

भारतीय मानक

IS 3908 : 2024

Indian Standard

(Amalgamating IS 3909 : 1986,
IS 3921 : 1985 and IS 5384 : 1985)

एल्युमिनियम बीम, चैनल और कोण
अनुभाग — आयाम और गुण

Aluminium Beam, Channel and
Angle Sections — Dimensions and
Properties

ICS 77.150.10

© BIS 2024



भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002

www.bis.gov.in www.standardsbis.in

July 2024

Price Group 10

FOREWORD

This Indian Standard 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 Standard had published standards for material, dimensions and sectional properties of equal leg angle, unequal leg angle, channels and 'I' beam sections 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 merged into one standard. The merger 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

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:

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

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, $(B - C_Y)$ |
| e_Z | Distance of extreme fibre from the Z-Z axis, $(A - C_Z)$ |
| I_U | Movement of inertia (<i>Max</i>) about the U-U axis |
| I_V | Movement of inertia (<i>Min</i>) 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 |
| $r_u = \sqrt{\frac{I_u}{a}}$ | Radius of gyration about the U-U axis |
| $r_v = \sqrt{\frac{I_v}{a}}$ | Radius of gyration about the V-V axis |
| $r_y = \sqrt{\frac{I_y}{a}}$ | Radius of gyration about the Y-Y axis |

To access Indian Standards click on the link below:

https://www.services.bis.gov.in/php/BIS_2.0/bisconnect/knownyourstandards/Indian_standards/isdetails/

