Designation: B718 – 00 (Reapproved 2016)

Standard Specification for Nickel-Chromium-Molybdenum-Cobalt-Tungsten-Iron-Silicon Alloy (UNS N06333) Plate, Sheet, and Strip[1]

This standard is issued under the fixed designation B718; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers wrought alloy UNS N06333 plate, sheet, and strip intended for heat resisting applications and general corrosive service.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to become familiar with all hazards including those identified in the appropriate Safety Data Sheet (SDS) for this product/material as provided by the manufacturer, to establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

B880 Specification for General Requirements for Chemical Check Analysis Limits for Nickel, Nickel Alloys and Cobalt Alloys

E8 Test Methods for Tension Testing of Metallic Materials

E10 Test Method for Brinell Hardness of Metallic Materials

E18 Test Methods for Rockwell Hardness of Metallic Materials

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E140 Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness

E1473 Test Methods for Chemical Analysis of Nickel, Cobalt and High-Temperature Alloys

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *plate, n*—material 3⁄16 in. (4.76 mm) and over in thickness and over 10 in. (254) mm in width.

3.1.2 *sheet, n*—material under 3⁄16 in. (4.76 mm) in thickness and 24 in. (610 mm) and over in width.

3.1.3 *strip, n*—material under 3⁄16 in. (4.76 mm) in thickness and under 24 in. (610 mm) in width.

4. Ordering Information

4.1 It is the responsibility of the purchaser to specify all requirements that are necessary for the safe and satisfactory performance of material ordered under this specification. Examples of such requirements include but are not limited to the following:

4.1.1 Alloy name or UNS number.

4.1.2 Quantity.

4.1.3 ASTM Designation and year of issue.

4.1.4 Form (plate, sheet, or strip).

4.1.5 Dimensions—Thickness, Width, and Length.

4.1.6 Finish (Section 9).

4.1.7 *Certification*—State if certification is required (Section 16).

4.1.8 *Samples for Product (Check) Analysis*—State whether samples shall be furnished.

4.1.9 *Purchaser Inspection*—If a purchaser wishes to witness tests or inspections of material at the place of manufacture, the purchase order must so state indicating which tests or inspections are to be witnessed.

5. Materials and Manufacture

5.1 All material shall be furnished in the annealed condition.

6. Chemical Requirements

6.1 The material shall conform to the requirements as to chemical composition specified in Table 1.

[1] This specification is under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.07 on Refined Nickel and Cobalt and Their Alloys.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

TABLE 1 Chemical Requirements

Element	Composition Limits, %
Carbon	0.10 max
Manganese	2.0 max
Phosphorus	0.03
Sulfur	0.03
Silicon	1.5 max
Chromium	24.0–27.0
Nickel	44.0–48.0
Molybdenum	2.5–4.0
Cobalt	2.5–4.0
Tungsten	2.5–4.0
Iron[A]	Remainder

[A] Element may be determined arithmetically by difference.

6.2 If a product (check) analysis is performed by the purchaser, the material shall conform to the product (check) analysis variations in Specification B880.

7. Mechanical and Other Requirements

7.1 The mechanical properties of the material at room temperature shall conform to those shown in Table 2.

8. Permissible Variations in Dimensions

8.1 *Sheet,* shall conform to the variations in dimensions specified in Tables 3-5, inclusive.

8.2 *Cold-Rolled Strip,* shall conform to the permissible variations in dimensions as specified in Tables 6-10 inclusive.

8.3 *Plate,* shall conform to the permissible variations in dimensions specified in Tables 11-16, inclusive.

8.4 *Sheet, Strip, and Plate*—Material with No. 1 finish may be ground to remove surface defects, provided such grinding does not reduce the thickness, width, or length at any point beyond the permissible variations in dimensions.

9. Workmanship, Finish, and Appearance

9.1 The material shall be uniform in quality and temper, smooth, commercially straight, and free from injurious imperfections.

9.2 Available finishes are:

9.2.1 *Sheet*—No. 1 finish; hot rolled, annealed, and descaled, and No. 2 D finish; cold rolled, dull finish.

