भारतीय मानक **IS 1173 : 2024**

Indian Standard

इस्पात के तप्त बेलित और स्लिट टी सरिए — आयाम और गुण

(तीसरा पुनरीक्षण)

Hot Rolled and Slit Steel Tee Bars — Dimensions and Properties

(Third Revision)

ICS 77.140.70

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Structural Engineering and Structural Sections Sectional Committee, CED 07

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Structural Engineering and Structural Sections Sectional Committee had been approved by the Civil Engineering Division Council.

This standard was first published in 1957 covering a wide range of hot rolled and slit tee bars and was subsequently revised in 1967 and 1978, which covered slit tee bars to be produced by slitting some of the Indian Standard light weight, medium weight and H-beam sections.

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.

In this revision, the following modifications have been effected:

a) New clause for customization of sizes through optimum flange width, beam depth, thicknesses of flange and web has been added; and

b) References clause has been updated.

This standard also aims at satisfying some Sustainable Development Goals by United Nations, especially Goal 9 'Industry, innovation and infrastructure', particularly its target **9.1**.

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

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 : 2022 'Rules for rounding off numerical values (*second revision*)'. 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

HOT ROLLED AND SLIT STEEL TEE BARS — DIMENSIONS AND PROPERTIES

(Third Revision)

1 SCOPE

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

2 REFERENCES

The standards given below contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards:

IS No.	*Title*
IS 808 : 2021	Hot rolled steel beam, column, channel and angle sections — Dimensions and properties (*fourth revision*)
IS 1852 : 1985	Specification for rolling and cutting tolerances for hot-rolled steel products (*fourth revision*)
IS 2062 : 2011	Hot rolled medium and high tensile structural steel — Specification (*seventh revision*)

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 2062 and the following shall apply.

3.1 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.

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

4 SYMBOLS

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 mm
C_{zz}	Distance of centre of gravity from top of flange
D	The angle between the web and flange of the section, in degrees
e_{yy}	Distance of extreme fibre from the Y-Y axis
e_{zz}	Distance of extreme fibre from the Z-Z axis
I_{yy}	Moment of inertia about the Y-Y axis
I_{zz}	Moment of inertia about the Z-Z axis
r_{yy}	$\sqrt{\frac{I_{yy}}{a}}$ = Radius of gyration about the Y-Y axis
r_{zz}	$\sqrt{\frac{I_{zz}}{a}}$ = Radius of gyration about the Z-Z axis
w	Calculated weight in kg/m = $(0.75\ a)$
Z_{yy}	$\frac{I_{yy}}{e_{yy}}$ = Modulus section about the Y-Y axis
Z_{zz}	$\frac{I_{zz}}{e_{zz}}$ = Modulus of section about the Z-Z axis

5 CLASSIFICATON

5.1 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).

5.2 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:

Sl No.	*Classification*	*Abbreviated Reference Symbols*
(1)	(2)	(3)
i)	ISNT	NT
ii)	ISDT	DT
iii)	ISLT	LT
iv)	ISMT	MT
v)	ISHT	HT

6 DIMENSIONS AND PROPERTIES

6.1 Nominal dimensions and weight of Indian Standard tee bars shall be as given in Table 1.

6.2 The tolerances on the dimensions shall be specified in IS 1852.

6.3 The customization of sizes through optimum flange width, beam depth, thicknesses of flange and web will enable cost savings on the overall steel take off in addition to the reliability of connections achieved. A new range of sections suiting to the need of the design requirements can be produced based on the formulae to calculate the geometrical sectional properties as per Annex A and Annex B of IS 808 that fulfils the design criteria.