$$r_z = \sqrt{\frac{I_z}{a}}$$

Radius of gyration about the Z-Z axis

$$Z_z = \frac{I_z}{e_z}$$

Modulus of section about the Z-Z axis

$$Z_y = \frac{I_y}{e_y}$$

Modulus of section about the Y-Y axis

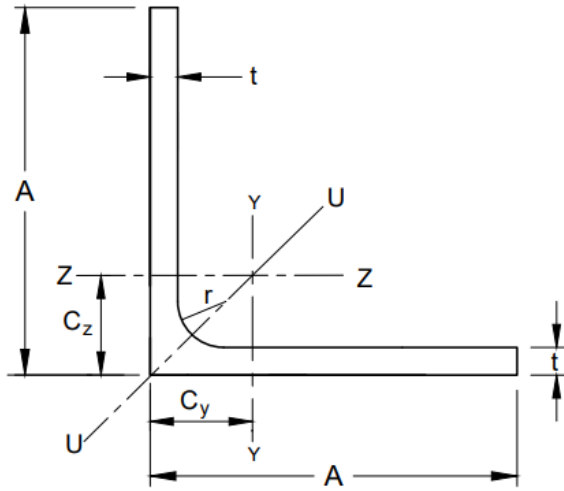


FIG. 1 SYMBOLS IN EQUAL LEG ANGLES

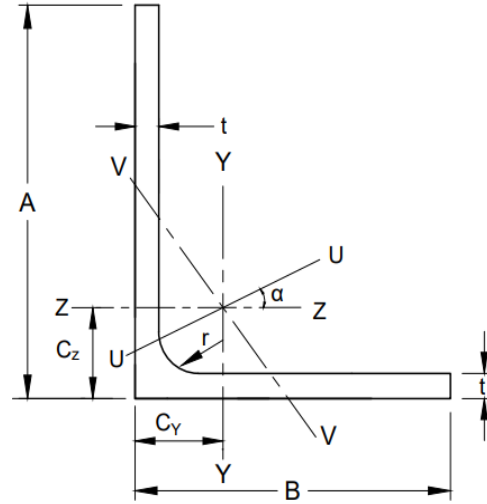


FIG. 2 ALUMINIUM UNEQUAL LEG ANGLE

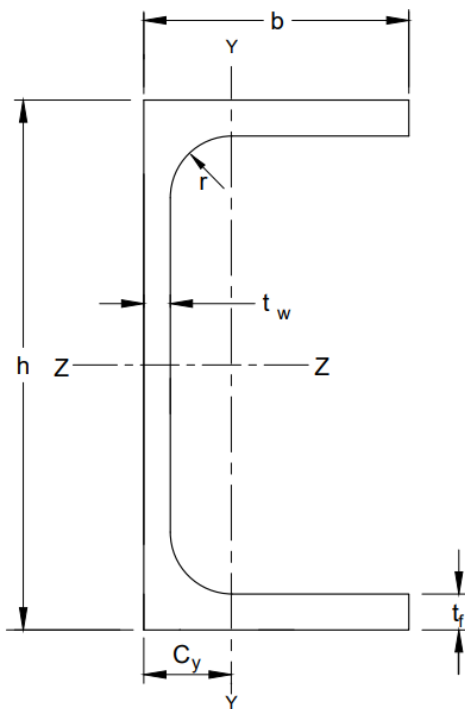


FIG. 3 ALUMINIUM CHANNEL SECTION

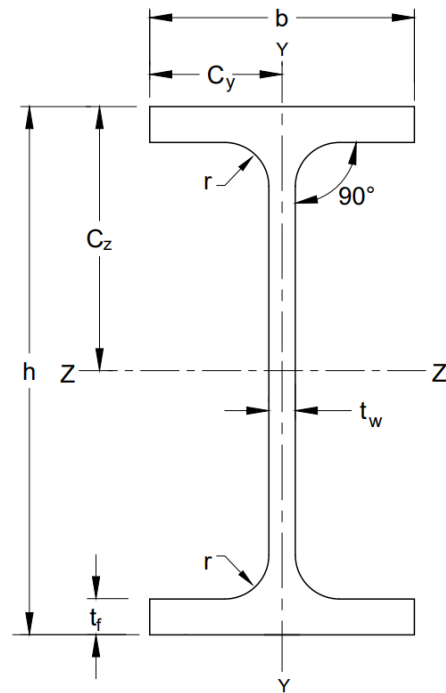


FIG. 4 ALUMINIUM I-BEAM

Table 1 Indian Standard Aluminium Equal Leg Angles

(Clauses 4.1, 6.1 and 6.1.1)

| SI 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 |
|--------|--|-----------------------|-------------------|-------------------|-------------------------|-------------------|-----------------|-----------------|--------------------|----------------|----------------|--------------------------|
| | | | | | | $I_z = I_y$ | I_u (Min) | I_v (Min) | $r_z = r_y$ | r_u (Min) | r_v (Min) | |
| | | (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 |

Table 1 (Continued)

| SI 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 |
|--------|--|-----------------------|-------------------|-------------------|-------------------------|-------------------|-----------------|-----------------|--------------------|----------------|----------------|--------------------------|
| | | | | | | $I_z = I_y$ | I_u (Min) | I_v (Min) | $r_z = r_y$ | r_u (Min) | r_v (Min) | |
| | | (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 |

Table 1 (Continued)

| SI 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 |
|----------|--|-----------------------|-------------------|-------------------|-------------------------|-------------------|-----------------|-----------------|--------------------|----------------|----------------|--------------------------|
| | | | | | | $I_z = I_y$ | I_u (Min) | I_v (Min) | $r_z = r_y$ | r_u (Min) | r_v (Min) | |
| | | (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 |

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 |
|---------|--|-----------------------|-------------------|-------------------|-------------------------|-------------------|-----------------|-----------------|--------------------|----------------|----------------|--------------------------|
| | | | | | | $I_z = I_y$ | I_u (Min) | I_v (Min) | $r_z = r_y$ | r_u (Min) | r_v (Min) | |
| | | (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) |
| xli) | 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 |
| xlii) | 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 |
| xliii) | 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 |
| xliiii) | 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 |

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 |
|--------|--|-----------------------|-------------------|-------------------|-------------------------|-------------------|-----------------|-----------------|--------------------|----------------|----------------|--------------------------|
| | | | | | | $I_z = I_y$ | I_u (Min) | I_v (Min) | $r_z = r_y$ | r_u (Min) | r_v (Min) | |
| | | (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) |
| xlvi) | 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 |
| i) | 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 |
| ii) | 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 |
| iii) | 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/cm³.