9.2.2 *Strip*—No. 1 finish; cold rolled, annealed, and descaled.

9.2.3 *Plate*—Hot rolled, annealed, and descaled.

10. Sampling

10.1 *Lot Definitions:*

10.1.1 A lot for chemical analysis shall consist of one heat.

10.1.2 A lot for mechanical properties shall consist of material from one heat of the same condition and nominal thickness.

TABLE 3 Thickness Tolerances for Hot-Rolled and Cold-Rolled Sheets

Specified Thickness, in. (mm)	Tolerance Over and Under, in. (mm)
Over 0.145 to less than 3/16 (3.68 to less than 4.76)	0.014 (0.36)
Over 0.130 to 0.145 (3.30 to 3.68), incl	0.012 (0.30)
Over 0.114 to 0.130 (2.90 to 3.30), incl	0.010 (0.25)
Over 0.098 to 0.114 (2.49 to 2.90), incl	0.009 (0.23)
Over 0.083 to 0.098 (2.11 to 2.49), incl	0.008 (0.20)
Over 0.072 to 0.083 (1.83 to 2.11), incl	0.007 (0.18)
Over 0.058 to 0.072 (1.47 to 1.83), incl	0.006 (0.15)
Over 0.040 to 0.058 (1.02 to 1.47), incl	0.005 (0.13)
Over 0.026 to 0.040 (0.66 to 1.02), incl	0.004 (0.10)
Over 0.016 to 0.026 (0.41 to 0.66), incl	0.003 (0.08)
Over 0.007 to 0.016 (0.18 to 0.41), incl	0.002 (0.05)
Over 0.005 to 0.007 (0.13 to 0.18), incl	0.0015 (0.04)
0.005 (0.13)	0.001 (0.03)

TABLE 4 Width, Length, and Camber Tolerances for Hot-Rolled and Cold-Rolled Sheets Not Resquared Nor Stretcher Leveled

Width Tolerances

Specified Thickness, in. (mm)	Tolerance for Specified Width, in. (mm)	
	24 to 48 (610 to 1220), excl	48 in. (1220) and over
Less than 3/16 in. (4.76)	1/16 (1.6) over, 0 under	1/8 in. (3.2) over, 0 under

Length Tolerances

Specified Length, ft (cm)	Tolerance, in. (mm)	
	Over	Under
Up to 10 (305), incl	1/4 (6.4)	0 (0)
Over 10 to 20 (305 to 610), incl	1/2 (12.7)	0 (0)

Camber Tolerances[A]

Specified Width, in. (mm)	Tolerance per Unit Length of any 8 ft (244 cm), in. (mm)
24 to 36 in. (610 to 914), incl	1/8 (3.2)
Over 36 in. (914)	3/32 (2.4)

[A] Camber is the greatest deviation of a side edge from a straight line, and measurement is taken by placing an 8-ft (2440-mm) straightedge *on the concave side* and measuring the greatest distance between the sheet edge and the straightedge.

10.2 *Test-Material Selection:*

10.2.1 *Chemical Analysis*—Representative samples from each lot shall be taken during pouring or subsequent processing.

10.2.1.1 Product (check) analysis shall be wholly the responsibility of the purchaser.

10.2.2 *Mechanical Properties*—Samples of the material to provide test specimens for mechanical properties shall be taken from such locations in each lot as to be representative of that lot.

TABLE 2 Mechanical Properties

Condition	Tensile Strength, Min psi (MPa)	Yield Strength, 0.2 % Offset, Min psi (MPa)	Elongation in 2 in. or 50 mm, or 4D, Min %	Hardness[A]
Annealed	80 000 (551)	35 000 (241)	30	75 to 95 HRB

[A] Hardness values are informative only and not to be construed as the basis for acceptance.

