भारतीय मानक

IS 3908 : 2024

Indian Standard

(*Amalgamating IS 3909, IS 3921 and IS 5384*)

एल्यूमिनियम बीम, चैनल और कोण अनुभाग — आयाम और गुण

(दूसरा पुनरीक्षण)

Aluminium Beam, Channel and Angle Sections — Dimensions and Properties

(Second Revision)

ICS 77.150.10

भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

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Structural Engineering and Structural Sections Sectional Committee, CED 07

FOREWORD

This Indian Standard (Second 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.

Aluminium, because of its lightness, strength and better resistance to atmospheric corrosion, has gained popularity in structures especially for use in hilly area and in defence establishments.

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 Committee had formulated Indian Standard series covering angles, channels, beams and tee sections for structural use and other applications.

Bureau of Indian Standards had first published IS 3908 for aluminium equal leg angles in 1966, IS 3909 for aluminium unequal leg angles in 1966, IS 3921 for aluminium channels in 1966 and IS 5384 for aluminium 'I' beams in 1969. Their first revisions were published as follows:

IS 3908 : 1986 Specification for aluminium equal leg angles (*first revision*)

IS 3909 : 1986 Specification for aluminium unequal leg angles (*first revision*)

IS 3921 : 1985 Specification for aluminium channels (*first revision*)

IS 5384 : 1985 Specification for aluminium I-beams (*first revision*)

In this revision, in view of the recent developments that have taken place, the Committee viewed that these standards be revised and amalgamated into one standard, that is, IS 3908. The amalgamation will facilitate better access of the sectional details under one resource document. The following additional modifications have been effected in this revision:

a) Cross reference have been updated; and

b) Tables for aluminium sections have been updated.

A code of practice for use of aluminium alloys in structure namely IS 8147 : 1976 ‘Code of practice for use of aluminium alloys in structures’ was published which covers provisions for the design of structures (except bridges and pressure vessels) using aluminium alloys.

In the formulation of this standard, assistance has been derived from:

BS 1161 : 1977 ‘Specification for aluminium alloy sections for structural purposes’.

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

ALUMINIUM BEAM, CHANNEL AND ANGLE SECTIONS — DIMENSIONS AND PROPERTIES

(Second Revision)

1 SCOPE

This standard covers the material, dimensions and sectional properties of aluminium equal leg angle, unequal leg angle, channel and 'I' beam sections for structural use and other applications.

2 REFERENCES

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

IS No.	*Title*
IS 733 : 1983	Specification for wrought aluminium and aluminium alloy bars, rods and sections (for general engineering purposes) (*third revision*)
IS 3965 : 1981	Dimensions for wrought aluminium and aluminium alloys, bar, rod and section (*first revision*)

3 TERMINOLOGY

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

3.1 Moment of Inertia — The quantity expressed by the section resisting angular acceleration which is the sum of the product of the mass of every particle with its square of a distance from the axis of rotation.

3.2 Radii of Gyration — As a measure of the way in which the mass of a rotating rigid body is distributed about the axis of rotation.

3.3 *U-U* and *V-V* Axes — Lines passing through the centre of gravity of the profile of the section, representing the principal axes of angle sections, where *U-U* is a major axis (when it does not coincide with *Z-Z* axis) and *V-V* axis is a minor axis (when it does not coincide with *Y-Y* axis).

3.4 *X-X* Axis — A line along the member passing through the centre of gravity of the sections profile.

3.5 *Y-Y* Axis — A line perpendicular to the flanges (in case of beams and channels) or perpendicular to the smaller leg (in case of an angle section) and passing through the centre of gravity of the sections profile.

3.6 *Z-Z* Axis — A line parallel to the flanges (in case of beams and channels) or parallel to the smaller leg (in case of an angle section) and passing through the centre of gravity of the sections profile.

4 SYMBOLS

4.1 Letter symbols used in this standard have been indicated in the Fig. 1 to Fig. 4. The letter symbols used in Table 1 to Table 4 shall have the meaning indicated against each as given below:

a	Sectional area
e_{Y}	Distance of extreme fibre from the *Y-Y* axis, $(B - C_{\mathrm{Y}})$
e_{Z}	Distance of extreme fibre from the *Z-Z* axis, $(A - C_{\mathrm{Z}})$
I_{U}	Moment of inertia (*Max*) about the *U-U* axis
I_{V}	Moment of inertia (*Min*) about the *V-V* axis
I_{Y}	Moment of inertia about the *Y-Y* axis
I_{Z}	Moment of inertia about the *Z-Z* axis
K	Torsional constant
M	Mass of the section per unit length
$r_{\mathrm{u}} = \sqrt{\frac{I_{\mathrm{u}}}{a}}$	Radius of gyration about the *U-U* axis
$r_{\mathrm{v}} = \sqrt{\frac{I_{\mathrm{v}}}{a}}$	Radius of gyration about the *V-V* axis
$r_{\mathrm{y}} = \sqrt{\frac{I_{\mathrm{y}}}{a}}$	Radius of gyration about the *Y-Y* axis

