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IS 1173 (1978): Hot rolled and slit steel tee bars [CED 7: Structural Engineering and structural sections]



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IS : 1173 - 1978
(Reaffirmed 1988)

Indian Standard

**SPECIFICATION FOR
HOT ROLLED AND SLIT STEEL TEE BARS**

(Second Revision)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR HOT ROLLED AND SLIT STEEL TEE BARS

(Second Revision)

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Indian Standard
SPECIFICATION FOR
HOT ROLLED AND SLIT STEEL TEE BARS
(*Second Revision*)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 10 April 1978, after the draft finalized by the Structural Sections Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 This standard was first published in 1957 covering a wide range of hot rolled and slit tee bars and was revised in 1967, which covered slit tee bars to be produced by slitting some of the Indian Standard light weight, medium weight and H-beam sections conforming to IS : 808-1964*.

0.2.1 In this revision Indian Standard provisional slit medium weight tee bars have been deleted since the Indian Standard provisional medium weight beam sections have been regularized as Indian Standard medium weight sections with slight modifications in their dimensions and have now been covered in IS : 808 (Part I)-1973†. The dimensions of Indian Standard slit medium weight tee bars have been modified to bring them in line with IS : 808 (Part I)-1973†. The geometrical properties have been expressed in SI units.

0.3 In the preparation of this standard, the Sectional Committee has kept in view the manufacturing and trade practices followed in the country in this field.

0.4 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 or analysis, shall be rounded off in accordance with IS : 2-1960‡. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Specification for rolled steel beam, channel and angle sections (*revised*).

†Dimensions for hot rolled steel beams: Part I MB series (*second revision*).

‡Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard lays down the nominal dimensions, weight and basic sectional properties of hot rolled and slit steel tee bars.

2. DEFINITIONS

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Y-Y Axis — A line passing through the centre of gravity of the profile of the section, parallel to the axis of the web of the section.

2.2 X-X Axis — A line passing through the centre of gravity of the profile of the section and at right angles to the Y-Y axis.

3. SYMBOLS

3.1 Letter symbols used in this standard have been indicated in Fig. 1, Fig. 2 and Table 1. Other letter symbols used in the standard have the meaning indicated against each as given below:

a = Sectional area in sq cm

w = Calculated weight in kg/m = (0.785 a)

C_{xx} = Distance of centre of gravity from top of flange

I_{xx} = Moment of inertia about the X-X axis

I_{yy} = Moment of inertia about the Y-Y axis

e_{xx} = Distance of extreme fibre from the X-X axis

e_{yy} = Distance of extreme fibre from Y-Y axis

$Z_{xx} = \frac{I_{xx}}{e_{xx}}$ = Modulus of section about the X-X axis

$Z_{yy} = \frac{I_{yy}}{e_{yy}}$ = Modulus section about the Y-Y axis

$r_{xx} = \sqrt{\frac{I_{xx}}{a}}$ = Radius of gyration about the X-X axis

$r_{yy} = \sqrt{\frac{I_{yy}}{a}}$ = Radius of gyration about the Y-Y axis

D = The angle between the web and flange of the section, in degrees.

4. CLASSIFICATION

4.1 Indian Standard Hot-rolled Steel Tee Bars may be classified as follows:

- a) Indian Standard Rolled Normal Tee Bars (ISNT),
- b) Indian Standard Rolled Deep Legged Tee Bars (ISDT),

- c) Indian Standard Slit Light Weight Tee Bars (ISLT),
 d) Indian Standard Slit Medium Weight Tee Bars (ISMT), and
 e) Indian Standard Slit Tee Bars from H-Sections (ISHT).

