The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE MAM 2201A

Issued JUL 1983
Cancelled JAN 2002

Superseding MAM 2201

Tolerances, Metric
Aluminum and Aluminum Alloy Bar, Rod, Wire, and Forging Stock
Rolled, Drawn, or Cold Finished

CANCELLATION NOTICE

This specification has been declared “CANCELLED” by the Aerospace Materials Division, SAE, as of January 2002, and has been superseded by ANSI H35.2(M). The requirements of the latest issue of ANSI H35.2(M) shall be fulfilled whenever reference is made to the cancelled MAM 2201. 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will remain listed in the Numerical Section of the Index of Aerospace Material Specifications noting that it is superseded by ANSI H35.2(M).

Cancelled specifications are available from SAE.

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1. SCOPE:

This specification covers established metric manufacturing tolerances applicable to aluminum alloy rolled, drawn, or cold finished bar, rod, wire, and forging stock ordered to metric dimensions. These tolerances apply to all conditions, unless otherwise noted. The general temper designation "-TX51" is used for brevity and denotes the full temper designations -T351, -T451, -T651, -T851, and -T7351, the "X" representing one or more digits preceding the "51."

2. DIAMETER, THICKNESS, AND WIDTH:

2.1 Rounds:

TABLE I

Specified Diameter Millimetres				Tolerance, Millimetres Plus and Minus, Except as Indicated			
				Drawn Wire	Cold Finished Rod	Rolled Rod	Centerless Ground Wire and Rod
	Up	to	0.80, incl	0.015	--	--	--
Over	0.80	to	1.60, incl	0.025	--	--	--
Over	1.60	to	3.20, incl	0.040	--	--	--
Over	3.20	to	10.00, incl	0.040	--	--	0.015
Over	10.00	to	12.50, incl	--	0.040	--	0.015
Over	12.50	to	16.00, incl	--	0.050	--	0.015
Over	16.00	to	25.00, incl	--	0.050	--	0.025
Over	25.00	to	40.00, incl	--	0.06	--	0.025
Over	40.00	to	50.00, incl	--	0.10	0.15	0.060
Over	50.00	to	70.00, incl	--	0.15	0.20	--
Over	70.00	to	90.00, incl	--	0.20	0.30	--
Over	90.00	to	120.00, incl	--	0.30	+0.80, -0.40	--
Over	120.00	to	200.00, incl	--	--	+1.60, -0.80	--

2.2 Bars and Wire:

2.2.1 Squares, Hexagons, and Octagons:

TABLE II

Specified Distance Between Parallel Sides Millimetres				Tolerance, Millimetre Plus and Minus: Drawn Wire	Cold Finished Bar	Rolled Bar
	Up	to	0.80, incl	0.025	--	--
Over	0.80	to	1.60, incl	0.040	--	--
Over	1.60	to	10.00, incl	0.050	--	--
Over	10.00	to	12.50, incl	--	0.050	--
Over	12.50	to	25.00, incl	--	0.06	--
Over	25.00	to	40.00, incl	--	0.08	--
Over	40.00	to	50.00, incl	--	0.13	0.40
Over	50.00	to	70.00, incl	--	0.20	0.50
Over	70.00	to	100.00, incl	--	--	0.50

2.2.1.1 If tolerances are desired all plus or all minus for hexagons, double the values of Table II.

2.2.2 Rectangles:

TABLE III

Specified Thickness and Width Millimetres				Tolerance, Millimetres Plus and Minus: Drawn Wire and Cold Finished Bar Thickness	Drawn Wire and Cold Finished Bar Width	Rolled Bar Thickness	Rolled Bar Width
	Up	to	0.80, incl	0.025	--	--	--
Over	0.80	to	1.60, incl	0.040	--	--	--
Over	1.60	to	12.50, incl	0.050	0.050	0.15	--
Over	12.50	to	20.00, incl	0.06	0.06	0.20	0.40
Over	20.00	to	25.00, incl	0.06	0.06	0.30	0.40
Over	25.00	to	40.00, incl	0.08	0.08	0.40	0.40
Over	40.00	to	50.00, incl	0.13	0.13	0.40	0.80
Over	50.00	to	70.00, incl	0.20	0.20	0.50	0.80
Over	70.00	to	100.00, incl	--	0.25	0.50	0.80
Over	100.00	to	160.00, incl	--	--	--	1.20
Over	160.00	to	250.00, incl	--	--	--	1.60

2.3 Flattened Wire, Flattened and Slit Wire:

2.3.1 Flattened Wire (Round Edge):

TABLE IV

Specified Thickness Millimetres	Thickness Tolerance, Millimetre Plus and Minus	Specified Width Millimetres	Width Tolerance, Millimetre Plus and Minus
Up to 0.50, incl	0.025	Up to 25.00, incl	0.18
Over 0.50 to 1.60, incl	0.040	Over 25.00 to 50.00, incl	0.25
Over 1.60 to 5.00, incl	0.050	--	--

2.3.2 Flattened and Slit Wire:

TABLE V

Specified Thickness Millimetres	Thickness Tolerance, Millimetre Plus and Minus	Specified Width Millimetres	Width Tolerance, Millimetre Plus and Minus
Over 0.40 to 0.50, incl	0.025	Over 12.50 to 16.00, incl	0.06
Over 0.50 to 1.60, incl	0.040	Over 16.00 to 40.00, incl	0.10
Over 1.60 to 2.00, incl	0.050	Over 40.00 to 120.00, incl	0.15

2.4 Forging Stock:

These tolerances are applicable for forging stock in rod and bar form. Tolerances for forging stock in plate form are contained in MAM 2202.