$r_z = \sqrt{\frac{I_z}{a}}$ Radius of gyration about the *Z-Z* axis

$Z_Y = \frac{I_y}{e_y}$ Modulus of section about the *Y-Y* axis

$Z_Z = \frac{I_z}{e_z}$ Modulus of section about the *Z-Z* axis

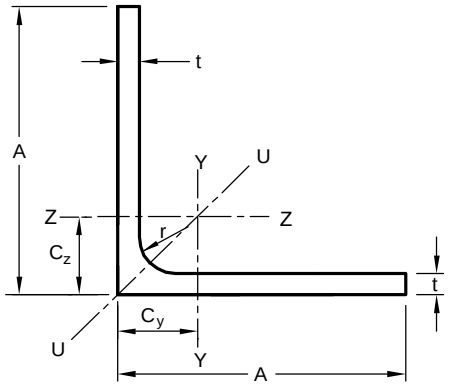

FIG. 1 ALUMINIUM EQUAL LEG ANGLES

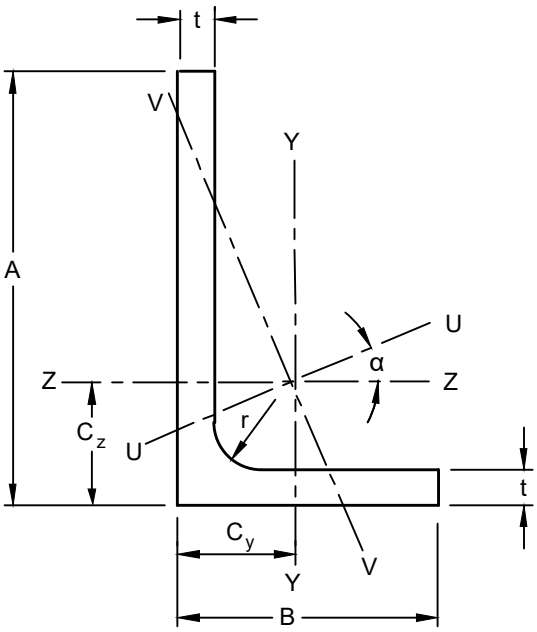

FIG. 2 ALUMINIUM UNEQUAL LEG ANGLE

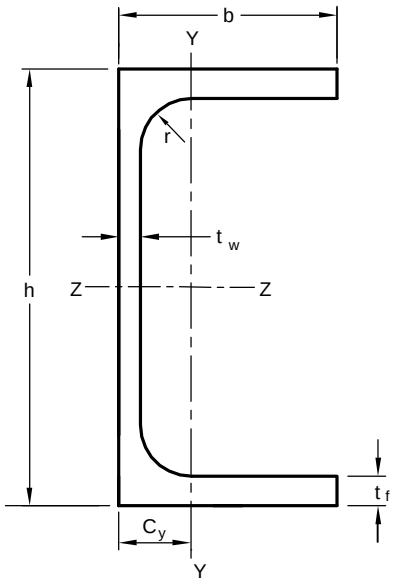

FIG. 3 ALUMINIUM CHANNEL SECTION

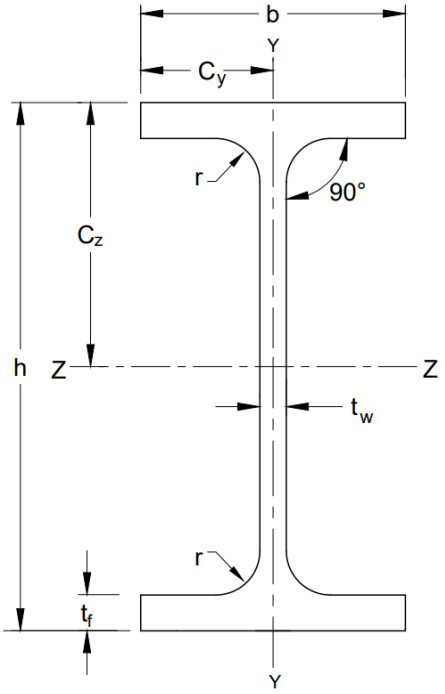

FIG. 4 ALUMINIUM I-BEAM

Table 1 Indian Standard Aluminium Equal Leg Angles

(*Clauses* 4.1, 6.1 *and* 6.1.1)

Sl No.	Designation and Size (A × B × t) (in mm)	Mass* Per Metre	Sectional Area	Radius at Root	Centre of Gravity	Moment of Inertia			Radius of Gyration			Modulus of Section
		(M)	(a)	(r)	$C_z = C_y$	$I_z = I_y$	I_u (*Min*)	I_v (*Min*)	$r_z = r_y$	r_u (*Min*)	r_v (*Min*)	$Z_z = Z_y$
		kg/m	cm^2	mm	cm	cm^4	cm^4	cm^4	cm	cm	cm	cm^3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
i)	ALE10 × 10 × 1.5	0.08	0.30	3.0	0.30	0.03	0.04	0.01	0.29	0.37	0.19	0.04
ii)	ALE10 × 10 × 2.0	0.10	0.38	3.0	0.32	0.03	0.05	0.01	0.29	0.36	0.19	0.05
iii)	ALE15 × 15 × 1.5	0.12	0.45	3.0	0.42	0.09	0.15	0.04	0.45	0.57	0.29	0.09
iv)	ALE15 × 15 × 2.0	0.16	0.58	3.0	0.44	0.12	0.18	0.05	0.45	0.56	0.29	0.11
v)	ALE15 × 15 × 3.0	0.22	0.83	3.0	0.48	0.16	0.25	0.07	0.44	0.55	0.29	0.16
vi)	ALE20 × 20 × 2.0	0.21	0.79	4.0	0.56	0.29	0.46	0.12	0.61	0.76	0.39	0.20
vii)	ALE20 × 20 × 3.0	0.31	1.14	4.0	0.60	0.40	0.64	0.17	0.59	0.75	0.39	0.29
viii)	ALE25 × 25 × 2.0	0.27	0.99	4.0	0.68	0.58	0.92	0.24	0.77	0.96	0.50	0.32
ix)	ALE25 × 25 × 3.0	0.39	1.44	4.0	0.73	0.82	1.31	0.34	0.76	0.95	0.49	0.47
x)	ALE25 × 25 × 4.0	0.51	1.87	4.0	0.77	1.04	1.64	0.44	0.74	0.93	0.48	0.60
xi)	ALE30 × 30 × 2.5	0.40	1.49	5.0	0.82	1.26	1.98	0.53	0.92	1.15	0.6	0.578
xii)	ALE30 × 30 × 3.0	0.48	1.76	5.0	0.85	1.47	2.33	0.61	0.91	1.15	0.59	0.68
xiii)	ALE30 × 30 × 3.0	0.62	2.29	5.0	0.89	1.86	2.95	0.78	0.90	1.13	0.58	0.88

*Based on density of 2.7 gm/cm^2.

Table 1 (*Continued*)

Sl No.	Designation and Size (A × B × t) (in mm)	Mass* Per Metre	Sectional Area	Radius at Root	Centre of Gravity	Moment of Inertia			Radius of Gyration			Modulus of Section
		(M)	(a)	(r)	$C_z = C_y$	$I_z = I_y$	I_u (Min)	I_v (Min)	$r_z = r_y$	r_u (Min)	r_v (Min)	$Z_z = Z_y$
		kg/m	cm^2	mm	cm	cm^4	cm^4	cm^4	cm	cm	cm	cm^3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
xiv)	ALE30 × 30 × 5.0	0.76	2.80	5.0	0.93	2.22	3.50	0.94	0.89	1.12	0.58	1.07
xv)	ALE35 × 35 × 3.0	0.56	2.06	5.0	0.97	2.38	3.77	0.99	1.07	1.35	0.69	0.94
xvi)	ALE35 × 35 × 4.0	0.73	2.69	5.0	1.01	3.04	4.81	1.26	1.06	1.34	0.69	1.22
xvii)	ALE35 × 35 × 5.0	0.89	3.30	5.0	1.05	3.66	5.76	1.53	1.05	1.32	0.68	1.49
xviii)	ALE40 × 40 × 3.0	0.64	2.36	5.0	1.10	3.61	5.72	1.50	1.24	1.56	0.80	1.24
xix)	ALE40 × 40 × 4.0	0.84	3.09	5.0	1.14	4.63	7.34	1.92	1.22	1.54	0.79	1.62
xx)	ALE40 × 40 × 5.0	1.03	3.80	5.0	1.18	5.58	8.84	2.32	1.21	1.52	0.78	1.98
xxi)	ALE45 × 45 × 3.0	0.73	2.69	6.0	1.21	5.21	8.22	2.20	1.39	1.75	0.90	1.58
xxii)	ALE45 × 45 × 4.0	0.95	3.52	6.0	1.26	6.66	10.61	2.71	1.38	1.74	0.88	2.06
xxiii)	ALE45 × 45 × 5.0	1.17	4.33	6.0	1.30	8.06	12.83	3.29	1.36	1.72	0.87	2.52
xxiv)	ALE50 × 50 × 3.0	0.81	2.99	6.0	1.34	7.22	11.43	3.00	1.55	1.96	1.00	1.97
xxv)	ALE50 × 50 × 4.0	0.06	3.92	6.0	1.38	9.32	14.78	3.86	1.54	1.94	0.99	2.57
xxvi)	ALE50 × 50 × 5.0	1.30	4.83	6.0	1.42	11.30	17.92	4.68	1.53	1.93	0.98	3.16

*Based on density of 2.7 gm/cm^2.

