

ANSI H35.2(M)-2024
Revision of H35.2(M)-2017

American National Standard Dimensional Tolerances for Aluminum Mill Products

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American National Standard Dimensional Tolerances for Aluminum Mill Products

Secretariat

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Approved January 11, 2024

American National Standards Institute

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Foreword

This Standard is a revision of ANSI H35.2(M)-2017, which consists of logical values for long-term metric use rather than a restatement of ANSI H35.2 in metric terms. This latest (2024) revision consists of updated illustrations, removal of footnote 1, changes to the list of definitions, the addition of the definition of applicable limits, edits to the definition of mean wall thickness, editorial corrections and clarification to table headings and footnotes. These changes are indicated by highlights in the text.

Dimensional Tolerances for Aluminum Mill Products

1. Definitions

Bar—A solid wrought product that is long in relation to its cross section which is square or rectangular (excluding plate and flattened wire) with sharp or rounded corners or edges, or is a regular hexagon or octagon, that is typically supplied in straight lengths and in which at least one perpendicular distance between parallel faces is 10 mm or greater. In North America, below this limit the product is called “Wire”. In Europe, bar is supplied in straight lengths; if supplied in coiled form, the product is called “Wire.”

Fin Stock—Coiled sheet or foil suitable and intended for manufacture of fins for heat-exchanger applications.

Foil—Generally, a rolled product rectangular in cross section of thickness equal to or less than 0.20 mm (Formerly 0.15 mm, changed to 0.20 mm for international harmonization). There is an overlap in the thickness range 0.15–0.20 mm defined for foil and sheet. Foil products in this thickness range are supplied to foil product specifications.

Forging Stock—A solid product, typically ingot, rod, bar or profile, intended and suitable for forging. Forging stock is typically a cast product or an extruded product.

Pipe—Tube in standardized combinations of outside diameter and wall thickness. Pipe is commonly designated by “Nominal Diameter” and “ANSI Schedule Numbers.”

Plate—A rolled product that is rectangular in cross section and with thickness not less than 6.3 mm and with sheared or sawed edges. (Note: In some international specifications plate products are defined as having a thickness not less than 6.0 mm).

Tread Plate—Plate (or sheet) upon which a pattern has been impressed on one side, by rolling using a specially prepared roll with an appropriate pattern, to provide improved traction.

Profile—A wrought product that is long in relation to its cross-sectional dimensions which is of a form other than that of sheet, plate, rod, bar, tube, wire or foil. For profiles sometimes the term “Shape” or “Section” is used, however the term “Shape” is no longer recommended.

Structural Profile—A profile, rolled or extruded, commonly used for structural purposes such as angles, channels, H-beams, I-beams, tees, and zees.

Rod—A solid wrought product of circular cross section that is long in relation to its diameter, typically supplied in straight lengths. In North America, the minimum diameter of a rod 10 mm; below this limit, the product is called “Wire.” In Europe, rod is supplied

in straight lengths and is often called “Round Bar”; if supplied in coiled form, the product is called “Wire.”

Shape—This term is no longer recommended. The term “Profile” is preferred. See “Profile.”

Sheet—Generally, a rolled product that is rectangular in cross section with thickness greater than 0.15 mm and less than 6.3 mm with slit, sheared or sawed edges. There is an overlap in the thickness range 0.15–0.20 mm defined for foil and sheet. Sheet products in this thickness range are supplied to sheet product specifications. (Note: In some international specifications sheet products are defined as having a thickness greater than 0.20 mm and less than 6.0 mm.)

Alclad Sheet—A composite aluminum sheet having an aluminum core and a metallurgically bonded aluminum layer or layers anodic to the core, on one or both sides, thus electrolytically protecting the core against corrosion. If only one side is clad, the product is often named “Alclad One Side Sheet.”

Brazing Sheet—Sheet of a low melting temperature alloy used for brazing or a clad sheet product having a bonded layer or layers of a low melting temperature alloy used for brazing.

Duct Sheet—Coiled or flat sheet suitable for duct applications.

