

TOLERANCES

Aluminum Alloy Standard Structural Shapes

1. **SCOPE:** This specification covers established manufacturing tolerances applicable to aluminum alloy standard structural shapes ordered to inch/pound 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. The term "excl" applies only to the higher figure of the specified range.
2. **CROSS-SECTIONAL DIMENSIONS:**
 - 2.1 **Structural Shapes Where Depth, Flange Width, or Stem Height is Less Than 8.000 Inches:** Depth tolerance applies only at web. Depth across other points is controlled by angularity tolerance.

TABLE I

Specified Dimension	Shape	Tolerance, Inch or Percent of Specified Dimension
Thickness	Angles, Channels, Tees, Zees, I-Beams, and H-Beams	+2.5% or +0.010 in., whichever is greater
Flange Width	Angles and Zees	+2.5% or +1/16 in. whichever is greater
	Channels, Tees, I-Beams, and H-Beams	+4%
Depth	Zees and H-Beams	+2.5% or +1/16 in., whichever is greater
	Channels and I-Beams	+3/32 in., -1/16 in.
Stem Height	Tees	+2.5% or +1/16 in., whichever is greater

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AMS 2204E

2.2 Structural Shapes Where Depth, Flange Width, or Stem Height is 8.000 to 15.000 in., Incl: Depth tolerance applies only at web. Depth across other points is controlled by angularity tolerance.

TABLE II

Specified Dimension	Shape	Tolerance, Inch or Percent of Specified Dimension
Thickness	I-Beams, H-Beams, and Channels	+3% or +0.015 in., whichever is greater
	Angles, Tees, and Zees	+2.5% or +0.015 in., whichever is greater
Flange Width	I-Beams, Channels, and Tees	+4%
	H-Beams	+4% or +1/4 in., whichever is greater
	Angles	+2.5% or +3/16 in., whichever is greater
	Zees	+2.5% or +3/32 in., whichever is greater
Depth	I-Beams, Channels, and Zees	+2.5% or +1/4 in., whichever is greater
	H-Beams	+3% or +1/4 in., whichever is greater
Stem Height	Tees	+2.5% or +1/4 in., whichever is greater

3. LENGTH:

TABLE III

Specified Depth, Flange Width, or Stem Height (Whichever is Greater) Inches	<u>Tolerance, Inch, Plus Only</u>			
	<u>Length Ranges, Feet</u>			
	Up to 12, incl	Over 12 to 30, incl	Over 30 to 50, incl	Over 50
Up to 3.000, excl	1/8	1/4	3/8	1
3.000 to 8.000, excl	3/16	5/16	7/16	1
8.000 and over	1/4	3/8	1/2	1

4. STRAIGHTNESS (Allowable deviation from straight): When weight of shape on flat surface minimizes deviation.

TABLE IV

\emptyset In total length or in any measured segment of one foot or more of total length	0.025 in. x length in ft
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5. TWIST: When weight of shape on flat surface minimizes deviation.

TABLE V

Specified Depth, Flange Width, or Stem Height (Whichever is Greater) Inches	Allowable Deviation from Straight Degrees
	In total length or in any measured segment of one foot or more of total length
Up to 1.500, excl	1 per ft; 7 max
1.500 to 3.000, excl	0.5 per ft; 5 max
3.000 and over	0.25 per ft; 3 max

6. ANGULARITY:

TABLE VI

Nominal Leg, Web or Flange Thickness (Whichever is Smaller) Inches	Allowable Deviation from Specified Angle, Degrees, Plus and Minus
Up to 0.188, excl	2
0.188 to 0.750, excl	1.5
0.750 and over	1

7. FLATNESS:

TABLE VII

\emptyset Surface Width Inches	Allowable Deviation from Flat, Inches
Up to 1.000, incl	0.004
Over 1.000 to 6.000, excl	0.004 x width (in.)
In any 1 in. of width	0.004