

**SRI LANKA STANDARD 354:1975**

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**METHOD OF  
IZOD IMPACT TEST FOR STEEL**

**BUREAU OF CEYLON STANDARDS**



# METHOD OF IZOD IMPACT FOR STEEL

SLS 354 : 1975

Gr. 5

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Sri Lanka.

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*This Standard does not purport to include all the necessary provisions of a contract.*

# SRI LANKA STANDARD

## METHOD OF IZOD IMPACT FOR STEEL

### FOREWORD

This Sri Lanka Standard Method of Test has been prepared by the Drafting Committee on Steel. It was approved by the Civil Engineering Divisional Committee of the Bureau of Ceylon Standards and was authorised for adoption and publication by the Council of the Bureau on 1975-07-02.

This standard is one of the Sri Lanka Standards on Methods of Impact Test. The other standard is SLS 355 Method of Charpy Impact (U-Notch) Test.

This standard is based on ISO Recommendation ISO-R 84 Izod Impact Test for Steel. All values given in this standard are in metric units.

### 1 SCOPE

This Sri Lanka Standard covers the test requirements and procedure of the Izod Impact Test.

### 2 PRINCIPLE OF TEST

The test consists in breaking by one blow from a swinging hammer, under conditions defined hereafter, a notched test piece, gripped vertically, with the bottom of the notch in the same plane as the upper face of the grips. The blow is struck on the same face as the notch at a fixed position. The energy absorbed is determined and



TABLE 1 - Tolerances on specified dimensions

Designation	Nominal dimensions	Machining tolerances	
		Values	ISA symbols
Minimum length:			
single-notch	75 mm		
two-notch	100 mm		
three-notch	130 mm		
Thickness	10 mm	± 0.11 mm	j 13
Width	10 mm	± 0.11 mm	j 13
Angle of notch	45°	± 2°	-
Depth below notch	8 mm	± 0.045 mm	j 11
Distance of notch from end of test piece and from adjacent notch	28 mm	± 0.42 mm	j 15
Angle between plane of symmetry of notch and the longitudinal axis of the test piece	90°	± 2°	-