TABLE 5 Flatness Tolerances for Hot-Rolled and Cold-Rolled Sheets

Sheets not Specified to Stretcher Leveled Standard of Flatness		
Specified Thickness, in. (mm)	Width, in. (mm)	Flatness Tolerance (max Deviation from a Horizontal Flat Surface), in. (mm)
0.062 (1.57) and over	To 60 in. (1524), incl	½ (12.7)
	Over 60 to 72 (1524 to 1829), incl	¾ (19.1)
	Over 72 (1829)	1 (25.4)
Under 0.062 (1.57)	To 36 (914), incl	½ (12.7)
	Over 36 to 60 (914 to 1524), incl	¾ (19.1)
	Over 60 (1524)	1 (25.4)

TABLE 6 Thickness Tolerances for Cold-Rolled Strip in Coils and Cut Lengths

NOTE 1—Thickness measurements are taken at least ⅜ inch (9.5 mm) in from edge of the strip, except that on widths less than 1 in. (25.4 mm) the tolerances are applicable for measurements at all locations.

NOTE 2—Above tolerances include crown.

Specified thickness, in. (mm)	Thickness Tolerances, in. (mm), for the Thicknesses and Widths Given, Over and Under		
	Width, in. (mm)		
	3/16 (4.8) to 6 (152), incl	Over 6 (152) to 12 (305), incl	Over 12 (305) to 24 (610), excl
0.005 (0.13) to 0.010 (0.25), incl	10 %	10 %	10 %
Over 0.010 (0.25) to 0.011 (0.28), incl	0.0015 (0.04)	0.0015 (0.04)	0.0015 (0.04)
Over 0.011 (0.28) to 0.013 (0.33), incl	0.0015 (0.04)	0.0015 (0.04)	0.002 (0.05)
Over 0.013 (0.33) to 0.017 (0.43), incl	0.0015 (0.04)	0.002 (0.05)	0.002 (0.05)
Over 0.017 (0.43) to 0.020 (0.51), incl	0.0015 (0.04)	0.002 (0.05)	0.0025 (0.06)
Over 0.020 (0.51) to 0.029 (0.74), incl	0.002 (0.05)	0.0025 (0.06)	0.0025 (0.06)
Over 0.029 (0.74) to 0.035 (0.89), incl	0.002 (0.05)	0.003 (0.08)	0.003 (0.08)
Over 0.035 (0.89) to 0.050 (1.27), incl	0.0025 (0.06)	0.0035 (0.09)	0.0035 (0.09)
Over 0.050 (1.27) to 0.069 (1.75), incl	0.003 (0.08)	0.0035 (0.09)	0.0035 (0.09)
Over 0.069 (1.75) to 0.100 (2.54), incl	0.003 (0.08)	0.004 (0.10)	0.005 (0.13)
Over 0.100 (2.54) to 0.125 (3.18), incl	0.004 (0.10)	0.0045 (0.11)	0.005 (0.13)
Over 0.125 (3.18) to 0.161 (4.09), incl	0.0045 (0.11)	0.0045 (0.11)	0.005 (0.13)
Over 0.161 (4.09) to 3/16 (4.76), excl	0.005 (0.13)	0.005 (0.13)	0.006 (0.15)

TABLE 7 Width Tolerances Cold-Rolled Strip in Coils and Cut Lengths Edge Nos. 1 and 5

Specified Edge No.	Width in., (mm)	Thickness, in. (mm)	Width Tolerance, in. (mm) for Thickness and Width Given Over and Under
1 and 5	9/32 (7.1) and under	1/16 (1.6) and under	0.005 (0.13)
1 and 5	Over 9/32 (7.1) to ¾ (19.1), incl	3/32 (2.4) and under	0.005 (0.13)
1 and 5	Over ¾ (19.1) to 5 (127), incl	⅛ (3.2) and under	0.005 (0.13)
5	Over 5 (127) to 9 (229), incl	⅛ (3.2) to .008 (.20), incl	0.010 (0.25)
5	Over 9 (229) to 20 (508), incl	0.105 (2.67) to 0.015 (0.38), incl	0.010 (0.25)
5	Over 20 (508) to 24 (610), excl	0.080 (2.03) to 0.023 (0.58), incl	0.015 (0.38)