2.4.1 Rounds:

2.4.1.1 Class 1 Forging Stock:

TABLE VI

Specified Diameter Millimetres	Tolerance, Millimetres Plus and Minus	Conditioning Allowance Millimetres, MInus Only (See 2.4.1.1.1)
Over 10.00 to 80.00, incl	0.38	1
Over 80.00 to 130.00, incl	0.78	2
Over 130.00 to 200.00, incl	1.60	2

2.4.1.1.1 Conditioning allowance is an additional tolerance at localized areas to permit removal of possible surface defects.

2.4.1.2 Class 2 Forging Stock:

TABLE VII

Specified Diameter Millimetres	Tolerance, Millimetre Plus and Minus
Over 10.00 to 12.50, incl	0.040
Over 12.50 to 25.00, incl	0.050
Over 25.00 to 40.00, incl	0.06
Over 40.00 to 80.00, incl	0.20

2.4.2 Squares:

2.4.2.1 Class 1 Forging Stock:

TABLE VIII

Specified Distance Between Parallel Sides Millimetres	Tolerance, Millimetre Plus and Minus
Over 10.00 to 12.50, incl	0.25
Over 12.50 to 25.00, incl	0.38
Over 25.00 to 50.00, incl	0.46
Over 50.00 to 80.00, incl	0.50
Over 80.00 to 100.00, incl	0.80

2.4.2.1.1 An additional conditioning allowance of -1 mm is permitted at localized areas on the face to permit removal of possible surface defects.

2.4.2.2 Class 2 Forging Stock:

TABLE IX

Specified Distance Between Parallel Sides Millimetres	Tolerance, Millimetre Plus and Minus
Over 10.00 to 12.50, incl	0.050
Over 12.50 to 25.00, incl	0.06
Over 25.00 to 40.00, incl	0.08
Over 40.00 to 100.00, incl	0.13

2.4.3 Rectangles:

2.4.3.1 Class 1 Forging Stock:

TABLE X

Specified Thickness Millimetres	Thickness Tolerance, Millimetre Plus and Minus	Specified Width Millimetres	Width Tolerance, Millimetre Plus and Minus
Over 10.00 to 12.50, incl	0.25	Up to 40.00, incl	0.46
Over 12.50 to 25.00, incl	0.38	Over 40.00 to 100.00, incl	0.76
Over 25.00 to 50.00, incl	0.46	Over 100.00 to 150.00, incl	1.20
Over 50.00 to 80.00, incl	0.50	Over 150.00 to 250.00, incl	1.60

2.4.3.1.1 An additional conditioning allowance of -1 mm for thickness and -2 mm for width is permitted at localized areas on the face to permit removal of possible surface defects.

2.4.3.2 Class 2 Forging Stock:

TABLE XI

Specified Thickness or Width Millimetres	Tolerance, Millimetre Plus and Minus
Over 10.00 to 12.50, incl	0.050
Over 12.50 to 25.00, incl	0.06
Over 25.00 to 40.00, incl	0.08
Over 40.00 to 100.00, incl	0.13

2.5 Rivet and Cold Heading Wire and Rod:

TABLE XII

Specified Diameter Millimetres	Tolerance, Millimetre Plus	Minus
Up to 1.60, incl	0.015	0.015
Over 1.60 to 3.20, incl	0.025	0.015
Over 3.20 to 4.00, incl	0.025	0.025
Over 4.00 to 12.50, incl	0.050	0.025
Over 12.50 to 25.00, incl	0.08	0.025

3. LENGTH:

Applicable to straight lengths only.

TABLE XIII

Specified Diameter, Width, or Distance Across Flats Millimetres	Tolerance, Millimetres, Plus Only Length Ranges, Millimetres			
	Up to 5000, incl	Over 5000 to 10,000, incl	Over 10,000 to 15,000 incl	Over 15,000
Up to 70.00, incl	4	7	10	25
Over 70.00 to 200.00, incl	6	9	11	25
Over 200.00	7	10	13	25

4. STRAIGHTNESS:

Applicable to straight lengths only; not applicable to forging stock or wire. When weight of material on flat surface minimizes deviation.

4.1 Rolled Bars and Rods, All Sizes and Tempers (Except -0 Temper and Screw Machine Stock):

TABLE XIV

Maximum Curvature (Depth of Arc) Millimetres
In total length or in any 300 mm or longer chord segment of total length
4 mm/m

4.2 Cold Finished Bars and Rods (Except Screw Machine Stock):

4.2.1 All Sizes and Tempers (Except -0 and -TX51 Tempers):

TABLE XV

Maximum Curvature (Depth of Arc) Millimetres
In total length or in any 300 mm or longer chord segment of total length
2 mm/m

4.2.2 Sizes 12.50 mm and Over in the -TX51 Tempers: