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IS 1444 (1989): Engineer's Pattern Drawing Boards [PGD 22: Educational Instruments and Equipment]



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Indian Standard

ENGINEER'S PATTERN
DRAWING BOARDS — SPECIFICATION

(*Second Revision*)

UDC 744.32

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FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards on 16 August 1989, after the draft finalized by the Optical and Mathematical Instruments Sectional Committee had been approved by the Light Mechanical Engineering Division Council.

This standard was originally published in 1959 and revised in 1963. In this present revision due consideration has been given to the need for keeping the drawing boards sizes as small as possible taking into consideration the dimensions of the parallelogram formed by the extreme movement of drafting unit. The drawing board sizes specified are in the range of sizes suitable for use with the ISO 'A' range of trimmed papers, and IS 10711 : 1983 'Sizes of drawing sheets'.

In the preparation of this standard considerable assistance has been derived from BS : 6381-1983 'Engineer's pattern drawing boards', published by the British Standards Institution, UK.

This standard is intended chiefly to cover the technical provisions relating to engineers' pattern drawing boards, and it does not include all the necessary provisions of a contract.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ENGINEER'S PATTERN DRAWING BOARDS — SPECIFICATION

(Second Revision)

1 SCOPE

1.1 This standard covers the requirements for four sizes of engineers' pattern drawing boards designated as D00, D0, D1, D2 and D3. Preliminarily intended for use with tee square.

2 REFERENCES

IS No.	Title
IS 287 : 1973	Recommendations for maximum permissible moisture content for timber used for different purposes (<i>second revision</i>)
IS 303 : 1975	Plywood for general purposes (<i>second revision</i>)
IS 401 : 1982	Code of practice for preservation of timber (<i>third revision</i>)
IS 410 : 1977	Cold rolled brass sheet, strip and foil (<i>third revision</i>)
IS 707 : 1976	Glossary of terms applicable to timber technology and utilization (<i>second revision</i>)
IS 848 : 1974	Synthetic resin adhesives for plywood (phenolic and amino-plastic) (<i>first revision</i>)
IS 1328 : 1982	Veneered decorative plywood (<i>second revision</i>)
IS 1659 : 1979	Blockboards (<i>second revision</i>)
IS 2233 : 1962	Straightedges for drawing office use
IS 6760 : 1972	Slotted countersunk head wood screws

3 DIMENSIONS

3.1 The dimensions and tolerances on dimensions of four sizes of drawing boards shall be as given in Table 1.

3.2 The thickness of the blockboard type drawing boards shall be between 20 and 25 mm with a tolerance of ± 5 percent.

4 MATERIALS

4.1 Timber

The working surface of the board and the battens

shall be constructed from any one of the following species of timber (*see* IS 399 : 1963):

a) Working Surface

Trade Name	Botanical Name
Benteak	<i>Lagerstroemia lanceolata</i> Wall
Blue pine	<i>Pinus wallichiana</i> A.B. Jacks
Fir	<i>Abies pindrow</i> spach, or <i>Abies spectabilis</i> spach.
Cypress	<i>Cupressus torulosa</i> Don
Oak	<i>Quercus</i> sp.
Red cedar	<i>Cederla</i> sp.

b) Battens

Aini	<i>Artocarpus hirsuta</i> Lamk
Anjan	<i>Hardwickiabinata</i> Roxb.
Bijasal	<i>Pterocarpus marsupium</i> Roxb.
Black chuglam	<i>Terminalia manii</i> King
Padauk	<i>Pterocarpus dalbergioides</i> Roxb.
Safed siris	<i>Albizzia procera</i> Benth.
Salai	<i>Boswellia serrata</i> Roxb.
Sissoo	<i>Dalbergia sissoo</i> Roxb.
Teak	<i>Tectona grandis</i> Linn. f.
Walnut	<i>Juglans</i> sp.

4.1.1 The wood used shall be thoroughly seasoned and shall have attained a moisture content of not more than 12 percent, which may be 14 percent in the case of teak (*Tectona grandis* Linn. f.), when the board is intended for use in moist zones (*see* IS 287 : 1973). It shall be free from knots, cracks, sap, shakes and other defects which may affect the serviceability or appearance of the boards (*see* IS 707 : 1976).

4.1.2 Blockboard

4.1.2.1 Material

In the case of blockboard type drawing boards, the timber for the core and the face veneer shall be from the species given in 4.1 or any of the following:

- a) *Bombox malabarica* when treated in accordance with IS 401 : 1982.
- b) Soft timbers specified in Class II of Appendix A of IS 303 : 1975.

Table 1 Dimensions of Engineer's Pattern Drawing Boards

(Clauses 3.1 and 6.1 and Fig. 1)

All dimensions in millimetres.

