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[CED 7: Structural Engineering and structural sections]



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IS : 6475 - 1987

Indian Standard
SPECIFICATION FOR
ALUMINIUM TEE BARS FOR
MARINE APPLICATION
(First Revision)

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

Indian Standard

SPECIFICATION FOR ALUMINIUM TEE BARS FOR MARINE APPLICATION

(First Revision)

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(Continued on page 2)

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(Continued on page 10)

Indian Standard
SPECIFICATION FOR
ALUMINIUM TEE BARS FOR
MARINE APPLICATION

(First Revision)

0. F O R E W O R D

0.1 This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards on 22 July 1987, after the draft finalized by the Structural Sections Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Aluminium, because of its lightness, strength and better resistance to atmospheric corrosion, is extensively used in marine application.

0.3 A large number of variety of aluminium sections are being produced in the country. In order to standardize these sections for their economic production, the Sectional Committee had formulated an Indian Standard series covering angles, channels, beams and tee sections for structural use and other applications, and bulb angles, bulb plates and tee bars for use in marine application. Other standards on aluminium sections for marine application are:

- a) IS : 6449-1987 Specification for aluminium bulb angles for marine application (*first revision*), and
- b) IS : 6476-1987 Specification for aluminium bulb plates for marine application (*first revision*).

0.4 This standard was first formulated in 1971. In this revision, alloys with new designations as covered in IS : 733-1983* have been used.

0.5 In the preparation of this standard, the Sectional Committee kept in view the manufacturing and trade practices followed in the country in this field. Assistance has also been derived from ISO 1175-1976 Shipbuilding — Dimensions and sectional properties of aluminium alloy sections for marine use, issued by the International Organization for Standardization.

*Specification for wrought aluminium and aluminium alloy bars, rods and sections (for general engineering purposes) (*third revision*).

0.6 A code of practice for use of aluminium alloys in structures, namely, IS : 8147-1976* was published which covered provisions for the design of structures (except bridges and pressure vessels) using aluminium alloys.

0.7 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.

1. SCOPE

1.1 This standard covers material, dimensions and sectional properties of aluminium tee bars for marine applications.

2. TERMINOLOGY

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

2.1 Y-Y Axis — A line parallel to the axis of web and passing through the centre of gravity of the profile 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 the standard have been indicated in the figures appearing along with Tables 1 and 2. The letter symbols used in Tables 1 and 2 shall have the meaning indicated against each as given below:

a = sectional area (without plate);

M = mass of the section per unit length (without plate);

O = centre of gravity;

e_x = distance of centre of gravity from the outersurface of the flange;

I_x = moment of inertia about X-X axis;

$Z_x = \frac{I_x}{e_x}$ = section modulus;

t = plate thickness 5, 10 or 15 mm; and

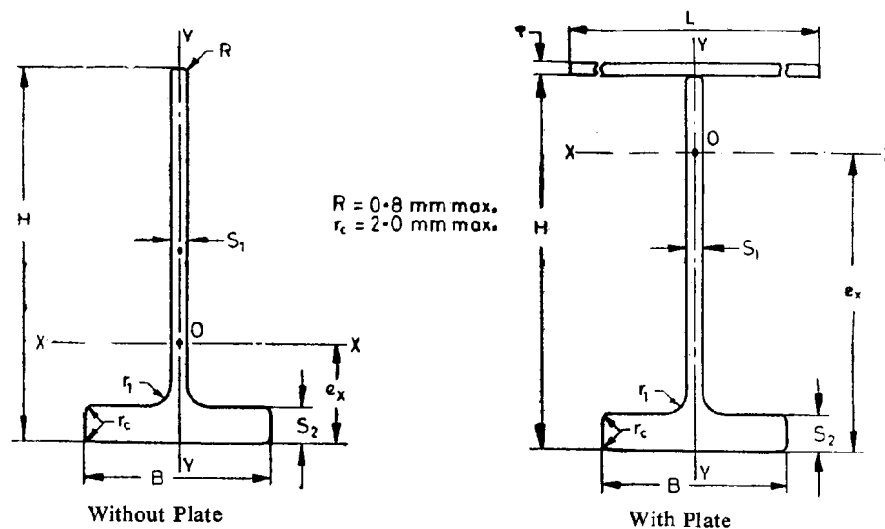
L = width of plate = 40 t .

