



PRECISION TOOLS



**SURFACE  
PLATES**



**Material.**

Luthra Surface Plates are made of close grained Cast Iron to IS:210:1962 and their rigidity is secured by deep cross ribbing.

**Hardness:**

Will be between 170-220 BHN.

**Stress Relieving.**

Castings internal stresses are relieved either by natural ageing or by artificial seasoning in our seasoning furnace as recommended in IS:2285:74

**Grades:**

Luthra Surface Plates are offered in two grades Grade-I and Grade-II.

**Workmanship and Finish:**

Grade-I and Grade-II Surface Plates are finished by hand scrapping.

**Accuracy:**

Local errors in flatness over 100 mm distance will not exceeds the following values:

Grade-I	0.005 mm
Grade-II	0.010 mm

In addition to the tolerance on flatness, accuracies & sizes of surface plates are given on the back page.

**Special Provisions:**

Tapped holes are also provided at the top surface, for fixing work or measuring instruments at extra cost. One or more T-Slot on working surface as per customer's requirement at an extra cost.

**Stands:**

Luthra Surface Plates are normally supplied without stand and levelling screws, but cast iron or fabricated stands with levelling screws could be supplied alongwith the Surface Plates at extra cost on request. The total height of the Marketing Table or Surface Plate is 850 to 920 mm approx. from the floor with stand.

**Wooden Cover:**

Wooden cover to protect the working surface and the sides is supplied free of cost with each Surface Plate.

**Testing:**

Every Surface Plate is tested as recommended in IS:2285:74 and inspection report furnished with each Surface Plate. Our certificate is your assurance of our Surface Plate's dependability and your guarantee that it is the most accurate Surface Plate you can own.

Luthra Surface Plates are most accurate so no point on the working Surface shall vary more than the accuracy specified and can be used with confidence, wherever strict accuracy is required so they are suitable for highest class of precision work and you can be assured that a job set anywhere on the Luthra Surface Plate will repeat the same measurement reading as specified. In accuracy and reliability — it is unbeatable. This is the only reason for their nationwide acceptance.

**Packing:** Each surface plate is protected against climatic conditions by suitable protective coating and the complete top is totally rapped in plastic paper.



## SURFACE PLATES SIZES & ACCURACIES

As Per IS:2285-74

Size of Plates in inches	Tolerance in flatness in microns Grade I	Tolerance in flatness in microns Grade II	Size of Plates in mm	Tolerance in flatness in microns Grade I	Tolerance in flatness in microns Grade II
12 x 12	5.0	10.0	250 x 250	5.0	10.0
12 x 18	7.5	15.0	400 x 400	7.5	15.0
18 x 18	7.5	15.0	500 x 500	7.5	15.0
18 x 24	7.5	15.0	400 x 630	7.5	15.0
24 x 24	7.5	15.0	630 x 630	7.5	15.0
24 x 36	10.0	20.0	1000 x 630	10.0	20.0
36 x 36	12.0	24.0	1000 x 1000	12.5	25.0
36 x 48	12.5	25.0	1200 x 900	12.5	25.0
48 x 48	15.0	30.0	1200 x 1200	15.0	30.0
40 x 60	17.5	35.0	1000 x 1600	17.5	35.0
			1000 x 2000	20.0	40.0
			1200 x 1800	20.0	40.0

other sizes on Request

## ANGLE PLATES (SLOTTED)

Sizes in MM

L	B	H	Flatness of working faces	Squareness of working surfaces	Squareness of end faces	Parallelism of opposite faces
150 x 100 x 125			0.005	0.010	0.013	0.013
200 x 150 x 125			0.008	0.015	0.018	0.018
250 x 150 x 175			0.008	0.015	0.018	0.018
300 x 200 x 225			0.008	0.017	0.019	0.019
350 x 200 x 250			0.008	0.018	0.020	0.020
450 x 300 x 350			0.010	0.018	0.020	0.020
500 x 335 x 225			0.010	0.019	0.022	0.022
600 x 400 x 450			0.010	0.020	0.023	0.023
700 x 450 x 600			0.030	0.070	0.070	0.070

As per IS:2554-71

## ANGLE PLATES (PLAIN)

Sizes in inches			Accuracies in MM			
4 x 4 x 4			0.005	0.010	0.013	0.013
5 x 5 x 5			0.005	0.010	0.013	0.013
4 x 4 x 5			0.005	0.010	0.013	0.013
5 x 5 x 6			0.008	0.013	0.015	0.015
6 x 6 x 6			0.008	0.013	0.015	0.015
6 x 6 x 8			0.008	0.013	0.015	0.016
8 x 8 x 8			0.008	0.015	0.018	0.018
8 x 8 x 10			0.008	0.017	0.019	0.019
10 x 10 x 10			0.008	0.018	0.020	0.020
12 x 12 x 12			0.008	0.018	0.020	0.020
18 x 18 x 18			0.010	0.018	0.020	0.020

## BOX ANGLE PLATES

As per IS:6232-1971

Dimensions in millimeters

L	B	H	Flatness of working surfaces	Squareness of adjacent faces Over H	Parallelism of opposite faces
125	75	100	0.005	0.015	0.013
175	100	125	0.005	0.013	0.015
250	150	175	0.008	0.015	0.018
350	200	250	0.008	0.018	0.020
450	300	350	0.010	0.018	0.020

Mfd. By:

**LUTHRA ENGINEERING WORKS**

## STRAIGHT EDGES

### I Section (Parallel Type)

### Camel Back (Bow Shape)

As per BS:5204-1975				As per IS:5268:69			
Size mm	Width mm	Flange Thickness	Accuracy mm	Size mm	Width mm	Flange Thickness	Accuracy mm
300	25	8	0.003	300	30	10	0.003
500	30	10	0.004	500	35	12	0.004
1000	35	12	0.010	1000	45	16	0.008
1500	40	12	0.015	1500	55	20	0.012
2000	50	14	0.020	2000	65	24	0.016
2500	55	15	0.025	2500	80	28	0.020
3000	55	16	0.030	3000	90	32	0.024
4000	60	18	0.040	4000	110	38	0.032
5000	65	20	0.050	5000	115	46	0.040
6000	70	22	0.060	6000	120	54	0.048

## TRIANGULAR/PRISMATIC STRAIGHT EDGES

As per IS:8823:78

Length	30°	45°	50°	55°	60°
MM	Width Of Working Faces.				
300	50	50	50	45	45
500	70	70	70	60	60
750	90	90	90	80	80
1000	110	110	110	100	100
1250	130	130	130	110	110
1500	160	160	160	130	130
2000	200	200	200	160	160

## ENGINEER'S STRAIGHT EDGES (STEEL) FLAT SECTION

## TOOL MAKER'S (KNIFE EDGES) STRAIGHT EDGES

Sizes in MM				As per IS:3512:66		
Length	Width	Thickness	Accuracy	Length	Width	Thickness
300	40	6	0.003	100	40	10
450	40	8	0.003	150	40	10
600	50	8	0.004	300	60	12
900	50	8	0.005	500	80	15
1000	50	10	0.007			
1200	60	10	0.007			
1500	60	12	0.008			
1800	65	12	0.008			
2000	65	15	0.010			
3000	75	20	0.025			

## CAST IRON CUBES

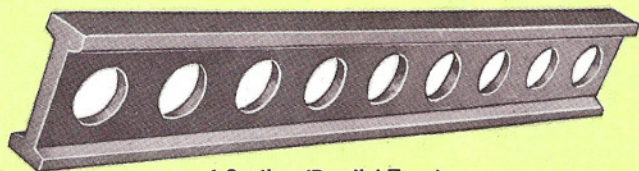
All dimensions in millimeters

Width	Length	Height	Thickness
100	100	100	22
125	125	125	25
150	150	150	28
200	200	200	32
225	225	225	35
250	250	250	35

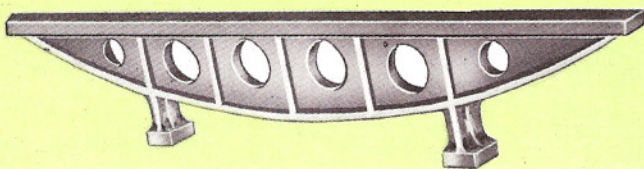
## CYLINDRICAL SQUARES (MASTER CYLINDER)

Length	Outside dia	Straightness	Flatness	Squareness
75	50	0.0008	0.0008	0.001
150	65	0.001	0.001	0.0025
225	75	0.002	0.002	0.0035
300	85	0.0025	0.0025	0.005
450	110	0.0035	0.0035	0.006
600	125	0.005	0.005	0.007

## C.I. STRAIGHT EDGES



**I-Section (Parallel Type)**



**Camel Back (Bow Shape)**

### I Section (Parallel Type)

As per BS:5204-1975

### Camel Back (Bow Shape)

As per IS:5268:69

- Straight Edges are made from close grained Cast Iron conforming to Grade-20.
- Hardness 170-220 BHN.
- Castings internal Stresses are relieved either by natural ageing or by artificial seasoning.
- Straight Edges are finished by hand scrapping.
- Straight Edges have been designed well and ribbed in the best manner to retain their accuracy under varying conditions and are as light as possible without sacrificing rigidity.
- Wooden Cover is provided with each Straight Edge to protect the working surface from rust and dust.
- Straight Edges are offered in two grades Grade — I and Grade — II
- All finished surfaces of Straight Edges are protected against climatic conditions by a suitable protective coating.

