Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N.Y. 10001

AEROSPACE MATERIAL SPECIFICATION

AMS 2204D
Superseding AMS 2204C
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TOLERANCES
Aluminum Alloy Standard Structural Shapes

1. SCOPE: This specification covers established manufacturing tolerances applicable to aluminum-base alloy standard structural shapes. 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. Tolerances in U.S. conventional units are primary; tolerances in SI units are shown as the equivalent of the inch/foot/degree dimensions and are not to be construed as standard for product produced to SI dimensions.

2. CROSS-SECTIONAL DIMENSIONS:

2.1 Structural Shapes Where Depth, Flange Width, or Stem Height is Less Than 8.00 In. (203.2 mm):

TABLE I

Nominal Dimension	Shape	Tolerance (See Note 1), Inch (Millimeters) or Percent of Nominal Dimension
Thickness	Angles, Channels, Tees, Zees, I-Beams, and H-Beams	± 2.5% or ± 0.010 in. (± 0.25 mm), whichever is greater
Flange Width	Angles and Zees	± 2.5% or ± 1/16 in. (± 1.6 mm), whichever is greater
	Channels, Tees, I-Beams, and H-Beams	± 4%
Depth	Zees and H-Beams	± 2.5% or ± 1/16 in. (± 1.6 mm), whichever is greater
	Channels and I-Beams	+ 3/32 in. (+ 2.4 mm), - 1/16 in. (- 1.6 mm)
Stem Height	Tees	± 2.5% or ± 1/16 in. (± 1.6 mm), whichever is greater

2.2 Structural Shapes Where Depth, Flange Width, or Stem Height is 8.00 to 15.00 in. (203.2 to 381.0 mm), Incl:

TABLE II

Nominal Dimension	Shape	Tolerance (See Note 1), Inch (Millimeters) or Percent of Nominal Dimension
Thickness	I-Beams, H-Beams, and Channels	± 3% or ± 0.015 in. (± 0.38 mm), whichever is greater
	Angles, Tees, and Zees	± 2.5% or ± 0.015 in. (± 0.38 mm), whichever is greater
Flange Width	I-Beams, Channels, and Tees	± 4%
	H-Beams	± 4% or ± 1/4 in. (± 6.4 mm), whichever is greater
	Angles	± 2.5% or ± 3/16 in. (± 4.8 mm), whichever is greater
	Zees	± 2.5% or ± 3/32 in. (± 2.4 mm), whichever is greater
Depth	I-Beams, Channels, and Zees	± 2.5% or ± 1/4 in. (± 6.4 mm), whichever is greater
	H-Beams	± 3% or ± 1/4 in. (± 6.4 mm), whichever is greater
Stem Height	Tees	± 2.5% or ± 1/4 in. (± 6.4 mm), whichever is greater

3. LENGTH:

TABLE III

Nominal Depth, Flange Width, or Stem Height (Whichever is Greater) Inches	Tolerance, Inch, Plus Only, Length Ranges, Feet			
	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 to 15.000, incl	1/4	3/8	1/2	1

TABLE III (SI)

Nominal Depth, Flange Width, or Stem Height (Whichever is Greater) Millimeters	Tolerance, Millimeters, Plus Only — Length Ranges, Meters			
	Up to 3.66, incl	Over 3.66 to 9.14, incl	Over 9.14 to 15.24, incl	Over 15.24
Up to 76.20, excl	3.2	6.4	9.5	25.4
76.20 to 203.20, excl	4.8	7.9	11.1	25.4
203.20 and over	6.4	9.5	12.7	25.4

4. STRAIGHTNESS (Allowable deviation from straight) (See Note 2):

TABLE IV

In any foot or less of length:	0.025 in.
In total length of piece:	0.025 x length, ft

TABLE IV (SI)

In any 304.8 mm or less of length:	0.64 mm
In total length of piece:	0.002 x length in mm

5. TWIST:

TABLE V

Nominal Depth, Flange Width, or Stem Height (Whichever is Greater) Inches	Allowable Deviation from Straight (See Note 2), Degrees	
	In Any Foot or Less of Length	In Total Length (L) of Piece
Up to 1.500, excl	1	L; 7 max
1.500 to 3.000, excl	1/2	L/2; 5 max
3.000 to 15.000, incl	1/4	L/4; 3 max

TABLE V (SI)

Nominal Depth, Flange Width, or Stem Height (Whichever is Greater) Millimeters	Allowable Deviation from Straight, Radians	
	In Any 304.8 mm or Less of Length	In Total Length (L) of Piece
Up to 38.10, excl	0.017	0.055 x length, m; 0.122 max
38.10 to 76.20, excl	0.009	0.027 x length, m; 0.087 max
76.20 to 381.00, incl	0.004	0.004 x length, m; 0.052 max