Designation	Length × Width B × A	Tolerance on Length/Width	Thickness	Tolerance on Thickness	Tolerance on Straightness of Working Edge	Recommended for Use with Sheet Sizes
D00	1 525 × 1 220	±5	22	±1	0.25	—
D0	1 270 × 920	±5	22	±1	0.25	A0
D1	920 × 650	±5	22	±1	0.25	A1
D2	650 × 470	±5	22	±1	0.1	A2
D3	500 × 350	±5	22	±1	0.1	A3

4.1.2.2 Core

The core reapers for blockboard type drawing boards shall not exceed 20 mm in width, and shall conform to 5.2 of IS 1659 : 1979.

4.1.2.3 Veneers

For blockboards type of drawing boards, the grain direction of the veneers shall be perpendicular to the grain direction of the core materials. The top facing veneers shall not have any defects other than those permitted in 6.1 and 6.2 of IS 1328 : 1982. The bottom (back) veneer shall not have defects other than those permitted for Face 'A' in Table 2 of IS 303 : 1975.

4.1.2.4 Adhesive

The adhesive used and bonding shall conform to BWR or WWR Grades of IS 848 : 1974.

4.1.2.5 Lipping

The timber for lipping shall be fine-grained hardwood from the species of timber given under Class I of Appendix A of IS 303 : 1975. Lipping shall be done externally on all exposed edges of the blockboard to a maximum width of 10 mm and shall be jointed by adhesive specified in 4.1.2.4.

4.1.2.6 The blockboard used for the manufacture of drawing boards shall conform to the requirements of 7.1, 7.2, 7.3, 8.1 and 8.2 of IS 1659 : 1979.

4.2 Edge

The working edge shall be well seasoned, fine-grained hardwood, such as ebony (*Diospyros melanoxylon* Roxb. or *Diospyros* sp.) or rosewood (*Dalbergia latifolia* Roxb.), or of aluminium or plastic.

4.2.1 Where plastics material is used it shall be of sheet form, complying with following requirements:

- The material shall be homogeneous,
- The coefficient of expansion shall not be greater than 0.000 09 percent within the temperature range 0 to 60°C and relative humidity range 25 percent to 100 percent,

c) The material shall possess toughness, hardness and flexibility in sufficient degree to permit constant handling and use without deterioration, and

d) The material shall contain not more than 2 percent plasticizer.

4.3 The washers with slots shall be made of rolled brass sheet (see IS 410 : 1977); or copper sheet, and shall be 1.7 to 2.0 mm in thickness. The wood screws used shall be of brass (see IS 6760 : 1972).

5 CONSTRUCTION**5.1 Working Surface**

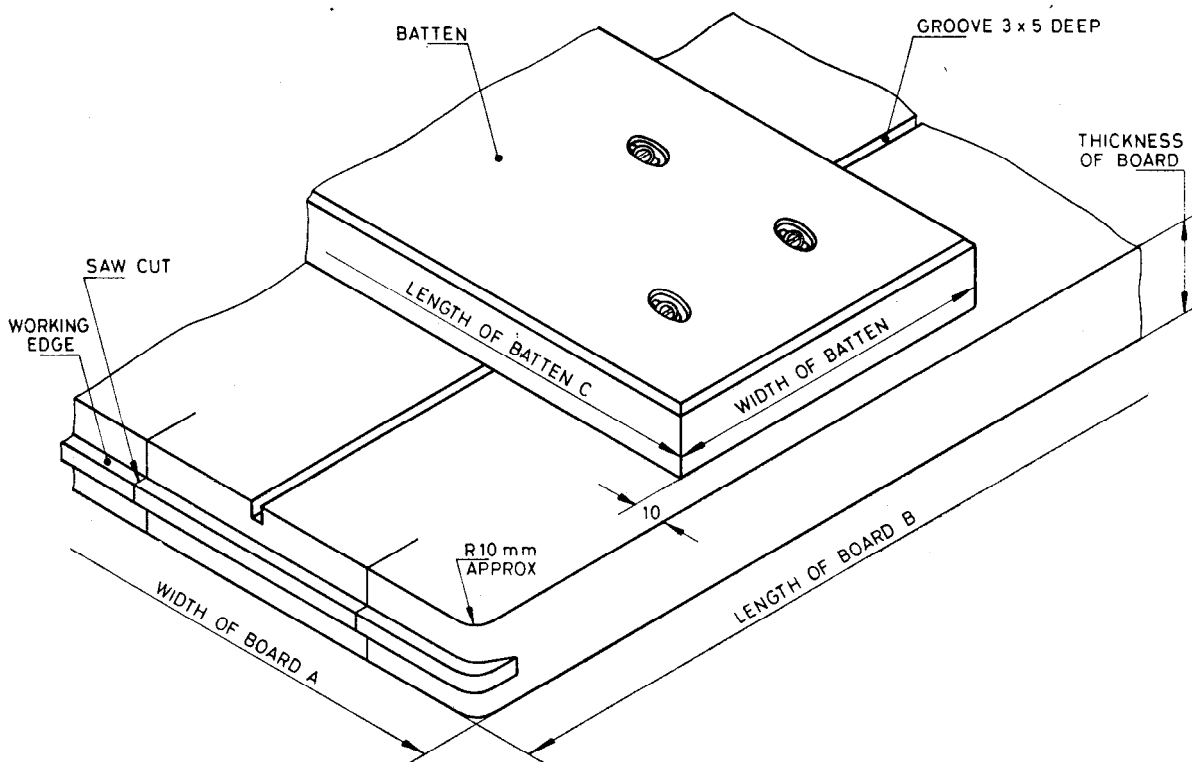
5.1.1 The boards shall have a smooth and true working surface. They shall not twist or bow by more than 1 mm. However, in case of drawing boards to be used on drafting machines, the twist or bow shall not exceed 2 mm.