Table 2 Indian Standard Aluminium Unequal Leg Angles

(Clauses 4.1, 6.1 and 6.1.1)

| SI 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 |
|--------|----------------------|-----------------------|-------------------|-------------------|----------------------|-------|-------------------|-----------------|-----------------|-----------------|--------------------|-------|--------------|--------------|-----------------------|-----------------|--------------|
| | | | | | 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 |

Table 2 (Continued)

| SI 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 |
|---------|----------------------|-----------------------|-------------------|-------------------|----------------------|-------|-------------------|-----------------|-----------------|-----------------|--------------------|-------|--------------|--------------|-----------------------|-----------------|--------------|
| | | | | | 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 |

Table 2 (Concluded)

| SI 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 |
|----------|----------------------|-----------------------|-------------------|-------------------|----------------------|-------|-------------------|-----------------|-----------------|-----------------|--------------------|-------|--------------|--------------|-----------------------|-----------------|--------------|
| | | | | | 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 |
| xxxii) | 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 |
| xxxiii) | 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 |
| xxxiv) | 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 |
| xxxv) | 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 |
| xxxvi) | 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 |
| xxxvii) | 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 |
| xxxviii) | 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 |
| xxxix) | 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 |
| xl) | 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 |
| xli) | 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 |
| xlii) | 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 |
| xliii) | 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 |

Table 2 (Continued)

| SI 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 |
|----------|----------------------|-----------------------|-------------------|-------------------|----------------------|-------|-------------------|-----------------|-----------------|-----------------|--------------------|-------|--------------|--------------|-----------------------|-----------------|--------------|
| | | | | | 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) |
| xliviii) | 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 |
| xliv) | 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 |
| xliv) | 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 |

Table 2 (Continued)

| SI 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 |
|---------|----------------------|-----------------------|-------------------|-------------------|----------------------|-------|-------------------|-----------------|-----------------|-----------------|--------------------|-------|--------------|--------------|-----------------------|-----------------|--------------|
| | | | | | 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 |

Table 2 (Concluded)

| SI 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 |
|---------|----------------------|-----------------------|-------------------|-------------------|----------------------|-------|-------------------|-----------------|-----------------|-----------------|--------------------|-------|--------------|--------------|-----------------------|-----------------|--------------|
| | | | | | 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/cm³

Table 3 Indian Standard Aluminium Channels

(Clauses 4.1, 6.1 and 6.1.1)

| SI 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 | |
|--------|---------------------|-----------------------|-------------------|------------------------|-----------------------|---------------------|------------------------|-------------------|-------------------------|-------------------|-----------------|-----------------------|-------|-----------------------|-----------------|
| | | | | | | | | | | I_z | I_y | r_z | r_y | Z_z | Z_y |
| | | (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 |

Table 3 (Continued)

| SI 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 | |
|---------|----------------------|-----------------------|-------------------|------------------------|-----------------------|---------------------|------------------------|-------------------|-------------------------|-------------------|-----------------|-----------------------|-------|-----------------------|-----------------|
| | | | | | | | | | | I_z | I_y | r_z | r_y | Z_z | Z_y |
| | | (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 |
| xxxii) | 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 |
| xxxiii) | 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 |

Table 3 (Concluded)

| SI 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 | |
|----------|-----------------------|-----------------------|-------------------|------------------------|-----------------------|---------------------|------------------------|-------------------|-------------------------|-------------------|-----------------|-----------------------|-------|-----------------------|-----------------|
| | | | | | | | | | | I_z | I_y | r_z | r_y | Z_z | Z_y |
| | | (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/cm³.