Dimensions in millimetres

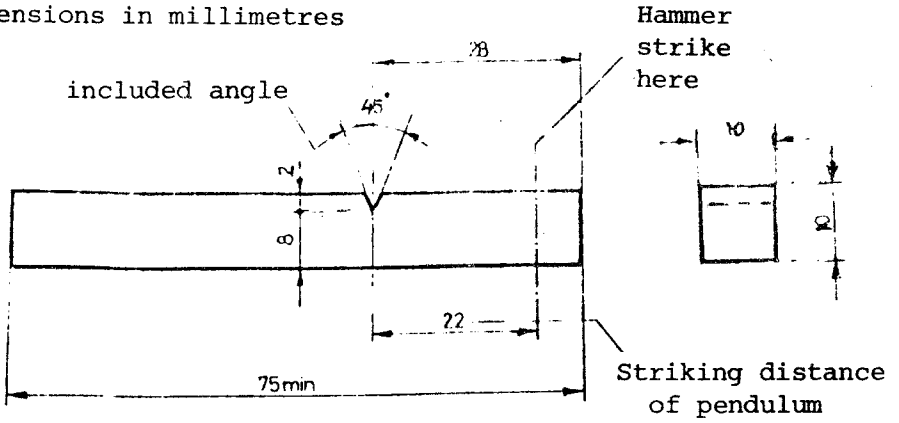


FIG. 1 Single-notch square test piece

Dimensions in millimetres

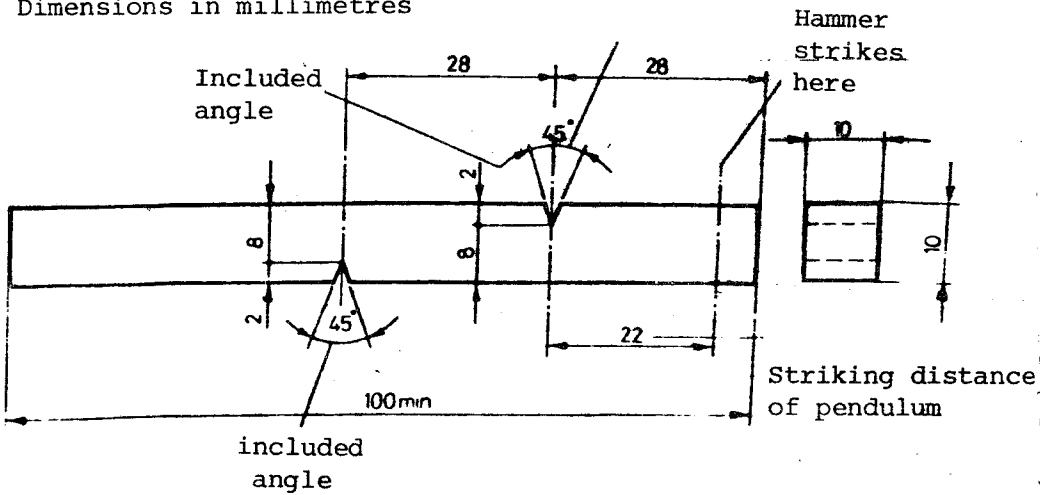


FIG. 2 Two-notch square test piece



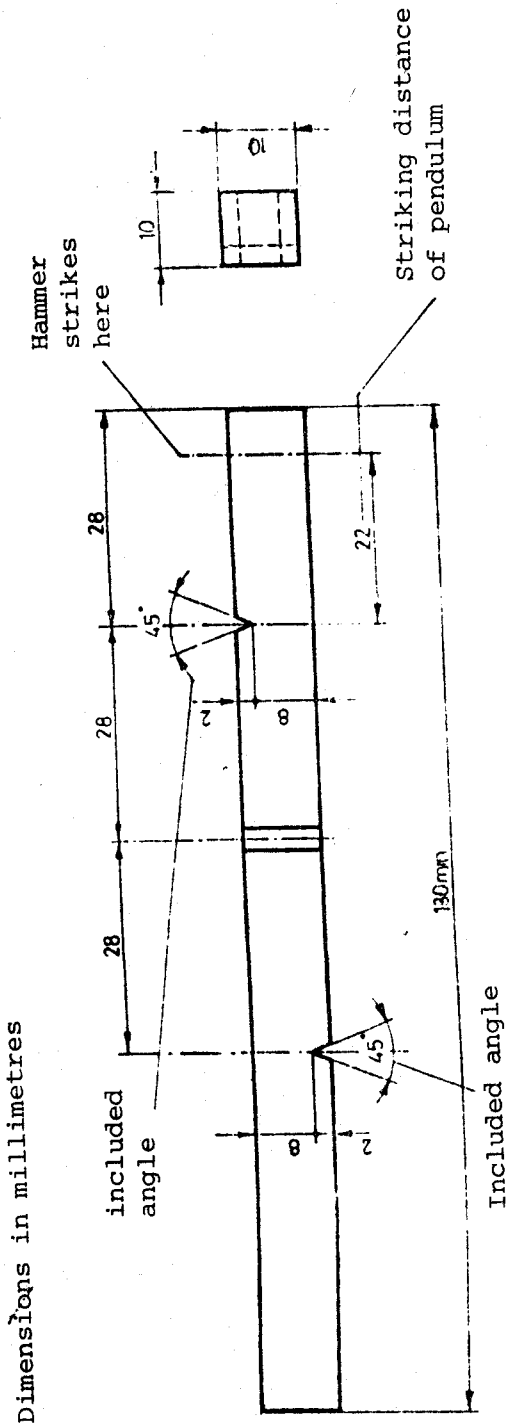
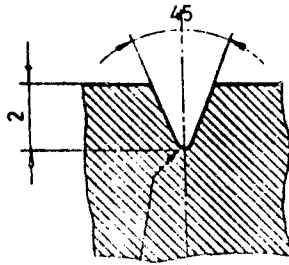


