

**AEROSPACE  
MATERIAL  
SPECIFICATION**



**MAM 2224C**

Issued JUL 1982  
Reaffirmed OCT 1999  
Noncurrent MAR 2003

Superseding MAM 2224B

Tolerances, Metric  
Copper and Copper Alloy Wire

**NONCURRENCY NOTICE**

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of March, 2003. It is recommended, therefore, that this specification not be specified for new designs.

AMS 2224 covers the same requirements.

"NONCURRENT" refers to those materials which have been widely used and which may be required on some existing designs in the future. The Aerospace Materials Division, however, does not recommend these as standard materials for future use in new designs.

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## 1. SCOPE:

This specification covers established metric manufacturing tolerances applicable to copper and copper alloy wire ordered to metric (SI) dimensions. These tolerances apply to all conditions, unless otherwise noted.

1.1 AMS 2224 is the inch/pound version of this MAM.

## 2. DIAMETER OR THICKNESS:

2.1 Metallic Coated, Not Redrawn:

2.1.1 Round Only, Non-Refractory: See Table 1.

TABLE 1 - Diameter or Thickness Tolerances

Specified Diameter mm	Tolerance	Tolerance
	mm plus	mm minus
Up to 0.25, incl	0.003	0.003
Over 0.25	0.005	0.005

2.2 Bare and Metallic Coated, Cold Drawn:

See 2.2.1 and 2.2.2.

2.2.1 Round, Hexagon, and Octagon: See Table 2.

2.2.2 Square and Rectangular: See Table 3

TABLE 2 - Diameter or Thickness Tolerance, Round, Hexagon, and Octagon

Specified Diameter or Distance Between Parallel Surfaces mm	Tolerance, mm Plus and Minus Non-Refractory Round	Tolerance, mm Plus and Minus Non-Refractory		Tolerance, mm Plus and Minus Refractory Round	Tolerance, mm Plus and Minus Refractory Hexagon Octagon
		Hexagon	Octagon		
Up to 0.25, incl	0.003	--	--	0.005	--
Over 0.25 to 0.50, incl	0.005	--	--	0.008	--
Over 0.50 to 0.75, incl	0.008	--	--	0.013	--
Over 0.75 to 1.0, incl	0.010	0.020	0.020	0.018	0.050
Over 1.0 to 1.2, incl	0.013	0.025	0.025	0.020	0.075
Over 1.2 to 1.5, incl	0.015	0.030	0.030	0.025	0.075
Over 1.5 to 2.0, incl	0.020	0.040	0.040	0.040	0.10
Over 2.0 to 3.8, incl	0.025	0.050	0.050	0.050	0.10
Over 3.8 to 12, incl	0.040	0.075	0.075	0.050	0.10
Over 12. to 20, incl	0.050	0.10	0.10	0.075	0.13

TABLE 3 - Diameter or Thickness Tolerances, Square and Rectangular

Thickness, mm	Thickness Tolerances Plus and Minus mm for Widths Given in mm	
	Up to 12, incl	Up to 12 to 32, incl
Up to 1.2, incl	0.040	0.050
Over 1.2 to 2.3, incl	0.050	0.075
Over 2.3 to 3.3, incl	0.075	0.10
Over 3.3 to 4.8, incl	0.10	0.11

## 3. WIDTH; RECTANGULAR:

See Table 4.

TABLE 4 - Width Tolerances, Rectangular

Width mm	Tolerances Plus and Minus mm
Up to 1.2, incl	0.040
Over 1.2 to 2.3, incl	0.050
Over 2.3 to 3.3, incl	0.075
Over 3.3 to 4.8, incl	0.10
Over 4.8 to 12, incl	0.13
Over 12 to 32, incl	0.18

## 4. LENGTH:

Square and rectangular wire in straight lengths shall not vary from the ordered length by more than -0, +10 mm when specific lengths are ordered or by more than -0, +25 mm 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.

## 5. STRAIGHTNESS:

Square and rectangular wire having cross-sectional area of 65 mm<sup>2</sup> and over and thickness of 0.25 mm 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 12 mm in any 2000 mm of length or 2.00 x length in 300 mm for shorter lengths. No straightness tolerances are established for round, hexagonal, and octagonal wire, for square and rectangular wire under 6 mm<sup>2</sup> in cross-sectional area or under 0.25 mm thick or when supplied on reels or on stagger-wound rolls.

## 6. FLATNESS:

No requirement established.

## 7. SPECIAL TOLERANCES:

- 7.1 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.
- 7.2 If tolerances specified herein are all plus and if all minus are desired, use the same values specified.
- 7.3 If tolerances specified herein are all plus and if plus and minus are desired, halve the values specified.