*Code of practice for use of aluminium alloys in structure.

†Rules for rounding off numerical values (revised).

TABLE 1 TEE BARS WITHOUT WELDING FLANGE

(Clauses 3.1, 5.1 and 5.3)



DESIGN- NATION	DIMENSIONS						SECTIONAL PROPERTIES											
							Section Without Plate			Section with Plate								
										$L \times t : 200 \times 5 \text{ mm}$			$L \times t : 400 \times 10 \text{ mm}$			$L \times t : 800 \times 15 \text{ mm}$		
(1)	H mm	B mm	S_1 mm	S_2 mm	r_1 mm	M kg/m	a cm ²	e_x cm	I_x cm ⁴	e_x cm	I_x cm ⁴	Z_x cm ³	e_x cm	I_x cm ⁴	Z_x cm ³	e_x cm	I_x cm ⁴	Z_x cm ³
AMT 80	80	40	4.0	8.0	6.0	1.64	6.20	2.27	36.9	5.96	174	29.2	7.66	249	32.4	8.33	297	35.7
AMT 90	90	45	4.0	9.0	6.0	1.96	7.41	2.43	54.5	6.35	252	39.8	8.39	370	44.1	9.19	438	47.7
AMT 100	100	50	4.0	10.0	6.0	2.31	8.82	2.57	78.1	6.67	352	52.7	9.08	530	58.4	10.0	625	62.4
AMT 110	110	55	4.0	11.8	6.0	2.68	10.1	2.71	105	6.95	473	68.0	9.72	733	75.4	10.8	866	80.0
AMT 120	120	60	4.0	12.0	6.0	3.08	11.6	2.83	140	7.19	617	85.9	10.3	986	95.5	11.6	1 170	101

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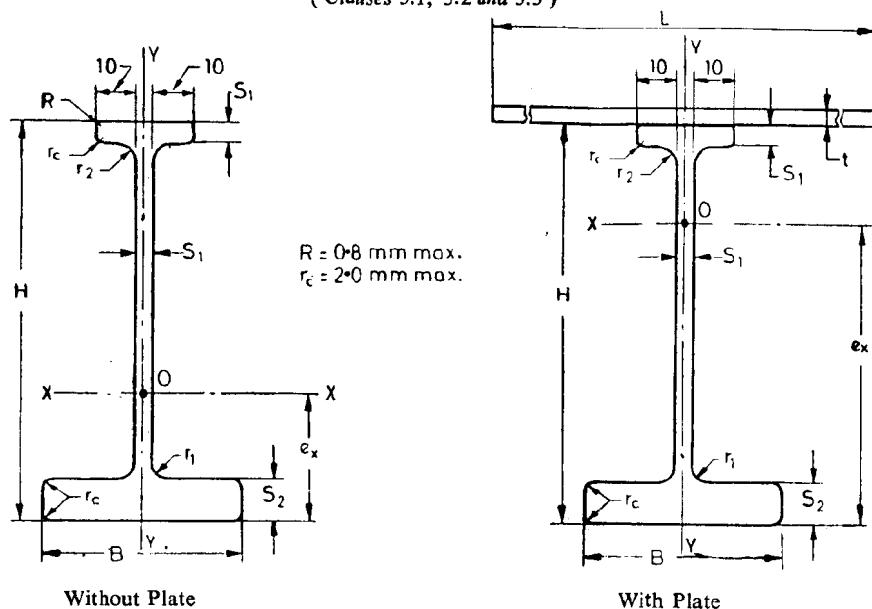
TABLE 1 TEE BARS WITHOUT WELDING FLANGE — *Contd.*