Table 1 (*Continued*)

Sl No.	Designation and Size (A × B × t) (in mm)	Mass* Per Metre	Sectional Area	Radius at Root	Centre of Gravity	Moment of Inertia			Radius of Gyration			Modulus of Section
		(M)	(a)	(r)	$C_z = C_y$	$I_z = I_y$	I_u (*Min*)	I_v (*Min*)	$r_z = r_y$	r_u (*Min*)	r_v (*Min*)	$Z_z = Z_y$
		kg/m	cm^2	mm	cm	cm^4	cm^4	cm^4	cm	cm	cm	cm^3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
xxvii)	ALE50 × 50 × 6.0	1.54	5.72	6.0	1.46	13.17	20.86	5.47	1.52	1.91	0.98	3.72
xxviii)	ALE60 × 60 × 3.5	1.17	4.31	7.0	1.57	14.7	23.1	6.31	1.85	2.31	1.21	3.32
xxix)	ALE60 × 60 × 4.0	1.28	4.75	7.0	1.62	16.44	26.06	6.81	1.86	2.34	1.20	3.76
xxx)	ALE60 × 60 × 5.0	1.58	5.86	7.0	1.67	20.02	31.76	8.27	1.85	2.33	1.19	4.62
xxxi)	ALE60 × 60 × 6.0	1.88	6.95	7.0	1.71	23.43	37.16	9.69	1.84	2.31	1.18	5.46
xxxii)	ALE70 × 70 × 5.0	1.86	6.89	8.0	1.91	32.35	51.31	13.39	2.17	2.73	1.39	6.36
xxxiii)	ALE70 × 70 × 6.0	2.21	8.18	8.0	1.95	38.03	60.26	15.80	2.16	2.71	1.39	7.53
xxxiv)	ALE70 × 70 × 7.0	2.55	9.45	8.0	1.99	43.43	68.80	18.06	2.14	2.70	1.38	8.67
xxxv)	ALE80 × 80 × 5.0	2.23	8.23	8.0	2.11	49.5	77.7	21.3	2.45	3.07	1.61	8.40
xxxvi)	ALE80 × 80 × 6.0	2.53	9.38	8.0	2.20	57.59	91.48	23.71	2.48	3.12	1.59	9.93
xxxvii)	ALE80 × 80 × 8.0	3.32	12.30	8.0	2.28	73.97	117.43	30.50	2.45	3.09	1.57	12.93
xxxviii)	ALE80 × 80 × 10.0	4.09	15.14	8.0	2.36	89.18	141.32	37.04	2.43	3.06	1.56	15.80
xxxix)	ALE100 × 100 × 6.0	3.17	11.81	9.0	2.72	115.15	182.92	47.42	3.10	3.92	1.99	15.78

*Based on density of 2.7 gm/cm^2.

Table 1 (*Continued*)

Sl No.	Designation and Size (A × B × t) (in mm)	Mass* Per Metre	Sectional Area	Radius at Root	Centre of Gravity	Moment of Inertia			Radius of Gyration			Modulus of Section
		(M)	(a)	(r)	$C_z = C_y$	$I_z = I_y$	I_u (*Min*)	I_v (*Min*)	$r_z = r_y$	r_u (*Min*)	r_v (*Min*)	$Z_z = Z_y$
		kg/m	cm^2	mm	cm	cm^4	cm^4	cm^4	cm	cm	cm	cm^3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
xl)	ALE100 × 100 × 8.0	4.19	15.53	9.0	2.78	148.73	236.41	61.06	3.09	3.92	1.98	20.59
xli)	ALE100 × 100 × 10.0	5.18	19.17	9.0	2.85	180.49	286.67	74.30	3.07	3.87	1.97	25.23
xlii)	ALE120 × 120 × 12.0	6.14	22.73	9.0	2.93	210.43	333.70	87.15	3.04	3.83	1.96	29.76
xliii)	ALE120 × 120 × 7.0	4.68	17.3	10.0	3.14	235	370	110	3.69	4.63	2.42	26.6
xliv)	ALE120 × 120 × 10.0	6.27	23.21	10.0	3.35	319.51	508.04	130.99	3.71	4.68	2.38	36.94
xlv)	ALE120 × 120 × 12.0	7.45	27.57	10.0	3.43	374.13	594.41	153.85	3.68	4.64	2.36	43.64
xlvi)	ALE120 × 120 × 16.0	9.73	36.05	10.0	3.58	475.66	753.35	191.97	3.63	4.57	2.34	56.43
xlvii)	ALE150 × 150 × 10.0	7.91	29.31	12.0	4.09	639.75	1017.61	261.88	4.67	5.89	2.99	58.64

*Based on density of 2.7 gm/cm^2.

Table 1 (*Concluded*)

Sl No.	Designation and Size (A × B × t) (in mm)	Mass* Per Metre	Sectional Area	Radius at Root	Centre of Gravity	Moment of Inertia			Radius of Gyration			Modulus of Section
		(M)	(a)	(r)	$C_z = C_y$	$I_z = I_y$	I_u (Min)	I_v (Min)	$r_z = r_y$	r_u (Min)	r_v (Min)	$Z_z = Z_y$
		kg/m	cm^2	mm	cm	cm^4	cm^4	cm^4	cm	cm	cm	cm^3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
xlviii)	ALE150 × 150 × 12.0	9.41	34.87	12.0	4.17	752.41	1 196.72	308.11	4.65	5.86	2.97	69.47
xlix)	ALE150 × 150 × 16.0	12.35	45.75	12.0	4.32	964.79	1 532.30	397.29	4.59	5.79	2.95	90.35
l)	ALE200 × 200 × 12.0	12.72	47.11	16.0	5.40	1 838.49	2 923.90	753.08	6.25	7.88	4.00	125.92
li)	ALE200 × 200 × 16.0	16.74	61.99	16.0	5.56	2 782.00	3 782.21	973.79	6.19	7.81	3.96	164.68
lii)	ALE200 × 200 × 20.0	20.67	76.55	16.0	5.71	2 886.35	4 586.40	1 186.30	6.14	7.74	3.94	202.02

*Based on density of 2.7 gm/cm^2.

Table 2 Indian Standard Aluminium Unequal Leg Angles

(*Clauses* 4.1, 6.1 *and* 6.1.1)