## TRIANGULAR/PRISMATIC STRAIGHT EDGES

Prismatic Straight Edges are used for checking Angle and flatness of machine tools dovetails, Fixtures etc.

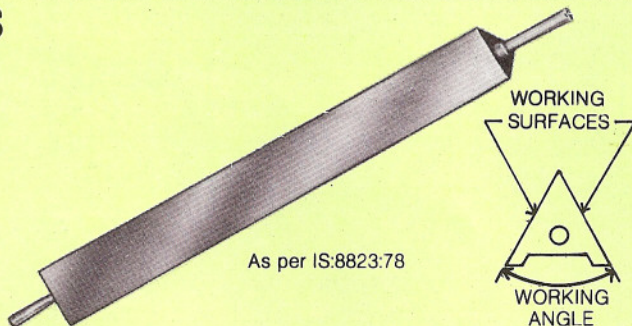
- Made from close grained Cast iron.
- Castings are artificially stress relieved.
- Working Surfaces are finished by hand scrapping.
- M.S. Handles are provided on either side.
- Hardness will be 170 - 220 BHN.

### Accuracy

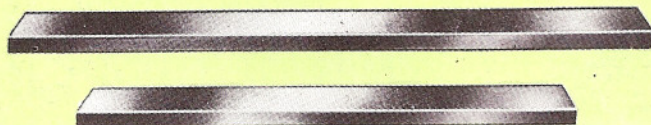
Bearing area: 25 spots in 25 x 25mm area.

Flatness : 0.004 mm per 300 mm.

Angle accuracy : Maximum error in specified angle between surfaces within  $\pm 5'$



As per IS:8823:78

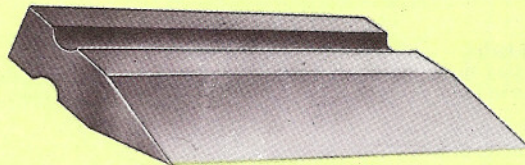


## ENGINEER'S STRAIGHT EDGES (STEEL) FLAT SECTION

These Straight Edges are made of alloy Steel and are hardened and ground. The Working Surfaces are hand scrapped. All finished surfaces are protected by protective coating and is supplied in a case.

## TOOL MAKER'S (KNIFE EDGES) STRAIGHT EDGES

These straight edges are being manufactured from 100mm to 500mm length, intended for very accurate work, and having one working edge, which is bevelled and very slightly rounded off. These straight edges are commonly known as "Knife Edge". Knife edges are manufactured from alloy Steel and are hardened and suitable heat treated to remove internal stresses. Hardness 55 to 60 HRC.



As per IS:3512:66



## CYLINDRICAL SQUARES (MASTER CYLINDER)

As per IS:6952:1973

The Cylindrical Squares are the most suitable means of Checking components for squereness by comparison methods.

**MATERIAL :** Cylindrical Squares are made of high quality alloy Steel and suitably hardened and stabilized.

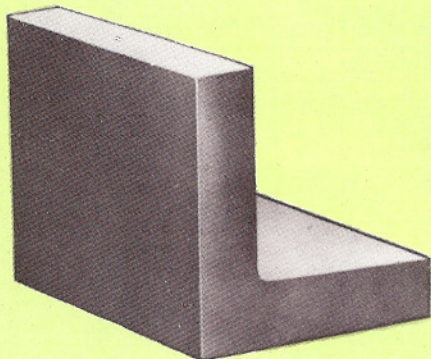
**HARDNESS :** The external surface of cylindrical squares have hardness of 700 HV.

**FINISH :** The external surface of Cylindrical Squares are either lapped or have fine ground finish.

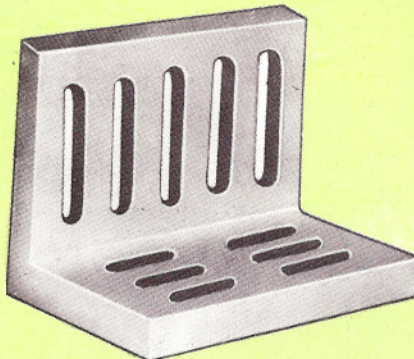
**HANDLE :** These are supplied with lifting handle.

Cylindrical Squares of 300 mm length or above are of hollow section and less than 300 mm length are of solid type.