FIG. 3 Three-notch square test piece

Dimensions in millimetres



Root radius  
0.25

FIG. 4 Enlarged view of notch for square test piece

Dimensions in millimetres

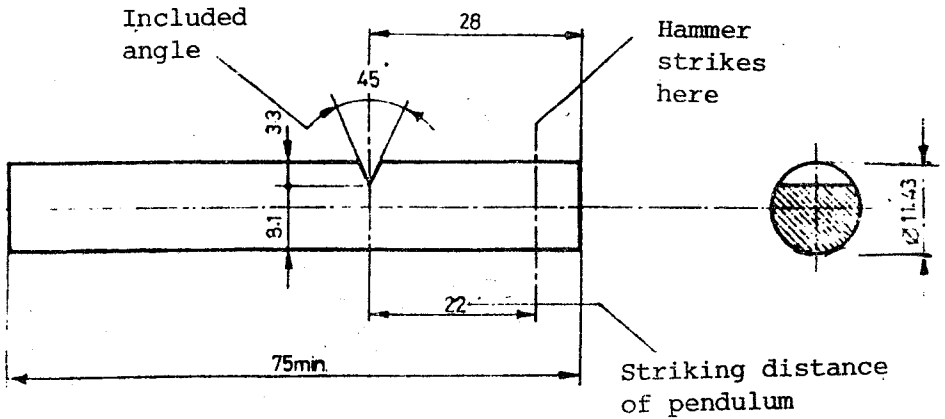


FIG. 5 Single-notch round test piece

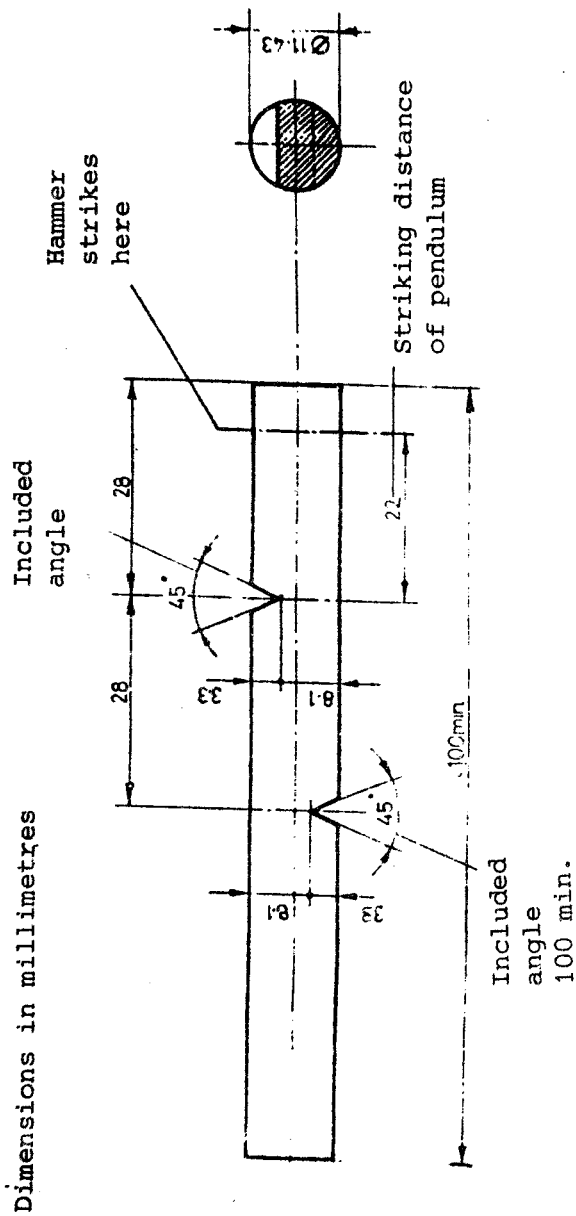


FIG. 6 Two-notch round test piece

Dimensions in millimetres

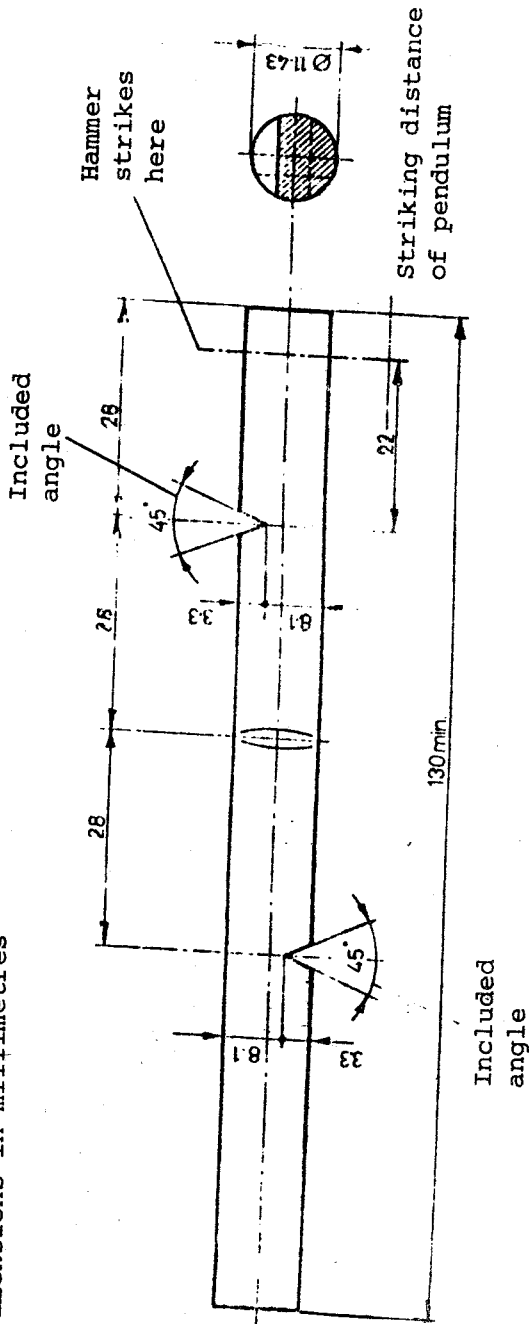


FIG. 7 Three-notch round test piece

TABLE 2 Tolerances on specified dimensions

Designation	Nominal dimension	Machining tolerance	
		Values	ISA symbols
Minimum length: single-notch two-notch three-notch	76.2 mm ( 3 in) 104.1 mm ( 4.1 in) 132.1 mm (5.2 in)		
Diameter	11.43 mm (0.45 in)	$\pm 0.14$ mm ( $\pm 0.005$ in)	j 13
Angle of notch	45°	$\pm 2^\circ$	-
Depth below notch	8.128 mm (0.32 in)	$\pm 0.045$ mm ( $\pm 0.002$ in)	j 11
Distance of notch from end of test piece and from adjacent notch	27.94 mm (1.1 in)	$\pm 0.42$ mm ( $\pm 0.018$ in)	j 15
Angle between plane of symmetry of notch and longitudinal axis of test piece	90°	$\pm 2^\circ$	-

3.6.1 The tolerances given in Table 2 are permitted.

