

DRAWING INSTRUMENTS AND THEIR USES

Drawing Instruments are used to prepare neat and accurate Drawings. To a greater extent, the accuracy of the Drawings depend on the quality of instruments used to prepare them. The following is the list of Drawing Instruments and other materials required.

- a) Drawing Board
- b) T-square or Drafter (Drafting machine)
- c) Set Squares
- d) Protractor
- e) Drawing Instrument Box
- f) Drawing Sheet
- g) Drawing Pencils
- h) Drawing Pins/Clips

a) Drawing Board:

Drawing board is made from strips of well seasoned soft wood generally 25 mm thick. It is cleated at the back by two battens to prevent warping. One of the shorter edges of the rectangular board is provided with perfectly straight ebony edge which is used as working edge on which the T-square is moved while making Drawings.

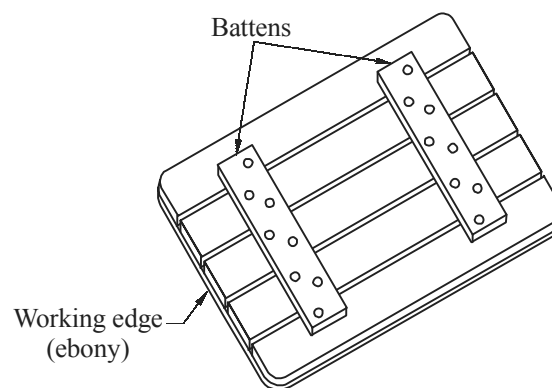


Fig. 1A.1

Note: When Minidrafter (Drafting machine) is used to prepare Drawings, the working edge is not used.

Drawing board size:

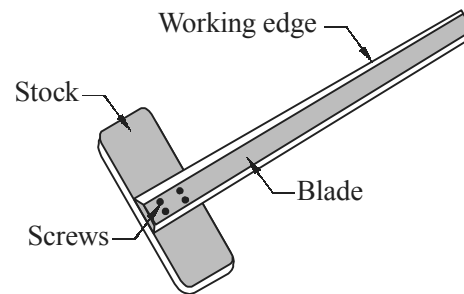
Drawing boards are made in various sizes. The selection of Drawing board depends on the size of drawing paper used. The sizes of Drawing board recommended by Bureau of Indian Standards (B.I.S) is given below

Standard size of Drawing boards

Designation	Size (mm)	Designation	Size (mm)
B0	1500 × 1000	B3	500 × 350
B1	1000 × 700	B4	250 × 350
B2	700 × 500		

b) T-square :

T-squares are made from hard wood. A T-square consists of two parts namely the stock and the blade joined together at right angles to each other by means of screws and Pins as shown in figure 1A.2. The stock is made to slide along the working edge and the Blade moves on the Drawing board.

**Fig. 1A.2**

The working edge of T-square is used to draw parallel lines, vertical lines or inclined lines at 30°, 60° to the horizontal using set squares.

Drafting machine (or Drafter):

In a Drafting machine, the uses and advantages of T-square, set square, scales, protractors are combined. One end of the Drafter is clamped at the left top end of the Drawing board by a screw provided in the drafter.

An adjustable head with a Protractor is fitted at the other end of the Drafter. Two blades made of transparent celluloid material are fitted to the adjustable head and are perfectly perpendicular to each other. These blades are used to draw parallel, horizontal, vertical and inclined lines. The blades always move parallel to the edges of the board. Use of Drafting machine helps in reducing the time required to prepare Drawing.

