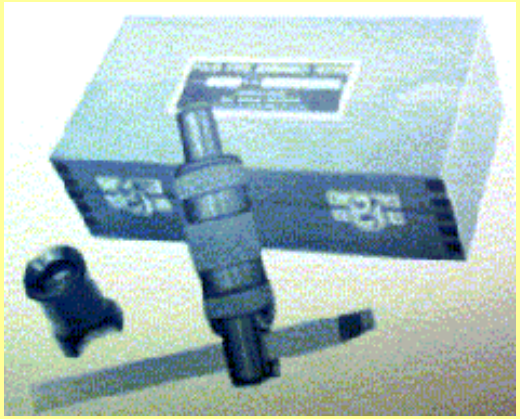
Standard Accessories

Models	VB-50	VB-50-S	VB-120	VB-120-S	VB-250
1. Flat Table of 100mm dia	1 No.	1 No.	1 No.	1 No.	1 No.
2. Vee Table for Specimen - 6 to 80mm	1 No.	1 No.	1 No.	1 No.	1 No.
3. Vickers Diamond Indentor	1 No.	1 No.	1 No.	1 No.	1 No.
4. 2.5mm Ball Indentor	-	-	-	-	1 No.
5. 5mm Ball Indentor	-	-	-	-	1 No.
6. Vickers Hardness Test Block	1 No.	1 No.	1 No.	1 No.	1 No.
7. Brinell Hardness Test Block	-	-	-	-	1 No.
8. Electrical Cord	1 No.	1 No.	1 No.	1 No.	1 No.
9. Instruction Manual	1 Book	1 Book	1 Book	1 Book	1 Book
10. 2.5 mm Steel Balls	-	-	-	5 Nos.	5 Nos.
11. 5 mm Steel Balls	-	-	-	5 Nos.	5 Nos.

POLDI HARDNESS TESTER

FEATURES:

The hammer type Poldi Impact Hardness Tester is suitable for measuring the Brinell Hardness of Steel, Cast iron, Brass, Aluminum, Copper etc. This Poldi Hardness Tester is useful to test parts, where bench type model is not useful. This type of machine is most ideal and simple for Foundries, Workshops, Engineering Colleges, Technical Institutions etc**.**



PRINCIPLE:

Load is applied by a hammer blow on the specimen and a standard test bar in linear direction through a hardened steel ball of 10 mm dia. The impact load on both is the same. The extent of indentation on the specimen and the test bar depends on their hardness. The two diameters of indentations on test bar and specimen are measured by a magnifier supplied alongwith the tester. The hardness of the specimen can be determined, by referring to the chart supplied with the machine

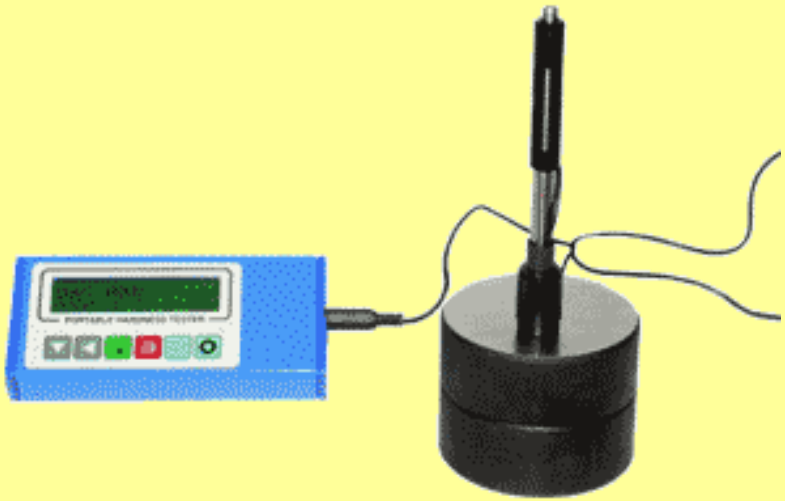
Hardened Steel Ball:
10 mm dia, fixed in a special holder with a spring loaded plunger.

Standard Test Bar:
Each bar individually calibrated and Multiplying Factor marked thereon.

Magnifier:
Measuring range : 10 mm
Scale graduation : 0.1 mm
Magnification : 10 x
Accuracy of measurement : 0.05 mm

Hardness Tables:
Comparison tables for finding hardness
Separate Tables for Steel, Cast iron, Brass, Copper and Aluminum.

DIGITAL PORTABLE HARDNESS TESTER



The Portable Hardness Tester an advanced pocketable hardness tester distinguished by its high accuracy, wide measuring range, simplicity of operation & above all it is a really portable instrument operating on three pencil cells of size AA. It is suitable for testing the hardness of many materials & finds applications for hardness testing in many areas of industry.

Measuring Method:- The measuring principle is based on absorption of kinetic energy & its relation in conventional scales of hardness. This is achieved with help of the probe, wherein a small body with a hard tip is propelled against the test surface by a spring & latch arrangement. The motion of body is the measure of its kinetic energy. The instrument converts the signal of absorbed energy in to a chosen scale of conventional hardness.