#### 4 TESTING MACHINE

4.1 The testing machine is constructed and installed steady and rigid.

4.1.1 The conditions given in Table 3 should be satisfied.

4.1.2 The mass of the anvil and its foundation is at least 40 times the mass of the hammer.

4.1.3 The plane of swing of the hammer is vertical. The machine is constructed so that the loss of energy (such as from translation, rotation or vibration) in the machine framework during a test is negligible.

4.1.4 The centre of percussion is at the point of impact of the hammer.

4.1.5 The accuracy of the graduation of the scale of the machine is  $\pm 0.14$  kgf m ( $\pm 1$  lbf ft).

4.1.6 In addition, the machine should satisfy the conditions stated in Figures 9 and 10.

*NOTE - The following relationships have been used for the conversion of metric units into foot and pound units.*

$1 \text{ kgf m} = 7.233 \text{ lbf ft}$

$1 \text{ ft} = 0.3048 \text{ m}$

$1 \text{ lbf ft} = 0.138 \text{ kgf m}$

$1 \text{ lb} = 0.4536 \text{ kg}$

#### 5 TEST REQUIREMENTS

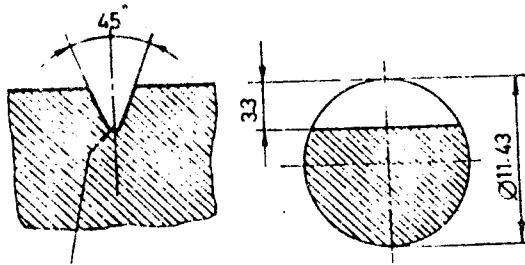
5.1 The longitudinal axis of the test piece should lie in the plane of swing of the centre of gravity of the hammer.