Sl No.	Designation and Size	Mass* per Metre	Sectional Area	Radius at Root	Centre of Gravity		Moment of Inertia				Radius of Gyration				Modulus of Section		Tan α
		(M)	(a)		C_z	C_y	I_z	I_y	I_u *Max*	I_v *Min*	r_z	r_y	r_u *Max*	r_v *Min*	Z_z	Z_y	
	(A × B × t, in mm)	kg/m	cm^2	mm	cm	cm	cm^4	cm^4	cm^4	cm^4	cm	cm	cm	cm	cm^3	cm^3	
(1)	(2)	(3)	(4)	(5)	(6)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
i)	ALU20 × 10 × 1.5	0.12	0.46	4.0	0.69	0.23	0.18	0.03	0.20	0.02	0.63	0.26	0.65	0.21	0.14	0.04	0.26
ii)	ALU20 × 10 × 2.0	0.16	0.59	4.0	0.72	0.25	0.23	0.04	0.25	0.03	0.63	0.26	0.64	0.21	0.18	0.18	0.26
iii)	ALU20 × 15 × 1.5	0.14	0.54	4.0	0.60	0.37	0.21	0.10	0.25	0.06	0.62	0.43	0.69	0.32	0.15	0.15	0.54
iv)	ALU20 × 15 × 2.0	0.19	0.69	4.0	0.63	0.39	0.27	0.13	0.32	0.07	0.62	0.43	0.68	0.32	0.19	0.19	0.54
v)	ALU20 × 15 × 3.0	0.27	0.99	4.0	0.67	0.43	0.37	0.17	0.45	0.10	0.61	0.42	0.67	0.31	0.28	0.28	0.54
vi)	ALU30 × 15 × 2.0	0.25	0.91	5.0	1.03	0.33	0.84	0.14	0.89	0.09	0.96	0.39	0.98	0.32	0.42	0.12	0.26
vii)	ALU30 × 15 × 3.0	0.35	1.31	5.0	1.09	0.37	1.17	0.20	1.24	0.13	0.94	0.39	0.97	0.31	0.61	0.17	0.25
viii)	ALU30 × 20 × 2.0	0.27	1.01	5.0	0.94	0.47	0.92	0.33	1.05	0.19	0.95	0.57	1.02	0.43	0.44	0.21	0.43
ix)	ALU30 × 20 × 3.0	0.40	1.46	5.0	0.99	0.51	1.29	0.46	1.48	0.27	0.94	0.56	1.01	0.43	0.64	0.31	0.43
x)	ALU30 × 20 × 4.0	0.51	1.89	5.0	1.03	0.55	1.63	0.57	1.86	0.34	0.93	0.55	0.99	0.42	0.85	0.39	0.42
xi)	ALU40 × 20 × 2.0	0.32	1.21	5.0	1.36	0.41	2.03	0.35	2.15	0.23	1.29	0.54	1.33	0.43	0.77	0.22	0.26
xii)	ALU40 × 20 × 3.0	0.48	1.76	5.0	1.42	0.45	2.89	0.49	3.06	0.32	1.28	0.53	1.32	0.43	1.12	0.32	0.26
xiii)	ALU40 × 20 × 4.0	0.62	2.29	5.0	1.46	0.49	3.67	0.62	3.89	0.41	1.27	0.52	1.30	0.42	1.45	0.41	0.25
xiv)	ALU40 × 25 × 2.0	0.36	1.34	6.0	1.25	0.54	2.19	0.67	2.45	0.41	1.28	0.71	1.35	0.55	0.80	0.34	0.38

*Based on density of 2.7 gm/cm^3

Table 2 (*Continued*)

Sl No.	Designation and Size	Mass* per Metre	Sectional Area	Radius at Root	Centre of Gravity		Moment of Inertia				Radius of Gyration				Modulus of Section		Tan α
		(M)	(a)		C_z	C_y	I_z	I_y	I_u *Max*	I_v *Min*	r_z	r_y	r_u *Max*	r_v *Min*	Z_z	Z_y	
	(A × B × t, in mm)	kg/m	cm^2	mm	cm	cm	cm^4	cm^4	cm^4	cm^4	cm	cm	cm	cm	cm^3	cm^3	
(1)	(2)	(3)	(4)	(5)	(6)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xv)	ALU40 × 25 × 3.0	0.52	1.94	6.0	1.31	0.59	3.13	0.94	3.50	0.57	1.27	0.70	1.34	0.54	1.16	0.49	0.38
xvi)	ALU40 × 25 × 4.0	0.68	2.52	6.0	1.35	0.63	3.98	1.19	4.46	0.72	1.26	0.69	1.33	0.53	1.51	0.64	0.38
xvii)	ALU45 × 30 × 3.0	0.60	2.24	6.0	1.43	0.70	4.56	1.65	5.25	0.96	1.43	0.86	1.53	0.66	1.49	0.72	0.44
xviii)	ALU45 × 30 × 4.0	0.79	2.92	6.0	1.47	0.74	5.91	2.10	6.76	1.52	1.42	0.85	1.25	0.65	1.95	0.93	0.43
xix)	ALU45 × 30 × 5.0	0.97	3.58	6.0	1.52	0.78	7.04	2.51	8.08	1.50	1.40	0.84	1.47	0.64	2.36	1.13	0.40
xx)	ALU50 × 25 × 3.0	0.60	2.24	6.0	1.74	0.53	5.80	1.00	6.15	0.65	1.61	0.67	1.66	0.54	1.78	0.50	0.26
xxi)	ALU50 × 25 × 4.0	0.79	2.92	6.0	1.79	0.57	7.43	1.26	7.87	0.82	1.60	0.66	1.64	0.53	2.31	0.65	0.26
xxii)	ALU50 × 25 × 5.0	0.97	3.58	6.0	1.83	0.61	8.96	1.50	9.47	0.99	1.58	0.65	1.63	0.53	2.83	0.79	0.25
xxiii)	ALU50 × 30 × 3.0	0.64	2.39	6.0	1.64	0.67	6.15	1.69	6.81	1.03	1.61	0.84	1.69	0.66	1.83	0.74	0.36
xxiv)	ALU50 × 30 × 4.0	0.84	3.12	6.0	1.68	0.71	7.91	2.16	8.75	1.32	1.59	0.83	1.68	0.65	2.38	0.94	0.36
xxv)	ALU50×30×5.0	1.03	3.83	6.0	1.73	0.75	9.55	2.58	10.54	1.59	1.58	0.82	1.66	0.64	2.92	1.15	0.35
xxvi)	ALU50 × 38 × 3.0	0.74	2.72	7.0	1.47	0.90	6.72	3.35	8.21	1.86	1.57	1.11	1.74	0.82	1.90	1.16	0.55
xxvii)	ALU50 × 38 × 4.0	0.95	3.50	7.0	1.53	0.95	8.60	4.28	10.5	2.34	1.57	1.11	1.74	8.1	2.48	1.50	0.56
xxviii)	ALU60 × 30 × 3.0	0.73	2.72	7.0	2.05	0.61	10.22	1.77	10.84	1.15	1.94	0.81	2.00	0.65	2.59	0.74	0.26

*Based on density of 2.7 gm/cm^3

Table 2 (*Continued*)