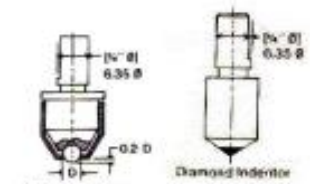
Typical applications for hardness testing with the portable hardness taster:-

1) In-situ hardness testing of individual parts or components in assembled machine.
2) Hardness testing of mould surface of a die.
3) Hardness testing of heavy components like rolls of rolling mill or sugar industry or paper industry.
4) Hardness testing of heavy pressure vessels.
5) Hardness testing of production line of components like crank shafts, cylinder blocks.
6) Checking hardness of material in stock.
7) Hardness testing when required in failure analysis.

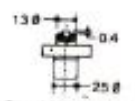
Functions available on the display of Indicating Instrument of the portable hardness tester:-

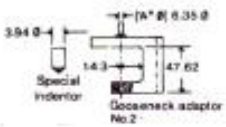
1) Display of hardness in various conventional scales of hardness as given in chart below for the standard probe.
2) The instrument has compensation for the angle of probe with respect to vertical while testing.
3) Immediate conversion between available conventional scales of hardness.
4) Standard deviation & average results up to nine readings can be taken.
5) The readings can be recorded & recalled for later viewing. The max capacity being 500 readings. The readings are store serially & the serial number being displayed. There is a batch number facility as well to distinguish from batch to batch. The entire batch readings can be cleared or the batch number can be reset using the specific keys.
6) The machine calibration can be done using the keyboard & there is no need of any expertise to recalibrate the machine.
7) Serial port (RS 232) or printer port (Centronics Compatible) is available on request.

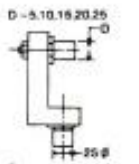
Accessories for Hardness Tester

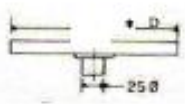


a) Rockwell Diamond Indentor
b) Rockwell cum Superficial Diamond Indentor
c) Vickers Diamond Indentor
d) Special type Rockwell & Vickers Indentor
for both Indian & Imported machines



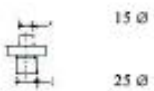


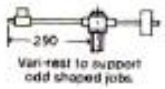


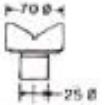


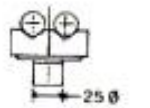
and

a) Rockwell A,B,C Scales
b) Brinell/Vickers
Hardness Blocks with
various loads.









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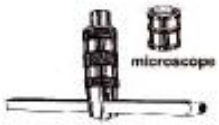
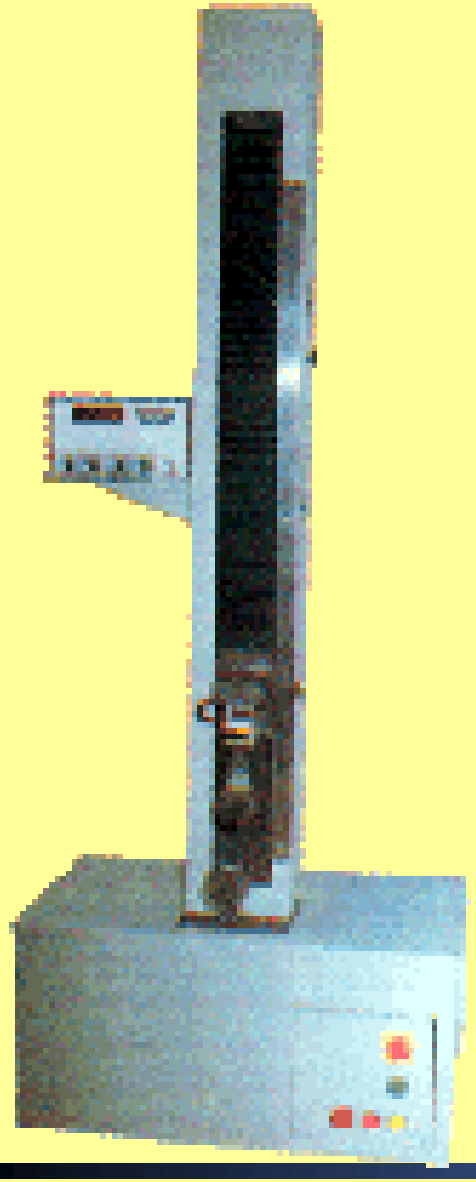


- Imported steel / carbide ballsf of dia 1/16",1/8",1/4",1/2",3/4" of different size
- Shallow 'V' Anvils

a) We can offer you complete range of Spare Parts and Accessories for Universal Testing Machine, Tensile Testing Machine, and Impact Tester. eg. Grips, Inserts, Graph Paper etc.

- Servicing & Calibration of all Indian and Imported Testing machines. Calibration as per ISO requirement and traceable to NPL, NewDelhi

