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मानक

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IS 5169 (1986): Hacksaw Frames [PGD 6: Earth, Metal And Wood Working Hand Tools]



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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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*Indian Standard*  
**SPECIFICATION FOR  
 HACKSAW FRAMES**  
*( First Revision )*

**1. Scope** — Covers the requirements of hacksaw frames, manually operated, suitable for hacksaw blades conforming to IS : 2594-1977 'Specification for hacksaw blades ( first revision )'.

**2. Types**

- Type A — Open grip adjustable flat hacksaw frame
- Type B — Closed grip adjustable flat hacksaw frame
- Type C — Straight grip adjustable flat hacksaw frame
- Type D — Straight grip non-adjustable flat hacksaw frame
- Type E — Deep throat non-adjustable flat hacksaw frame
- Type F — Closed grip adjustable tubular hacksaw frame
- Type G — Closed grip non-adjustable tubular hacksaw frame

**3. Nomenclature** — Shall be as given in Fig. 1.

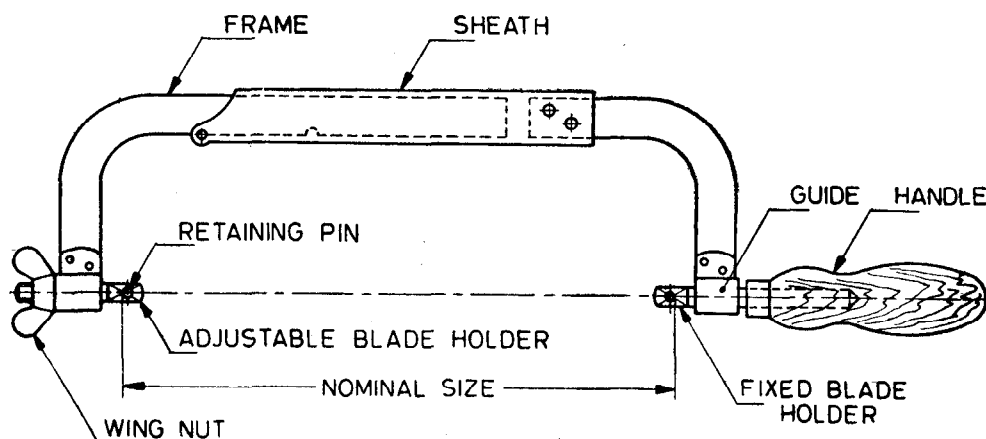


Fig. 1 NOMENCLATURE FOR HACKSAW FRAME

**4. Dimensions**

**4.1** Dimensions for hacksaw frames shall be as given in Tables 1 to 7.

**4.1.1** The illustrations given in Tables 1 to 7 are diagrammatic only and are not intended to illustrate the details of design.

**4.1.2** The retaining pin shall be of such a diameter as to fit in the holes of the hacksaw blades conforming to IS : 2594-1977.

TABLE 1 DIMENSIONS FOR TYPE A OPEN GRIP ADJUSTABLE FLAT HACKSAW FRAME  
( Clause 4.1 )

All dimensions in millimetres.