5.1.2 In order to ensure a permanently true working surface, longitudinal grooves of 5 mm to 7 mm depth and 3 mm in width shall be cut at intervals of not more than 100 mm, at the back of the board, leaving the longitudinal strength practically unimpaired and taking the transverse strength out of the board so that the trueness of surface in this direction is controlled by the pair of wooden battens screwed to the back of the board (see Fig. 1).

5.1.3 The entire board shall be manufactured from the same species of timber (see 4.1). Pieces, 100 to 150 mm in width, shall be used in the construction of the board and the grain of the wood shall run along the length of the board. The pieces of wood shall be properly and permanently joined together by means of tongue and groove joints or butt joints and securely glued. The projection of the tongue and groove joints shall not exceed 3 mm.

5.1.4 The edges shall be trimmed square and the corners rounded to a radius of approximately 10 mm. Patching or stopping of defects shall not be resorted to.

5.1.5 The blockboard type drawing boards shall be mounted directly on the drafting machine without battens and fixing screws, specified in 5.3.1 and 5.3.2.



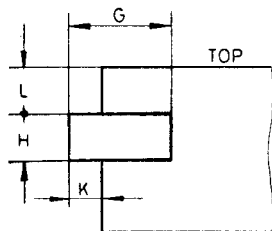
All dimensions in millimetres.

FIG. 1 DIMENSIONS FOR ENGINEERS' PATTERN DRAWING BOARD

5.1.6 When a steel straightedge, 1 m long and complying with the requirements of IS 2233 : 1962, is placed on a working surface, the surface shall not deviate from the straightedge by more than 1.5 mm, irrespective of the position of the straightedge on the surface.

5.2 Working Edge

5.2.1 A true working edge shall be provided by the insertion of a suitable strip (see 4.2) which shall be securely glued to the working end of the board. The dimensions and position of the strip shall be as specified in Fig. 2.



	Min	Max
G	12	15
H	5	7
K	4	5
L	5	7

All dimensions in millimetres.

FIG. 2 DIMENSIONS AND POSITION OF STRIP FOR TRUE WORKING EDGE

5.2.2 To admit of its contraction with the body of the board, the strip shall be saw-cut, after insertion, at points coinciding with the longitudinal grooves at the back of the board or located midway between them.

5.2.3 The edge shall be provided in all cases excepting when the drawing boards are fitted on drafting machines.

5.2.4 Opposite edges shall be parallel within a tolerance of ± 0.5 mm over each 1.0 m length of working edge.

5.2.5 When a steel straightedge, complying with the requirements of IS 2233 : 1962, is placed along a working edge, that edge shall not deviate from the straightedge by more than 0.25 mm over each 1 m length of the working edge.

5.3 Battens

5.3.1 Two battens, smoothly finished and with chamfered or rounded edges shall be fitted to the back of the board. The battens shall be 114^{+6}_0 mm wide in case of size D0, and 74^{+6}_0 mm wide in case of sizes D1, D2 and D3. The thickness of the battens shall be 20^{+5}_0 mm.

The length C of each battens shall be such that it leaves a margin of 10 mm on both edges of the board. They shall be fitted at a distance of 75 to 85 mm from the ends of the board by means of round-head wood screws of suitable length with oval and round washers.

5.3.2 The heads of the screws and the washers shall be housed in recesses below the surface of the battens in a zig zag way. The screw holes in battens and oval washers shall be slotted or elongated to allow for the expansion or contraction of the board. The end slotted holes shall be 25 mm clear from each end of battens and the others at equal intervals, clear of the grooves. Every intermediate plank shall be provided with one screw while the end planks shall be provided with two screws. While fixing the screws, joints and grooves shall be avoided.

6 DESIGNATION

6.1 The drawing boards shall be designated by their designation as given in Table 1 and the number of this standard. For example, a drawing board of designation D1, shall be designated as:

Drawing Board D1 IS 1444

7 FINISH

7.1 The edges of the board shall be coated with two coats of approved varnish.

8 MARKING

8.1 Each board shall be clearly and legibly marked on the back with the manufacturer's name or trademark and also the year of manufacture.

9 PACKING

9.1 In the absence of any specific agreement as to the mode of packing each board shall be properly protected to prevent damage of the working edge in transit and in storage.

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