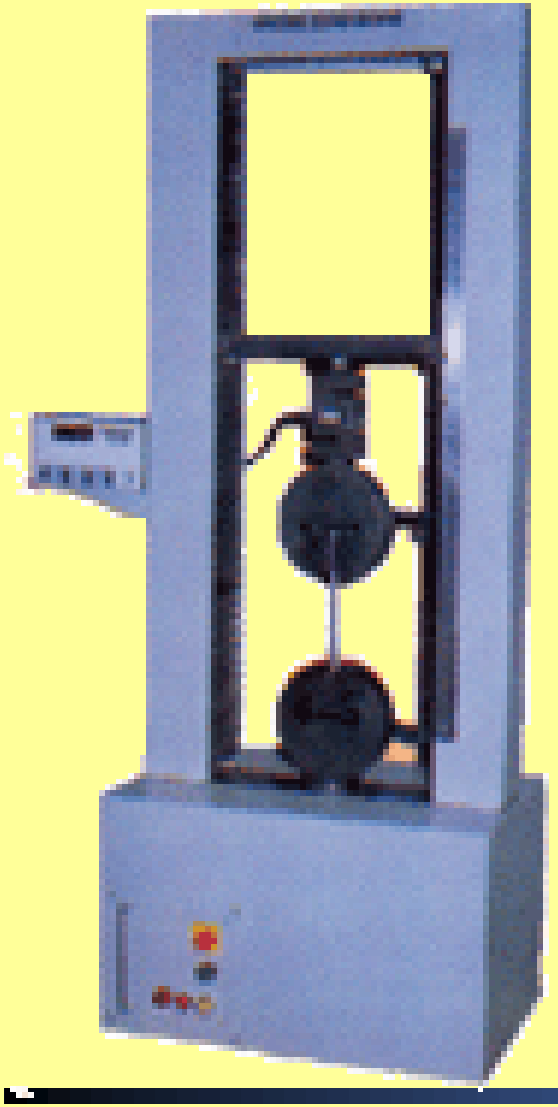
Digital Tensile Testing Machine



Technical Specification

Specification	Model / Capacity
	2500 N (250Kg)
Capacity of Load frame	2500 N
Load cell capacity	200 N to 2500 N
Max. Crosshead Travel (excluding grip)	750 mm
Max. Working Width	-
No. of Screws	1 no
Load measurement	By Load Cell
Speeds : A) Standard : Speed Provided B Optional : DC Variable Speed Drive	 2 speeds 50 / 500 mm / min 50 to 500 mm / min
Elongation Measurement Standard : 1 mtr. scale Optional a) Digital Encoder b) Digital Vernier	 1 mm Resolution L.C. : 0.1mm L.C. : 0.01mm
Load Accuracy	± 1% As per IS : 1828 or BS 1610
Grip (Tensile Test)	Screw grip
Overall Dimension L X D X H (approx. in mm)	660 X 400 X 1700
Approx. Weight	65 kg
Supply Voltage a) STD machine b) DC Variable speed drive machine	 3 phase : 415V : 0.25HP Single phase : 230 V
Limit Switch : Upper & Lower limits Overload protection	 ✓ ✓

Universal Testing Machine 50KN



Technical Specification

Specification	Model / Capacity
	50KN (5Tons)
Capacity of Load frame	50 KN
Load cell capacity	50 KN
Max. Crosshead Travel (excluding grip)	1000 mm
Max. Working Width	400 mm
No. of Screws	2 nos
Load measurement	By Load Cell
Speeds : A) Standard : Speed Provided B Optional : DC Variable Speed Drive	 2 speeds 25 / 50 mm / min 50 to 200 mm / min
Elongation Measurement Standard : 1 mtr. scale Optional a) Digital Encoder b) Digital Vernier	 1 mm Resolution L.C. : 0.5mm L.C. : 0.1mm
Load Accuracy	± 1% As per IS : 1828 or BS 1610
Grip (Tensile Test)	Wedge action grip
Overall Dimension L X D X H (approx. in mm)	660 X 450 X 2100
Approx. Weight	150 kg
Supply Voltage a) STD machine b) DC Variable speed drive machine	 3 phase : 415V : 0.5HP Single phase : 230 V
Limit Switch : Upper & Lower limits Overload protection	 ✓ ✓

Universal Testing Machine

Universal Testing Machine of capacities 100,200,400,600 and 1000 KN

SALIENT FEATURES

- Machines are available in mechanical & digital / computerized model.
  This will enables you to see the Load vs Displacement curve, Maximum Load, Maximum Displacement, U.T.S.-% Elongation.
- Accuracy conforming to IS 1828 Gr.1
- Simplified design for ease of operation and maintenance
- Safety provisions against over load/over travel
- Number of extra accessories available for different tests.
- Machine with auto load features
- Calibration in kgs available on request
- Middle beam has motorized up & down adjustments.
- Easy adjustment of straining rate
  Highly rigid loading frame