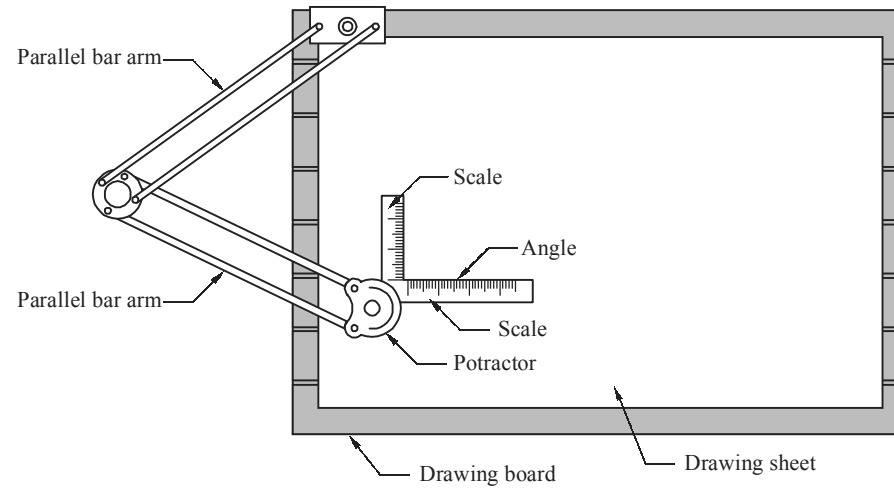


Fig. 1A.3

c) Set Squares :

Set squares are generally made from Plastic or celluloid material. They are triangular in shape with one corner, a right angle triangle. A pair of set squares (30° – 60°) and 45° (45° set square are generally provided with Protractor) facilitate marking of angles as shown in figures 1A.4 and 1A.5.

They are used to draw lines at 30° , 60° and 45° to the vertical and horizontal.

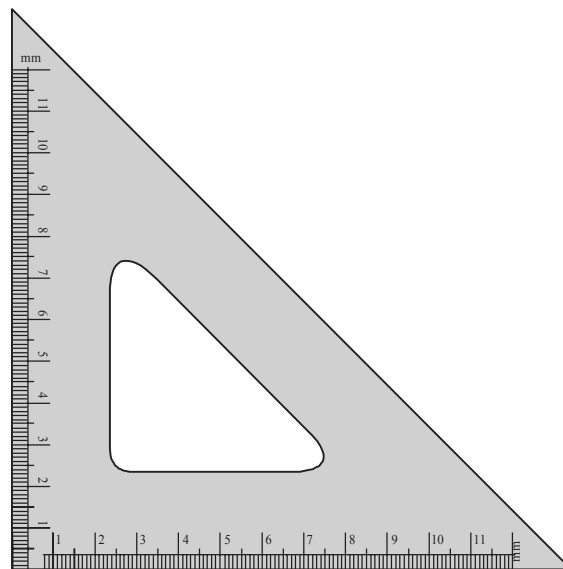


Fig. 1A.4. 45° Set Square

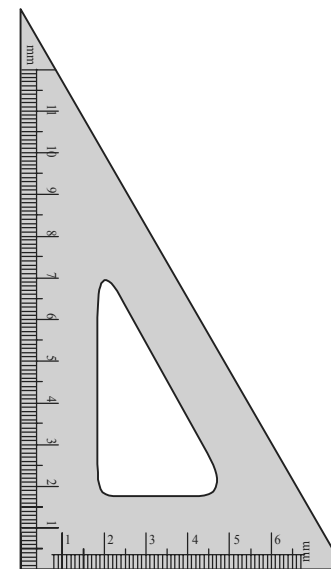


Fig. 1A.5. 30° – 60° Set Square

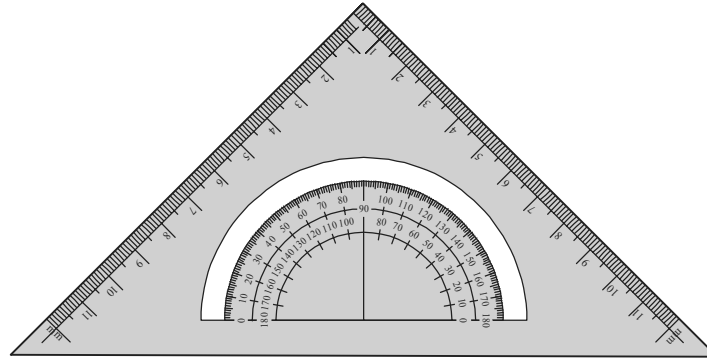


Fig. 1A.6. 45° Set Square with Protractor

d) Protractor:

Protractors are used to mark or measure angles between 0 and 180°. They are semicircular in shape (of diameter 100mm) and are made of Plastic or celluloid which has more life. Protractors with circular shape capable of marking and measuring 0 to 360° are also available in the market.

