



AEROSPACE MATERIAL

Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N. Y. 10001

AMS 2242C

Superseding AMS 2242 B

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TOLERANCES

Corrosion and Heat Resistant Steel and Iron Base Alloy Sheet, Strip, and Plate
and

Titanium and Titanium Alloy Sheet, Strip, and Plate

1. **PURPOSE:** To publish established manufacturing tolerances.
2. **APPLICATION:** Tolerances shown herein apply, unless otherwise agreed upon by purchaser and vendor. These tolerances apply to all alloys and conditions and are based on individual measurements, unless otherwise noted. The term "excl" is used to apply only to the higher figure of the specified range.
3. **PARAGRAPH AND TABLE NUMBERS:** Paragraph and table numbers in this issue of AMS 2242 are not completely the same as in previous issues and may not be those referenced in AMS published earlier. The following cross-reference list is provided to assist in finding paragraphs and tables in this issue which are referenced in other AMS to their former numbers.

Former Paragraph and Table Number	AMS 2242C Paragraph and Table Number	Former Paragraph and Table Number	AMS 2242C Paragraph and Table Number
3.1, I	4.1, I	5.3	6.3, XII
3.2, II	4.2, II	6.1	7.1, XIII
3.3.1, III	4.3, III	6.2	7.2
3.3.2, IIIA	4.3, III	7.1, VI	8.1, XIV
4.1	5.1.2, V	7.2, VIII	8.2, XV
4.2	5.2.2, VII	7.3	8.3, XVI
4.3	5.3, VIII	7.4	8.4, XVII
5.1	6.1.2, X	8, IX	9, XVIII
5.2	6.2, XI		

4. **THICKNESS:** Thickness is measured at any place on widths less than 1 in., at any place 0.375 in. and over from an edge on widths 1 in. and over.

4.1 Sheet:

TABLE I

Nominal Thickness Inch	Thickness Tolerance, Inch Plus and Minus
0.005	0.001
Over 0.005 to 0.007, incl	0.0015
Over 0.007 to 0.016, incl	0.002
Over 0.016 to 0.026, incl	0.003
Over 0.026 to 0.040, incl	0.004
Over 0.040 to 0.058, incl	0.005
Over 0.058 to 0.072, incl	0.006
Over 0.072 to 0.083, incl	0.007
Over 0.083 to 0.098, incl	0.008
Over 0.098 to 0.114, incl	0.009
Over 0.114 to 0.130, incl	0.010
Over 0.130 to 0.145, incl	0.012
Over 0.145 to 0.1875, incl	0.014