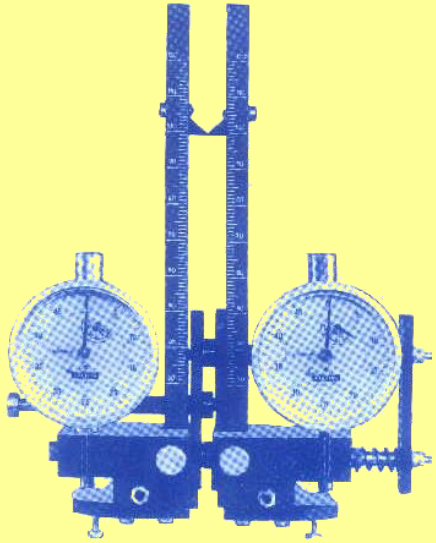
Technical Specification:Mechanical UTM

Model	UTM – 100	UTM – 200	UTM – 400	UTM – 600	UTM - 1000
Capacity KN	100	200	400	600	1000
1ST Range KN Least Count KN	0-100 0.2	0-200 0.4	0-400 0.8	0-600 1	0-1000 2
II nd Range KN Least Count KN	0-50 0.1	0-100 0.2	0-200 0.4	0-300 0.5	0-500 1
IIIrd Range kN Least Count kN	0-25 0.05	0-50 0.1	0-100 0.2	0-120 0.2	0-250 0.5
IV th Range KN Least count KN	0-10 0.02	0-20 0.04	0-40 0.08	0-60 0.1	0-100 0.2
Max. Tensile Clearance or full decended piston position mm	50-700	50-700	50-700	50-800	50-850
Max. clearance for compression test mm	0-700	0-700	0-700	0-800	0-850
Distance between columns mm	450	500	500	600	750
Piston stroke mm	150	200	200	250	250
Max Straining speed of No load mm/min	300	150	150	100	80
Power supply	3phase	440 volts	50 cycles	A.C.	
H.P. (Total)	1.5	1.5	2.5	2.5	4
Overall Dimensions (Approx) mm	1950x800x 1850	2000x800x 1900	2100x800x2 060	2200x800x2 400	2350x800x 2700
Weights in kgs.(Approx)	1300	1400	2300	3200	5100

Technical Specification:Computerised UTM

MODEL	UTM-C 100	UTM-C 200	UTM-C 400	UTM-C 600	UTM-C 1000	UTM-C 2000
Measuring Cap. (KN)	100	200	400	600	1000	2000
Measuring Range	0-100	0-200	0-400	0-600	0-1000	0-2000
Least Count (KN)	0.01	0.02	0.04	0.06	0.1	0.2
Load range in KN With Accuracy of Measurement ± 1%	2 to 100	4 to 200	8 to 400	12 to 600	20 to 1000	40 to 2000
Resolution of Piston movement (mm)	0.1	0.1	0.1	0.1	0.1	0.1
Max. Tensile clearance at fully decended piston position	50 to 700	50 to 700	50 to 700	50 to 800	50 to 850	50 to 900
Maximum clearance for compression test (mm)	0-700	0-700	0-700	0-800	0-850	0-900
Distance between columns (mm)	450	500	500	600	750	850
Piston Stroke (mm)	150	200	200	250	250	300
Maximum straining speed at no load (mm/min)	300	150	150	100	80	45
Power supply		3 Phase	415 V	50 Hz	A. C.	
H. P. (Total)	1.5	1.5	2.5	2.5	4.0	6.5
Overall dimensions (Approx) (mm L x W x H)	1950 x 800 x 1850	2000 x 800 x 1900	2100 x 800 x 1900	2200 x 800 x 2400	2350 x 800 x 2700	3000 x 800 x 3600
Weight (Approx) (Kg)	1300	1400	2000	3000	4200	10000

Mechanical Extensometer

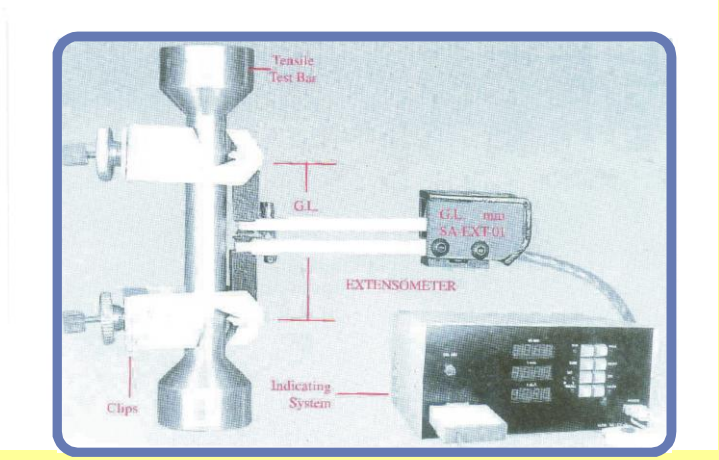


Extensometer is an attachment to Universal / Tensile Testing Machines. It measures the elongation of a test piece on load for the set gauge length.

Measuring Range	0.3 mm.
Least count	0.01mm
Gauge Length adjustable from	30- 120 mm
Specimen size	1 to 20mm. Round or flat upto 20 x 20mm.

Electronic Extensometer

Electronic Extensometer with a digital indicating system for measurement of fine elongation / deflection



Specification

A. EXTENSOMETER	
GAUGE LENGTH	10,15,20,25,30,40,50,60,63,70,100 and 120mm (Each extensometer has fixed gauge length)
NON-LINEARITY	Better than 0.2%
MAXIMUM DEFLECTION	± 3mm
B. INDICATING SYSTEM	
OPERATING VOLTAGE	230V 50HZ
DISPLAY (DL/LX100)	7 Segment LED display a. 4 Digit DL Deflection (0.001 mm Resolution) b. 4 Digit GL display c. 4 Digit % DL / L Display (0.01% Resolution)
FACILITIES	Peakhold , Reset, Tare Zero Remote Push switch & 'CAL ON'

Conforms to Extensometer Standards of ASTM E-83-96,BS-EN-10002-4, IS-12872, ISO-9513

Broaching Machine Manual

Notch Broaching machine suitable for ferrous & non-ferrous material for sample preparation of ‘ V ’ & ‘ U’ notches for Impact Testing Machine.

Notch Broaching Machine can cut correct ‘ U ‘ & ‘ V ‘ notches in Charpy or Izod specimen by means of a multi-toothed broach.