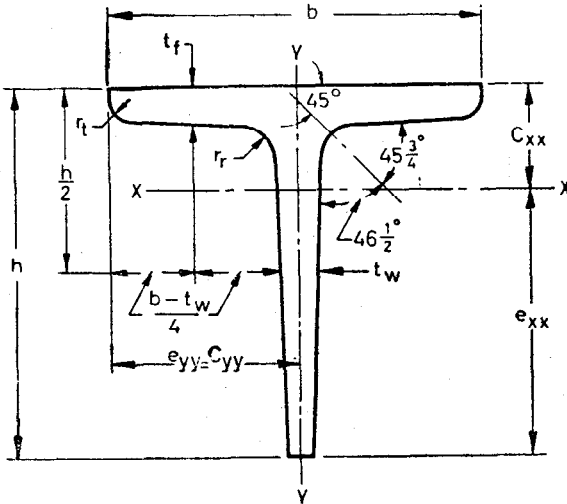


FIG. 1 ROLLED NORMAL TEE BAR (ISNT)

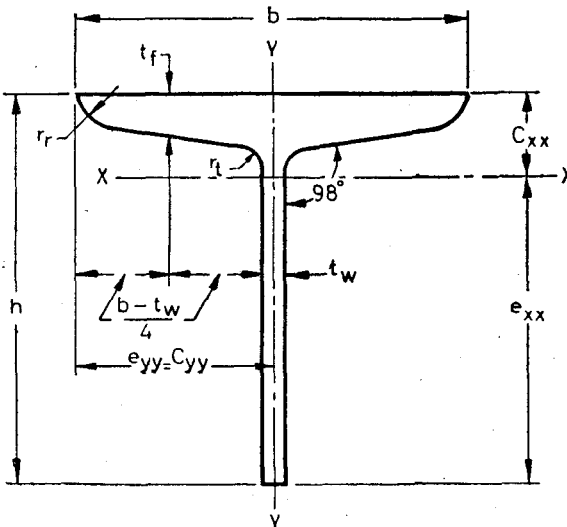


FIG. 2 SLIT TEE BAR AND DEEP LEGGED TEE BAR

IS : 1173 - 1978

4.2 For shop marking and drawing office purposes, the following abbreviated reference symbols may also be permitted provided specific understanding exists between the fabricator, the producer and the drawing office that members designated by these symbols refer only to Indian Standard Sections:

<i>Classification</i>	<i>Abbreviated Reference Symbols</i>
ISNT	NT
ISDT	DT
ISLT	LT
ISMT	MT
ISHT	HT

5. DIMENSIONS AND PROPERTIES

5.1 Nominal dimensions and weight of Indian Standard Tee Bars shall be as given in Table 1.

5.2 The tolerances on the dimensions shall be as specified in IS : 1852-1973*.

*Rolling and cutting tolerances for hot-rolled steel products (*second revision*).

TABLE 1 NOMINAL DIMENSIONS, WEIGHT AND GEOMETRICAL PROPERTIES OF INDIAN STANDARD TEE BARS

(Clauses 3.1 and 5.1)

