



AEROSPACE MATERIAL SPECIFICATION

AMS2224™**REV. H**

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Revised 2023-06

Superseding AMS2224G

Tolerances
Copper and Copper Alloy Wire

RATIONALE

AMS2224H results from a Five-Year Review and update of this specification with changes to update Applicable Documents (see Section 2), relocate Definitions (see 2.2), clarify information for tolerances expressed as percentages (see 3.1.1.2), and to add a Note regarding usage of non-refractory and refractory tables in this specification and references to the note (see 3.1.1, 3.2.1, 3.2.2, Section 4, and 9.2).

1. SCOPE

This specification covers established inch/pound manufacturing tolerances applicable to copper and copper alloy wire ordered to inch/pound dimensions. These tolerances apply to all conditions, unless otherwise noted.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA); www.sae.org.

AS7766 Terms Used in Aerospace Metals Specifications

2.2 Definitions

Terms used in AMS are defined in AS7766.

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3. DIAMETER OR THICKNESS

3.1 Metallic Coated, Not Redrawn

3.1.1 Round Only, Non-Refractory (see 9.2)

3.1.1.1 See Table 1.

3.1.1.2 When specified as a percentage, tolerance shall be expressed to the nearest 0.001 inch.

Table 1 - Diameter or thickness tolerance round, non-refractory

Specified Diameter Inches	Tolerance Inches Plus	Tolerance Inches Minus
Up to 0.010, incl	0.0001	0.0001
Over 0.010	3.0%D	1.0%D

3.2 Bare and Metallic Coated, Cold Drawn

See 3.2.1 and 3.2.2.

3.2.1 Round, Hexagon, and Octagon Refractory and Non-Refractory (see 9.2)

3.2.1.1 See Table 2.

Table 2 - Diameter or thickness tolerance round, hexagon, and octagon

Specified Diameter or Distance Between Parallel Surfaces Inches	Tolerance, Inches Plus and Minus Non-Refractory Round	Tolerance, Inches Plus and Minus Non-Refractory		Tolerance, Inches Plus and Minus Refractory	
		Hexagon Octagon		Refractory Round	Refractory Hexagon Octagon
Up to 0.010, incl	0.0001	--		0.0002	--
Over 0.010 to 0.020, incl	0.0002	--		0.0003	--
Over 0.020 to 0.030, incl	0.0003	--		0.0005	--
Over 0.030 to 0.040, incl	0.0004	0.0008		0.0007	0.002
Over 0.040 to 0.050, incl	0.0005	0.0010		0.0008	0.003
Over 0.050 to 0.060, incl	0.0006	0.0012		0.0010	0.003
Over 0.060 to 0.080, incl	0.0008	0.0016		0.0015	0.004
Over 0.080 to 0.150, incl	0.0010	0.002		0.002	0.004
Over 0.150 to 0.500, incl	0.0015	0.003		0.002	0.004
Over 0.500 to 0.750, incl	0.002	0.004		0.003	0.005

3.2.2 Square and Rectangular Copper and Refractory and Non-Refractory (see 9.2)

3.2.2.1 See Table 3.

Table 3 - Diameter or thickness tolerances, square and rectangular

Specified Thickness Inches	Tolerance, Inches	Tolerance, Inches	Tolerance, Inches	Tolerance, Inches	Tolerance, Inches	Tolerance, Inches
	Plus and Minus Width Ranges	Plus and Minus Width Ranges	Plus and Minus Width Ranges	Plus and Minus Width Ranges	Plus and Minus Width Ranges	Plus and Minus Width Ranges
	Inches	Inches	Inches	Inches	Inches	Inches
	Up to 0.500, Incl Copper	Up to 0.500, Incl Non-Refractory	Up to 0.500, Incl Refractory	Over 0.500 to 1.250, Incl Copper	Over 0.500 to 1.250, Incl Non-Refractory	Over 0.500 to 1.250, Incl Refractory
Up to 0.013, incl	0.0010	0.0010	0.0015	0.0013	0.0013	0.002
Over 0.013 to 0.050, incl	0.0013	0.0013	0.0015	0.0015	0.0015	0.002
Over 0.050 to 0.090, incl	0.0015	0.0015	0.002	0.002	0.002	0.003
Over 0.090 to 0.130, incl	0.002	0.002	0.003	0.0025	0.0025	0.004
Over 0.130 to 0.188, incl	0.003	0.003	0.004	0.0035	0.0035	0.0045

4. WIDTH; RECTANGULAR REFRACTORY AND NON-REFRACTORY (SEE 9.2)

See Table 4.

Table 4 - Width tolerances, rectangular

Specified Width Inches	Tolerance, Inches	Tolerance, Inches
	Plus and Minus Non-Refractory	Plus and Minus Refractory
Up to 0.050, incl	0.0013	0.0015
Over 0.050 to 0.090, incl	0.0015	0.002
Over 0.090 to 0.130, incl	0.002	0.003
Over 0.130 to 0.188, incl	0.003	0.004
Over 0.188 to 0.500, incl	0.0035	0.005
Over 0.500 to 1.250, incl	0.005	0.007

5. LENGTH

Square and rectangular wire in straight lengths shall not vary from the ordered length by more than -0, +0.375 inch when specific lengths are ordered or by more than -0, +1.0 inch when specific lengths with ends or stock lengths with or without ends are ordered. No length tolerances are established for round, hexagonal, and octagonal wire.

6. STRAIGHTNESS

Square and rectangular wire having cross-sectional area of 0.010 square inch and over and thickness of 0.010 inch and over, when supplied in straight lengths, in rolls, or on bucks, shall be of such straightness that the maximum edgewise curvature (depth of arc) shall be not greater than 0.500 inch in any 6 feet of length, or 0.083 inch x length in feet for shorter lengths. No straightness tolerances are established for round, hexagonal, and octagonal wire, for square and rectangular wire under 0.010 square inch in cross-sectional area or under 0.010 inch thick or when supplied on reels or on stagger-wound rolls.

7. FLATNESS

No requirement established.

8. SPECIAL TOLERANCES

- 8.1 If tolerances specified herein are plus and minus and if all plus or all minus are desired, use the sum of the plus and minus values specified, neglecting the signs.
- 8.2 If tolerances specified herein are all plus and if all minus are desired, use the same values specified.
- 8.3 If tolerances specified herein are all plus and if plus and minus are desired, halve the values specified.