4.2 Strip: This table includes crown tolerances.

TABLE II
Thickness Tolerance, Inch
Width Range, Inches

Nominal Thickness (T) Inch	Width Range, inches									
	3/16 to 1, excl	1 to 3, excl	3 to 5, incl	Over 5 to 6, incl	Over 6 to 9, incl	Over 9 to 12, incl	Over 12 to 16, incl	Over 16 to 20, incl	Over 20 to 24, excl	Over 24 to 30, incl
0.005 to 0.010, excl	+0.10T ¹ -0.10T	+0.10T ¹ -0.10T	+0.10T ¹ -0.10T	+0.10T ² -0.10T	+0.10T ² -0.10T	+0.10T ² -0.10T	+0.10T ³ -0.10T	+0.15T ³ -0.15T	+0.15T ³ -0.15T	+0.15T ³ -0.15T
0.010	+0.001 -0.001	+0.00175 -0.001	+0.00175 -0.001	+0.002 -0.001	+0.002 -0.001	+0.002 -0.001	+0.0025 -0.001	+0.003 -0.0015	+0.003 -0.0015	+0.003 -0.0015
Over 0.010 to 0.011, incl	+0.001 -0.001	+0.002 -0.001	+0.002 -0.001	+0.0025 -0.001	+0.0025 -0.001	+0.0025 -0.001	+0.003 -0.0015	+0.0035 -0.0015	+0.0035 -0.0015	+0.0035 -0.0015
Over 0.011 to 0.012, incl	+0.001 -0.001	+0.002 -0.001	+0.002 -0.001	+0.0025 -0.001	+0.0025 -0.001	+0.003 -0.0015	+0.0035 -0.0015	+0.0035 -0.0015	+0.0035 -0.0015	+0.0035 -0.0015
Over 0.012 to 0.016, incl	+0.001 -0.001	+0.002 -0.001	+0.002 -0.001	+0.0025 -0.001	+0.003 -0.0015	+0.003 -0.0015	+0.004 -0.002	+0.004 -0.002	+0.004 -0.002	+0.004 -0.002
Over 0.016 to 0.019, incl	+0.001 -0.001	+0.002 -0.001	+0.002 -0.001	+0.0025 -0.001	+0.003 -0.0015	+0.0035 -0.002	+0.004 -0.0025	+0.0045 -0.0025	+0.005 -0.003	+0.0055 -0.003
Over 0.019 to 0.025, incl	+0.001 -0.001	+0.002 -0.001	+0.0025 -0.0015	+0.003 -0.0015	+0.0035 -0.002	+0.004 -0.002	+0.0045 -0.0025	+0.005 -0.003	+0.0055 -0.003	+0.006 -0.004
Over 0.025 to 0.028, incl	+0.001 -0.001	+0.003 -0.0015	+0.003 -0.0015	+0.0035 -0.0015	+0.004 -0.002	+0.004 -0.002	+0.0045 -0.0025	+0.005 -0.003	+0.0055 -0.003	+0.006 -0.004
Over 0.028 to 0.034, incl	+0.0015 -0.0015	+0.003 -0.0015	+0.0035 -0.002	+0.004 -0.002	+0.0045 -0.0025	+0.005 -0.0025	+0.0055 -0.0025	+0.006 -0.004	+0.0065 -0.004	+0.007 -0.004
Over 0.034 to 0.039, incl	+0.002 -0.002	+0.0035 -0.002	+0.004 -0.0025	+0.0045 -0.0025	+0.005 -0.003	+0.0055 -0.003	+0.006 -0.003	+0.0065 -0.004	+0.007 -0.004	+0.0075 -0.004
Over 0.039 to 0.049, incl	+0.002 -0.002	+0.0035 -0.002	+0.004 -0.0025	+0.0045 -0.0025	+0.005 -0.003	+0.0055 -0.003	+0.006 -0.003	+0.0065 -0.004	+0.007 -0.004	+0.0075 -0.004
Over 0.049 to 0.065, incl	+0.002 -0.002	+0.0035 -0.002	+0.004 -0.003	+0.0045 -0.003	+0.005 -0.003	+0.0055 -0.003	+0.006 -0.003	+0.0065 -0.004	+0.007 -0.004	+0.0075 -0.004
Over 0.065 to 0.068, incl	+0.002 -0.002	+0.004 -0.002	+0.005 -0.003	+0.0055 -0.003	+0.006 -0.003	+0.0065 -0.004	+0.007 -0.004	+0.0075 -0.004	+0.008 -0.004	+0.0085 -0.004
Over 0.068 to 0.099, incl	+0.002 -0.002	+0.004 -0.002	+0.005 -0.003	+0.0055 -0.003	+0.006 -0.003	+0.0065 -0.004	+0.007 -0.004	+0.0075 -0.004	+0.008 -0.004	+0.0085 -0.004
Over 0.099 to 0.160, incl	+0.002 -0.002	+0.004 -0.002	+0.005 -0.003	+0.0055 -0.003	+0.006 -0.004	+0.0065 -0.004	+0.007 -0.004	+0.0075 -0.004	+0.008 -0.004	+0.0085 -0.004
Over 0.160 to 0.1875, excl.	+0.002 -0.002	+0.005 -0.003	+0.006 -0.004	+0.0065 -0.004	+0.007 -0.004	+0.0075 -0.004	+0.008 -0.004	+0.0085 -0.004	+0.009 -0.004	+0.0095 -0.004

Notes: 1. Add 0.00075 in. after multiplying.
2. Add 0.001 in. after multiplying.
3. Add 0.0015 in. after multiplying.

- 4.3 Plate: Minus tolerance shall be 0.010 in. for all widths and for all thicknesses up to 2.000 in., incl, in all alloys; plus tolerances shall be as in Table III.

TABLE III

Nominal Thickness Inches	Thickness Tolerance, Plus, Inch For Width Ranges Shown, Inches			
	Over 10 to 84, incl	Over 84 to 120, incl	Over 120 to 144, incl	Over 144
0.1875 to 0.375, excl	0.046	0.050	--	--
0.375 to 0.750, excl	0.054	0.058	0.075	0.090
0.750 to 1.000, excl	0.060	0.064	0.083	0.100
1.000 to 2.000, incl	0.070	0.074	0.095	0.115

- 4.3.2 Thickness tolerances, both plus and minus, for plates over 2.000 in. thick shall be as agreed upon by purchaser and vendor.