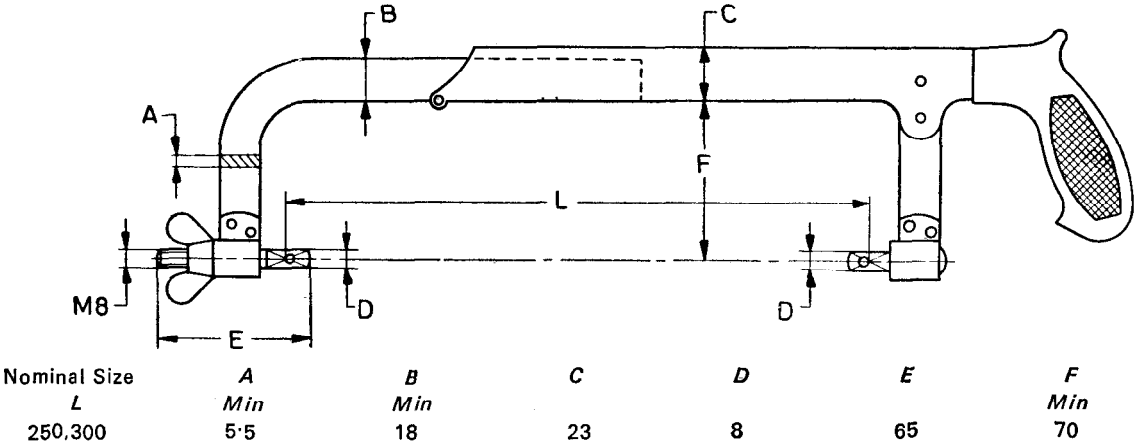


TABLE 2 DIMENSIONS FOR TYPE B CLOSED GRIP ADJUSTABLE FLAT HACKSAW FRAME  
( Clause 4.1 )

All dimensions in millimetres.

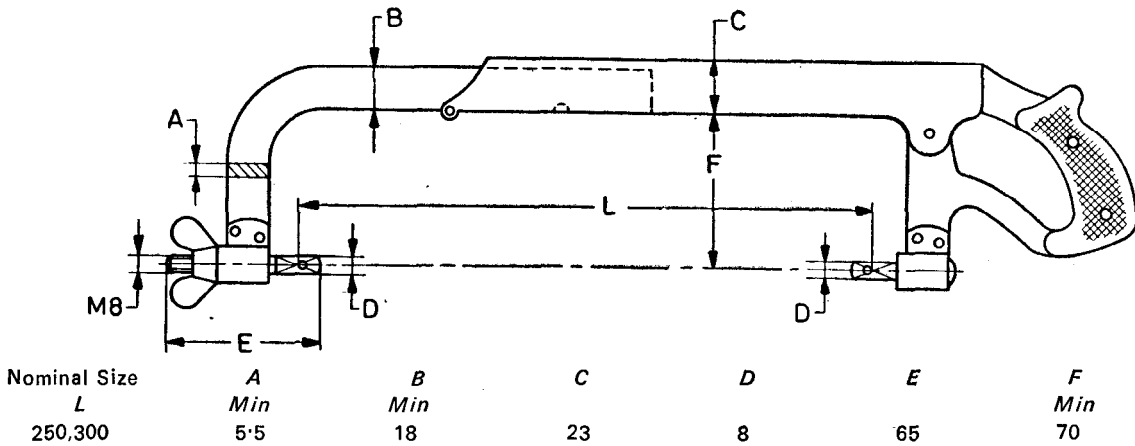
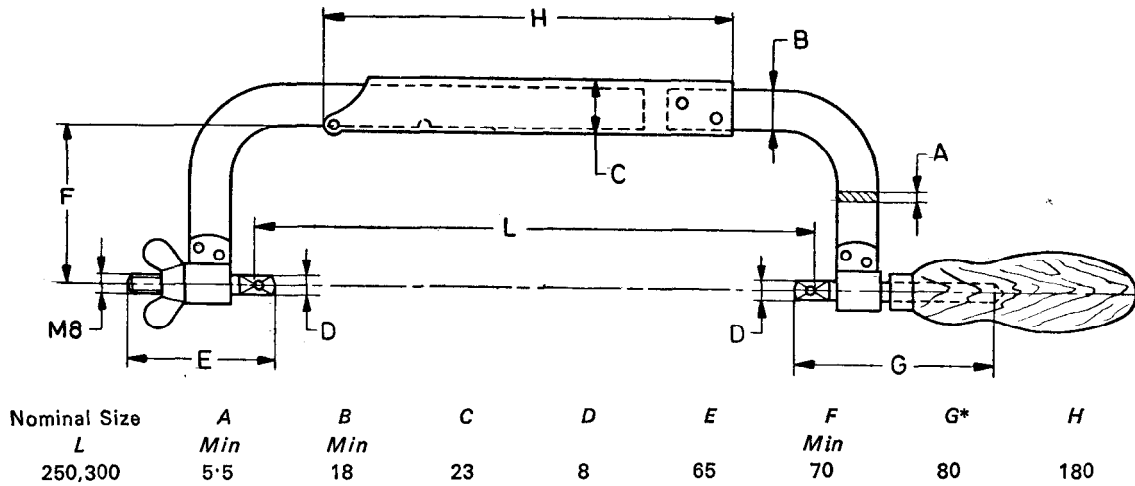