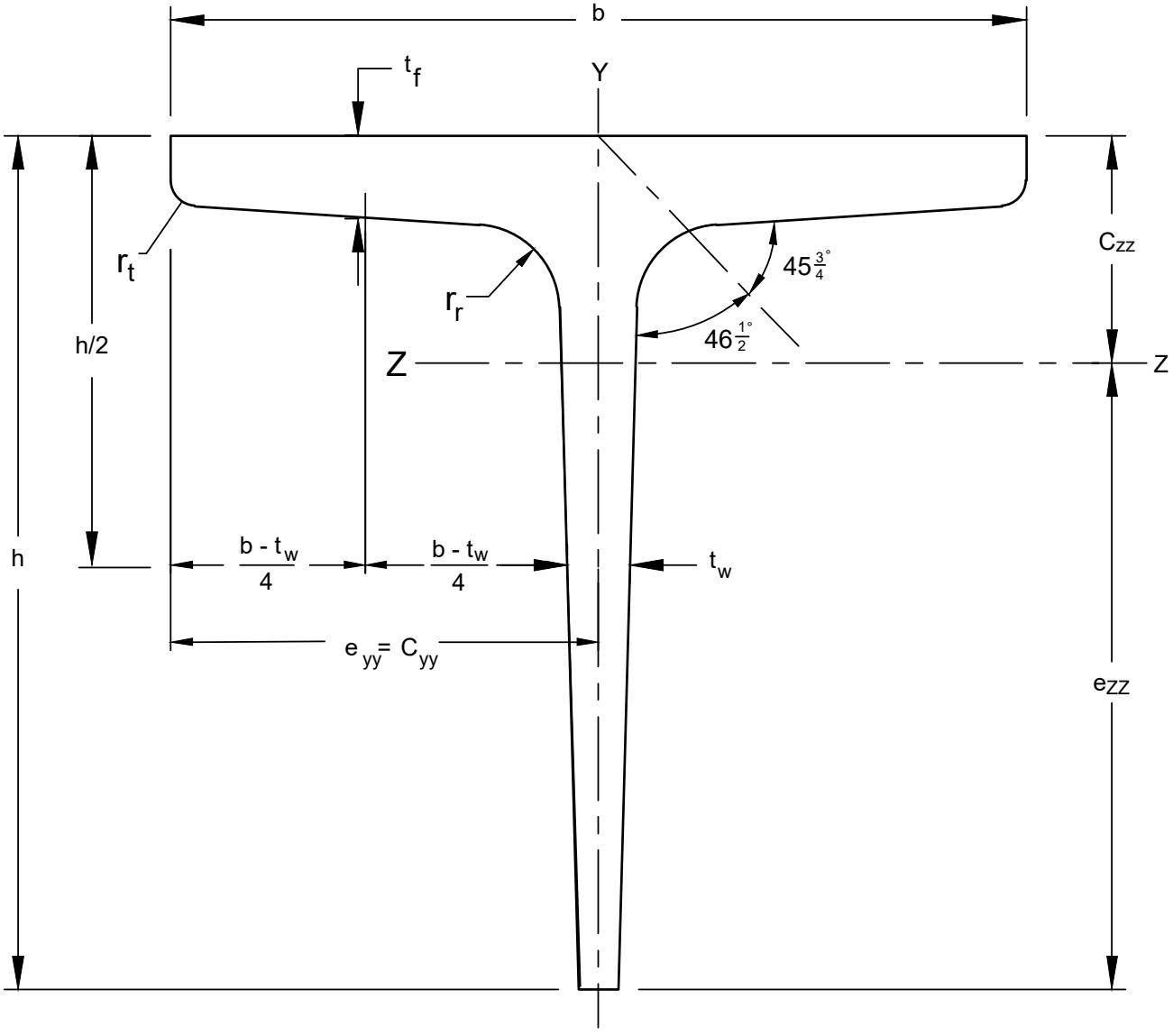

FIG. 1 ROLLED NORMAL TEE BAR (ISNT)