- Robustly constructed machine cuts the notches by means of a specially designed multi-toothed broach, which is drawn across the specimen by self -push of rotating hand wheel.
- A simple hand-vice for holding the specimen is built on to the machine. The tooling includes the adjustors & end stops necessary to ensure notch-depth & position are correctly set.
- The approx.weight is around 35 kg.
- The machine dimension (approx.) 210mm X 210mm X 1050mm.

The machine will broach a notch in 10mm square material to the following standards :

* A.S.T.M. A370, E23
* B.S.131:PART I, II, III, IV . BS EN 10045-1993
* DIN 50 115
* IS 1598 1977, IS 1757 1988, IS 1499 1977

Broaching Machine Motorised

Notch Broaching machine suitable for ferrous & non-ferrous material for sample preparation of ‘ V ’ & ‘ U’ notches for Impact Testing Machine.

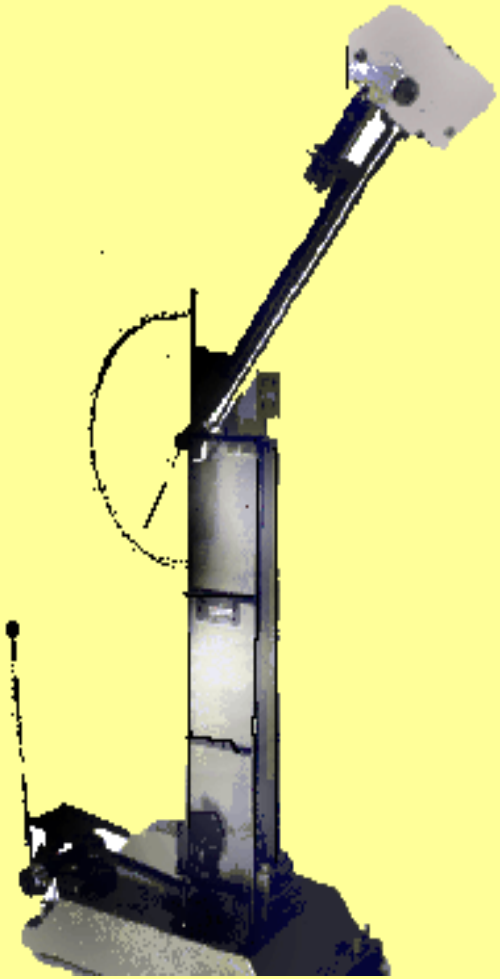
Notch Broaching Machine can cut correct ‘ U ‘ & ‘ V ‘ notches in Charpy or Izod specimen by means of a multi-toothed broach.

- The machine is a free standing unit built sturdily.
- The broach is mounted in a carrier, which is drawn by a twin lead screw mechanism through the full stroke with the help of 0.5 HP motor.
- V / U notch Broaching Machine fixture to clamp the specimen. The tooling includes the vice for holding the 10mm X 10mm specimen. The tooling/ fixtures include the adjustors & the end stop necessary to ensure the notch depth & position accurately as per the Standards.
- The approx. weight is around 100 kg.
- The machine dimension (apprx.) 385mm X 385mm X 1050mm

•The machine will broach a notch in 10mm square material to the following standards :

* A.S.T.M. A370, E23
* B.S.131:PART I, II, III, IV . BS EN 10045-1993
* DIN 50 115
* IS 1598 1977, IS 1757 1988, IS 1499 1977

Impact Testing Machine



TECHNICAL SPECIFICATION

DESCRIPTION	Model		
	IT-300		IT – 300-ASTM
	CHARPY	IZOD	CHARPY
Pendulum Drop Angle	140°	90°	140°
Pendulum Effective Weight (Kg)	21. 300	21. 300	22. 350
Striking Velocity of Pendulum (m/sec)	5. 308	3.994	5.18
Pendulum Impact Energy(Joules)	300	170	300
Min. Scale Graduation(Joules)	2	2	2
(only for FIT- 300 - D)	0.5	0.5	---
Distance between axis of Pendulum to centre of strike (Length of Pendulum in (mm)	813. 5	813. 5	775
Max. total friction & windage losses	0.5% (of Max. Impact Energy)	0.5% (of Max. Impact Energy)	0.75% (of Max Impact Energy)
Striking Edge :- a) Angle	30°	75°	30°
b) Radius of Curvature (mm)	2	0.7	8
c) Width at tip(mm)	18	---	4
d) Horizontal relief (Degree)	---	10°	---
e) Vertical relief (Degree)	---	5°	---
Specimen Anvils and supports :- a) Suitable for max. specimen cross section (mm)	10 x10	10 x 10	10 x 10
b) Distance between specimen Anvils (mm)	40	---	40
c) Included angle of Anvil tip(Degree)	79°	---	80°
d) Radius of Curvature (mm)	1	---	1
Overall size(mm)(approx)	760(L)x 440(W)x 1925(H)		935(L)x 430(W)x 2070(H)
Net Weight(kg)(approx)	For Model IT-300-N : 300 For Model IT-300-EN : 450 For Model IT-300-D : 450		