TABLE 3 DIMENSIONS FOR TYPE C STRAIGHT GRIP ADJUSTABLE FLAT HACKSAW FRAME  
( Clause 4.1 )

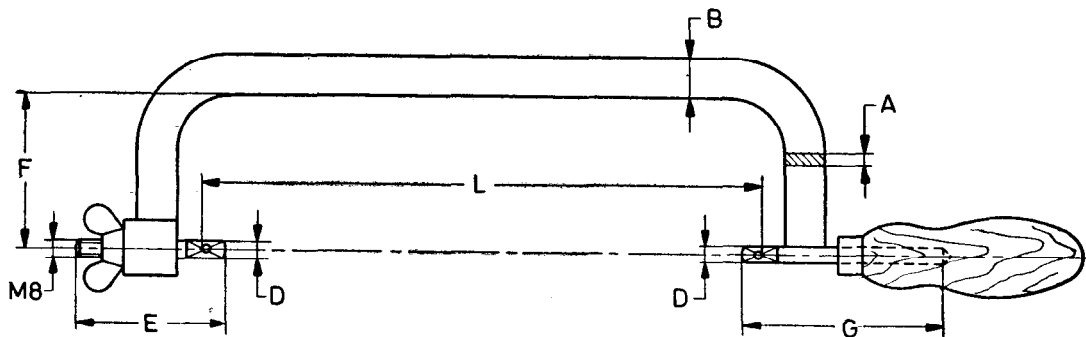
All dimensions in millimetres.



\*For guidance only.

TABLE 4 DIMENSIONS FOR TYPE D STRAIGHT GRIP NON-ADJUSTABLE  
FLAT HACKSAW FRAME  
( Clause 4.1 )

All dimensions in millimetres.