5.2 The notch should be positioned so that its plane of symmetry coincides with the top face of the grips.

TABLE 3 Characteristics of testing machine

Designation	Metric units	Foot and pound units
Distance between base of notch (top of grips) and point of specimen hit by striker (L of Fig. 9)	22 mm $\pm$ 0.5 mm	0.822 in $\pm$ 0.020 in
Angle between top face of grips and face holding the specimen vertical	90°	90°
Angle at tip of hammer	75°	75°
Angle between normal plane to specimen and underside face of hammer at striking point	10°	10°
Speed of hammer at impact	3 to 4 m/s	9.8 to 13.1 ft/s
Striking energy	16.56 kgf m $\pm$ 0.34 kgf m	120 lbf ft $\pm$ 2.5 lbf ft

Dimensions in millimetres



Root radius

FIG. 8 Enlarged view of notch for round test piece

Dimensions in millimetres

NOTE - Dimensions  $a, b, c, d, e, f, g, k$  and  $P$  and the angles  $\theta$  and  $\phi$  should be obtained from the actual grips in the machine. The dimension should be checked and, if necessary corrected to make  $L = 22$  mm.

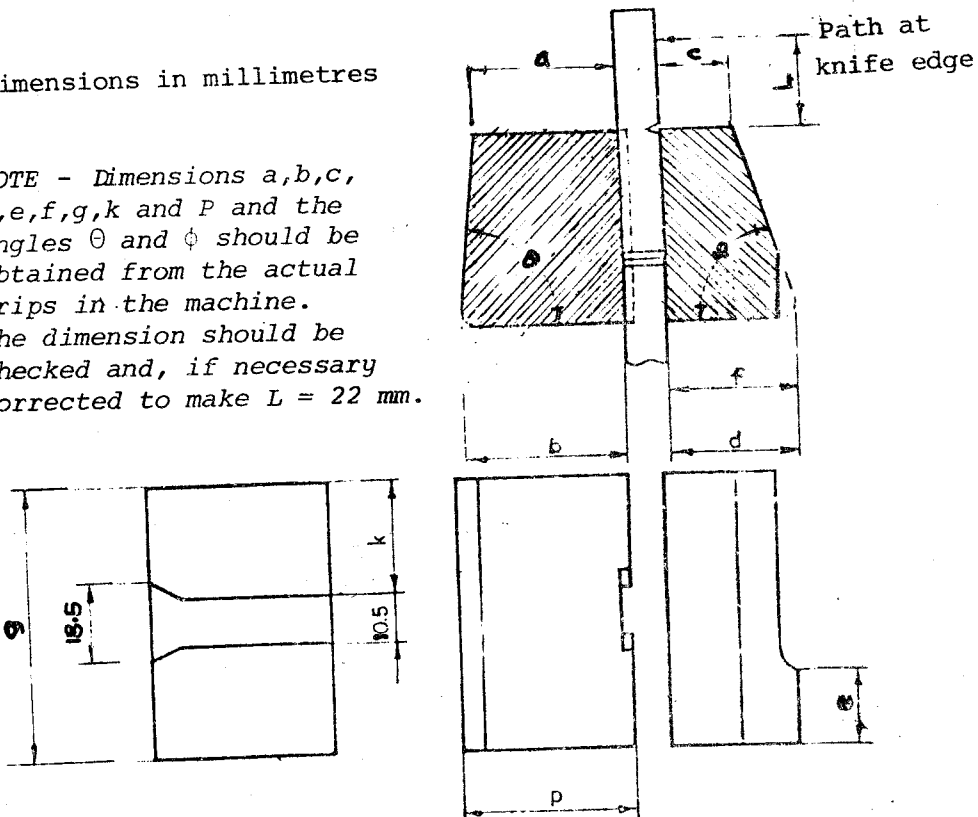


FIG. 9 View of grips and mode of assembly for testing square specimens



Dimensions in millimetres

NOTE - See Figure 9 and note for dimensions a, b, c, etc. Slot for gauge setting test piece notch parallel to knife edge with top of vice.

