SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE MAM 2263B

Issued	APR 1981
Reaffirmed	OCT 2000
Noncurrent	MAR 2003
Cancelled	SEP 2007

Superseded by AMS 2263

Tolerances, Metric
Nickel, Nickel Alloy, and Cobalt Alloy Tubing

RATIONALE

MAM 2263A has been designated Cancelled and Superseded because equivalent technical requirements are provided by AMS 2263.

CANCELLATION NOTICE

This specification has been declared “CANCELLED” and superseded by the Aerospace Materials Division, SAE, as of September, 2007, and has been superseded by AMS 2263. The requirements of the latest issue of AMS 2263 shall be fulfilled whenever reference is made to the cancelled MAM 2263A. By this action, this document will remain listed in the Numerical Section of the Index of Aerospace Material Specifications indicating that it has been “CANCELLED”.

Cancelled specifications are available from SAE.

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 2263 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.

“NONCURRENT” specifications are available from SAE.

1. SCOPE:

This specification covers established metric manufacturing tolerances applicable to seamless and welded thin-walls aircraft tubing of nickel, nickel alloys, and cobalt alloys ordered to metric dimensions. These tolerances apply to all conditions and are based on individual measurements, unless otherwise noted. The term “excl” is used to apply only to the higher figure of a specified range.

1.1 These tables are based on logical metric values and preferred metric sizes.

1.2 Throughout this specification the term “metric” is intended to refer to the SI system.

2. DIAMETER:

Mean diameter is the average of two measurements taken at right angles to each other at the same section. Ovality is the difference between the maximum and minimum diameter of any one section of a tube.

2.1 Seamless, Cold Finished:

2.1.1 Nickel-Copper Alloy, Annealed:

TABLE I

Specified OD Millimetres	Specified Wall Thickness % of OD	Tolerance, Millimetre				
		OD		Mean OD		Ovality
		Plus	Minus	Plus	Minus	
Up to 10.0, incl	Up to 3.0, incl	--	--	0.10	0	0.10
	Over 3.0	0.10	0	--	--	--
Over 10.0 to 16.0, excl	Up to 3.0, incl	--	--	0.13	0	0.13
	Over 3.0	0.13	0	--	--	--
16.0 to 38.0, incl	Up to 3.0, incl	--	--	0.13	0.13	0.01xOD
	Over 3.0	0.13	0.13	--	- -	--
Over 38.0 to 115.0, incl	Up to 3.0, incl	--	--	0.25	0.25	0.01xOD
	Over 3.0	0.25	0.25	--	--	--
Over 115.0 to 150.0, incl	Up to 3.0, incl	--	--	0.38	0.38	0.01xOD
	Over 3.0	0.75	0.75	0.38	0.38	--
Over 150.0 to 190.0, incl	Up to 3.0, incl	--	--	0.50	0.50	0.01xOD
	Over 3.0	1.00	1.00	0.50	0.50	--
Over 190.0 to 220.0, incl	Up to 3.0, incl	--	--	0.65	0.65	0.01xOD
	Over 3.0	1.25	1.25	0.65	0.65	--

2.1.2 Nickel-Chromium Iron Alloy, Annealed:

TABLE II

Specified OD Millimetres	Specified Wall Thickness % of OD	Tolerance, Millimetre				
		OD		Mean OD		Ovality
		Plus	Minus	Plus	Minus	
Up to 10.0, incl	Up to 3.0, incl	--	--	0.10	0	0.10
	Over 3.0	0.10	0	--	--	--
Over 10.0 to 16.0, excl	Up to 3.0, incl	--	--	0.13	0.13	0.13
	Over 3.0	0.13	0	--	--	--
16.0 to 38.0, incl	Up to 3.0, incl	--	--	0.19	0.19	0.01xOD
	Over 3.0	0.19	0.19	--	--	- -
Over 38.0 to 90.0, incl	Up to 3.0, incl	--	--	0.25	0.25	0.01xOD
	Over 3.0	0.25	0.25	--	--	--
Over 90.0 to 115.0, incl	Up to 3.0, incl	--	--	0.38	0.38	0.01xOD
	Over 3.0	0.38	0.38	--	--	--
Over 115.0 to 150.0, incl	Up to 3.0, incl	--	--	0.50	0.50	0.01xOD
	Over 3.0	1.00	1.00	0.50	0.50	--
Over 150.0 to 170.0, incl	Up to 3.0, incl	--	--	0.65	0.65	0.01xOD
	Over 3.0	1.25	1.25	0.65	0.65	--

2.2 Copper Furnace Brazed, Cold Finished:

2.2.1 Nickel-Copper Alloy, Annealed:

TABLE III

Specified OD Millimetres	Specified Wall Thickness Millimetre	OD Tolerance Millimetre	
		Plus	Minus
3.20	0.70	0.03	0.03
4.75	0.70	0.03	0.03
6.25	0.70	0.08	0
8.00	0.70	0.08	0
9.50	0.70	0.08	0
12.50	0.70	0.13	0
16.00	0.70	0.13	0
16.00	0.90	0.13	0

2.3 Welded, All Alloys:

For tubing with specified wall thickness 3% or less of specified OD, OD tolerances apply to mean OD. OD and ID tolerances shall not apply to the same lot of tubing.

TABLE IV

Specified OD Millimetres	Specified Wall Thickness % of OD	Tolerance, Millimetre Plus and Minus OD	ID	Ovality
Up to 2.5, incl	Up to 3.0, incl	0.03	0.03	0.03
	Over 3.0	0.03	0.03	- -
Over 2.5 to 5.0, excl	Up to 3.0, incl	0.04	0.04	0.04
	Over 3.0	0.04	0.04	- -
5.0 to 12.5, incl	Up to 3.0, incl	0.08	0.13	0.08
	Over 3.0	0.08	0.13	- -
12.5 to 25.0, incl	Up to 3.0, incl	0.10	0.15	0.10
	Over 3.0	0.10	0.15	- -
25.0 to 37.5, incl	Up to 3.0, incl	0.13	0.18	0.13
	Over 3.0	0.13	0.18	- -
37.5 to 50.0, incl	Up to 3.0, incl	0.15	0.20	0.15
	Over 3.0	0.15	0.20	- -
50.0 to 62.5, incl	Up to 3.0, incl	0.18	0.25	0.18
	Over 3.0	0.18	0.25	- -
62.5 to 90.0, incl	Up to 3.0, incl	0.25	0.35	0.25
	Over 3.0,	0.25	0.35	- -
90.0 to 125.0, incl	Up to 3.0, incl	0.38	0.50	0.38
	Over 3.0,	0.38	0.50	- -

3. WALL THICKNESS:

3.1 Seamless, Cold Finished:

3.1.1 Wall thickness of all tubes except for those alloys and sizes shown in 3.1.2 and 3.1.3 shall not vary more than ±10%.

3.1.2 Nickel-Copper Alloy, Seamless:

3.1.2.1 Wall thickness may vary ±12.5% for the following sizes:

3.1.2.1.1 Tubes with specified OD over 10.0 to 16.0 mm, excl, with specified wall thickness of 1.0 mm and over.

3.1.2.1.2 Tubes with specified wall thickness greater than 25% of the specified OD.

3.1.2.1.3 Tubes over 115.0 mm in specified OD.