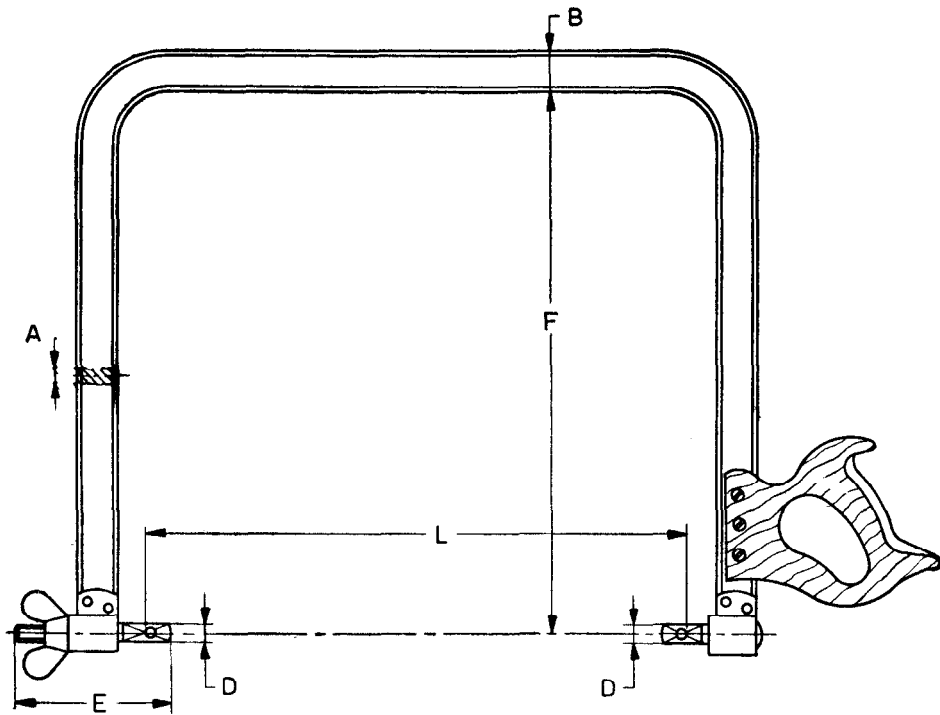


Nominal Size	A	B	D	E	F	G*
L	Min	Min			Min	
250	5.5	18	8	65	70	80
300	5.5	18	8	65	70	80

\*For guirdance only.

TABLE 5 DIMENSIONS FOR TYPE E DEEP THROAT NON-ADJUSTABLE FLAT  
HACKSAW FRAME  
( Clause 4.1 )

All dimensions in millimetres.

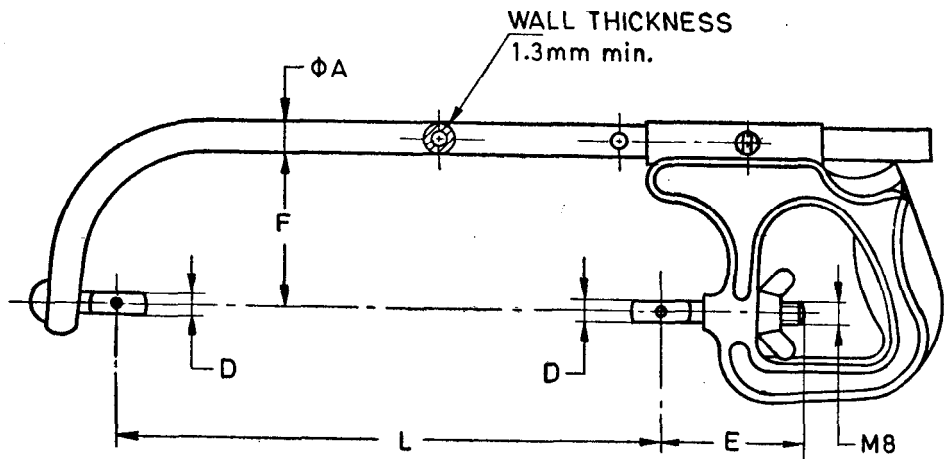
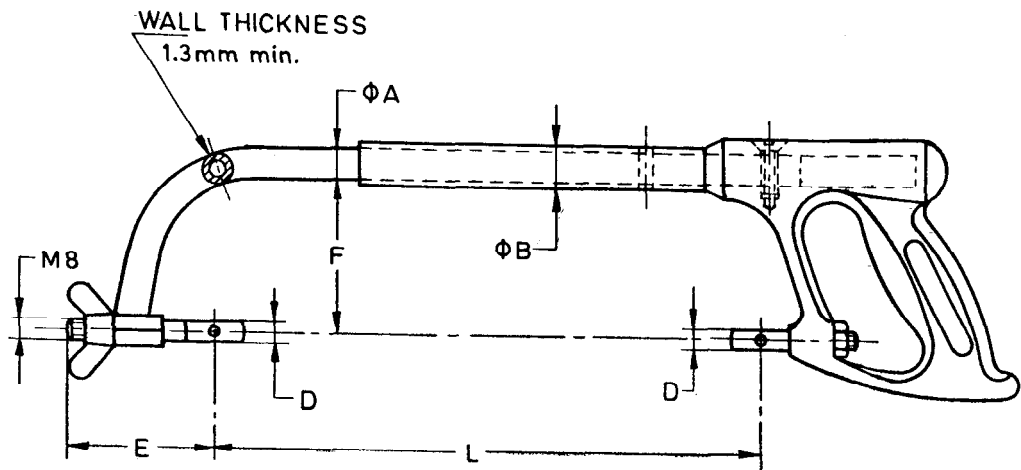