DESIG- NATION	DIMENSIONS					MASS* (WITHOUT PLATE)	SECTIONAL PROPERTIES											
							Section Without Plate			Section With Plate								
							a	e_x	I_x	$L \times t : 200 \times 5 \text{ mm}$			$L \times t : 400 \times 10 \text{ mm}$			$L \times t : 800 \times 15 \text{ mm}$		
	H	B	S_1	S_2	r_1					e_x	I_x	Z_x	e_x	I_x	Z_x	e_x	I_x	Z_x
(1)	mm	mm	mm	mm	mm	kg/m	cm ²	cm	cm ⁴	cm	cm ⁴	cm ³	cm	cm ⁴	cm ³	cm	cm ⁴	cm ³
AMT 130	130	65	4.5	13.0	7.0	3.68	13.9	3.12	198	7.36	795	108	10.8	1 310	121	12.3	1 570	128
AMT 140	140	70	5.0	14.0	7.5	4.32	16.3	3.42	273	7.53	1 000	133	11.3	1 700	150	13.0	2 064	159
AMT 150	150	75	5.0	15.0	7.5	4.82	18.2	3.54	342	7.69	1 230	160	11.8	2 130	182	13.7	2 620	191
AMT 160	160	80	5.5	16.0	8.5	5.56	21.0	3.83	453	7.84	1 500	191	12.1	2 670	220	14.3	3 310	232
AMT 170	170	85	6.0	17.0	9.0	6.34	23.9	4.12	589	7.99	1 800	226	12.5	3 270	262	14.9	4 120	277
AMT 180	180	90	6.0	18.0	9.0	6.95	26.2	4.25	710	8.11	2 130	262	12.9	3 930	306	15.5	5 000	323
AMT 190	190	95	6.5	19.0	10.0	7.83	29.6	4.54	899	8.26	2 520	305	13.1	4 710	358	16.0	6 060	379
AMT 200	200	100	7.0	20.0	10.5	8.76	33.0	4.83	1 120	8.41	2 950	350	13.4	5 570	415	16.5	7 264	441
AMT 220	220	110	7.5	22.0	11.0	10.48	39.5	5.25	1 610	8.68	3 920	451	13.9	7 530	541	17.4	10 000	577
AMT 240	240	120	8.0	24.0	12.0	12.4	46.8	5.66	2 240	8.94	5 090	569	14.4	9 890	689	18.2	13 500	738
AMT 260	260	130	9.0	26.0	13.5	14.7	55.6	6.24	3 180	9.29	6 570	707	14.7	12 700	865	18.9	17 600	933

*Based on a density of 2.65 g/cm³.

TABLE 2 TEE BARS WITH WELDING FLANGE

(Clauses 3.1, 5.2 and 5.3)



DESIGN- NATION	DIMENSIONS							SECTIONAL PROPERTIES											
								Section Without Plate			Section With Plate								
											$L \times t : 200 \times 5 \text{ mm}$			$L \times t : 400 \times 10 \text{ mm}$			$L \times t : 600 \times 15 \text{ mm}$		
(1)	H (2) mm	B (3) mm	S ₁ (4) mm	S ₂ (5) mm	r ₁ (6) mm	r ₂ (7) mm	M (8) kg/m	a (9) cm ³	e _x (10) cm	I _x (11) cm ⁴	e _x (12) cm	I _x (13) cm ⁴	Z _x (14) cm ³	e _x (15) cm	I _x (16) cm ⁴	Z _x (17) cm ³	e _x (18) cm	I _x (19) cm ⁴	Z _x (20) cm ³
AMTW 80	80	40	4.0	8.0	6.0	4.0	1.87	7.05	2.93	59.7	6.05	177	29.2	7.67	249	32.4	8.33	298	35.7
AMTW 90	90	45	4.0	9.0	6.0	4.0	2.19	8.26	3.08	85.3	6.46	258	39.9	8.40	371	44.1	9.19	438	47.7
AMTW 100	100	50	4.0	10.0	6.0	4.0	2.54	9.57	3.21	117	6.81	360	52.8	9.09	531	58.3	10.0	625	62.4
AMTW 110	110	55	4.0	11.0	6.0	4.0	2.91	11.0	3.33	156	7.11	485	68.8	9.74	734	75.4	10.8	866	80.0
AMTW 120	120	60	4.0	12.0	6.0	4.0	3.31	12.5	3.44	204	7.36	634	86.2	10.4	987	95.4	11.6	1 170	101
AMTW 130	130	65	4.5	13.0	7.0	4.5	3.94	14.9	3.75	282	7.57	822	188	10.9	1 310	121	12.3	1 570	128

(Continued)