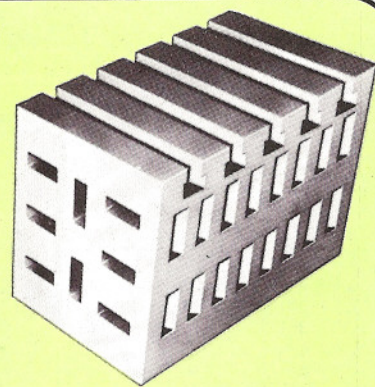
## ANGLE PLATES & BOX ANGLE PLATES



**Angle plates (Plain)**



**Angle plates (Slotted)**



**Box Angle plates**

As per IS:6232-1971

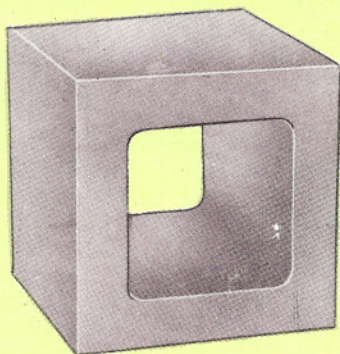
As per IS:2554:71

Angle Plates Plain and slotted are made of Close Grained Cast iron of adequate thickness to ensure rigidity. All six faces of Small Angle Plates upto 350 x 250 mm (Slotted) and 10" x 10" x 10" (Plain) are accurately ground and higher sizes are hand scrapped and are 90 degrees true to one another. Castings internal stresses are relieved either by naturally ageing or by artificial seasoning. Hardness is 180 to 200 BHN.

Box Angle Plates are provided with suitable number of Machined T-Slots on one working Surface and cored slots on four opposite Surfaces to facilitate clamping.

**Matched Pairs**

Matched pairs Angle Plates can also be supplied at extra cost of 30% of list price per plate. Accuracy of two units on dimensions L, B & H will be for Grade-I 0.03 mm Grade-II 0.07 mm



## CAST IRON CUBES

Cubes are made of high quality close grained Cast Iron, seasoned and accurately ground all over.

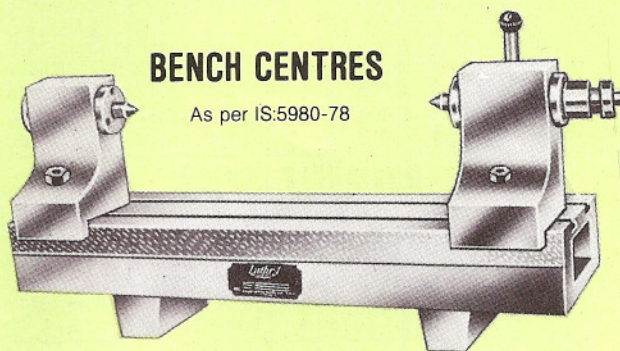
**Accuracy**

- Squareness of working surfaces within 0.0025 mm in 25 mm length.
  - Straightness within + 0.0012 mm in 25 mm length.
  - Squareness of end faces within 0.005 mm in 25 mm length.
- Can also be supplied in matched pairs at an extra cost of 30%.

- Base of the Bench Centre is made of Close Grained Castings and finished to high degree of accuracy by hand scrapping
- The Base of Bench Centre and its heads are artificially Stress Relieved.
- One of the centre is spring loaded to ensure uniform pressure while holding work pieces and easy holding and unloading without disturbing the accuracy of centres.
- Both heads are adjustable to the required position, easy and quick setting of the required distance between centres.
- The heavy duty bed is provided with two T-Slots, parallel to each other.
- Bench Centre is ideal for checking of run-out, concentricity, parallelism and axial runout of components.

## BENCH CENTRES

As per IS:5980-78

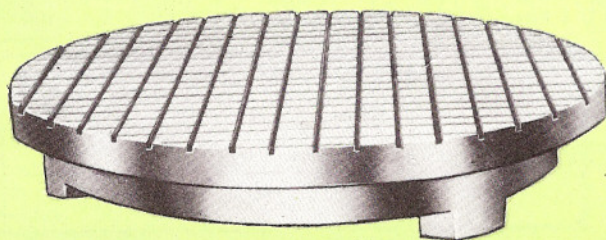


**GEAR TESTING ATTACHMENT**

- Gear Testing attachment is unique in design and meant for inspecting concentricity and commulative errors of Gears with respect to gear axis.

**ACCURACY:** Parallelism of centres with base within 0.005mm./300 mm The flatness of base 0.003/300 mm.

Centre Distance in MM	300, 500, 750, 1000, 1250, 1500, 2000
Centre Height in MM	125, 160, 175, 200, 250, 400



## LAPPING PLATES

Lapping Plates are made from close grained cast iron in round as well as in Square pattern.

Serrations are 3mm wide, spaced 25mm approx. Hardness — 200 BHN.

These are used to lap wide range of materials like hand lapping of nylon, plastic, Ceramics and other non ferrous materials.

Accuracy : -0.004mm/300 mm.

Available in sizes : 100, 200, 250, 300, 400 and 450 mm  $\phi$  and square