

**AEROSPACE  
MATERIAL  
SPECIFICATION**

**MAM 2253B**

Issued JAN 1983  
Reaffirmed SEP 1998  
Noncurrent MAR 2003  
Cancelled JUN 2007

Superseded by AMS 2253

Tolerances, Metric  
Carbon and Alloy Steel Tubing

**RATIONALE**

MAM 2253A has been designated cancelled and superseded because AMS 2253 provides equivalent technical requirements.

**CANCELLATION NOTICE**

This specification has been declared "CANCELLED" by the Aerospace Materials Division, SAE, as of June, 2007, and has been superseded by AMS 2253. The requirements of the latest issue of AMS 2253 shall be fulfilled whenever reference is made to the cancelled MAM 2253A. By this action, this document will remain listed in the Numerical Section of the Index of Aerospace Material Specifications noting that it is superseded by AMS 2253.

Cancelled specifications are available from SAE.

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**MAM 2253A**

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Noncurrent MAR 2003

Superseding MAM2253

Tolerances, Metric  
Carbon and Alloy Steel Tubing

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 2253 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.

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## 1. SCOPE:

This specification covers established metric manufacturing tolerances applicable to carbon and alloy tubing ordered to metric dimensions. These tolerances apply to all conditions unless otherwise noted. The term "excl" is used to apply only to the higher figure of the specified range.

## 2. DIAMETER:

## 2.1 Aircraft Type, Seamless; Cold Finished:

TABLE 1

Specified OD Millimeters	OD Tolerance, Millimeter, Plus and Minus Annealed, Normalized, or Stress Relieved	OD Tolerance, Millimeter Plus and Minus Quenched and Tempered
Up to 12.5, incl	0.12	0.25
Over 12.5 to 37.5, incl	0.12	0.35
Over 37.5 to 75.0, incl	0.25	0.75
Over 75.0 to 150.0, incl	0.35	1.15
Over 150.0	0.50	1.50

- 2.1.1 Tubes with wall thickness less than 3% of the nominal OD will be allowed an ovality tolerance over and under equal to 0.5% of the nominal OD in addition to the tolerance indicated in Table 1, but the mean OD shall be within the individual measurement tolerances specified in Table 1.
- 2.1.2 When specified on the purchase order, the tolerance for the OD shall apply to the ID instead, but not to both ID and OD of the same lot of tubing.

## 2.2 Aircraft Type, Welded; Annealed, Normalized, or Stress Relieved:

TABLE 2

Specified OD Millimeters	Specified Wall Thickness Millimeter	OD Tolerance, Millimeter	
		Diameter Plus and Minus	OD Tolerance, Millimeter Ovality
Up to 12.5, incl	All	0.08	0.10
Over 12.5 to 15.5, incl	All	0.10	0.10
Over 15.5 to 25.0, incl	0.70 to 1.60, excl	0.10	0.12
Over 15.5 to 25.0, incl	1.60 to 3.00, incl	0.10	0.10
Over 25.0 to 34.5, incl	0.70 to 3.00, incl	0.12	0.20
Over 34.5 to 50.0, incl	0.70 to 1.60, excl	0.15	0.20
Over 34.5 to 50.0, incl	1.60 to 3.35, incl	0.12	0.15
Over 50.0 to 62.5, incl	All	0.18	0.25
Over 62.5 to 75.0, incl	0.85 to 2.10, excl	0.25	0.50
Over 62.5 to 75.0, incl	2.10 to 3.35, incl	0.25	0.38
Over 75.0 to 87.5, incl	1.00 to 2.35, excl	0.30	0.50
Over 75.0 to 87.5, incl	2.35 to 3.35, incl	0.25	0.50
Over 87.5 to 100.0, incl	1.00 to 2.35, excl	0.40	0.62
Over 87.5 to 100.0, incl	2.35 to 3.35, incl	0.30	0.50
Over 100.0 to 125.0, incl	1.25 to 2.35, excl	0.55	0.80
Over 100.0 to 125.0, incl	2.35 to 3.35, incl	0.40	0.80

2.2.1 When specified on the purchase order, the tolerance for OD shall apply to the ID instead, but not to both ID and OD of the same lot of tubing.