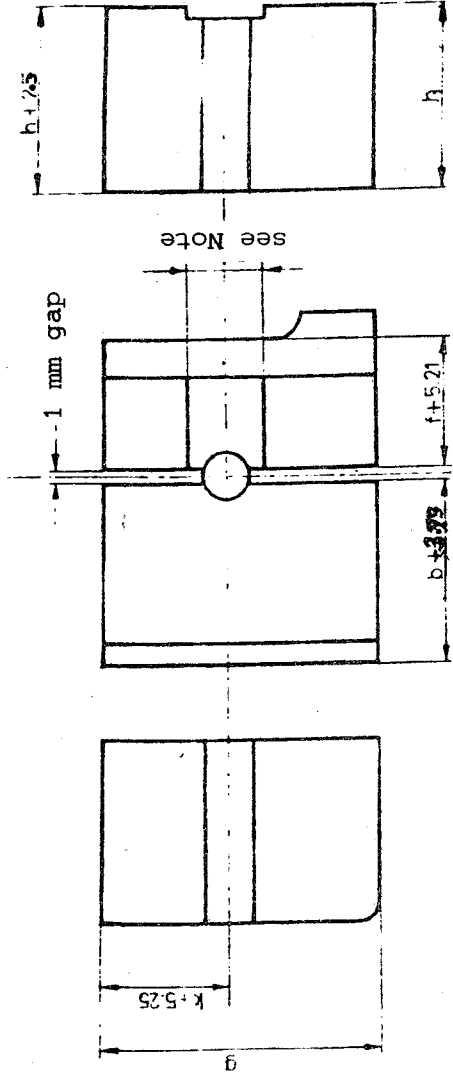
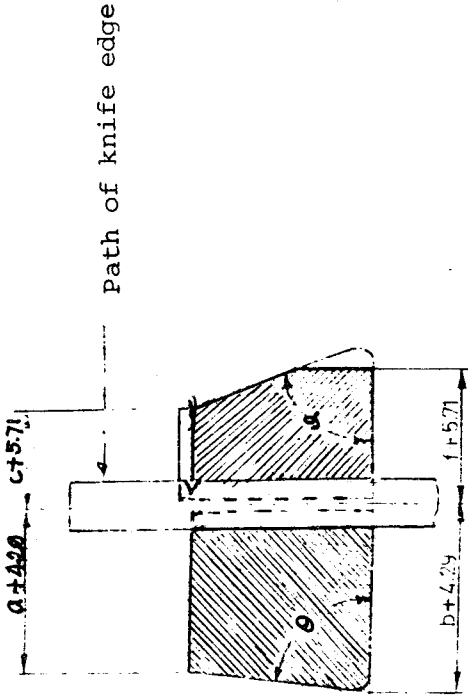


FIG. 10 View of grips and mode of assembly for testing round specimens

5.3 The notch should be at right angles to the plane of swing of the centre of gravity of the hammer. This is ensured by the form of the test piece and the method of grip.

5.3.1 The test piece should be gripped tightly in the anvil grips.

5.4 During testing of the two and three-notch pieces, the material remaining for testing after each test should be examined to ensure that the correct length of test piece is available above the next notch, and any undesirable deformed metal should be removed to ensure that the form and length of the test piece are correct before further testing

5.5 The impact value is quoted in foot-pounds-force or kilogrammes-force-metre (1 kgf m is equivalent to 7.233 ft lbf).

5.6 The temperature of the test piece at the moment of breaking should not differ from the specified temperature by more than  $\pm 2^{\circ}\text{C}$ , unless some other tolerance is agreed. If the temperature of testing is not specified, it should be taken as  $20^{\circ}\text{C}$  in temperate climates and  $27^{\circ}\text{C}$  in tropical climates, subject in each case to the above tolerance. In all cases the temperature of test is to be recorded.

5.7 If, during the test, the test piece is not completely broken, the impact value obtained is indefinite. The test report should state that the test piece was unbroken by  $x \text{ kgf m/cm}^2$  (ft lbf/in<sup>2</sup>).

*NOTE - There is no general process for converting the impact values, obtained by one method of test, into those which would be obtained by another method of test.*

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