Table 4 Indian Standard Aluminium I-Beams

(Clauses 4.1, 6.1 and 6.1.1)

| Sl No. | Designation | Mass* | 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 | | | | | | | |

Table 4 (Continued)

| Sl No. | Designation | Mass* | Sectional | Depth | Width | Thickness | Thickness | Radius | Moment of | | Radius of | | Modulus of | | Torsion |
|---------|----------------------|-----------------|-----------|-------|--------|-----------|-----------|--------|-----------------|-----------------|-----------|----------|-----------------|-----------------|-----------------|
| | | per | Area | of | of | of | of | at | Inertia | Gyration | Section | Constant | | | |
| | | Metre | (a) | Beam | Flange | Web | Flange | Root | I_z | I_y | r_z | r_y | Z_z | Z_y | k |
| | (M) | 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 | 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 |
| 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 |

Table 4 (Concluded)

| Sl No. | Designation | Mass* | 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) | <i>h</i> | <i>b</i> | <i>t_w</i> | <i>t_f</i> | <i>r</i> | <i>I_z</i> | <i>I_y</i> | <i>r_z</i> | <i>r_y</i> | <i>Z_z</i> | <i>Z_y</i> | <i>k</i> |
| | | kg/m | cm ² | mm | mm | mm | mm | mm | cm ⁴ | cm ⁴ | cm | cm | cm ³ | cm ³ | cm ⁴ |
| 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/cm³.

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 [Tables 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 [Tables 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:

For equal leg section: 19 000, 24 345, 24 534, 52 000, 53 000, 54 4300, 63 400, 64 423, 64 430, 65 032 and 74 530

For unequal leg section: 19 000, 24 345, 24 534, 52 000, 53 000, 543 000, 63 400, 64 423, 64 430, 65 032, and 74 530

For channel section: 19 000, 24 345, 24 534, 52 000, 53 000, 63 400, 64 423, 64 430, 65 032 and 74 530

For I-beam: 19 000, 24 345, 24 534, 52 000, 53 000, 544 300, 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 Sectional Committee, CED 07

| <i>Organization</i> | <i>Representative(s)</i> |
|---|---|
| In Personal Capacity (<i>II, 2A, Rani Meyyammai Towers MRC Nagar, R A Puram Chennai - 600028</i>) | DR V. KALYANARAMAN (Chairperson) |
| Ashwathnarayana & Eswara, Chennai | SHRI H. E. SRIPRAKASH SHASTRY |
| Bhilai Institute of Technology, Durg | DR MOHAN KUMAR GUPTA |
| Central Electricity Authority, New Delhi | SHRI A. K. JAIN DIRECTOR (TRANSMISSION) (<i>Alternate</i>) |
| Central Public Works Department, New Delhi | SHRI D. K. GARG SHRI N. K. BANSAL (<i>Alternate</i>) |
| Construma Consultancy Pvt Limited, Mumbai | DR HARSHAVARDHAN SUBBARAO |
| C.R. Narayana Rao, Architects & Engineers, Chennai | DR C. N. SRINIVASAN SHRI C. R. ARVIND (<i>Alternate</i>) |
| CSIR - Structural Engineering Research Centre, Chennai | DR G. S. PALANI DR NAPA PRASAD RAO (<i>Alternate I</i>) DR R. BALAGOPAL (<i>Alternate II</i>) |
| Engineers India Limited, New Delhi | SHRI ANURAG SINHA DR SUDIP PAUL (<i>Alternate</i>) |
| GAIL India Ltd, New Delhi | SHRI S. ASHISH VAIDYA |
| Indian Institute of Engineering Science and Technology, Shibpur | DR SUBRATA CHACKRABORTY MS CHAITALI RAY (<i>Alternate</i>) |
| Indian Institute of Technology Delhi, New Delhi | DR DIPTI RANJAN SAHOO DR ALOK MADAN (<i>Alternate</i>) |
| Institute for Steel Development & Growth, Kolkata | SHRI ARIJIT GUHA SHRI LAKHAMANA RAO PYDI (<i>Alternate</i>) |
| Jindal Steel & Power Ltd, Gurugram | SHRI SANJAY NANDANWAR |
| Larsen & Toubro Limited, Chennai | SHRI T. VENKATESH RAO |
| MECON Limited, Ranchi | SHRI B. K. PANDEY SHRI J. K. SARKAR (<i>Alternate</i>) |
| M. N. Dastur & Company Pvt Limited, Kolkata | SHRI SHUVENDU CHATTOPADHYAY SHRI GARGI ADITYA BASU (<i>Alternate I</i>) SHRIMATI MOHUA CHATTERJEE (<i>Alternate II</i>) |
| NTPC Ltd, Noida | SHRI HIMANSHU KUNDU SHRI CHANDER SHEKHAR (<i>Alternate</i>) |