Sl No.	Designation and Size	Mass* per Metre	Sectional Area	Radius at Root	Centre of Gravity		Moment of Inertia				Radius of Gyration				Modulus of Section		Tan α
		(M)	(a)		C_z	C_y	I_z	I_y	I_u *Max*	I_v *Min*	r_z	r_y	r_u *Max*	r_v *Min*	Z_z	Z_y	
	(A × B × t, in mm)	kg/m	cm^2	mm	cm	cm	cm^4	cm^4	cm^4	cm^4	cm	cm	cm	cm	cm^3	cm^3	
(1)	(2)	(3)	(4)	(5)	(6)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xxix)	ALU60 × 30 × 4.0	0.96	3.55	7.0	2.11	0.65	13.16	2.25	13.96	1.46	1.93	0.80	1.98	0.64	3.38	0.96	0.26
xxx)	ALU60 × 30 × 5.0	1.18	4.36	7.0	2.15	0.69	15.94	2.70	16.88	1.76	1.91	0.79	1.97	0.64	4.15	1.17	0.26
xxxi)	ALU60 × 40 × 4.0	1.07	3.95	7.0	1.93	0.94	14.48	5.20	16.66	3.02	1.92	1.15	2.05	0.88	3.54	1.70	0.44
xxxii)	ALU60 × 40 × 5.0	1.31	4.86	7.0	1.96	0.98	17.58	6.28	20.21	3.65	1.90	1.14	1.98	0.87	4.25	2.08	0.43
xxxiii)	ALU60 × 40 × 6.0	1.55	5.75	7.0	2.00	0.61	20.52	7.29	23.55	4.26	1.89	1.13	1.97	0.86	5.13	2.45	0.43
xxxiv)	ALU60 × 45 × 3.5	1.03	3.79	7.0	1.77	1.06	13.5	6.52	16.4	3.65	1.89	1.31	2.08	0.98	3.20	1.90	0.54
xxxv)	ALU65 × 45 × 4.0	1.17	4.35	7.0	2.03	1.06	18.8	7.41	22.0	4.21	2.08	1.31	2.25	0.98	4.21	2.15	0.47
xxxvi)	ALU65 × 45 × 5.0	1.45	5.36	7.0	2.08	1.10	22.78	8.99	26.7	5.07	0.06	1.30	2.23	0.97	5.15	2.64	0.47
xxxvii)	ALU75 × 50 × 5.0	1.66	6.14	8.0	2.39	1.17	35.47	12.77	40.67	5.57	2.40	1.44	2.57	1.11	6.94	3.33	0.43
xxxviii)	ALU75 × 50 × 6.0	1.97	7.28	8.0	2.44	1.21	41.42	14.91	47.54	8.79	2.39	1.43	2.56	1.10	18.19	3.93	0.43
xxxix)	ALU80 × 40 × 4.0	1.29	4.78	8.0	2.76	0.81	32.10	5.58	34.07	3.61	2.59	1.08	2.67	0.87	6.12	1.75	0.26
xl)	ALU80 × 40 × 6.0	1.88	6.98	8.0	2.85	0.89	45.87	7.84	48.62	5.09	2.56	1.06	2.64	0.85	8.91	2.52	0.26
xli)	ALU80 × 40 × 8.0	2.46	9.10	8.0	2.94	0.97	58.51	9.84	61.86	6.49	2.54	1.04	2.61	0.84	11.57	3.25	0.25
xlii)	ALU80 × 60 × 4.0	1.51	5.58	8.0	2.39	1.41	36.59	17.86	44.76	9.68	2.56	1.79	2.83	1.32	6.52	3.89	0.55

*Based on density of 2.7 gm/cm^3

Table 2 (*Continued*)

Sl No.	Designation and Size	Mass* per Metre	Sectional Area	Radius at Root	Centre of Gravity		Moment of Inertia				Radius of Gyration				Modulus of Section		Tan α
		(M)	(a)		C_z	C_y	I_z	I_y	I_u *Max*	I_v *Min*	r_z	r_y	r_u *Max*	r_v *Min*	Z_z	Z_y	
	(A × B × t, in mm)	kg/m	cm^2	mm	cm	cm	cm^4	cm^4	cm^4	cm^4	cm	cm	cm	cm	cm^3	cm^3	
(1)	(2)	(3)	(4)	(5)	(6)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
xliii)	ALU80 × 60 × 5.0	1.96	7.23	8.0	2.36	1.43	45.6	21.9	55.2	12.3	2.51	1.74	2.76	1.30	8.08	4.79	0.54
xliv)	ALU80 × 60 × 6.0	2.21	8.18	8.0	2.43	1.50	52.59	25.50	64.31	13.78	2.54	1.77	2.80	1.30	9.53	5.66	0.55
xlv)	ALU80 × 60 × 8.0	2.89	10.70	8.0	2.56	1.57	67.38	32.46	82.20	17.64	2.51	1.74	2.77	1.28	12.37	7.33	0.55
xlvi)	ALU90 × 60 × 60	2.37	8.78	8.0	2.89	1.41	72.93	26.42	83.96	15.39	2.88	1.73	3.09	1.32	11.94	5.76	0.44
xlvii)	ALU100 × 50 × 6.0	2.38	8.81	9.0	3.51	1.06	91.88	15.91	97.53	10.27	3.23	1.34	3.33	1.08	14.16	4.04	0.26
xlviii)	ALU100 × 50 × 8.0	3.11	11.53	9.0	3.60	1.14	118.11	20.16	125.16	13.11	3.20	1.32	3.29	1.07	18.45	5.22	0.26
xlix)	ALU100 × 50 × 10.0	3.83	14.17	9.0	3.68	1.21	142.61	24.03	150.80	15.83	3.17	1.30	3.26	1.06	22.58	6.35	0.25
l)	ALU100 × 75 × 6.0	2.94	10.8	9.0	2.95	1.78	107	51.6	130	28.9	3.14	2.18	3.46	1.63	15.2	9.01	0.54
li)	ALU100 × 75 × 8.0	3.77	13.9	9.0	3.08	1.88	137	66.0	167	36.3	31.4	2.18	3.46	1.62	19.8	11.7	0.54
lii)	ALU100 × 80 × 6.0	2.87	10.61	9.0	2.97	1.98	107.33	61.52	137.22	31.63	3.18	2.41	3.60	1.73	15.26	10.22	0.63
liii)	ALU100 × 80 × 8.0	3.76	13.93	9.0	3.05	2.06	138.58	79.09	176.97	40.70	3.15	2.38	3.56	1.71	19.94	13.32	0.63
liv)	ALU100 × 80 × 10.0	4.64	17.17	9.0	3.13	2.14	167.96	96.46	214.01	49.41	3.13	2.36	3.53	1.70	24.44	16.28	0.62
lv)	ALU120 × 80 × 8.0	4.21	15.57	10.0	3.86	1.89	230.16	83.17	265.44	47.89	3.84	2.31	4.13	1.75	28.28	13.61	0.44
lvi)	ALU120 × 80 × 10.0	5.19	19.21	10.0	3.94	1.97	279.93	100.45	322.29	58.09	3.82	2.29	4.10	1.74	34.74	16.64	0.44

*Based on density of 2.7 gm/cm^3

Table 2 (*Continued*)

