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IS : 5384 - 1985

Indian Standard
SPECIFICATION FOR
ALUMINIUM I-BEAMS
(*First Revision*)

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

Indian Standard

SPECIFICATION FOR ALUMINIUM I-BEAMS

(First Revision)

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Indian Standard

SPECIFICATION FOR ALUMINIUM I-BEAMS

(*First Revision*)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 20 December 1985, after the draft finalized by the Structural 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 has gained popularity in structures specially for use in hilly areas and in defence installations.

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.

0.4 This Indian Standard was first published in 1969. 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 manufacturing and trade practices followed in the country in this field.

0.6 A code of practice for use of aluminium alloys in structures, namely, IS : 8147-1976† has already been published which covers 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.

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

†Code of practice for use of aluminium alloys in structures.

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

1. SCOPE

1.1 This standard covers the material, dimensions and sectional properties of aluminium I-beam sections for structural use and other applications.

2. TERMINOLOGY

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

2.1 X-X Axis — A line parallel to the axis of either flange and passing through the centre of gravity of the profile of the section.

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

3. SYMBOLS

3.1 Letter symbols used in this standard have been indicated in the figure appearing alongwith Table 1. The letter symbols used in Table 1 shall have the meaning indicated against each as given below:

a = sectional area,

M = mass of the section per unit length,

I_x = moment of inertia about X-X axis,

I_y = moment of inertia about Y-Y axis,

$Z_x = \frac{I_x}{C_x}$ = modulus of section about X-X axis,

$Z_y = \frac{I_y}{C_y}$ = modulus of section about Y-Y axis,

$r_x = \sqrt{\frac{I_x}{a}}$ = radius of gyration about X-X axis,

$r_y = \sqrt{\frac{I_y}{a}}$ = radius of gyration about Y-Y axis, and

K = torsional constant.

4. DESIGNATION

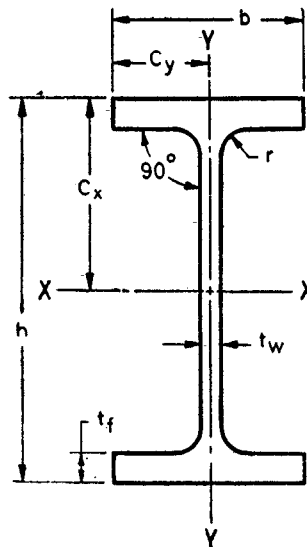
4.1 Aluminium I-beam sections shall be designated as ALB followed by the depth of the section, width of flange in millimetres and mass in kilograms per metre of the section.

Example:

ALB 120 × 60 — 4.7

TABLE 1 INDIAN STANDARD ALUMINIUM BEAMS

(Clauses 3.1, 6.1 and 6.1.1)