TABLE 8 Width Tolerances Cold-Rolled Strip in Coils and Cut Lengths Edge No. 3

Specific Thickness, in. (mm)	Width Tolerances, in. (mm) Over and Under, for Thickness and Width Given					
	Under ½ (12.7) to 3/16 (4.8)	½ (12.7) to 6 (152)	Over 6 (152) to 9 (229)	Over 9 (229) to 12 (305)	Over 12 (305) to 20 (508)	Over 20 (508) to 24 (610)
0.068 (1.73) and under	0.005 (0.13)	0.005 (0.13)	0.005 (0.13)	0.010 (0.25)	0.016 (0.41)	0.020 (0.51)
Over 0.068 (1.73) to 0.099 (2.51), incl	0.008 (0.20)	0.008 (0.20)	0.010 (0.25)	0.010 (0.25)	0.016 (0.41)	0.020 (0.51)
Over 0.099 (2.51) to 0.160 (4.06), incl	0.010 (0.25)	0.010 (0.25)	0.016 (0.41)	0.016 (0.41)	0.020 (0.51)	0.020 (0.51)
Over 0.160 (4.06) to under 3/16 in. (4.76), excl	...	0.016 (0.41)	0.020 (0.51)	0.020 (0.51)	0.031 (0.79)	0.031 (0.79)

11. Number of Tests

11.1 *Chemical Analysis*—One test per lot.

11.2 *Mechanical Properties*—One test per lot.

TABLE 9 Length Tolerances Cold-Rolled Strip in Cut Lengths

Specified Length, in. (mm)	Tolerance, in. (mm) Over Specified Length, No Tolerance Under
Up to 60 (1524), incl	⅜ (9.5)
Over 60 (1524) to 120 (3048), incl	½ (12.7)
Over 120 (3048) to 240 (6096), incl	⅝ (15.9)

TABLE 10 Camber[A] Tolerances Cold-Rolled Strip in Coils and Cut Lengths

Specified Width, in. (mm)	Tolerance in. (mm) Per Unit Length of any 8 ft (2440 mm)
Up to 1 ½ (38.1), incl	½ (12.7)
Over 1 ½ (38.1) to 24 (609.6), excl	¼ (6.4)

[A] Camber is the deviation of a side edge from a straight line, and measurement is taken by placing an 8-ft (2440-mm) straightedge on the concave side and measuring the greatest distance between the strip edge and the straight edge.

TABLE 11 Permissible Variations in Thickness for Plates[A]

Specified Thickness, in. (mm)	Width, in. (mm)			
	To 84 (2134), incl	Over 84 (2134) to 120 (3048), incl	Over 120 (3048) to 144 (3658), incl	Over 144 (3658)
	Tolerance Over specified Thickness,[A,B] in. (mm)			
3/16 (4.76) to ⅜ (9.52). excl	0.045 (1.14)	0.050 (1.27)	...	...
⅜ (9.52) to ¾ (19.05), excl	0.055 (1.40)	0.060 (1.52)	0.075 (1.90)	0.090 (2.29)
¾ (19.05) to 1 (25.40), excl	0.060 (1.52)	0.065 (1.65)	0.085 (2.16)	0.100 (2.54)
1 (25.40) to 2 (50.80), excl	0.070 (1.78)	0.075 (1.90)	0.095 (2.41)	0.115 (2.92)
2 (50.80) to 3 (76.20), excl	0.125 (3.18)	0.150 (3.81)	0.175 (4.44)	0.200 (5.08)
3 (76.20) to 4 (101.6), excl	0.175 (4.44)	0.210 (5.33)	0.245 (6.22)	0.280 (7.11)

[A] Thickness is measured along the longitudinal edges of the plate at least ⅜ in. (9.52 mm), but not more than 3 in. (76.20 mm), from the edge.
[B] For circles, the over thickness tolerances in this table apply to the diameter of the circle corresponding to the width ranges shown. For plates of irregular shape, the over thickness tolerances apply to the greatest width corresponding to the width ranges shown. For plates up to 10 in. (254.0 mm), incl, in thickness, the tolerance under the specified thickness is 0.010 in. (0.25 mm).