Tube—A hollow wrought product of uniform cross-section with only one enclosed void and with a uniform wall thickness, supplied in straight lengths or in coiled form. Cross-sections are in the shape of circles, ovals, squares, rectangles, equilateral triangles or regular polygons and can have corners rounded, provided the inner and outer cross-sections are concentric and have the same form and orientation. Tube can be formed by extrusion or by forming and joining of sheet.

Heat-Exchanger Tube—A tube used in an apparatus in which fluid inside the tube will be heated or cooled by fluid outside the tube, but the term is typically not applied to coiled tube or to tube for use in refrigerators or radiators.

Welded Tube—A tube produced by longitudinal seam-welding, typically of formed sheet. Welded tube can be fabricated by arc-welding with or without welding wire, high frequency seam welding, or any other type of welding.

Wire—A solid wrought product that is long in relation to its cross section, which is square or rectangular with sharp or rounded corners or edges, or is round, hexagonal, or octagonal. In North America, the maximum diameter or perpendicular distance

between parallel faces of a wire is 10 mm; above this limit the product is called “Rod” or “Bar”. In Europe, wire is supplied in coiled form; if supplied in straight lengths, the product is called “Rod” or “Bar.”

2. Standard Limits for Expressing Tolerances

2.1 Standard limits for expressing the tolerances depend on the type of instrument ordinarily used in measuring the particular dimension. Where instruments permitting the required degree of accuracy generally are used, the tolerances are expressed in decimals as follows (except for foil):

Tolerance less than 0.050 mm	multiple of 0.005 mm
Tolerance over 0.050 thru 0.50 mm	multiple of 0.01 mm
Tolerance over 0.50 thru 1.00 mm	multiple of 0.02 mm
Tolerance over 1.00 mm	multiple of 0.05 mm

For measurements commonly made with instruments not permitting such accuracy, standard dimensional tolerances are expressed as follows:

Tolerance up thru 5 mm	multiple of 0.5 mm
Tolerance over 5 thru 50 mm	multiple of 1 mm
Tolerance over 50 mm	multiple of 5 mm

2.2 Rounding For purposes of determining conformance to the dimensional tolerances, a measured value is not rounded off. To determine applicable limits when a dimension is specified to more decimal places than are used in these standards, it shall be rounded off to the same number of places in conformance with ASTM E29, Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.

Aluminum Mill Products**3. Applicable Limits**

The applicable limits for mechanical properties, physical properties, cladding thickness, and ultrasonic discontinuity limits are those that apply to the specified (ordered) dimension.

Tolerances other than equal bilateral may be specified but shall be within the standard plus and minus limits for the specified (ordered) dimension.

When a specified (ordered) dimension is expressed to more decimal places than are used in these standards, applicable limits are determined by rounding off the specified dimension to the same number of places in conformance with the rounding-off method of ASTM recommended Practice E29.

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5. Section intentionally blank

6. Section intentionally blank

7. Sheet and Plate

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7. Sheet and Plate

TABLE 7.7a Sheet and Plate Thickness Tolerances (Applicable to All Alloys Not Included in the Aerospace Alloys Table 7.7b or Not Specified for Aerospace Applications)

NOTE: ALSO APPLICABLE TO ALLOYS WHEN SUPPLIED AS ALCLAD.