Nominal Size	A	B	D	E	F
L	Min	Min			Min
250	5.5	18	8	65	250
300	5.5	18	8	65	250

TABLE 6 DIMENSIONS FOR TYPE F CLOSED GRIP ADJUSTABLE TUBULAR HACKSAW FRAME

( Clause 4.1 )

All dimensions in millimetres.

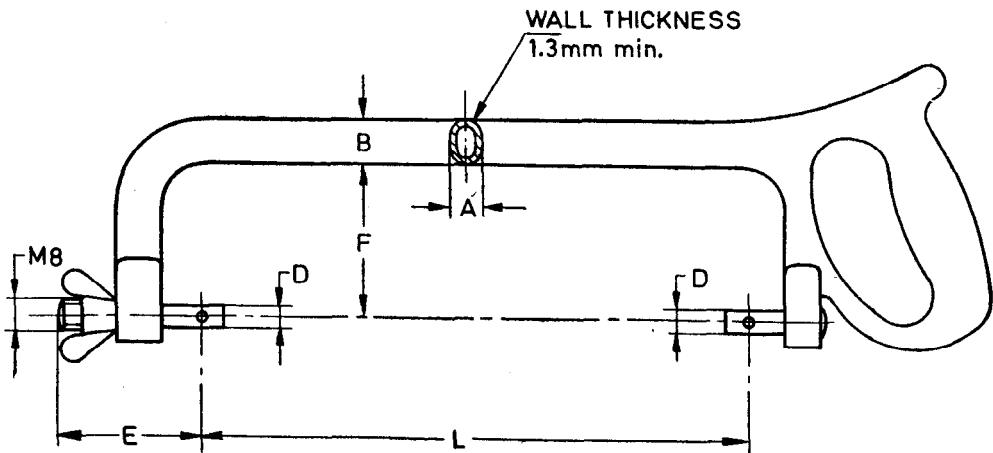


Nominal Size	A	B	D	E	F
L	Min	Min			Min
250,300	15	20	8	65	70

TABLE 7 DIMENSIONS FOR TYPE G CLOSED GRIP NON-ADJUSTABLE TUBULAR HACKSAW FRAME

( Clause 4.1 )

All dimensions in millimetres.



Nominal Size	A	B	D	E	F
L	Min	Min			Min
250	15	20	8	65	70
300	15	20	8	65	70

## 5. Material

**5.1** The component parts of the hacksaw frames shall be manufactured from suitable materials which fulfil the requirements laid down in 8. Some of the suitable materials for this purpose are given below :

<i>Part</i>	<i>Material</i>
Frame	Fe 330 of IS : 1570 (Part 1)-1978 'Steel specified by tensile and/or yield properties ( <i>first revision</i> )'
Sheath and guides	5C4 of IS : 1570 (Part 2)-1979 'Carbon steels (unalloyed steels) ( <i>first revision</i> )'
Adjustable and fixed blade holders	35C4 of IS : 1570 (Part 2)-1979
Retaining pins	T50 of Schedule VI of IS : 1570-1961 'Schedules for wrought steels for general engineering purposes'.

**5.1.1** The wing nuts shall conform to IS : 2636-1972 'Specification for wing nuts (*first revision*)'.

**5.2 Handles** — The handles for Types A, B, F and G hacksaw frames shall be manufactured from flat pressed steel sheet, malleable cast iron, aluminium alloy or of composition material, such as hard rubber and plastics.

The handles for Types C and D hacksaw frames shall be manufactured from suitable tough hardwood, whereas for Type E hacksaw frames these shall be manufactured from composition material or any suitable tough, thoroughly seasoned and clear straight grained hardwood.