12. Specimen Preparation

12.1 Tension test specimens shall be taken from material in the final condition (temper). Tests shall be performed transverse to the direction of rolling, where width will permit.

12.1.1 All material shall be tested in full cross-section size when possible.

12.2 Tension-test specimens shall be as follows:

12.2.1 Full thickness of the material, machine to the form and dimensions shown for the sheet-type specimen in Test Methods E8 for material up through ½ in. (12.7 mm) in thickness.

12.2.2 The largest possible round specimen shown in Test Methods E8 for material over ½ in. (12.7 mm).

13. Test Methods

13.1 *Chemical Composition*—Test Methods E1473.

13.2 *Tension Test*—Test Methods E8.

13.3 *Rockwell Hardness*—Test Methods E18.

13.4 *Brinell Hardness*—Test Method E10.

13.5 *Hardness Conversion*—Hardness Conversion Tables E140.

13.6 *Rounding Method*—For purposes of determining compliance with the limits in this specification, an observed value or a calculated value shall be rounded off as indicated below, in accordance with the rounding-off method of Practice E29.

Requirement	Rounded-Off Unit for Observed or Calculated Value
Chemical composition hardness and tolerances (when expressed in decimals)	nearest unit in the last right-hand place of figures of the specified limit. If two choices are possible, as when the digits dropped are exactly a 5 or a 5 followed only by zeros, choose the one ending in an even digit with zero defined as an even digit.
Tensile and yield strengths	nearest 1000 psi (6.9 MPa)
Elongation	nearest 1 %

14. Inspection

14.1 Inspection of the material by the purchaser shall be as agreed upon by the purchaser and the supplier as part of the purchase contract.

15. Rejection and Rehearing

15.1 Material that fails to conform to the requirements of this specification may be rejected. Rejection should be reported to the producer or supplier promptly and in writing. In case of dissatisfaction with the results of the test, the producer or supplier may make claim for a rehearing.

TABLE 12 Width and Length Tolerances for Plates[A,B]