SPECIFIED THICKNESS, mm		SPECIFIED WIDTH—mm							
		Up thru 1 000	Over 1 000 Thru 1 500	Over 1 500 Thru 2 000	Over 2 000 Thru 2 500	Over 2 500 Thru 3 000	Over 3 000 Thru 3 500	Over 3 500 Thru 4 000	Over 4 000 Thru 4 500
over	thru	TOLERANCES—mm plus and minus							
0.15	0.40	0.025	0.040	..	..	..	..	..	..
0.40	0.63	0.040	0.050	0.08	0.09	..	..	..	..
0.63	0.80	0.045	0.06	0.09	0.10	..	..	..	..
0.80	1.00	0.050	0.08	0.09	0.11	0.15	..	..	..
1.00	1.20	0.06	0.09	0.11	0.14	0.18	0.20	..	..
1.20	1.60	0.08	0.09	0.13	0.15	0.18	0.23	..	..
1.60	2.00	0.09	0.10	0.14	0.18	0.20	0.25	..	..
2.00	2.50	0.09	0.11	0.15	0.18	0.23	0.28	..	..
2.50	3.20	0.11	0.14	0.18	0.23	0.28	0.33	..	..
3.20	4.00	0.14	0.18	0.23	0.28	0.33	0.38	..	..
4.00	5.00	0.18	0.23	0.28	0.33	0.38	0.46	..	..
5.00	6.30	0.23	0.28	0.33	0.38	0.46	0.56	0.69	..
6.30	8.00	0.30	0.36	0.38	0.46	0.56	0.69	0.89	1.10
8.00	10.00	0.38	0.43	0.51	0.58	0.69	0.84	1.05	1.30
10.00	16.00	0.58	0.58	0.69	0.81	0.89	1.10	1.35	1.65
16.00	25.00	0.79	0.79	0.94	1.10	1.20	1.45	1.80	2.15
25.00	40.00	1.00	1.00	1.20	1.40	1.65	1.90	2.30	2.65
40.00	60.00	1.40	1.40	1.55	1.80	2.45	2.55	2.90	..
60.00	80.00	1.90	1.90	2.15	2.55	2.65	3.20	..	..
80.00	100.00	2.55	2.55	2.90	3.20	3.30	4.00	..	..
100.00	160.00	3.30	3.30	3.70	4.20	..	..	..	..
160.00	200.00	4.00	4.00	4.00	4.20	..	..	..	..
200.00	300.00	4.80	4.80	4.80	4.80	**	**	**	**

TABLE 7.7b Sheet and Plate Thickness Tolerances (Applicable to All Alloys Specified for Aerospace Applications)

(INCLUDES AEROSPACE ALLOYS 2014, 2024, 2124, 2219, 2324, 2419, 7050, 7075, 7150 and 7475)

NOTE: ALSO APPLICABLE TO ALLOYS WHEN SUPPLIED AS ALCLAD.

SPECIFIED THICKNESS, mm		SPECIFIED WIDTH—mm											
		Up thru 1 000	Over 1 000 thru 1 200	Over 1 200 thru 1 400	Over 1 400 thru 1 500	Over 1 500 thru 1 800	Over 1 800 thru 2 000	Over 2 000 thru 2 200	Over 2 200 thru 2 500	Over 2 500 thru 3 000	Over 3 000 thru 3 500	Over 3 500 thru 4 000	Over 4 000 thru 4 500
over	thru	TOLERANCE—mm plus and minus											
0.15	0.25	0.035	0.06	0.06	0.06	..	..	..	..	..	..	..	..
0.25	0.40	0.040	0.07	0.07	0.07	..	..	..	..	..	..	..	..
0.40	0.63	0.040	0.07	0.07	0.07	..	..	..	..	..	..	..	..
0.63	0.80	0.040	0.040	0.06	0.08	0.08	..	..	..	..	..	..	..
0.80	1.00	0.040	0.040	0.06	0.08	0.08	0.10	0.10	0.20	..	..	..	..
1.00	1.20	0.050	0.050	0.06	0.08	0.08	0.10	0.10	0.22	0.26	0.30	..	..
1.20	1.60	0.050	0.050	0.08	0.08	0.08	0.10	0.10	0.24	0.30	0.34	..	..
1.60	2.00	0.050	0.050	0.08	0.09	0.09	0.10	0.10	0.26	0.34	0.40	..	..
2.00	2.50	0.065	0.065	0.09	0.11	0.11	0.12	0.12	0.30	0.38	0.46	..	..
2.50	3.20	0.09	0.09	0.10	0.12	0.12	0.12	0.12	0.34	0.42	0.52	..	..
3.20	4.00	0.11	0.11	0.12	0.18	0.18	0.25	0.25	0.40	0.48	0.58	..	..
4.00	5.00	0.15	0.18	0.18	0.23	0.23	0.30	0.30	0.46	0.56	0.66	..	..
5.00	6.30	0.24	0.32	0.32	0.32	0.44	0.44	0.54	0.54	0.64	0.76	..	..
6.30	8.00	0.32	0.40	0.40	0.40	0.50	0.50	0.62	0.62	0.74	0.86	1.05	1.30
8.00	10.00	0.44	0.46	0.46	0.46	0.58	0.58	0.72	0.72	0.86	1.00	1.20	1.50
10.00	16.00	0.60	0.60	0.60	0.60	0.72	0.72	0.86	0.86	1.00	1.20	1.50	1.80
16.00	25.00	0.80	0.80	0.80	0.80	0.94	0.94	1.10	1.10	1.30	1.55	1.90	2.20
25.00	40.00	1.00	1.00	1.00	1.00	1.20	1.20	1.40	1.40	1.65	1.95	2.30	2.70
40.00	60.00	1.40	1.40	1.40	1.40	1.60	1.90	1.90	1.90	2.30	2.60	3.00	..
60.00	80.00	2.00	2.00	2.00	2.00	2.10	2.10	2.80	2.80	3.30	3.30	..	..
80.00	100.00	2.60	2.60	2.60	2.60	2.95	2.95	3.40	3.40	3.90	4.10	..	..
100.00	160.00	3.40	3.40	3.40	3.40	3.80	3.80	4.30	4.30	..	..	..	..
160.00	200.00	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.20	..	..	..	..
200.00	250.00	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	**	**	**	**