DESIGNATION	MASS* PER METRE	SEC- TIONAL AREA	DEPTH OF BEAM	WIDTH OF FLANGE	THICK- NESS OF WEB (t_w)	THICK- NESS OF FLANGE (t_f)	RADIUS AT ROOT (r)	MOMENT OF INERTIA		RADIUS OF GYRATION		SECTION MODULUS		TORSION CONSTANT K
	(M)	(a)	(h)	(b)	(t_w)	(t_f)	(r)	I_x	I_y	r_x	r_y	Z_x	Z_y	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	kg/m	cm ²	mm	mm	mm	mm	mm	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ⁴
ALB 40 × 20-0.4	0.4	1.66	40	20	2.0	2.0	4.0	4.1	0.3	1.57	0.41	2.0	0.3	0.039
ALB 40 × 20-0.6	0.6	2.36	40	20	3.0	3.0	4.0	5.5	0.4	1.52	0.42	2.7	0.4	0.104
ALB 50 × 30-0.9	0.9	3.33	50	30	3.0	3.0	5.0	13.0	1.4	1.98	0.64	5.2	0.9	0.154
ALB 50 × 30-1.2	1.2	4.29	50	30	4.0	4.0	5.0	16.0	1.8	1.93	0.66	6.4	1.2	0.322
ALB 60 × 30-1.1	1.1	4.17	60	30	3.0	4.0	5.0	23.7	1.8	2.38	0.66	7.9	1.2	0.252
ALB 60 × 30-1.5	1.5	5.73	60	30	4.0	6.0	5.0	31.2	2.7	2.33	0.69	10.4	1.8	0.824
ALB 60 × 30-1.9	1.9	7.21	60	30	5.0	8.0	5.0	37.2	3.7	2.27	0.71	12.4	2.5	1.700
ALB 60 × 40-1.9	1.9	7.03	60	40	4.0	6.0	6.0	40.4	6.5	2.40	0.96	13.5	3.2	0.897
ALB 60 × 40-2.4	2.4	8.91	60	40	5.0	8.0	6.0	48.5	8.6	2.33	0.98	16.2	4.3	1.97
ALB 80 × 40-2.1	2.1	7.83	80	40	4.0	6.0	6.0	79.6	6.5	3.19	0.91	19.9	3.2	0.940
ALB 80 × 40-2.7	2.7	9.91	80	40	5.0	8.0	6.0	97.1	8.6	3.13	0.93	24.3	4.3	1.99
ALB 80 × 40-3.2	3.2	11.91	80	40	6.0	10.0	6.0	112.0	10.8	3.07	0.95	28.0	5.4	3.63
ALB 100 × 50-3.4	3.4	12.62	100	50	5.0	8.0	7.0	201.3	16.8	3.99	1.15	40.3	6.7	2.55
ALB 100 × 50-3.9	3.9	14.42	100	50	5.0	10.0	7.0	230.9	21.0	4.00	1.21	46.2	8.4	4.27
ALB 100 × 60-3.9	3.9	14.35	100	60	5.0	8.0	8.0	237.2	29.0	4.07	1.42	47.4	9.7	3.05
ALB 100 × 60-4.1	4.1	15.19	100	60	6.0	8.0	8.0	242.2	29.1	3.99	1.38	48.4	9.7	3.43
ALB 100 × 60-4.7	4.7	17.35	100	60	6.0	10.0	8.0	277.6	36.3	4.00	1.45	55.5	12.1	3.54
ALB 120 × 60-4.7	4.7	17.55	120	60	5.0	10.0	8.0	418.4	36.2	4.88	1.44	69.7	12.1	5.47
ALB 120 × 60-5.0	5.0	18.70	120	60	6.0	10.0	9.0	430.0	36.4	4.80	1.39	71.7	12.1	5.95
ALB 120 × 70-5.6	5.6	20.70	120	70	6.0	10.0	9.0	490.7	57.5	4.87	1.67	81.8	16.4	6.62
ALB 120 × 80-6.1	6.1	22.70	120	80	6.0	10.0	9.0	551.4	85.7	4.93	1.94	91.9	21.4	7.28
ALB 120 × 80-7.4	7.4	27.58	120	80	8.0	12.0	9.0	635.9	103.1	4.30	1.93	106.0	25.8	12.8
ALB 150 × 80-6.6	6.6	24.50	150	80	6.0	10.0	9.0	922.8	85.8	6.14	1.87	123.0	21.4	7.50
ALB 150 × 80-8.1	8.1	29.98	150	80	8.0	12.0	9.0	1 075.7	103.2	5.99	1.86	143.4	25.8	13.3
ALB 150 × 100-7.7	7.7	28.66	150	100	6.0	10.0	10.0	1 125.4	167.2	6.27	2.42	150.0	33.4	9.14
ALB 150 × 100-9.4	9.4	34.94	150	100	8.0	12.0	10.0	1 310.6	200.9	6.12	2.40	174.7	40.2	16.1
ALB 150 × 100-12.1	12.1	44.66	150	100	10.0	16.0	10.0	1 607.9	268.1	6.00	2.45	214.4	53.6	35.3
ALB 200 × 100-10.5	10.5	38.94	200	100	8.0	12.0	10.0	2 550.1	201.1	8.09	2.27	255.0	40.2	16.9
ALB 200 × 100-13.4	13.4	49.66	200	100	10.0	16.0	10.0	3 167.9	268.5	7.99	2.33	316.8	53.7	36.9
ALB 200 × 120-12.9	12.9	47.64	200	120	10.0	12.0	12.0	3 092.6	347.9	8.06	2.70	309.3	58.0	24.1
ALB 200 × 120-16.1	16.1	59.80	200	120	12.0	16.0	12.0	3 814.3	464.2	7.99	2.79	381.4	77.4	49.6

*Based on density of 2.7 g/cm³.

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5. MATERIAL

5.1 Aluminium sections covered in this standard shall be manufactured from the following alloys in appropriate temper:

19000, 24345, 24534, 52000, 53000, 54300, 63400, 64423, 64430, 65032 and 74530.

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

6. DIMENSIONS AND SECTIONAL PROPERTIES

6.1 Dimensions and mass of Indian Standard aluminium I-beam sections shall be as given in Table 1. For convenience of reference sectional properties are also given in Table 1.

6.1.1 Sections of dimensions other than those included in Table 1 may also be manufactured subject to the agreement between the purchaser and the manufacturer.

6.1.2 Sections without root radius (square fillet) may also be manufactured subject to the agreement between the purchaser and the manufacturer.

6.2 Dimensional tolerances for the section shall be as specified in IS : 3965-1981†.

7. PACKING

7.1 Aluminium I-beams shall be securely bundled and wrapped in bitumanised hessian cloth or in wooden boxes or as mutually agreed. Weight of each bundle may be as agreed between the purchaser and the manufacturer.

8. MARKING

8.1 Aluminium I-beam sections shall be clearly marked with designation, alloy and temper, manufacturer's name and lot number/year of manufacture.

8.2 I-beam sections may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI 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 ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

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

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

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