Width, in.	Length, in.	Tolerance Over Specified Width and Length for Given Width, Length, and Thickness, in.					
		Under 3/8 in.		3/8 to 1/2 in., incl, in Thickness		Over 1/2 in. in Thickness	
		Width	Length	Width	Length	Width	Length
48 and under	144 and under	1/8	3/16	3/16	1/4	5/16	3/8
Over 48 to 60, incl		3/16	1/4	1/4	5/16	3/8	7/16
Over 60 to 84, incl		1/4	5/16	5/16	3/8	7/16	1/2
Over 84 to 108, incl		5/16	3/8	3/8	7/16	1/2	9/16
Over 108		3/8	7/16	7/16	1/2	5/8	11/16
48 and under	over 144 to 240	3/16	3/8	1/4	1/2	5/16	5/8
Over 48 to 60, incl		1/4	7/16	5/16	5/8	3/8	3/4
Over 60 to 84, incl		3/8	1/2	7/16	11/16	1/2	3/4
Over 84 to 108, incl		7/16	9/16	1/2	3/4	5/8	7/8
Over 108		1/2	5/8	5/8	7/8	11/16	1
48 and under	over 240 to 360	1/4	1/2	5/16	5/8	3/8	3/4
Over 48 to 60, incl		5/16	5/8	3/8	3/4	1/2	3/4
Over 60 to 84, incl		7/16	11/16	1/2	3/4	5/8	7/8
Over 84 to 108, incl		9/16	3/4	5/8	7/8	3/4	1
Over 108		5/8	7/8	11/16	1	7/8	1
60 and under	over 360 to 480	7/16	1 1/8	1/2	1 1/4	5/8	1 3/8
Over 60 to 84, incl		1/2	1 1/4	5/8	1 3/8	3/4	1 1/2
Over 84 to 108, incl		9/16	1 1/4	3/4	1 3/8	7/8	1 1/2
Over 108		3/4	1 3/8	7/8	1 1/2	1	1 5/8
60 and under	over 480 to 600	7/16	1 1/4	1/2	1 1/2	5/8	1 5/8
Over 60 to 84, incl		1/2	1 3/8	5/8	1 1/2	3/4	1 5/8
Over 84 to 108, incl		5/8	1 3/8	3/4	1 1/2	7/8	1 5/8
Over 108		3/4	1 1/2	7/8	1 5/8	1	1 3/4
60 and under	over 600	1/2	1 3/4	5/8	1 7/8	3/4	1 7/8
Over 60 to 84, incl		5/8	1 3/4	3/4	1 7/8	7/8	1 7/8
Over 84 to 108, incl		5/8	1 3/4	3/4	1 7/8	7/8	1 7/8
Over 108		7/8	1 3/4	1	2	1 1/8	2 1/4
Width, mm	Length, mm	Tolerance Over Specified Width and Length for Given Width, Length, and Thickness, mm					
		Under 9.5 mm		9.5 to 12.7 mm, incl in Thickness		Over 12.7 mm in Thickness	
		Width	Length	Width	Length	Width	Length
1219 mm and under		3.2	4.8	4.8	6.4	7.9	9.5
Over 1219 to 1524, incl	3658 and under	4.8	6.4	6.4	7.9	9.5	11.1
Over 1524 to 2134, incl		6.4	7.9	7.9	9.5	11.1	12.7
Over 2134 to 2743, incl		7.9	9.5	9.5	11.1	12.7	14.3
Over 2743		9.5	11.1	11.1	12.7	15.9	17.5
1219 mm and under		4.8	9.5	6.4	12.7	7.9	15.9
Over 1219 to 1524, incl	over 3658 to 6096	6.4	11.1	7.9	15.9	9.5	19.1
Over 1524 to 2134, incl		9.5	12.7	11.1	17.5	12.7	19.1
Over 2134 to 2743, incl		11.1	14.3	12.7	19.1	15.9	22.2
Over 2743		12.7	15.9	15.9	22.2	17.5	25.4
1219 mm and under		6.4	12.7	7.9	15.9	9.5	19.1
Over 1219 to 1524, incl	over 6096 to 9144	7.9	15.9	9.5	19.1	12.7	19.1
Over 1524 to 2134, incl		11.1	17.5	12.7	19.1	15.9	22.2
Over 2134 to 2743, incl		14.3	19.1	15.9	22.2	19.1	25.4
Over 2743		15.9	22.2	17.5	25.4	22.2	25.4
1524 mm and under		11.1	28.6	12.7	31.8	15.9	34.9
Over 1524 to 2134, incl	over 9144 to 12 192	12.7	31.8	15.9	34.9	19.1	38.1
Over 2134 to 2743, incl		14.3	31.8	19.1	34.9	22.2	38.1
Over 2743		19.1	34.9	22.2	38.1	25.4	41.3
1524 mm and under		11.1	31.8	12.7	38.1	15.9	41.3
Over 1524 to 2134, incl	over 12 192 to 15 240	12.7	34.9	15.9	38.1	19.1	41.3
Over 2134 to 2743, incl		15.9	34.9	19.1	38.1	22.2	41.3
Over 2743		19.1	38.1	22.2	41.3	25.4	44.3
1524 mm and under		12.7	44.5	15.9	47.6	19.1	47.6
Over 1524 to 2134, incl	over 15 240	15.9	44.5	19.1	47.6	22.2	47.6
Over 2134 to 2743, incl		15.9	44.5	19.1	47.6	22.2	47.6
Over 2743		22.2	44.5	25.4	50.8	28.6	57.2

[A] The tolerance under specified width and length is 1/4 in. (6.4 mm).

[B] Rectangular plates over 1 in. (25.4 mm) in thickness are not commonly sheared and are machined or otherwise cut to length and width or produced in the size as rolled, uncropped.

TABLE 13 Camber Tolerance for Plates

Tolerance = 1/8 in. (3.2 mm) × [ft(cm) of length/5 ft (152 cm)]

TABLE 14 Flatness Tolerances for Plates, in.

Specified Thickness, in.	Flatness Tolerance (Deviation from A Flat Horizontal Surface) for Thickness and Width Given, in.								
	Width, in.								
	48 and Under	Over 48 to 60, excl	60 to 72, excl	72 to 84, excl	84 to 96, excl	96 to 108, excl	108 to 120, excl	120 to 144, excl	144 and Over
3/16 to 1/4, excl	3/4	1 1/16	1 1/4	1 3/8	1 5/8	1 5/8	1 7/8	2	
1/4 to 3/8, excl	11/16	3/4	15/16	1 1/8	1 3/8	1 7/16	1 9/16	1 7/8	
3/8 to 1/2, excl	1/2	9/16	11/16	3/4	15/16	1 1/8	1 1/4	1 7/16	
1/2 to 3/4, excl	1/2	9/16	5/8	5/8	13/16	1 1/8	1 1/8	1 1/8	1 3/4
3/4 to 1, excl	1/2	9/16	5/8	5/8	3/4	13/16	15/16	1	1 3/8
1 to 1 1/2 , excl	1/2	9/16	9/16	9/16	11/16	11/16	11/16	3/4	1 1/8
1 1/2 to 4, excl	3/16	5/16	3/8	7/16	1/2	9/16	5/8	3/4	1
4 to 6, excl	1/4	3/8	1/2	9/16	5/8	3/4	7/8	1	1 1/8
Specified Thickness, mm	Flatness Tolerance (Deviation from A Flat Horizontal Surface) for Thickness and Width Given, mm								
	Width, mm								
	1219 and Under	Over 1219 to 1524, excl	1524 to 1829, excl	1829 to 2134, excl	2134 to 2438, excl	2438 to 2743, excl	2743 to 3048, excl	3048 to 3658, excl	3658 and Over
4.76 to 6.35, excl	19.1	27.0	31.8	34.9	41.3	41.6	47.6	50.8	
6.35 to 9.53, excl	17.5	19.1	23.8	28.6	34.9	36.5	39.7	47.6	
9.53 to 12.7, excl	12.7	14.3	17.5	19.1	23.8	28.6	31.8	36.5	44.5
12.7 to 19.05, excl	12.7	14.3	15.9	15.9	20.6	28.6	28.6	28.6	34.9
19.05 to 25.4, excl	12.7	14.3	15.9	15.9	19.1	20.6	23.8	25.4	28.6
25.4 to 38.1, excl	12.7	14.3	14.3	14.3	17.5	17.5	17.5	19.1	25.4
38.1 to 102, excl	4.8	7.9	9.5	11.1	12.7	14.3	15.9	19.1	22.2
102 to 152, excl	6.4	9.5	12.7	14.3	15.9	19.1	22.2	25.4	28.6

TABLE 15 Recommended Plate Flame-Cutting Tolerances to Clean up in Machining

Specified Thickness, in. (mm)	Machining Allowance per Edge, in. (mm)
Under 2 (51)	1/4 (6.4)
Over 2 to 3 (51 to 76), incl	3/8 (9.5)
Over 3 to 6 (76 to 152), incl	1/2 (12.7)

TABLE 16 Abrasive-Cutting Width and Length Tolerances

Specified Thickness, in. (mm)	Tolerance Over[A] Specified Width and Length, in. (mm)	
	Width	Length
Up to 1 1/4 (32)	1/8 (3.2)	1/8 (3.2)
Over 1 1/4 to 2 1/4 (32 to 70)	3/16 (4.8)	3/16 (4.8)

[A] The tolerance under specified width and length is 1/8 in. (3.2 mm).

16. Certification

16.1 When specified in the purchase order or contract, a producer's or supplier's certification shall be furnished to the purchaser that the material was manufactured, sampled, tested, and inspected in accordance with this specification and has been found to meet the requirements. When specified in the purchase order or contract, a report of the test results shall be furnished.

17. Packaging and Marking

17.1 Material shall be bundled or boxed in such a manner as to assure undamaged delivery to its destination when properly transported by a common carrier.

17.2 Each piece (or bundle, where applicable) shall be marked with the grade of the material or UNS number and heat number.

18. Keywords

18.1 plate; sheet; strip; UNS N06333