Note: Capability to provide tighter tolerances may vary with supplier.

① Footnote is inactive.

Aluminum Mill Products

TABLE 7.8 Width Tolerances—Sheared Flat Sheet and Plate

SPECIFIED THICKNESS mm		SPECIFIED WIDTH—mm						
		Up thru 250	Over 250 thru 500	Over 500 thru 1 000	Over 1 000 thru 2 000	Over 2 000 thru 3 000	Over 3 000 thru 4 000	Over 4 000 thru 5 000
over	thru	TOLERANCES ②—mm						
0.15	3.20	±1.5	±2	±2.5	±3	±4	±4.5	..
3.20	6.30	±2	±2.5	±3	±3.5	±4.5	±5	..
6.30	12.50	+6	+7	+8	+9	+11	+12	+14

TABLE 7.9 Length Tolerances—Sheared Flat Sheet and Plate

SPECIFIED THICKNESS mm		SPECIFIED LENGTH—mm										
		Up thru 1 000	Over 1 000 thru 2 000	Over 2 000 thru 3 000	Over 3 000 thru 4 000	Over 4 000 thru 5 000	Over 5 000 thru 7 500	Over 7 500 thru 10 000	Over 10 000 thru 12 500	Over 12 500 thru 15 000	Over 15 000 thru 17 500	Over 17 500 thru 20 000
over	thru	TOLERANCES ②—mm										
0.15	3.20	±2	±2.5	±3	±3	±3.5	±4.5	±5	±6	±7	±8	..
3.20	6.30	±2.5	±3	±3	±3.5	±4	±5	±6	±7	±8	±9	..
6.30	12.50	+8	+9	+10	+10	+11	+13	+14	+16	+18	+19	+21

TABLE 7.10 Width and Length Tolerances—Sawed Flat Sheet and Plate

SPECIFIED THICKNESS mm		SPECIFIED WIDTH AND LENGTH—mm										
		Up thru 1 000	Over 1 000 thru 2 000	Over 2 000 thru 3 000	Over 3 000 thru 4 000	Over 4 000 thru 5 000	Over 5 000 thru 7 500	Over 7 500 thru 10 000	Over 10 000 thru 12 500	Over 12 500 thru 15 000	Over 15 000 thru 17 500	Over 17 500 thru 20 000
over	thru	TOLERANCES ②—mm										
2.00	6.30	±3	±3	±4	±4	±5	±6	±7	±8	±9	±10	±11
6.30	300.00	+6	+7	+8	+9	+10	+12	+14	+16	+18	+20	+22