**5.2.1** The handles manufactured from wood shall conform to Class 5 of IS : 620-1975 'General requirements for wooden tool handles (*third revision*)'.

**6. Designation** — The hacksaw frames shall be designated by commonly used name, type, size and number of this standard.

*Example :*

A non-adjustable flat hacksaw frame of Type E and of 250 mm nominal size shall be designated as :

Non-adjustable Flat Hacksaw Frame, E 250, IS : 5169

An adjustable tubular hacksaw frame of Type F and of 250-300 mm nominal size shall be designated as :

Adjustable tubular Hacksaw Frame, F 250-300, IS : 5169

## 7. Workmanship and Finish

**7.1** All frames shall be provided with hand adjustment for regulating and producing correct blade tension and shall maintain the initial tension adjustment.

**7.2** Blade holders shall hold the blade rigidly and in true alignment with centre line of the frame. Blade bearing surfaces shall be smoothly finished to provide a flat bearing surface for the blade.

**7.3** The handles of Types A, B, F and G frames when manufactured from sheet steel, shall have a continuous weld over the entire length of seams and edges of the handle-grip section. The welding shall be finished smooth. The handle-grip section of the handles shall be knurled or pressed to provide a secure gripping surface.

**7.4** The component parts of the hacksaw frames shall be finished smooth and further suitable anti-corrosive coating, like chromium plating, nickel plating, cadmium plating, zinc plating or painting, or a combination of these, shall be applied to avoid rust.

## 8. Tests

**8.1 Tension Load Test** — Shallow centre punch marks shall be applied on both ends of the frame, preferably just above the guides. The distance between these two punch marks shall be measured while the frame is subjected to the initial tension load of 9 kgf. The contraction of the frame shall not be more than 6 mm when the tension is increased to 110 kgf in case of Types A, B, C, D, F and G hacksaw frames and 90 kgf in case of Type E hacksaw frames. There shall be no permanent set when the load is decreased to the initial tension load of 9 kgf. If the frame shows a permanent set



less than 1.5 mm, the test shall be repeated once again. After the second test, if the frame shows no further permanent set, it shall be considered to have met the test satisfactorily. Adjustable frames shall be set to maximum blade capacity when subjected to this test and care shall be exercised to see that the loads are applied to the blade holders.

**8.1.1** The apparatus shown in Fig. 2 may be employed for the test. It consists chiefly of an angle iron, a notched bar and a weight. The angle iron and the bar are held together by means of a pin at C. The holes,  $F_1$  and  $F_2$  are 300 mm apart (when bar is in horizontal position) and are directly in line with each other. The distance between C and  $F_2$  is 50 mm. The tension load between blade holders is computed by dividing the product of arm length and load at D by 50. The arm length is the distance from C to the load attached on the bar at D.