Profile Projector

Screen	250mm Antiglare hard glass screen, rotatable through 360º having least count 6 minutes of an arc.Provided with four clips to hold overlay charts & drawings.
Magnification	10x Standard
Field of View	25mm
Working Distance	Contour/Surface 50mm
Illumination	**Contour Illuminator 24V/150W (Halogen)** A Green Filter incorporated into optical system is specially convenient as it reduces eye strain, improves contrast & eliminates any trace of residualchromatic aberration. Lamp is cooled by turbine type silent fan. Light Intensity control system allows different intensities as per requirement. **Surface Illuminator 12V/100W (Halogen)** Double light source with dichoric halogen lamp (cold reflector type) with facetted surface for bright illumination. Heat absorbing filters are incorporated to the system as standard equipment, thereby avoiding excessive over heating of the piece being inspected. Surface illumination can be used simultaneously with contour projection.
Cooling	Built-in noiseless and vibration free cooling fan.
Cross Travel Stage	Size 125x125mm Tabel Trave upto 50x50mm (with the use of Gauge Blocks). Micro-Head standard 0-25mm, least count 0.01mm. Rotary Stage Glass Diameter 62mm.
Optional Accessories	Digital Micrometers LC 0.001mm & Projection Objectives lenses 20x & 50x

Spring Testing Machine

The design & manufacture of Digital Spring Testers for testing springs for both compression & tensile test. Rugged housing construction suitable upper & lower compression plate of 60mm / 100mm diameter will be provided for keeping compression springs. For Tension spring suitable mounting arrangement will be provided.

We offer variety of models to test spring of 5 to 500 kg & can test spring having diameters of 50 mm & 150 mm free length. The direct display will be on digital display.

Elongation Measurement: Simple scale with a least count of 1mm or dial gauge with a least count of 0.01mm or digital vernier with a least count of 0.01mm can be provided.

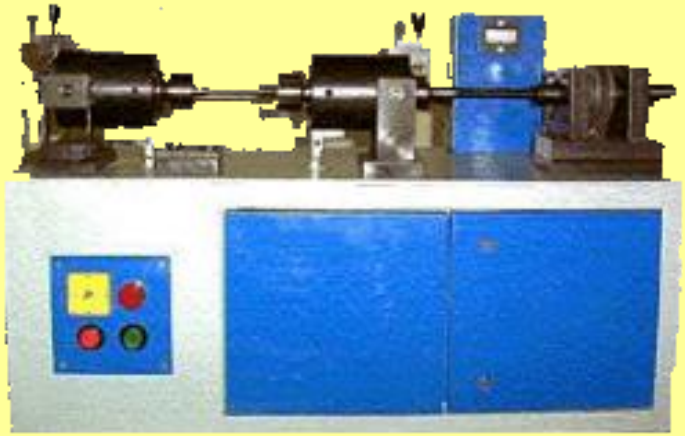
Technical Specification :

Model / Capacity	UST - 30	UST - 250	UST - 500
Maximum Capacity	5kg, 10kg, 20kg, 30kg	50kg, 100kg, 250kg	250kg, 500kg
Maximum Cross Head Travel	100mm	180mm	250mm
Force Measuring Resolution	1gm	10gm	0.1 kg
Type of Construction	Single Column	Single Column	Double Column

Displacement Measuring Resolution :

Type	Range	Resolution
Mechanical Scale - (Standard)	0 - 150mm	1mm
Digital Vernier Gauge - (Optional)	0 - 150mm	0.01mm
Rotary Encoder - (Optional)	0 - 150mm	0.10mm / 0.01mm

Fatigue Testing Machine



APPLICATION & OPERATION

This machine is used to test the fatigue strength of materials and to draw S-N diagram by research institutes, laboratories, material manufacturers and various industries. This is a rotating beam type machine in which load is applied in reversed bending fashion. The standard 8 mm dia specimen is held in special holders at its ends and 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. Total number of revolutions at which the specimen fails are recorded by a mechanical counter. An interlocking system puts off the motor at specimen failure. Machine meets requirements of IS 5075-1969

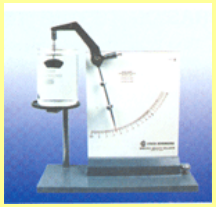
Features :

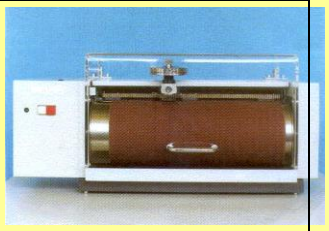
- Light weight, compact size, simple design
- Table model, no need of foundation
- Simple lever system for changing load
- Accurately calibrated as per IS 5075
- Calibration in Nm available on request

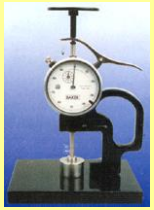
Technical Specification of Fatigue Testing Machine

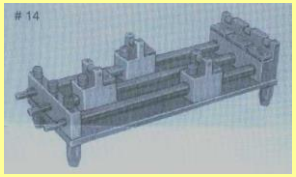
1) Maximum bending moment	Kg Cm	200
2) Bending moment adjustable	Kg Cm	30-200
3) Ranges	I-Kg Cm II-Kg Cm	30-100 100-200
4) Gripping dia of specimen	mm	12
5) Testing dia of specimen	mm	8
6) Rotating speed	rpm	4200
7) Accuracy of applied bending moment		± 1%
8) Digital Counter No. of digits		6
9) Power required	HP	0.5
10) Main supply	A.C. 3 ph.	440V,50 Hz
11) Overall size(approx.)	mm	1000 L,X,500W X 600 H
12) Weight(approx.)	Kg	120

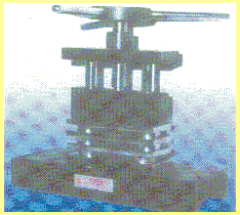
Rubber Testing Equipment











Other Rubber Testing Equipment

Tensile Testing Machine

- Adhesion / Peel - Bond

(please refer Tensile Testing catalogue)

Muffle Furnance, Coating Thickness Gauge,- Ross Flex Tester

Shore A & D Hardness Tester

The Shore Hardness is defined as the resistance to penetration by an indentor of specified shape under a defined load.