TABLE 7.11 Width Tolerances—Slit Coiled Sheet

SPECIFIED THICKNESS mm		SPECIFIED WIDTH—mm							
		Up thru 150	Over 150 thru 250	Over 250 thru 500	Over 500 thru 750	Over 750 thru 1 000	Over 1 000 thru 1 500	Over 1 500 thru 2 000	Over 2 000 thru 2 500
over	thru	TOLERANCES ②—mm plus and minus							
0.15	3.20	0.25	0.5	1	1	1	1.5	2.5	3.5
3.20	5.00	..	1	1	1	1.5	2	3	..
5.00	6.30	..	1	1	1.5	2	3	4	..

TABLE 7.12 Lateral Bow Tolerances—Coiled Sheet

SPECIFIED THICKNESS mm		SPECIFIED WIDTH—mm				
		12 thru 25	Over 25 thru 50	Over 50 thru 100	Over 100 thru 250	Over 250
over	thru	TOLERANCE—mm in 2 000 mm Allowable Deviation of a Side Edge from a Straight Line				
0.15	1.60	20	15	10	6	5
1.60	3.20	..	..	10	6	5

For all numbered footnotes, see page 12.

TABLE 7.13 Lateral Bow Tolerances—Flat Sheet and Plate

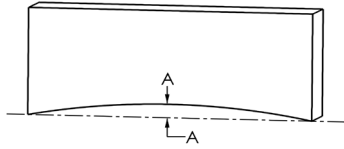
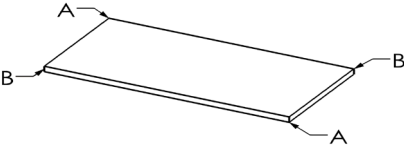
SPECIFIED THICKNESS mm		SPECIFIED WIDTH mm		ALLOWABLE DEVIATION OF A SIDE EDGE FROM A STRAIGHT LINE						
										
				Maximum allowable value of A						
				SPECIFIED LENGTH—mm						
				Up thru 1 000	Over 1 000 thru 2 000	Over 2 000 thru 3 000	Over 3 000 thru 4 000	Over 4 000 thru 5 000	Over 5 000 thru 6 000	
over	thru	over	thru	TOLERANCE—mm						
0.15	3.20	..	100	3	11	25	45	70	100 ⑤	
		100	250	1	3.5	8	13	21	30 ⑤	
		250	900	1	2.5	5	9	14	30 ⑤	
		900	..	0.5	1.5	3	5	8	12 ⑤	
3.20	6.30	100	400	1	3	6	11	17	25 ⑤	
		400	..	0.5	1.5	3	5	8	12 ⑤	
6.30	300.00	..	250	3	11	25	45	70	100 ⑤	
		250	400	1	3	6	11	17	25 ⑤	
		400	..	0.5	2	3.5	6	10	14 ⑤	

TABLE 7.14 Squareness Tolerances—Flat Sheet and Plate

SPECIFIED LENGTH mm	SPECIFIED WIDTH—mm	
	Up thru 1 000	Over 1 000
	ALLOWABLE DIFFERENCE IN LENGTH OF DIAGONALS ④—mm	
		
	Maximum difference between AA and BB	
Up thru 3 500	0.8 × each 100 mm segment of width ③	0.7 × each 100 mm segment of width ③
Over 3 500	1.2 × each 100 mm segment of width ③	1.0 × each 100 mm segment of width ③

① Footnote is inactive.

② Tolerances applicable at ambient mill temperatures. A change in dimension of 0.24 mm per metre per 10°C must be recognized.

③ If specified width is other than an exact multiple of 100 mm, tolerance is determined by using the next largest exact multiple. For example, if specified width is 750 mm and specified length is 2 800 mm, the tolerance is

0.8 mm × 8 = 6.4 mm. This result, if not a whole mm, is rounded upward to the nearest mm.

④ Use values for calculating only. Round result upward to nearest mm.