5. WIDTH:

5.1 Sheet:

5.1.1 Stretcher Leveled, Resquared:

TABLE IV

Nominal Thickness Inch	Width Tolerance, Plus Only, Inch For Width Ranges Shown, Inches	
	24 to 48, excl	48 and Over
Up to 0.131, excl	1/16	1/8
0.131 to 0.150, incl	1/8	1/8
Over 0.150 to 0.170, incl	3/16	3/16
Over 0.170 to 0.1875, excl	1/4	1/4

5.1.2 Not Resquared, Flat or In Coils:

TABLE V

Nominal Width Inches	Width Tolerance, Plus Only, Inch
24 to 48, excl	1/16
48 and Over	1/8

5.2 Strip:5.2.1 Rolled Edge or Approximately Square Edge Produced By Rolling or Filing After Slitting:

TABLE VI

Nominal Width Inches	Nominal Thickness Inch	Width Tolerance, Inch Plus and Minus
Up to 0.28125, incl	Up to 0.0625, incl	0.005
Over 0.28125 to 0.750, incl	Up to 0.09375, incl	0.005
Over 0.750 to 5.000, incl	Up to 0.125, incl	0.005
Over 5.000 to 9.000, incl	0.008 to 0.125, incl	0.010
Over 9.000 to 20.000, incl	0.015 to 0.105, incl	0.010
Over 20.000 to 24.000, excl	0.023 to 0.080, incl	0.015

5.2.2 Slit Edge:

TABLE VII

Nominal Width Inches	Width Tolerance, Plus and Minus, Inch For Thickness Ranges Shown, Inch			
	Up to 0.068, incl	Over 0.068 to 0.099, incl	Over 0.099 to 0.160, incl	Over 0.160 to 0.1875, excl
0.1875 to 0.500, excl	0.005	0.008	0.010	--
0.500 to 6.000, incl	0.005	0.008	0.010	0.016
Over 6.000 to 9.000, incl	0.005	0.010	0.016	0.020
Over 9.000 to 12.000, incl	0.010	0.010	0.016	0.020
Over 12.000 to 20.000, incl	0.016	0.016	0.020	0.031
Over 20.000 to 24.000, excl	0.020	0.020	0.020	0.031

5.3 Plate: Minus tolerance shall be 1/4 in. for all widths in all lengths and in all thicknesses up to 1.000 in., incl; plus tolerances shall be as shown in Table VIII.

TABLE VIII

Nominal Width Inches	Nominal Length Inches	Width Tolerance, Plus, Inches For Thickness Ranges Shown, Inch		
		3/16 to 3/8, excl	3/8 to 1/2, incl	Over 1/2 to 1, incl
Over 10 to 48, incl	Up to	1/8	3/16	5/16
Over 48 to 60, incl	144,	3/16	1/4	3/8
Over 60 to 84, incl	incl	1/4	5/16	7/16
Over 84 to 108, incl		5/16	3/8	1/2
Over 108		3/8	7/16	5/8
Over 10 to 48, incl	Over 144	3/16	1/4	5/16
Over 48 to 60, incl	to 240,	1/4	5/16	3/8
Over 60 to 84, incl	incl	3/8	7/16	1/2
Over 84 to 108, incl		7/16	1/2	5/8
Over 108		1/2	5/8	11/16

(Continued)

TABLE VIII (Cont'd)

Nominal Width Inches	Nominal Length Inches	Width Tolerance, Plus, Inches For Thickness Ranges Shown, Inch		
		3/16 to 3/8, excl	3/8 to 1/2, incl	Over 1/2 to 1, incl
Over 10 to 48, incl	Over 240	1/4	5/16	3/8
Over 48 to 60, incl	to 360,	5/16	3/8	1/2
Over 60 to 84, incl	incl	7/16	1/2	5/8
Over 84 to 108, incl		9/16	5/8	3/4
Over 108		5/8	11/16	7/8
Over 10 to 60, incl	Over 360	7/16	1/2	5/8
Over 60 to 84, incl	to 480,	1/2	5/8	3/4
Over 84 to 108, incl	incl	9/16	3/4	7/8
Over 108		3/4	7/8	1
Over 10 to 60, incl	Over 480	7/16	1/2	5/8
Over 60 to 84, incl	to 600,	1/2	5/8	3/4
Over 84 to 108, incl	incl	5/8	3/4	7/8
Over 108		3/4	7/8	1
Over 10 to 60, incl	Over	1/2	5/8	3/4
Over 60 to 108, incl	600	5/8	3/4	7/8
Over 108		7/8	1	1-1/8

5.3.1 Width tolerances for plates over 1.000 in. thick shall be as agreed upon by purchaser and vendor.

6. LENGTH:

6.1 Sheet:

6.1.1 Stretcher Leveled, Resquared:

TABLE IX

Nominal Thickness Inch	Length Tolerance, Plus Only, Inch For Length Ranges Shown, Inches	
	Up to 120, excl	120 and Over
Up to 0.131, excl	1/16	1/8
0.131 to 0.150, incl	1/8	1/8
Over 0.150 to 0.170, incl	3/16	3/16
Over 0.170 to 0.1875, excl	1/4	1/4