IS 3908 : 2024

| <i>Organization</i> | <i>Representative(s)</i> |
|---|--|
| Powergrid Corporation of India Limited, New Delhi | SHRI ABHISHEK MS SUMANA MUKHERJEE (<i>Alternate</i>) |
| Ramboll India, Hyderabad | SHRI D. SANKAR GANESH |
| Salasar Techno Engg Limited, Noida | SHRI DAYANAND K. |
| Steel Authority of India Limited, Ranchi | SHRI GAUTAM KUMAR MITRA SHRI DEEPAK RANGARAO (<i>Alternate</i>) |
| STUP Consultants Pvt Ltd, Kolkata | SHRI ANIRBAN SENGUPTA SHRI SUMANTRA SENGUPTA (<i>Alternate I</i>) SHRI MANDAR SARDESAI (<i>Alternate II</i>) |
| Takalkar Power Engineering and Consultants Private Limited, Vadodara | SHRI S. M. TAKALKAR SHRI SHREEDHAR V. RANA (<i>Alternate</i>) |
| Tata Consulting Engineers Ltd, Mumbai | SHRI PRATIP BHATTACHARYA SHRI T. SHRIPRASAD (<i>Alternate</i>) |
| The Institution of Engineers (India), Kolkata | SHRI S. H. JAIN |
| In Personal Capacity, Mumbai | SHRI V. N. HEGGADE |
| In Personal Capacity (<i>Plot No. 686/2884, Shantinagar, Canal Road, Jharapada, Bhubaneswar - 751006</i>) | SHRI GYANA RANJAN MOHANTY |
| BIS Directorate General | SHRI DWAIPAYAN BHADRA, SCIENTIST 'E'/DIRECTOR AND HEAD (CIVIL ENGINEERING) [REPRESENTING DIRECTOR GENERAL (<i>Ex-officio</i>)] |

Member Secretary
SHRI ABHISHEK PAL
SCIENTIST 'D'/JOINT DIRECTOR

AND

SHRI DHEERAJ DAMACHYA
SCIENTIST 'B'/ASSISTANT DIRECTOR
(CIVIL ENGINEERING), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 2016* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Head (Publication & Sales), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: CED 07 (22225).

Amendments Issued Since Publication

| Amend No. | Date of Issue | Text Affected |
|-----------|---------------|---------------|
| | | |
| | | |
| | | |
| | | |

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002

Telephones: 2323 0131, 2323 3375, 2323 9402

Website: www.bis.gov.in

Regional Offices:

| | Telephones |
|---|--------------------------|
| Central : 601/A, Konnectus Tower -1, 6 th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002 | { 2323 7617 |
| Eastern : 8 th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091 | { 2367 0012 2320 9474 |
| Northern : Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019 | { 265 9930 |
| Southern : C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113 | { 2254 1442 2254 1216 |
| Western : Manakalya, 4 th Floor, NTH Complex (W Sector), F-10, MIDC, Andheri (East), Mumbai 400093 | { 283 25838 |

Branches : AHMEDABAD, BENGALURU, BHOPAL, BHUBANESHWAR, CHANDIGARH, CHENNAI, COIMBATORE, DEHRADUN, DELHI, FARIDABAD, GHAZIABAD, GUWAHATI, HARYANA (CHANDIGARH), HUBLI, HYDERABAD, JAIPUR, JAMMU, JAMSHEDPUR, KOCHI, KOLKATA, LUCKNOW, MADURAI, MUMBAI, NAGPUR, NOIDA, PARWANOO, PATNA, PUNE, RAIPUR, RAJKOT, SURAT, VIJAYAWADA.