TABLE 2 TEE BARS WITH WELDING FLANGE — *Contd*

DESIG- NATION	DIMENSIONS						MASS* (WITHOUT PLATE)	SECTIONAL PROPERTIES											
								Section Without Plate			Section with Plate								
											L × t : 200 × 5 mm			L × t : 400 × 10 mm			L × t : 600 × 15 mm		
											e _x	I _x	Z _x	e _x	I _x	Z _x	e _x	I _x	Z _x
(1)	H (2) mm	B (3) mm	S ₁ (4) mm	S ₂ (5) mm	r ₁ (6) mm	r ₂ (7) mm	M (8) kg/m	a (9) cm ²	e _x (10) cm	I _x (11) cm ⁴	e _x (12) cm	I _x (13) cm ⁴	Z _x (14) cm ³	e _x (15) cm	I _x (16) cm ⁴	Z _x (17) cm ³	e _x (18) cm	I _x (19) cm ⁴	Z _x (20) cm ³
AMTW 140	140	70	5.0	14.0	7.5	5.0	4.61	17.4	4.06	382	7.78	1 040	134	11.3	1 710	150	13.0	2 064	158
AMTW 150	150	75	5.0	15.0	7.5	5.0	5.11	19.3	4.17	471	7.95	1 280	161	11.8	2 140	182	13.7	2 620	191
AMTW 160	160	80	5.5	16.0	8.5	5.5	5.88	22.2	4.48	614	8.13	1 570	193	12.2	2 680	220	14.3	3 310	231
AMTW 170	170	85	6.0	17.0	9.0	6.0	6.70	25.3	4.79	788	8.32	1 901	229	12.6	3 300	262	14.9	4 120	276
AMTW 180	180	90	6.0	18.0	9.0	6.0	7.30	27.6	4.90	939	8.45	2 250	266	13.0	3 960	306	15.5	5 000	322
AMTW 190	190	95	6.5	19.0	10.0	6.5	8.22	31.0	5.20	1 180	8.63	2 650	309	13.2	4 750	358	16.0	6 070	379
AMTW 200	200	100	7.0	20.0	10.5	7.0	9.18	34.6	5.51	1 450	8.81	3 140	356	13.6	5 630	416	16.5	7 280	441
AMTW 220	220	110	7.5	22.0	11.0	7.5	10.9	41.3	5.93	2 050	9.11	4 190	460	14.1	7 630	542	17.5	10 100	576
AMTW 240	240	120	8.0	24.0	12.0	8.0	12.9	48.5	6.35	2 810	9.41	5 470	582	14.6	10 000	690	18.3	13 500	738
AMTW 260	260	130	9.0	26.0	13.5	9.0	15.3	57.7	6.95	3 940	9.80	7 110	725	15.0	13 000	867	19.0	17 700	933

*Based on a density of 2.65 g/cm³.

4. DESIGNATION

4.1 Aluminium tee bars shall be designated as AMT or AMTW respectively for without and with welding flange, followed by the depth of section in mm, for example AMT 100 or AMTW 100.

5. DIMENSIONS AND SECTIONAL PROPERTIES

5.1 Dimensions and mass of Indian Standard aluminium tee bars without welding flange shall be as given in Table 1.

5.2 Dimensions and mass of Indian Standard aluminium tee bars with welding flange shall be as given in Table 2.

5.3 For convenience of reference, sectional properties are also given in Tables 1 and 2.

5.4 Dimensional tolerances for the sections shall be as specified in IS : 3965-1981*.

6. MATERIAL

6.1 Aluminium sections covered in this standard shall be manufactured from the alloys 53000, 54300 and 64430 in appropriate temper.

6.1.1 Aluminium alloys and temper selected shall conform to the provisions of IS : 733-1983†.

7. MARKING

7.1 Each lot/bundle of aluminium tee bars shall be clearly marked with designation, alloy and temper, manufacturer's name and lot number/year of manufacture.

7.1.1 Tee bars may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act 1986, and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers, may be obtained from the Bureau of Indian Standards.

*Dimensions for wrought aluminium and aluminium alloys, bars, rod and section (first revision).

†Specification for wrought aluminium and aluminium alloy bars, rods and sections (for general engineering purposes) (third revision).

(Continued from page 2)

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