DESIGNATION	WEIGHT (<i>w</i>)	SECTIONAL AREA (<i>a</i>)	SIZE (NOMINAL) (<i>h</i> × <i>b</i>)	THICK- NESS OF WEB (<i>t_w</i>)	THICK- NESS OF FLANGE (<i>t_f</i>)	RADIUS AT ROOT (<i>r_r</i>)	RADIUS AT TOE (<i>r_t</i>)	SLOPE OF FLANGE (<i>D</i> °)	CENTRE OF GRAVITY POSITION (<i>C_{xx}</i>)	MOMENTS OF INERTIA		RADIUS OF GYRATION		MODULI OF SECTION	
										<i>I_{xx}</i>	<i>I_{yy}</i>	<i>r_{xx}</i>	<i>r_{yy}</i>	<i>Z_{xx}</i>	<i>Z_{yy}</i>
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	kg/m	mm ²	mm × mm	mm	mm	mm	mm		mm	10 ⁶ mm ⁴	10 ⁶ mm ⁴	mm	mm	10 ³ mm ³	10 ³ mm ³
Indian Standard Normal Tee Bars															
ISNT 20	1.1	145	20 × 20	4.0	4.0	4.0	3.0		6.0	0.005	0.002	5.8	4.1	0.3	0.2
ISNT 30	1.8	226	30 × 30	4.0	4.0	5.0	3.5		8.2	0.018	0.008	8.9	5.9	0.8	0.5
ISNT 40	3.5	445	40 × 40	6.0	6.0	5.5	4.0		11.4	0.061	0.029	11.8	8.1	2.1	1.5
ISNT 50	4.4	566	50 × 50	6.0	6.0	6.0	4.0		13.5	0.123	0.057	14.7	10.1	3.4	2.3
ISNT 60	5.4	685	60 × 60	6.0	6.0	6.5	4.5	(See Fig. 1)	15.6	0.214	0.097	17.7	11.9	4.8	3.2
ISNT 75	10.0	1 270	75 × 75	9.0	9.0	8.0	5.5		20.4	0.620	0.292	22.1	15.2	11.4	7.8
ISNT 100	14.9	1 900	100 × 100	10.0	10.0	9.0	6.0		26.2	1.64	0.768	29.4	20.1	22.2	15.4
ISNT 150	22.7	2 890	150 × 150	10.0	10.0	10.0	7.0		36.1	5.41	2.50	43.3	29.4	47.5	33.4
Indian Standard Deep Legged Tee Bars															
ISDT 100	8.1	1 040	100 × 50	5.8	10.0	8.0	4.0	98°	30.3	0.990	0.096	30.9	9.6	14.2	3.8
ISDT 150	15.7	2 000	150 × 75	8.0	11.6	9.0	4.5	98°	47.5	4.50	0.370	47.5	13.6	43.9	9.9
Indian Standard Slit Light Weight Tee Bars*															
ISLT 200	28.4	3 620	200 × 165	8.0	12.5	16.0	8.0	98°	47.8	12.7	3.58	59.2	31.5	83.3	43.4
ISLT 250	37.5	4 780	250 × 180	9.2	14.1	17.0	8.5	98°	64.0	27.7	5.32	76.2	33.4	149.2	59.1
Indian Standard Slit Medium Weight Tee Bars†															
ISMT 50	5.8	735	50 × 70	4.5	7.5	9.0	4.5	98°	10.4	0.108	0.177	12.1	15.5	2.7	5.05
ISMT 62.5	6.7	850	62.5 × 70	5.0	8.0	9.0	4.5	98°	13.9	0.218	0.192	16.5	15.1	4.4	5.50
ISMT 75	7.5	955	75 × 75	5.0	8.0	9.0	4.5	98°	17.3	0.412	0.234	20.8	15.7	7.1	6.25
ISMT 87.5	9.8	1 240	87.5 × 85	5.8	9.0	10.0	5.0	98°	20.6	0.756	0.384	24.7	17.6	11.3	9.00
ISMT 100	12.7	1 620	100 × 100	5.7	10.8	11.0	5.5	98°	21.3	1.16	0.750	26.8	21.5	14.7	15.0
Indian Standard Slit Tee Bars from H-Section‡															
ISHT 75	15.3	1 950	75 × 150	8.4	9.0	8.0	4.0	94°	16.2	0.962	2.30	22.2	34.4	16.4	30.1
ISHT 100	20.0	2 550	100 × 200	7.8	9.0	9.0	4.5	94°	19.1	1.94	4.97	27.6	44.2	24.0	49.3
ISHT 125	27.4	3 480	125 × 250	8.8	9.7	10.0	5.0	94°	23.7	4.15	10.0	34.5	53.7	41.0	79.9
ISHT 150	29.4	3 740	150 × 250	7.6	10.6	11.0	5.5	94°	26.6	5.74	11.0	39.2	54.1	46.5	87.7

*Slit from ISLB 200 and ISLB 500.

†Slit from MB 100, 125, 150, 175 and 200.

‡Slit from ISHB 150, 200, 250 and 300.

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