Sl No.	Designation and Size	Mass* per Metre	Sectional Area	Radius at Root	Centre of Gravity		Moment of Inertia				Radius of Gyration				Modulus of Section		Tan α
		(M)	(a)		C_z	C_y	I_z	I_y	I_u *Max*	I_v *Min*	r_z	r_y	r_u *Max*	r_v *Min*	Z_z	Z_y	
	(A × B × t, in mm)	kg/m	cm^2	mm	cm	cm	cm^4	cm^4	cm^4	cm^4	cm	cm	cm	cm	cm^3	cm^3	
(1)	(2)	(3)	(4)	(5)	(6)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
lvii)	ALU120 × 80 × 12.0	6.15	22.77	10.0	4.02	2.04	327.13	116.60	375.79	67.94	3.79	2.26	4.06	1.73	41.00	19.57	0.43
lviii)	ALU120 × 90 × 7	4.11	15.2	10.0	3.52	2.13	216	104	262	58.5	3.78	2.62	4.16	1.96	25.6	15.2	0.54
lix)	ALU120 × 90 × 10	5.65	20.9	10.0	3.70	2.26	295	142	358	78.1	3.76	2.60	4.14	1.94	35.5	21.0	0.54
lx)	ALU125 × 80 × 8.0	4.31	15.97	10.0	4.07	1.85	257.62	84.05	292.35	49.32	4.02	2.29	4.28	1.76	30.56	13.67	0.41
lxi)	ALU125 × 80 × 10.0	5.32	19.71	10.0	4.15	1.93	313.57	101.54	355.28	59.83	3.99	2.27	4.25	1.74	37.57	16.72	0.41
lxii)	ALU125 × 80 × 12.0	6.31	23.37	10.0	4.23	2.00	365.72	117.88	414.63	69.98	3.96	2.25	4.22	1.73	44.36	19.66	0.40
lxiii)	ALU140 × 105 × 8.5	5.83	21.5	12.0	4.13	2.49	416	200	504	112	4.40	3.05	4.84	2.28	42.2	25.0	0.54
lxiv)	ALU140 × 105 × 11	7.26	26.8	12.0	4.30	2.62	518	250	630	137	4.40	3.05	4.85	2.26	53.4	31.7	0.54
lxv)	ALU150 × 80 × 8.0	4.88	18.07	12.0	5.13	1.69	426.69	87.93	459.21	55.41	4.86	2.21	5.04	1.75	43.22	13.93	0.30
lxvi)	ALU150 × 80 × 10.0	6.02	22.31	12.0	5.22	1.77	520.60	106.29	559.73	67.16	4.83	2.18	5.09	1.74	53.22	17.05	0.29
lxvii)	ALU150 × 80 × 12.0	7.15	26.47	12.0	5.30	1.84	610.41	123.50	655.43	78.48	4.80	2.16	4.98	1.72	62.94	20.06	0.29
lxviii)	ALU200 × 100 × 10.0	7.98	29.55	16.0	6.95	2.04	1 245.12	217.90	1 322.87	140.15	6.49	2.72	6.69	2.18	95.38	27.37	0.27
lxix)	ALU200 × 100 × 12.0	9.48	35.11	16.0	7.04	2.12	1 466.07	254.59	1 556.66	163.99	6.46	2.69	6.66	2.16	113.13	32.30	0.26
lxx)	ALU200 × 100 × 16.0	12.42	45.99	16.0	7.22	2.28	1 886.05	322.58	1 999.02	209.61	6.40	2.65	6.59	2.13	147.52	41.76	0.26

*Based on density of 2.7 gm/cm^3

Table 2 (*Concluded*)

Sl No.	Designation and Size	Mass* per Metre	Sectional Area	Radius at Root	Centre of Gravity		Moment of Inertia				Radius of Gyration				Modulus of Section		Tan α
		(M)	(a)		C_z	C_y	I_z	I_y	I_u *Max*	I_v *Min*	r_z	r_y	r_u *Max*	r_v *Min*	Z_z	Z_y	
	(A × B × t, in mm)	kg/m	cm^2	mm	cm	cm	cm^4	cm^4	cm^4	cm^4	cm	cm	cm	cm	cm^3	cm^3	
(1)	(2)	(3)	(4)	(5)	(6)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
lxxi)	ALU200 × 150 × 12.0	11.10	41.11	16.0	6.10	3.63	1 679.35	819.32	2 059.03	439.65	6.39	4.46	7.08	3.27	120.82	72.09	0.55
lxxii)	ALU200 × 150 × 16.0	14.58	51.99	16.0	6.26	3.79	2 168.22	1 051.71	2 653.96	565.97	6.34	4.41	7.01	3.24	157.86	93.82	0.55
lxxiii)	ALU200 × 150 × 20.0	18.05	66.86	20.0	6.40	3.94	2 632.10	1 267.91	3 210.76	689.24	6.27	4.35	6.93	3.21	193.58	114.59	0.55

*Based on density of 2.7 gm/cm^3

Table 3 Indian Standard Aluminium Channels

(*Clauses* 4.1, 6.1 *and* 6.1.1)

Sl No.	Designation	Mass* per Metre	Sectional Area	Depth of Section	Width of Flange	Thickness of Web	Thickness of Flange	Radius at Root	Centre of Gravity	Moment of Inertia		Radius of Gyration		Modulus of Section	
		(M)	(a)	h	b	t_w	t_f	r	C_y	I_z	I_y	r_z	r_y	Z_z	Z_y
		kg/m	cm^2	mm	mm	mm	mm	mm	cm	cm^4	cm^4	cm	cm	cm^3	cm^3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
i)	ALC 40 × 20 - 0.44	0.44	1.63	40	20	2.0	2.0	5.0	0.56	3.98	0.58	1.56	0.60	1.99	0.40
ii)	ALC 40 × 20 - 0.63	0.63	2.33	40	20	3.0	3.0	5.0	0.60	5.37	0.81	1.52	0.59	2.69	0.58
iii)	ALC 50 × 30 - 0.88	0.88	3.27	50	30	3.0	3.0	6.0	0.91	12.75	2.79	1.97	0.92	5.10	1.33
iv)	ALC 50 × 30 - 1.14	1.14	4.23	50	30	4.0	4.0	6.0	0.95	15.80	3.52	1.93	0.91	6.32	1.72
v)	ALC 60 × 30 - 1.33	1.13	4.17	60	30	3.0	4.0	7.0	0.94	23.62	3.59	2.38	0.93	7.87	1.75
vi)	ALC 60 × 30 - 1.55	1.55	5.73	60	30	4.0	6.0	7.0	1.03	31.10	4.89	2.33	0.92	10.37	2.48
vii)	ALC 60 × 30 - 1.69	1.69	6.24	60	30	5.0	6.0	7.0	0.98	32.2	5.03	2.27	0.89	10.7	2.50
viii)	ALC 60 × 30 - 1.95	1.95	7.21	60	30	5.0	8.0	7.0	1.09	37.14	6.05	2.27	0.92	12.39	3.17
ix)	ALC 60 × 40-1.87	1.87	6.93	60	40	4.0	6.0	7.0	1.46	39.88	11.05	2.90	1.26	13.29	4.35
x)	ALC 60 × 40 - 2.38	2.98	8.81	60	40	5.0	8.0	7.0	1.53	48.04	13.76	2.84	1.25	16.01	5.57
xi)	ALC 80 × 35 - 2.29	2.29	8.44	80	35	4.0	5.0	7.0	1.13	79.8	9.57	3.08	1.06	20.0	4.04
xii)	ALC 80 × 40 - 2.10	2.10	7.79	80	40	4.0	6.0	8.0	1.32	79.19	12.22	3.19	1.25	19.80	4.56
xiii)	ALC 80 × 40 - 2.67	2.67	9.87	80	40	5.0	8.0	8.0	1.40	96.72	15.28	3.13	1.24	24.18	5.87
xiv)	ALC 80 × 40 - 3.21	3.21	11.87	80	40	6.0	10.0	8.0	1.46	111.67	18.09	3.07	1.23	27.91	7.11
xv)	ALC 100 × 40 - 2.95	2.95	10.95	100	40	5.0	8.0	9.0	1.29	166.03	16.52	3.89	1.23	33.21	6.09
xvi)	ALC 100 × 40 - 3.20	3.20	11.8	100	40	6.0	8.0	9.0	1.24	171	16.9	3.81	1.19	34.2	6.12
xvii)	ALC 100 × 40 - 3.55	3.55	13.15	100	40	6.0	10.0	9.0	1.35	193.29	19.60	3.83	1.22	38.66	7.39

*Based on density of 2.7 g/cm^3.