⑤ Also applicable to any 6 000 mm increment of longer sheet or plate.

Aluminum Mill Products

TABLE 7.15 Diameter Tolerances—Sheared or Blanked Sheet and Plate Circles

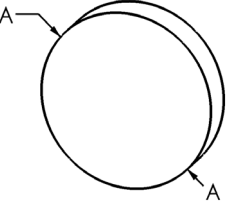
over thru		SPECIFIED DIAMETER—mm					
		Up thru 500	Over 500 thru 1 000	Over 1 000 thru 2 000	Over 2 000 thru 3 000	Over 3 000 thru 4 000	Over 4 000 thru 5 000
SPECIFIED THICKNESS mm		ALLOWABLE DEVIATION FROM SPECIFIED DIAMETER mm plus and minus					
							
		Difference between AA and specified diameter					
		0.15 6.30 12.50 25.00	1 2.5 6	1.5 3.5 7	2.5 5 9	4 7 11	6 9 13

TABLE 7.16 Diameter Tolerances—Sawed Sheet and Plate Circles

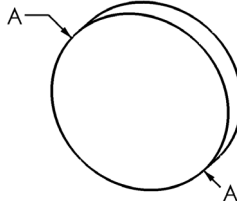
over thru		SPECIFIED DIAMETER—mm					
		Up thru 500	Over 500 thru 1 000	Over 1 000 thru 2 000	Over 2 000 thru 3 000	Over 3 000 thru 4 000	Over 4 000 thru 5 000
SPECIFIED THICKNESS mm		ALLOWABLE DEVIATION FROM SPECIFIED DIAMETER mm plus and minus					
							
		Difference between AA and specified diameter					
		2.00 25.00 50.00 100.00	3.5 5 8	4 6 10 12	5 8 10 15	6 10 13 18	8 11 16 21

TABLE 7.17 Flatness Tolerances—Flat Sheet^① and Coiled Cut-to-Length Flat Sheet^{③ ④}

ALLOY (Includes Alclads)	SPECIFIED THICKNESS mm		Longitudinal or Transverse Distance (mm) Center to Center of Buckles or Edge Waves ^⑤				
			Up thru 500	Over 500 thru 1 000	Over 1 000 thru 1 500	Over 1 500 thru 2 000	Over 2 000
	over	thru	TOLERANCES, mm ^{⑥ ⑦ ⑧}				
1060, 1100, 1350, 3003, 3005, 3105, 5005, 5050, 5X57	0.50	1.60	2	4	6	8	10
	1.60	6.30	3	5	8	10	13
3004, 5052, 5083, 5086, 5252, 5X54, 5456, brazing sheet, and all heat treatable alloys	0.50	1.60	4	6	9	11	14
	1.60	6.30	5	7	10	12	15

① Footnote is inactive.

② Footnote is inactive.

③ Not applicable to flat sheet over 1 500 mm wide.

④ It is the responsibility of the entity processing coiled sheet to cut flat lengths to meet these tolerances.

⑤ Also applicable to overall length or width of sheet if only one longitudinal and/or transverse buckle or edge wave is present.

⑥ Allowable deviation from flat with the sheet positioned on flat horizontal surface to minimize deviation.

⑦ Not applicable to O, F and HX8 and harder tempers.

⑧ Not applicable to end or corner turnup.

TABLE 7.18 Flatness Tolerances—Sawed or Sheared Plate**LONGITUDINAL FLATNESS**

SPECIFIED THICKNESS, mm		TOLERANCE ① mm—Allowable Deviation from Flat	
over	thru	TX51 tempers ②	Other than TX51 tempers ② ⑦
6.30 80.00	80.00 300.00	5 in any 2 000 mm ③ 3.5 in any 2 000 mm or less	7 in any 2 000 mm or less 7 in any 2 000 mm or less