Shore Hardness tester are available in various models for testing Vulcanized Rubber, Plastic, Ebonite, Fibre and all other soft and Hard Elastomers as per latest American Std ASTM-D 2240 and German Std DIN 53505.

Shore A are suited for use on soft elastomers the hardness of which is between 10 and 90 Shore A.

Shore D are suited for use on harder elastomer (hardness >80 Shore A) and on plastics the hardness of which is between 30 and 90 Shore D.

Stand for Hardness Tester

Hardness Tester Stand available in two types Loading from Top & Loading from Bottom

Flex Tester

The resistance of rubber to the formation of cracks when subjected to repeated flexing or bending under specified conditions and known periods on the De Mattia type machine.

The machine essentially design as per

IS : 3400 (Part 7) – 1985 & IS : 3400 (Part 8) - 1983

International Rubber Hardness Tester (IRHD)

International Rubber Hardness Degree Meter used to determine the Hardness of Rubber Components where highly accuracy and reliable determination of the Hardness is of extreme important. The principal behind determination of hardness by dead load apparatus is based on the measurement of the difference between the depth of indentation of a standard ball in to the rubber under a small contact force and a large indenting force. This type of hardness determination is widely accepted by I.S, B.S and I.S.O specification.

Resilience Tester

APPLICATION :

Resilience Tester is used to test an important property of Resilience of rubber and such other elastomer is defined as the energy returned by specimen when it suddenly released from a state of strain of deformation. The energy returned is expressed as the percentage of original potential energy is a measure of Resilience.

Spark Tester

APPLICATION :

Spark Tester model ST-40 is suitable to detect Pinhole, Puncture & Blank portion in thick (1mm to 10mm) insulating coating on conductive material.

- * FRP Lining
- * Glass Lining
- * Rubber Lining,
- * Teflon Lining
- *P.U.Coating
- * Cement Coating etc.

SPECIFICATION :

Operated by 230± 2%, 50Hz
Output Voltage 0 KV to 40 KV pulse type
Mechanical Diamension : (W) 11” (D) 8.5” (H) 5.5”
Apprx. weight 4.00 kgs

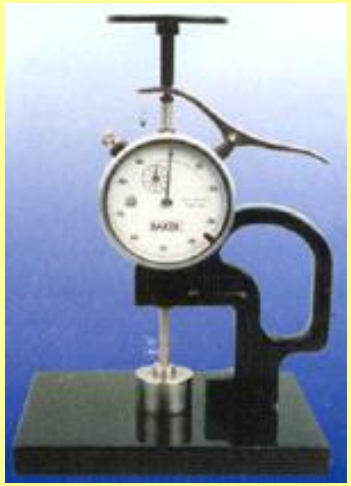
SALIENT FEATURES :

- Compact & light weight
- Easy to carry
- Separate H.T.probe

Specific Gravity Balance

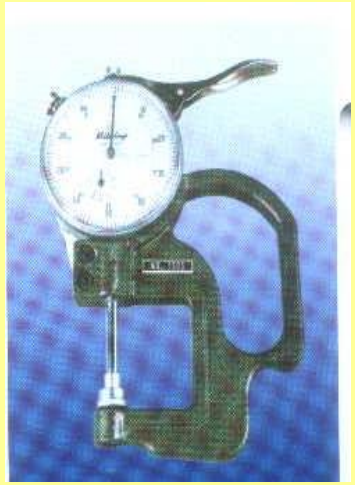
Specific Gravity Balance direct reading type for use on vulcanized rubber or such other elastomers. The balance consists of rigid quadrant scale with figures printed on the scale standing vertically fitted on a heavy base. The balance is calibrated from 0.9 to 3.0. For most elastomers the specific gravity lies between 0.9 – 2.0, and test results in this range can be read directly and accurately by two decimal places. The balance is supplied with glass baker & calibration weight for periodical checking.

Thickness Gauge



Thickness Gauge with stand (Table model)

Most suitable for checking the thickness of Rubber sheet, Fabrics, Leather, Rexine, Paper, Thin Films and all other flexible materials. It provides a maximum compressive load on the specimen to get exact reading as per I.S. specification



Hand held Thickness Gauge

Suitable for checking various materials in production control, routine and series test available in different range accuracy and throat as per Std specification.