Table 3 (*Continued*)

Sl No.	Designation	Mass* per Metre	Sectional Area	Depth of Section	Width of Flange	Thickness of Web	Thickness of Flange	Radius at Root	Centre of Gravity	Moment of Inertia		Radius of Gyration		Modulus of Section	
		(M)	(a)	h	b	t_w	t_f	r	C_y	I_z	I_y	r_z	r_y	Z_z	Z_y
		kg/m	cm^2	mm	mm	mm	mm	mm	cm	cm^4	cm^4	cm	cm	cm^3	cm^3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
xviii)	ALC 100 × 50 - 3.39	3.39	12.55	100	50	5.0	8.0	9.0	1.70	199.97	31.06	3.99	1.57	39.99	9.40
xix)	ALC 100 × 50 - 4.09	4.09	15.15	100	50	6.0	10.0	9.0	1.76	233.96	37.01	3.93	1.56	46.79	11.44
xx)	ALC 100 × 50 - 4.98	4.98	18.43	100	50	8.0	12.0	9.0	1.78	267.54	43.34	3.18	1.53	53.51	13.46
xxi)	ALC 120 × 50 - 3.68	3.68	13.63	120	50	5.0	8.0	10.0	1.59	308.82	33.07	4.76	1.56	51.47	9.69
xxii)	ALC 120 × 50 - 4.19	4.19	15.5	120	50	6.0	9.0	10.0	1.59	339	36.8	4.68	1.54	56.5	10.8
xxiii)	ALC 120 × 50 - 4.43	4.43	16.43	120	50	6.0	10.0	10.0	1.65	363.14	39.48	4.70	1.55	60.52	11.80
xxiv)	ALC 120 × 60 - 4.98	4.98	18.43	120	60	6.0	10.0	10.0	2.07	423.81	66.04	4.80	1.89	70.63	16.80
xxv)	ALC 120 × 60 - 6.08	6.08	22.51	120	60	8.0	12.0	10.0	2.08	489.62	77.97	4.66	1.86	81.60	19.87
xxvi)	ALC 140 × 60 - 5.66	5.66	20.9	140	60	7.0	10.0	12.0	1.89	625	71.5	5.47	1.85	89.2	17.4
xxvii)	ALC 150 × 60 - 5.51	5.51	20.42	150	60	6.0	10.0	12.0	1.90	722.88	71.41	5.95	1.87	96.38	17.43
xxviii)	ALC 150 × 60 - 6.77	6.77	25.10	150	60	8.0	12.0	12.0	1.91	843.19	84.30	5.80	1.83	112.42	20.60
xxix)	ALC 150 × 80 - 6.59	6.59	24.42	150	80	6.0	10.0	12.0	2.74	919.22	159.60	6.14	2.56	122.56	30.34
xxx)	ALC 150 × 80 - 8.07	8.07	29.90	150	80	8.0	12.0	12.0	2.73	072.29	190.37	5.99	2.52	142.97	36.09
xxxi)	ALC 150 × 80 - 10.26	10.26	38.02	150	80	10.0	16.0	12.0	2.87	311.20	233.10	5.87	2.50	174.83	46.41
xxxii)	ALC 160 × 70 - 6.58	6.58	24.3	160	70	7.0	10.0	16.0	2.18	970	116	6.32	2.18	121	24.0
xxxiii)	ALC 180 × 75 - 8.06	8.06	29.8	180	75	8.0	11.0	16.0	2.27	1480	159	7.05	2.31	164	30.5

*Based on density of 2.7 g/cm^3.

Table 3 (*Concluded*)

Sl No.	Designation	Mass* per Metre	Sectional Area	Depth of Section	Width of Flange	Thickness of Web	Thickness of Flange	Radius at Root	Centre of Gravity	Moment of Inertia		Radius of Gyration		Modulus of Section	
		(M)	(a)	h	b	t_w	t_f	r	C_y	I_z	I_y	r_z	r_y	Z_z	Z_y
		kg/m	cm^2	mm	mm	mm	mm	mm	cm	cm^4	cm^4	cm	cm	cm^3	cm^3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
xxxiv)	ALC 200 × 80 - 9.19	9.19	33.9	200	80	8.0	12.0	16.0	2.45	2110	210	7.88	2.49	211	37.8
xxxv)	ALC 200 × 80 - 9.28	9.28	34.38	200	80	8.0	12.0	16.0	2.43	140.69	210.38	7.89	2.47	214.07	37.80
xxxvi)	ALC 200 × 80 -11.74	11.74	43.50	200	80	10.0	16.0	16.0	2.58	638.55	268.98	7.79	2.46	263.86	48.72
xxxvii)	ALC 200 × 100 -13.47	13.47	49.90	200	100	10.0	16.0	16.0	3.40	181.61	495.96	7.99	3.15	318.16	75.20
xxxviii)	ALC 200 × 100 - 15.33	15.33	56.78	200	100	12.0	18.0	18.0	3.41	499.65	552.64	7.85	3.12	349.97	83.84
xxxix)	ALC 240 × 100 - 12.5	12.5	46.0	240	100	9.0	13.0	18.0	3.03	4170	450	9.52	3.12	345	64.65

*Based on density of 2.7 g/cm^3.

Table 4 Indian Standard Aluminium I-Beams

(*Clauses* 4.1, 6.1 *and* 6.1.1)

Sl No.	Designation	Mass* per Metre	Sectional Area	Depth of Beam	Width of Flange	Thickness of Web	Thickness of Flange	Radius at Root	Moment of Inertia		Radius of Gyration		Modulus of Section		Torsion Constant
		(M)	(a)	h	b	t_w	t_f	r	I_z	I_y	r_z	r_y	Z_z	Z_y	k
		kg/m	cm^2	mm	mm	mm	mm	mm	cm^4	cm^4	cm	cm	cm^3	cm^3	cm^4
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
i)	ALC 40 × 20-0.4	0.4	1.66	40	20	2.0	2.0	4.0	0.3	1.57	0.41	2.0	0.3	0.039	0.039
ii)	ALC 40 × 20 - 0.6	0.6	2.36	40	20	3.0	3.0	4.0	0.4	1.52	0.42	2.7	0.4	0.104	0.104
iii)	ALC 50 × 30 - 0.9	0.88	3.33	50	30	3.0	3.0	5.0	1.4	1.98	0.064	5.2	0.9	0.154	0.154
iv)	ALC 50 × 30 - 1.2	1.14	4.29	50	30	4.0	4.0	5.0	1.8	1.93	0.66	6.4	1.2	0.322	0.322
v)	ALC 60 × 30 - 1.1	1.2	4.17	60	30	3.0	4.0	5.0	1.8	2.38	0.66	7.9	1.2	0.252	0.252
vi)	ALC 60 × 30 - 1.5	1.5	5.73	60	30	4.0	6.0	5.0	2.7	2.33	0.69	10.4	1.8	0.824	0.824
vii)	ALC 60 × 30 - 1.9	1.9	7.21	60	30	5.0	8.0	5.0	3.7	2.27	0.71	12.4	2.5	1.700	1.700
viii)	ALC 60 × 40-1.9	1.9	7.03	60	40	4.0	6.0	6.0	6.5	2.40	0.96	13.5	3.2	0.897	0.897
ix)	ALC 60 × 40 - 2.4	2.4	8.91	60	40	5.0	8.0	6.0	8.6	2.33	0.98	16.2	4.3	1.97	1.97
x)	ALC 80 × 40 - 2.1	2.1	7.83	80	40	4.0	6.0	6.0	6.5	3.19	0.91	19.9	3.2	0.940	0.940
xi)	ALC 80 × 40 - 2.5	2.5	9.38	80	40	5.0	7.0	6.0	91.6	7.63	3.12	0.90	22.9	3.82	1.69
xii)	ALC 80 × 40 - 2.7	2.7	9.91	80	40	5.0	8.0	6.0	8.6	3.13	0.93	24.3	4.3	1.97	1.99
xiii)	ALC 80 × 40 - 3.2	3.2	11.91	80	40	6.0	6.0	6.0	10.8	3.07	0.95	28.0	5.4	3.63	3.63
xiv)	ALC 100 × 50 - 3.4	3.4	12.62	100	50	5.0	8.0	7.0	16.8	3.99	1.15	40.3	6.7	2.55	2.55
xv)	ALC 100 × 50 - 3.7	3.7	13.7	100	50	6.0	8.0	7.0	210	17.0	3.92	1.11	42.1	6.80	3.30

*Based on density of 2.7 g/cm^3.