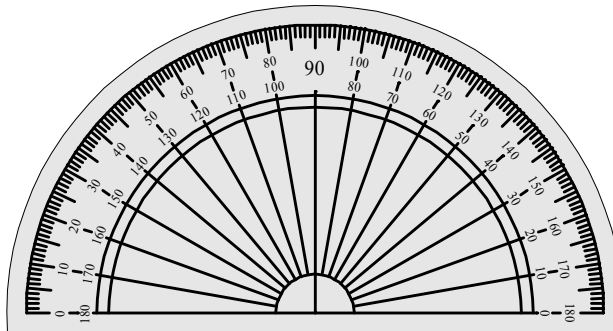


Fig. 1A.7

e) Drawing Instrument Box :

It consists of the following

- a) Large size compasses,
- b) Large size divider,
- c) Small size bow pen, bow divider, and
- d) Lengthening bar

f) Drawing sheet:

They are available in many varieties and good quality paper with smooth surface should be selected for Drawings which are to be preserved for longer time. Sizes of Drawing Sheets recommended by Bureau of Indian Standards (B.I.S) is given below,

Standard size of Drawing sheet

Designation	Size (mm)	Designation	Size (mm)
A0	1189 × 841	A3	420 × 297
A1	841 × 594	A4	297 × 210
A2	594 × 420	A5	210 × 148

g) Drawing Pencils:

The accuracy and appearance of a Drawing depends on the quality of Pencil used to make Drawing. The grade of a Pencil lead is marked on the Pencil. HB denotes medium grade. Increase in hardness is shown by value put in front of H such as 2H, 3H etc., Softer pencils are marked as 2B, 3B, 4B etc. A Pencil marked 3B is softer than 2B and Pencil marked 4B is softer than 3B and so on. Beginning of a Drawing may be made with H or 2H. For lettering and dimensioning, H and HB Pencils are used.

h) Drawing Pins and clips:

These are used to fix the Drawing sheet on the Drawing board.

Compass:

Compass is used for drawing circles and arcs of circles. The compass has two legs hinged at one end. One of the legs has a pointed needle fitted at the lower end where as the other end has provision for inserting pencil lead. Circles upto 120mm diameters are drawn by keeping the legs of compass straight. For drawing circles more than 150 mm radius, a lengthening bar is used. It is advisable to keep the needle end about 1mm long compared to that of pencil end so that while drawing circles, when the needle end is pressed it goes inside the drawing sheet by a small distance (approximately 1mm). Refer fig. 1A.8.

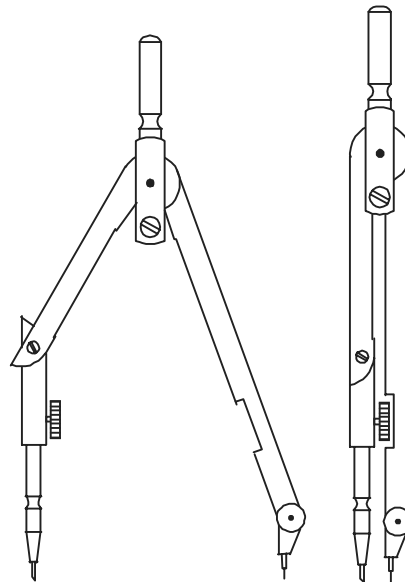


Fig. 1A.8 Compass