6.1.2 Not Resquared:

TABLE X

Nominal Length Feet	Length Tolerance, Plus Only, Inch
Up to 10, incl	1/4
Over 10 to 20, incl	1/2

6.2 Strip:TABLE XI

Nominal Length Feet	Length Tolerance, Plus Only, Inch
Up to 5, incl	3/8
Over 5 to 10, incl	1/2
Over 10 to 20, incl	5/8

- 6.3 Plate: Minus tolerance shall be 1/4 in. for all lengths in all widths and in all thicknesses up to 1.000 in., incl; plus tolerances shall be as shown in Table XII.

TABLE XII

Nominal Width Inches	Nominal Length Inches	<u>Length Tolerance, Plus, Inches</u> <u>For Thickness Ranges Shown, Inch</u>		
		3/16 to 3/8, excl	3/8 to 1/2 incl	Over 1/2 to 1, incl
Over 10 to 48, incl	Up to	3/16	1/4	3/8
Over 48 to 60, incl	144,	1/4	5/16	7/16
Over 60 to 84, incl	incl	5/16	3/8	1/2
Over 84 to 108, incl		3/8	7/16	9/16
Over 108		7/16	1/2	11/16
Over 10 to 48, incl	Over 144	3/8	1/2	5/8
Over 48 to 60, incl	to 240,	7/16	5/8	3/4
Over 60 to 84, incl	incl	1/2	11/16	3/4
Over 84 to 108, incl		9/16	3/4	7/8
Over 108		5/8	7/8	1
Over 10 to 48, incl	Over 240	1/2	5/8	3/4
Over 48 to 60, incl	to 360,	5/8	3/4	3/4
Over 60 to 84, incl	incl	11/16	3/4	7/8
Over 84 to 108, incl		3/4	7/8	1
Over 108		7/8	1	1
Over 10 to 60, incl	Over 360	1-1/8	1-1/4	1-3/8
Over 60 to 108, incl	to 480	1-1/4	1-3/8	1-1/2
Over 108	incl	1-3/8	1-1/2	1-5/8
Over 10 to 60, incl	Over 480	1-1/4	1-1/2	1-5/8
Over 60 to 108, incl	to 600,	1-3/8	1-1/2	1-5/8
Over 108	incl	1-1/2	1-5/8	1-3/4
Over 10 to 108, incl	Over	1-3/4	1-7/8	1-7/8
Over 108	600	1-3/4	2	2-1/4

- 6.3.1 Length tolerances for plate over 1.000 in. thick shall be as agreed upon by purchaser and vendor.

7. STRAIGHTNESS:

7.1 Sheet and Strip:

TABLE XIII

Nominal Width Inches	Any 8 Ft Length	Shorter Lengths
Up to 1.500, incl	0.50	0.0625 x Length in Ft
Over 1.500 to 24.000, excl	0.25	0.03125 x Length in Ft
24.000 to 36.000, incl	0.125	0.0156 x Length in Ft
Over 36.000	0.09375	0.0118 x Length in Ft

7.2 Plate: Shall be of such straightness that the maximum edgewise curvature (depth of arc) shall not exceed 0.125 in. in any 5 ft of length or 0.025 in. x length in feet for shorter lengths.

8. FLATNESS: The following tolerances do not apply to strip or to Dead Soft sheet or to Deep Drawing sheet for which there are no established tolerances.

8.1 Sheet, Not Stretcher Levelled: The following table does not apply to cold worked tempers of austenitic grades.

TABLE XIV

Nominal Thickness Inch	Nominal Width Inches	Variation from Flat Inch
Up to 0.062, excl	24 to 36, incl	1/2
	Over 36 to 60, incl	3/4
	Over 60	1
0.062 to 0.1875, excl	24 to 60, incl	1/2
	Over 60 to 72, incl	3/4
	Over 72	1

8.2 Cold Worked Austenitic Sheet, 1/4 and 1/2 Hard Tempers:

TABLE XV

Nominal Thickness Inch	Nominal Width Inches	Variation from Flat Inches	
		1/4 Hard	1/2 Hard
Up to 0.016, incl	24 to 36,	1/2	3/4
Over 0.016 to 0.030, incl	excl	5/8	7/8
Over 0.030 to 0.1875, excl		3/4	7/8
Up to 0.016, incl	36 to 48,	5/8	1
Over 0.016 to 0.030, incl	incl	3/4	1-1/8
Over 0.030 to 0.1875, excl		1	1-1/8