TRANSVERSE FLATNESS

SPECIFIED THICKNESS, mm		TOLERANCE ① mm—Allowable Deviation from Flat						
		WIDTH—mm						
		Up thru 500	Over 500	Thru 1 000	Over 1 000	Thru 1 500	Over 1 500	Thru 2 000
over	thru	All tempers ⑦	TX51 tempers ②	Other than TX51 tempers ② ⑦	TX51 tempers ②	Other than TX51 tempers ② ⑦	TX51 tempers ②	Other than TX51 tempers ② ⑦
6.30 16.00 40.00 80.00	16.00 40.00 80.00 300.00	Only short-span flatness tolerance applies	6 4 3 2.5	7 6 5 4	8 6 4 3	10 8 6 5	10 8 5 3.5	13 10 7 6

SHORT-SPAN FLATNESS ⑤

SPECIFIED THICKNESS, mm		TOLERANCE ⑥ mm—Allowable Deviation from Flat	
over	thru	TX51 tempers ②	Other than TX51 tempers ② ⑦
6.30 16.00	16.00 300.00	2.00 1.50	2.50 1.80

① As measured with plate resting on a flat surface concave side upward, using a straightedge and a feeler gage, dial gage or scale.

② TX51 is a general designation for the following stress-relieved tempers: T351, T451, T651, T851, T7351, T7451 and T7651.

③ For lengths under 2 000 mm, the tolerance is 3.5 mm.

④ For widths over 2 000 mm, these tolerances apply for any 2 000 mm of total width.

⑤ Short-span flatness is the deviation from flat over full span for spans 500 mm and less.

⑥ As measured with the plate resting on a flat surface.

⑦ Not applicable to O, F, and HX8 and harder tempers.

Tables 7.19 – 7.25 intentionally blank

TABLE 7.26 Thickness Tolerances① — Commercial Roofing and Siding

NOMINAL THICKNESS mm	NOMINAL WIDTH—mm	
	Up thru 1 000	Over 1 000 thru 1 500
TOLERANCE—mm plus and minus		
0.60	0.06	0.10
0.80	0.07	0.11
0.90	0.08	0.12
1.0	0.08	0.12
1.2	0.10	0.13

TABLE 7.27 Depth of Corrugation Tolerances—Commercial Roofing and Siding

Allowable deviation from nominal depth of corrugation: ±1 mm
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TABLE 7.28 Length Tolerances②—Commercial Roofing and Siding

Allowable deviation from specified length: ±13 mm

TABLE 7.29 Parallelness of Corrugations—Commercial Roofing and Siding

PRODUCT	PARALLELNESS OF CORRUGATIONS
Corrugated roofing and siding	Capable of being lapped at either end.
V-beam roofing and siding	Capable of being lapped at either end.
Ribbed roofing	Capable of being lapped at either end and ribs are parallel to each other and to edges of sheet within ±3 mm
Ribbed siding	Capable of being lapped at either end.

TABLE 7.30 Squareness Tolerance—Commercial Roofing and Siding

Allowable difference in length of diagonals: ±13 mm

① Applicable prior to painting, corrugating or embossing.

② Applicable to lengths of 1 000 thru 9 000 mm for all products except ribbed siding. For ribbed siding, tolerances are applicable to lengths of 1 000 thru 11 000 mm.

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TABLE 7.31 Thickness Tolerances—Duct Sheet

STANDARD THICKNESS mm	TOLERANCE—mm plus and minus	
	STANDARD WIDTHS—mm	
	600, 750, 900	1 200
0.40	0.030	0.050
0.45, 0.50, 0.55, 0.60	0.040	0.06
0.80	0.045	0.07
1.0	0.050	0.08
1.2	0.06	0.09
1.6	0.08	0.10

TABLE 7.32 Width Tolerances—Flat Duct Sheet

STANDARD THICKNESS mm	TOLERANCE—mm plus and minus	
	STANDARD WIDTHS—mm	
	600, 750, 900	1 200
All	2.5	3

TABLE 7.33 Width Tolerances—Coiled Duct Sheet and Coiled Duct Sheet Cut to Length

STANDARD THICKNESS mm	TOLERANCE—mm plus and minus	
	STANDARD WIDTHS—mm	
	600, 750, 900	1 200
All	1	1.5