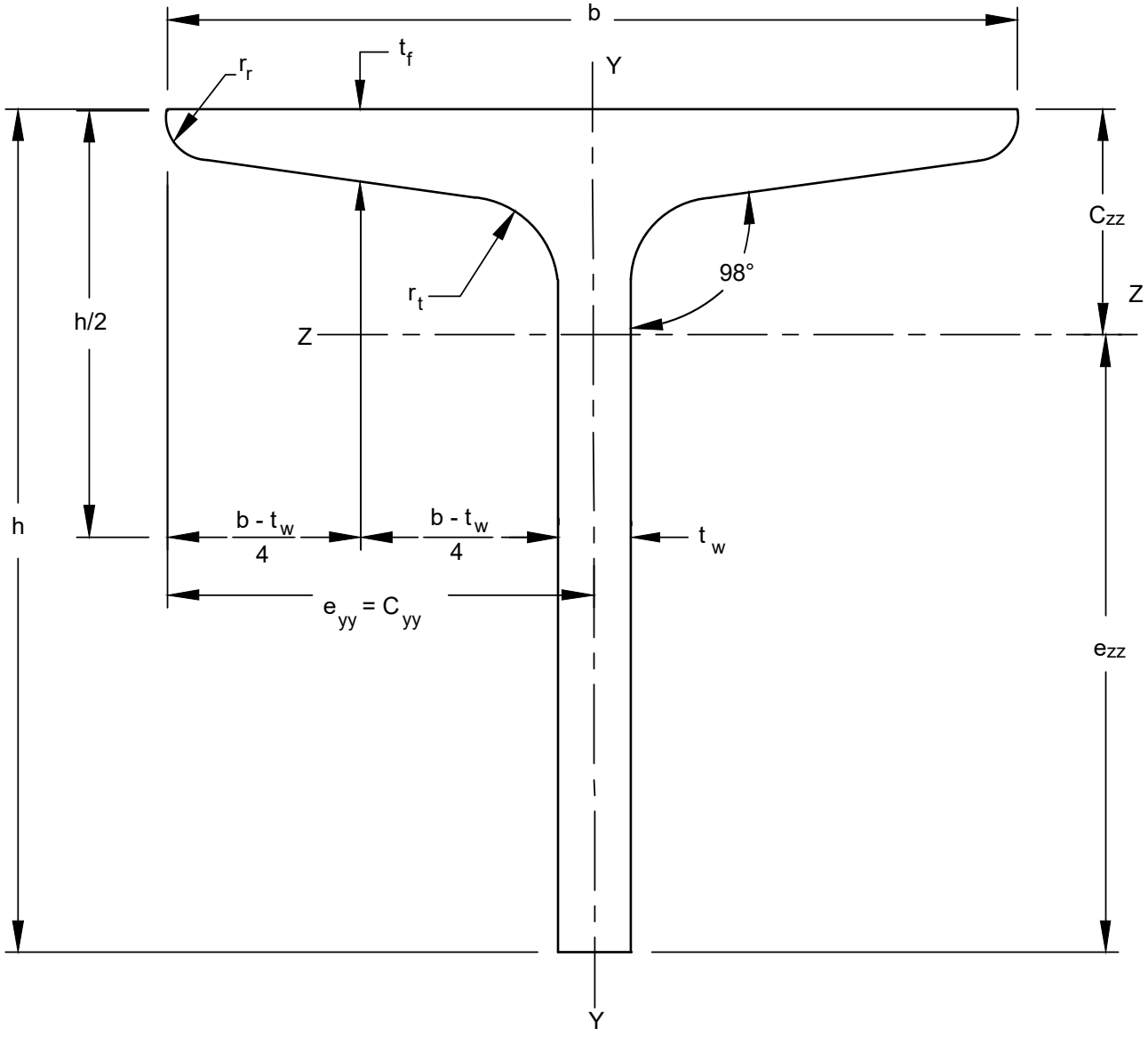

FIG. 2 SLIT TEE BAR AND DEEP LEGGED TEE BAR

Table 1 Nominal Dimensions, Weight and Geometrical Properties of Indian Standard Tee Bars

(*Clauses* 4 *and* 6.1)

Sl No.	Designation	Weight	Sectional Area	Size (Nominal)	Thickness of Web	Thickness of Flange	Radius at Root	Radius at Toe	Slope of Flange	Centre of Gravity Position	Moment of Inertia		Radii of Gyration		Moduli of Section	
		(w)	(a)	$(h \times b)$	(t_w)	(t_f)	(r_r)	(r_t)	$(D°)$	(C_{zz})	I_{zz}	I_{yy}	r_{zz}	r_{yy}	Z_{zz}	Z_{yy}
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
		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																
i)	ISNT 20	1.1	145	20 × 20	4.0	4.0	4.0	3.0	(*See* Fig. 1)	6.0	0.005	0.002	5.8	4.1	0.3	0.2
ii)	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
iii)	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
iv)	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
v)	ISNT 60	5.4	685	60 × 60	6.0	6.0	6.5	4.5		15.6	0.214	0.097	17.7	11.9	4.8	3.2
vi)	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
vii)	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
viii)	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																
ix)	ISDT 100	8.1	1 040	100 × 150	5.8	10.0	8.0	4.0	98°	30.3	0.990	0.096	30.9	9.6	14.2	3.8
x)	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

Table 1 (*Concluded*)

Sl No.	Designation	Weight	Sectional Area	Size (Nominal)	Thickness of Web	Thickness of Flange	Radius at Root	Radius at Toe	Slope of Flange	Centre of Gravity Position	Moment of Inertia		Radii of Gyration		Moduli of Section	
		(w)	(a)	$(h \times b)$	(t_w)	(t_f)	(r_r)	(r_t)	$(D°)$	(C_{zz})	I_{zz}	I_{yy}	r_{zz}	r_{yy}	Z_{zz}	Z_{yy}
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Indian Standard Slit Light Weight Tee Bars*																
xi)	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
xii)	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†																
xiii)	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
xiv)	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
xv)	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
xvi)	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
xvii)	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‡																
xviii)	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
xix)	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
xx)	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
xxi)	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.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Structural Engineering Sectional Committee, CED 07

Organization	*Representative(s)*
In Personal Capacity (*II, 2A, Rani Meyyammai Towers MRC Nagar, R A Puram Chennai - 600028*)	DR V. KALYANARAMAN **(*Chairperson*)**
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AND

Member Secretary
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Amend No.	Date of Issue	Text Affected

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