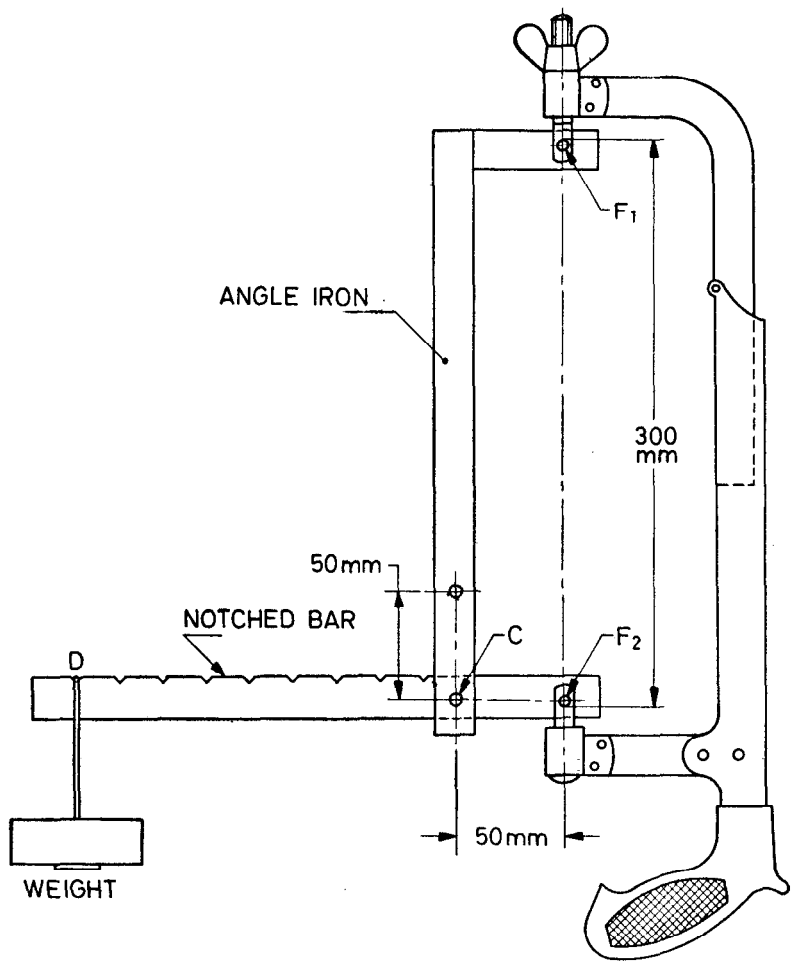


FIG. 2 TENSION LOAD TEST SET UP

**8.2** The handles, if made of composition material, shall successfully withstand the following tests.

**8.2.1 Impact test** — The frames shall be held with its handle downward and dropped on a concrete floor or slab from a height of 3 metres. After impact, there shall be no flaking off or breakage of the handle.

**8.2.2 Heat-distortion test** — The handle of the frame shall be completely immersed in water heated to approximately 70°C, for a period of 30 minutes. At the end of this period, the sample shall be removed from the water and it shall show no significant signs of distortion or blistering.

**9. Marking** — The hacksaw frames shall be marked with type, manufacturer's name or trade-mark and year of manufacture.

**9.1 ISI Certification Marking** — Details available with the Indian Standards Institution.

**10. Sampling**

**10.1** Unless otherwise agreed to between the manufacturer and the purchaser the sampling plan

and criteria for conformity, shall be as in IS : 2500 ( Part 1 )-1973 'Inspection by attributes and by count of defects ( *first revision* )'.

**10.2** For dimensions as well as workmanship and finish a sampling plan with inspection level II and AQL of 1.5 percent as given in Tables 1 and 2 of IS : 2500 ( Part 1 )-1973 shall be followed.

**10.3** For tension load test a sampling plan with inspection level I as given in Table I of IS : 2500 ( Part 1 )-1973 shall be followed. If any frame in the samples fails to meet the requirement of this characteristic, the lot shall be declared defective.

**10.4** If the lot is found satisfactorily according to **10.2** and **10.3** then 3 samples from each lot of 200 frames or parts thereof shall be selected and divided into three groups of equal size. The frames belonging to each group shall be subjected to impact test, heat distortion test and flammability test. The lot shall be declared conforming to the requirements of this specification if all the frames tested for the above mentioned tests are found conforming to the relevant requirements.

## **EXPLANATORY NOTE**

This standard was first issued in 1969. This revision has been taken up in order to include the tubular types of hacksaw frames. Miniature hacksaw frames suitable for 150 mm blades are not included in this specification. These are being covered in a standard separately.

While preparing this specification, considerable assistance has been derived from the details received from the leading manufacturers, and also from the following documents :

DIN 6473-1973 Hand saws for metal, hacksaw frames, issued by Deutsche Institute für Normenausschuss.

GGG-F-671 b Frame, hand hacksaw, frame, jewellers saw, and frame copying saw, issued by Federal Supply Services, USA.