Hardness Conversion Chart

Soft steel, grey & malleable cast iron and most non-ferrous metals								HARDENED STEEL & HARD ALLOYS				
ROCKWELL STANDARD		ROCKWELL STANDARD				BRINELL	BRINELL VICK	ROCKWELL STANDARDS			VICKERS	BRINELL
								C	A	D	HV	BHN
B	F	E	H	K	A	HB	BHN / HV	150 KG	60 KG	100 KG	10 KG	3000 Kg
100kg 1/16" Ball	60kg 1/16"Ball	100kg 1/8"Ball	60kg 1/8"Ball	150kg 1/8"Ball	60kg Diamond	500kg 100mm Ball	3000kg 10mm Ball 10kg	DIAMOND INDENTOR				100 mm Ball
100					61.5	201	240	80	92	86.5	1865	
99					60.9	195	234	79	91.5	85.5	1787	
98					60.2	189	228	78	91	84.5	1710	
97					59.5	184	222	77	90.5	84	1633	
96					58.9	179	216	76	90	83	1556	
95					58.3	175	210	75	89.5	82.5	1478	
94					57.6	171	205	74	89	81.5	1400	
93					57	167	200	73	88.5	81	1323	NA
92				100	56.4	163	195	72	88	80	1245	
91				99.5	55.8	160	190	71	87	79.5	1160	
90				98.5	55.2	157	185	70	86.5	78.5	1076	
89				98	54.6	154	180	69	86	78	1004	
88	NA			97	54	151	176	68	85.6	76.9	940	
87		NA		96.5	53.4	148	172	67	85	76.1	900	
86				95.5	52.8	145	169	66	84.5	75.4	865	
85				94.5	52.3	142	165	65	83.9	74.5	832	739
84				94	51.7	140	162	64	83.4	73.8	800	722
83				93	51.1	137	159	63	82.8	73	772	706
82				92	50.6	135	156	62	82.3	72.2	746	688
81				91	50	133	153	61	81.8	71.5	720	670
80				90.5	49.5	130	150	60	81.2	70.7	697	654
79				89.5	48.9	128	147	59	80.7	69.9	674	634
78				88.5	48.4	126	144	58	80.1	69.2	653	615
77				88	47.9	124	141	57	79.6	68.5	633	595
76				87	47.3	122	139	56	79	67.7	613	577
75	99.6			86	46.8	120	137	55	78.5	66.9	595	560
74	99.1			85	46.3	118	135	54	78	66.1	577	543
73	98.5			84.5	45.8	116	132	53	77.4	65.4	560	525
72	98			83.5	45.3	114	130	52	76.8	64.6	544	512
71	97.4	100		82.5	44.8	112	127	51	76.3	63.8	528	496
70	96.8	99.5		81.5	44.3	110	125	50	75.9	63.1	513	481
69	96.2	99	NA	81	43.8	109	132	49	75.2	62.1	498	469
68	95.6	98		80	43.3	107	121	48	74.7	61.4	484	455
67	95.1	97.5		79	42.8	106	119	47	74.1	60.8	471	443
66	94.5	97		78.5	42.3	104	117	46	73.6	60	458	432
65	93.9	96		77.5	41.8	102	116	45	73.1	59.2	446	421
64	93.4	95.5		76	41.4	101	114	44	72.5	58.5	434	409
63	92.8	95		74.5	40.9	99	112	43	72	57.7	423	400
62	92.2	94.5		74	40.4	98	110	42	71.5	56.9	412	390
61	91.7	93.5		74	40	96	108	41	70.9	56.2	402	381
60	91.1	93		73	39.5	95	107	40	70.4	55.4	392	371
59	90.5	92.5		72	39	94	106	39	69.9	54.6	382	362
58	90	92		71	38.6	92	104	38	69.4	53.8	372	353
57	89.4	91		70.5	38.1	91	103	37	68.9	53.1	363	344
56	88.8	90.5		69.5	37.7	90	101	36	68.4	52.3	354	336
55	88.2	90		68.5	37.2	89	100	35	67.9	51.5	345	327
54	87.7	89.5		68	36.8	87		34	67.4	50.8	336	319
53	87.1	89		67	36.3	86		33	66.8	50	327	311
52	86.5	88		66	35.9	85		32	66.3	49.2	318	301
51	86	87.5		65	35.5	84		31	65.8	48.4	310	294
50	85.4	87		64.5	35	83		30	65.3	47.7	302	286
49	84.8	86.5		63.5	34.6	82		29	64.6	47	294	279
48	84.3	85.5		62.5	34.1	81		28	64.3	46.1	286	271
47	83.7	85		61.5	33.7	80		27	63.8	45.2	279	264
46	83.1	84.5		61	33.3	80		26	63.3	44.6	272	258
45	82.6	84		60	32.9	79		25	62.8	43.8	266	253
44	82	83.5		59	32.4	78		24	62.4	43.1	260	247
43	81.4	82.5		58	32	77		23	62	42.1	254	243
42	80.8	82		57.5	31.6	76		22	61.5	41.6	248	237
41	80.3	81.5		56.5	31.2	75		21	61	40.9	243	231
40	79.7	81		55.5	30.7	75		20	60.5	40.1	238	226
39	79.1	80		54.5	30.3	74						
38	78.6	79.5		54	29.9	73						
37	78	79		53	29.5	72						
36	77.4	78.5	100	52	29.1	72						
35	76.9	78	99.5	51.5	28.7	71						
34	76.3	77	99	50.5	28.2	70						
33	75.7	76.5	98.8	49.5	27.8	69						
32	75.2	76	98.5	48.5	27.4	69						
31	74.6	75.5	98	48	27	68						
30	74	75	97.8	47	26.6	67						
29	73.5	74	97.5	46	26	66						
28	73	73.5	97	45	25.5	66						
27	72.5	73	96.5	44.5	25	65						