TABLE 7.34 Length Tolerances—Coiled Duct Sheet Cut to Length and Flat Duct Sheet

STANDARD LENGTH	STANDARD WIDTH	TOLERANCE, mm
All	All	±6

Table 7.35 intentionally blank

TABLE 7.36 Mass per Square Metre—Tread Plate

The following nominal masses per square metre are based on alloy 6061, which has a density of 2.70×10^3 kilograms per cubic metre:

THICKNESS mm	NOMINAL MASS kg/m ²
2.50	7.4
3.20	9.3
4.00	11.5
5.00	14.2
6.00	16.9
8.00	22.3
10.00	27.7
12.00	33.1
16.00	43.9

TABLE 7.38 Width Tolerances—Tread Plate

Allowable deviation from specified width: plus 10 mm

TABLE 7.39 Length Tolerances—Tread Plate

SPECIFIED LENGTH mm		TOLERANCE mm—plus
over	thru	
..	4 000	10
4 000	6 000	11
6 000	..	12

TABLE 7.40 Height of Pattern Tolerance—Tread Plate

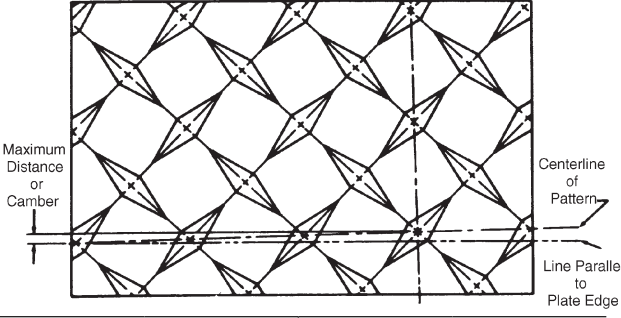
Minimum height of raised pattern: 1.00 mm.
(Maximum height is controlled by weight tolerance.)

TABLE 7.37 Thickness Tolerances—Tread Plate

SPECIFIED THICKNESS①—mm	TOLERANCE—mm	
	Plus②	Minus
2.50	0.20	0.30
3.20	0.26	0.38
4.00	0.28	0.48
5.00	0.35	0.60
6.00	0.42	0.72
8.00	0.56	0.96
10.00	0.70	1.20
12.00	0.84	1.40
16.00	1.10	1.90

① Specified thickness does not include height of pattern.

② In case of dispute, allowed plus tolerance shall be determined by mass. The allowed deviation from nominal mass shall not exceed plus 8 percent.

**TABLE 7.41 Camber of Pattern Line^④
Tolerances—Tread Plate**


SPECIFIED LENGTH mm		TOLERANCE—mm	
		SPECIFIED WIDTH—mm	
over	thru	Up thru 1 000	Over 1 000 thru 2 000
..	500	3	3
500	2 000	13	13
2 000	4 000	20	25
4 000	..	25	40

**TABLE 7.42 Lateral Bow^③ Tolerances—
Tread Plate**

SPECIFIED WIDTH mm		TOLERANCE—mm
		ALLOWABLE DEVIATION OF A SIDE EDGE FROM A STRAIGHT LINE
		SPECIFIED THICKNESS—mm
over	thru	2.50–16.00 mm
..	100	25 in any 3 000 mm
100	400	6 in any 3 000 mm
400	2 000	3 in any 3 000 mm

**TABLE 7.43 Squareness Tolerances^⑤—
Tread Plate**

SPECIFIED LENGTH mm		TOLERANCE—mm
		ALLOWABLE DIFFERENCE IN LENGTH OF DIAGONALS
over	thru	
..	4 000	10
4 000	6 000	11
6 000	..	12

③ Applicable only to lengths up through 6 000 mm.

④ The camber of a pattern line is the maximum distance between the center of any figure in a pattern line and a line parallel with the edge of the plate that passes through the center of the figure in the same pattern line nearest to the edge of the floor plate.

⑤ Not resquared.