Table 4 (*Continued*)

Sl No.	Designation	Mass* per Metre	Sectional Area	Depth of Beam	Width of Flange	Thickness of Web	Thickness of Flange	Radius at Root	Moment of Inertia		Radius of Gyration		Modulus of Section		Torsion Constant
		(M)	(a)	h	b	t_w	t_f	r	I_z	I_y	r_z	r_y	Z_z	Z_y	k
		kg/m	cm^2	mm	mm	mm	mm	mm	cm^4	cm^4	cm	cm	cm^3	cm^3	cm^4
xvi)	ALC 100 × 50 - 3.9	3.9	14.42	100	50	5.0	10.0	7 .0	21.0	4.00	1.21	46.2	8.4	4.27	4.27
xvii)	ALC 100 × 60 - 3.9	3.9	14.35	100	60	5.0	8.0	8.0	29.0	4.07	1.42	47.4	9.7	3.05	3.05
xviii)	ALC 100 × 60 - 4.1	4.1	15.19	100	60	6.0	10.0	8.0	29.1	3.99	1.38	48.4	9.7	3.43	3.43
xix)	ALC 100 × 60 - 4.7	4.7	17.35	100	60	6.0	8.0	8.0	36.3	4.00	1.45	55.5	12.1	3.54	3.54
xx)	ALC 120 × 60 - 4.7	4.7	17.55	120	60	5.0	8.0	8.0	36.2	4.88	1.44	69.7	12.1	5.47	5.47
xxi)	ALC 120 × 60-5.0	5.0	18.70	120	60	6.0	10.0	9.0	36.4	4.80	1.39	71.7	12.1	5.95	5.95
xxii)	ALC 120 × 70 - 5.6	5.6	20.70	120	70	6.0	10.0	9.0	57.5	4.87	1.67	81.8	16.4	6.62	6.62
xxiii)	ALC 120 × 80 - 6.1	6.1	22.70	120	80	6.0	10.0	9.0	85.7	4.96	1.94	91.9	21.4	7.28	7.28
xxiv)	ALC 120 × 80 - 7.4	7.4	27.58	120	80	8.0	12.0	9.0	103.1	4.30	1.93	106.0	25.8	12.8	12.8
xxv)	ALC 140 × 70 - 6.3	6.3	23.4	140	70	7.0	10.0	9.0	725	57.9	5.57	1.57	104	16.5	8.00
xxvi)	ALC 150 × 80 - 6.6	6.6	24.50	150	80	6.0	10.0	9.0	85.8	6.14	1.87	123.0	21.4	7.50	7.50
xxvii)	ALC 150 × 80 - 8.1	8.1	29.98	150	80	8.0	12.0	9.0	103.2	5.99	1.86	143.4	25.8	13.3	13.3
xxviii)	ALC 150 × 100 - 7.7	7.7	28.66	150	100	6.0	10.0	10.0	167.2	6.27	2.42	150.0	33.4	9.14	9.14
xxix)	ALC 150 × 100 - 9.4	9.4	34.94	150	100	8.0	12.0	10.0	200.9	6.12	2.40	174.7	40.2	16.1	16.1
xxx)	ALC 150 × 100 - 12.1	12.1	44.66	150	100	10.0	16.0	10.0	268.1	6.00	2.45	214.4	53.6	35.3	35.3

*Based on density of 2.7 g/cm^3.

Table 4 (*Concluded*)

Sl No.	Designation	Mass* per Metre	Sectional Area	Depth of Beam	Width of Flange	Thickness of Web	Thickness of Flange	Radius at Root	Moment of Inertia		Radius of Gyration		Modulus of Section		Torsion Constant
		(M)	(a)	h	b	t_w	t_f	r	I_z	I_y	r_z	r_y	Z_z	Z_y	k
		kg/m	cm^2	mm	mm	mm	mm	mm	cm^4	cm^4	cm	cm	cm^3	cm^3	cm^4
xxxi)	ALC 160 × 80 - 7.6	7.6	28.2	160	80	7.0	11.0	10.0	117 0	94.6	6.45	1.83	147	23.7	10.8
xxxii)	ALC 200 × 100 - 10.5	10.5	38.94	200	100	8.0	12.0	10.0	201.1	8.09	2.27	255.0	40.2	16.9	16.9
xxxiii)	ALC 200 × 100 - 13.4	13.4	49.66	200	100	10.0	16.0	10.0	268.5	7.99	2.33	316.8	53.7	36.9	36.9
xxxiv)	ALC 200 × 120 - 12.9	12.9	47.64	200	120	10.0	12.0	12.0	347.9	8.06	2.70	309.3	58.0	24.1	24.1
xxxv)	ALC 200 × 120 - 16.1	16.1	59.80	200	120	12.0	16.0	12.0	464.2	7.99	2.79	381.4	77.4	49.6	49.6

*Based on density of 2.7 g/cm^3.

5 DESIGNATION

5.1 Aluminium equal leg angles sections shall be designated as ALE followed by lengths of legs and thickness of the section in mm.

Example:

ALE 80 × 80 × 6

5.2 Aluminium unequal leg angle sections shall be designated as ALU followed by lengths of the longer and shorter legs and thickness of the section in mm.

Example:

ALU 80 × 60 × 6

5.3 Aluminium channels shall be designated as ALC followed by the depth of channel in mm, flange width in mm and mass of the section in kg/m.

Example:

ALC 80 × 40 - 3.21

5.4 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

6 DIMENSIONS AND SECTIONAL PROPERTIES

6.1 Dimensions and mass of Indian Standard aluminium sections shall be as given in Table 1 to Table 4. For convenience of reference sectional properties are also given in the tables.

6.1.1 Sections of dimensions other than those included in the Table 1 to Table 4 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 sections shall be as specified in IS 3965.

7 MATERIALS

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

19 000, 24 345, 24 534, 52 000, 53 000, 54 300, 63 400, 64 423, 64 430, 65 032 and 74 530

Aluminium alloys and temper selected shall conform to the provisions of IS 733.

7.2 Other alloys and temper as per IS 733, as mutually agreed between purchaser and manufacturer, may also be used.

8 PACKING

Aluminium sections that are covered under this standard shall be securely bundled and wrapped in bituminised hessian cloth or in wooden boxes or as mutually agreed. Weight of each bundle may be as agreed to between the purchaser and the manufacturer.

9 MARKING

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

9.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Structural Engineering and Structural Sections Sectional Committee, CED 07

Organization	*Representative(s)*
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AND

SHRI DHEERAJ DAMACHYA
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