2.2.2 Ovality is the difference between the maximum and minimum diameters of any one section of the tube.

## 2.3 Mechanical Type, Seamless; Cold Finished, As Finished or Stressed Relieved:

TABLE 3

Specified OD Millimeters	Specified Wall Thickness Millimeters	OD Tolerance, Millimeters Plus	OD Tolerance, Millimeters Minus
4.70 to 12.5, excl	All	0.10	0
12.5 to 37.5, excl	All	0.12 (2.3.1)	0 (2.3.1)
37.5 to 87.5, excl	All	0.25 (2.3.1)	0 (2.3.1)
87.5 to 135.0, excl	All	0.38 (2.3.1)	0 (2.3.1)
135.0 to 200.0, excl	Under 5% of OD	0.75 (2.3.1)	0.75 (2.3.1)
135.0 to 200.0, excl	5 - 7.5%, incl, of OD	0.50	0.50
135.0 to 200.0, excl	Over 7.5% of OD	0.75	0
200.0 to 270.0, incl	Under 5% of OD	1.12 (2.3.1)	1.12 (2.3.1)
200.0 to 270.0, incl	5 - 7.5%, incl, of OD	0.88	0.88
200.0 to 270.0, incl	Over 7.5% of OD	1.12	0

2.3.1 Tubes with wall thickness less than 3% of the nominal OD will be allowed an ovality tolerance over and under equal to 0.5% of the nominal OD in addition to the tolerance indicated in Table 3, but the average OD shall be within the individual measurement tolerances specified in Table 3.

2.4 Mechanical Type, Seamless; Hot Finished:

TABLE 4

Specified OD Millimeters	Specified Wall Thickness Millimeters	OD Tolerance, Millimeters, Plus and Minus As Finished, Annealed or Normalized	OD Tolerance, Millimeters Plus and Minus Quenched and Tempered
37.5 to 75.0, excl	Over 2.35	0.55	0.75
75.0 to 80.0, excl	Over 2.35	0.75	1.15
80.0 to 135.0, excl	3% of OD or more	0.75	1.15
135.0 to 200.0, excl	3% of OD or more	1.15	1.50
200.0 to 270.0, incl	3 to 5%, excl, of OD	1.55	1.85
200.0 to 270.0, incl	5% of OD or more	1.15	1.50

## 2.5 Mechanical Type, Seamless; Cold Finished, Annealed, Normalized, or Quenched and Tempered:

TABLE 5

Specified OD Millimeters	Specified Wall Thickness	OD Tolerance, Millimeters Plus and Minus
4.65 to 12.5, incl	All	0.25
Over 12.5 to 37.5, incl	3% of OD or more	0.38
Over 37.5 to 87.5, incl	3% of OD or more	0.75
Over 87.5 to 135.0, incl	3% of OD or more	1.15
Over 135.0 to 200.0, incl	3% of OD or more	1.50
Over 200.0 to 270.0, incl	3 to 5%, excl, of OD	1.85
Over 200.0 to 270.0, incl	5% of OD or more	1.50

## 3. WALL THICKNESS:

## 3.1 Aircraft Type, Cold Finished:

3.1.1 Wall thickness of tubes 12.5 mm and over in nominal ID shall not vary more than  $\pm 10\%$ .3.1.2 Wall thickness of tubes under 12.5 mm in nominal ID shall not vary more than  $\pm 15\%$ .

## 3.2 Aircraft Type, Welded:

TABLE 6

Specified Wall Thickness Millimeters	Tolerance, Millimeter, Minus Only (3.2.1) Outside Diameter Ranges, Millimeters			
	9.40 to 22.0, incl	Over 22.0 to 50.0, incl	Over 50.0 to 75.0, incl	Over 75.0 to 100.0, incl
Up to 0.70, incl	0.10	0.10	-	-
Over 0.70 to 0.85, incl	0.10	0.10	0.12	-
Over 0.85 to 1.25, incl	0.10	0.12	0.15	-
Over 1.25 to 1.65, incl	0.10	0.15	0.15	0.15
Over 1.65 to 2.10, incl	0.10	0.15	0.15	0.15
Over 2.10 to 2.75, incl	-	0.15	0.15	0.15
Over 2.75 to 3.00, incl	-	0.15	0.20	0.20
Over 3.00 to 3.35, incl	-	0.15	0.20	0.20