SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
400 Commonwealth Dr., Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

MAM 2204A

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Superseding MAM 2204

TOLERANCES, METRIC
Aluminum Alloy Standard Structural Shapes

1. SCOPE: This specification covers established metric manufacturing tolerances applicable to aluminum alloy standard structural shapes ordered to metric dimensions. Standard structural shapes are shapes in certain standard alloys, tempers, sizes, and sections such as angles, channels, Tees, Zees, I-Beams, and H-Beams commonly used for structural purposes. These tolerances apply to all conditions, unless otherwise noted.

2. CROSS-SECTIONAL DIMENSIONS: Applicable tolerances are those found in Ø MAM 2205 when shape is produced by the extension process. When shape is produced by rolling, the tolerances of Tables I and II apply.

REAFFIRMED
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2.1 Structural Shapes Where Depth, Flange Width, or Stem Height is 200 mm or Less: Depth tolerance applies only at web. Depth across other points is controlled by angularity tolerance.

TABLE I

Specified Dimension	Shape	Tolerance, Percent of Specified Dimension or Millimetres
Thickness	Angles, Channels, Tees, Zees I-Beams, and H-Beams	±2.5% or ±0.25 mm, whichever is greater
Flange Width	Angles and Zees	±2.5% or ±1.5 mm, whichever is greater
Flange Width	Channels, Tees, I-Beams, and H-Beams	±4%
Depth	Zees and H-Beams	±2.5% or ±1.5 mm, whichever is greater
Depth	Channels and I-Beams	+2.5, -1.5 mm
Stem Height	Tees	±2.5% or ±1.5 mm, whichever is greater

2.2 Structural Shapes Where Depth, Flange Width, or Stem Height is Over 200 to 400 mm, Inclusive: Depth tolerance applies only at web. Depth across other points is controlled by angularity tolerance.

TABLE II

Specified Dimension	Shape	Tolerance, Percent of Specified Dimension or Millimetres
Thickness	I-Beams, H-Beams, and Channels	±3% or ±0.40 mm, whichever is greater
Thickness	Angles, Tees, and Zees	±2.5% or ±0.40 mm, whichever is greater
Flange Width	I-Beams, Channels, and Tees	±4%
Flange Width	H-Beams	±4% or ±6 mm, whichever is greater
Flange Width	Angles	±2.5% or ±5 mm whichever is greater
Flange Width	Zees	±2.5% or ±2.5 mm, whichever is greater
Depth	I-Beams, Channels, and Zees	±2.5% or ±6 mm, whichever is greater
Depth	H-Beams	±3% or ±6 mm, whichever is greater
Stem Height	Tees	±2.5% or ±6 mm, whichever is greater

3. LENGTH:

TABLE III

Specified Depth, Flange Width, or Stem Height (Whichever is Greater) Millimetres	Tolerance, Millimetres, Plus Only Specified Length, Millimetres			
	Up to 5000, incl	Over 5000 to 10,000, incl	Over 10,000 to 15,000, incl	Over 15,000
Up to 70.00, incl	4	7	10	25
Over 70.00 to 200.00, incl	6	9	11	25
Over 200.00	7	10	13	25

4. STRAIGHTNESS (Allowable Deviation From Straight): When weight of shape on flat surface minimizes deviation.

TABLE IV

In total length or in any 300 mm or longer chord segment of total length	2 mm/m

5. TWIST: When weight of shape on flat surface minimizes deviation.

TABLE V

Specified Depth, Flange Width, or Stem Height (Whichever is Greater) Millimetres	Allowable Deviation from Straight Degrees In total length or in any 300 mm or longer chord segment of total length
Up to 40.00, incl	3/m; 7 maximum
Over 40.00 to 80.00, incl	1.5/m; 5 maximum
Over 80.00	1/m; 3 maximum

6. ANGULARITY:

TABLE VI

Specified Leg, Web, or Flange Thickness (Whichever is Smaller) Millimetres	Allowable Deviation From Specified Angle Degrees, Plus and Minus
Up to 5.00, incl	2
Over 5.00 to 20.00, incl	1.5
Over 20.00	1

7. FLATNESS:

TABLE VII

Surface Width Millimetres	Maximum Allowable Deviation from Flat Millimetre
Up to 25, incl	0.10
Over 25 to 150, incl	0.004 x width (mm)
In any 25 mm of width	0.10

8. SQUARENESS OF SAW CUTS: Ends shall not deviate from square by more than one degree.