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Designation: B473 – 07

Standard Specification for UNS N08020, UNS N08024, and UNS N08026 Nickel Alloy Bar and Wire[1]

This standard is issued under the fixed designation B473; 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[2] covers UNS N08020, UNS N08026, and UNS N08024 bar and wire other than required for reforging.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

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 Material Safety Data Sheet (MSDS) 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:*[3]

A262 Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels

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

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 The terms bar and wire as used in this specification are described as follows:

3.1.2 *bars*, *n*—hot-finished rounds, squares, octagons, and hexagons: ¼ in. (6.35 mm) and over in diameter or size. Hot-finished flats: ¼ to 10 in. (254 mm), inclusive, in width, ⅛ in. (3.175 mm) and over in thickness. Cold-finished rounds, squares, octagons, hexagons, and shapes: over ½ in. (12.7 mm) in diameter or size. Cold-finished flats: ⅜ in. (9.525 mm) and over in width (see Discussion(1)), ⅛ in. and over in thickness (see Discussion(2)).

3.1.2.1 *Discussion*—(1) Widths less than ⅜ in. (9.525 mm) and thicknesses less than 3⁄16 in. (4.75 mm) are generally described as flat wire.

3.1.2.2 *Discussion*—(2) Thicknesses ⅛ in. (3.175 mm) to under 3⁄16 in. (4.75 mm) can be cold-rolled strip as well as bar.

3.1.3 *wire*, *n*—cold finished only: round, square, octagon, hexagon, and shape wire, ½ in. (12.7 mm) and under in diameter or size. Cold-finished only: flat wire, 3⁄16 in. (4.76 mm) to under ⅜ in. (9.525 mm) in width, 0.010 in. (0.254 mm) to under 3⁄16 in. in thickness.

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 Quantity (weight or number of pieces),
4.1.2 Name of material or UNS number,
4.1.3 Form (bar or wire),
4.1.4 Dimensions,
4.1.5 Condition,
4.1.6 Finish,
4.1.7 ASTM designation and year of issue,
4.1.8 Inspection (15.1),
4.1.9 Supplementary requirements, if any, and
4.1.10 If possible, the intended end use.

NOTE 1—A typical ordering description is as follows: 200 bars, UNS N08020, 1 in. (25.4 mm) round by 10 to 14 ft (3.0 to 3.6 m), centerless ground, Specification B473.

[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 ASME Boiler and Pressure Vessel Code applications see related Specification SB-473 in Section II of that Code.

[3] 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.

***A Summary of Changes section appears at the end of this standard.**

5. Materials and Manufacture

5.1 *Heat Treatment*—The product of UNS N08020 alloy shall be furnished in the stabilized-annealed condition. The product of UNS N08026 alloy shall be furnished in the solution-annealed condition. The product of UNS N08024 alloy shall be furnished in the annealed condition.

NOTE 2—The recommended annealing temperatures all followed by quenching in water or rapidly cooling by other means are as follows: 1700 to 1850°F (927 to 1010°C) for UNS N08020, 2050 to 2200°F (1121 to 1204°C) for UNS N08026, and 1925 to 1975°F (1052 to 1079°C) for UNS N08024.

6. Chemical Composition

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

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

7. Condition

7.1 Bars shall be furnished annealed and either hot finished or cold finished. Strain-hardened material is available only as cold finished.

7.2 Wire will be furnished only as annealed and cold finished.

8. Mechanical Properties

8.1 The material shall conform to the applicable requirements as to mechanical properties prescribed in Table 2.

9. Dimensions and Permissible Variations

9.1 *Bar*—Bars shall conform to the variations in dimensions prescribed in Tables 3-11, inclusive, as applicable.

9.2 *Wire*—Wire shall conform to the permissible variations in dimensions prescribed in Tables 12-16, inclusive, as applicable.

10. Workmanship, Finish, and Appearance

10.1 The product shall be uniform in quality and condition, smooth, commercially straight or flat, and free of injurious imperfections.

11. Sampling

11.1 *Lot*:

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

11.1.2 A lot for mechanical properties shall consist of all material from the same heat, nominal diameter or thickness, of each heat-treatment charge.

11.2 *Test Material Selection*:

11.2.1 *Chemical Analysis*—Representative samples shall be taken during pouring or subsequent processing.

11.2.1.1 *Check analysis* shall be wholly the responsibility of the purchaser.

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

12. Number of Tests

12.1 *Chemical Analysis*—One test per lot.

12.2 *Mechanical Properties*—One test per lot.

13. Specimen Preparation

13.1 Tension test specimens shall be taken from the material after final heat treatment, and shall be selected in the longitudinal direction. The tension test specimens shall conform to the appropriate sections of Test Methods E8.

14. Test Methods

14.1 The chemical composition and mechanical properties of the material as enumerated in this specification shall, in case of disagreement, be determined in accordance with the following methods:

Test	ASTM Designations
Chemical analysis	E1473[A]
Tension	E8

[A] Iron shall be determined arithmetically by difference.

15. Inspection

15.1 If specified, source inspection of the material by the purchaser at the manufacturer's plant shall be made as agreed upon between the purchaser and the manufacturer as part of the purchase contract.

16. Rejection and Rehearing

16.1 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 1 Chemical Requirements

Element	Composition, %		
	UNS N08026	UNS N08020	UNS N08024
Carbon, max	0.03	0.07	0.03
Manganese, max	1.00	2.00	1.00
Phosphorus, max	0.03	0.045	0.035
Sulfur, max	0.03	0.035	0.035
Silicon, max	0.50	1.00	0.50
Nickel	33.00 to 37.20	32.00 to 38.00	35.00 to 40.00
Chromium	22.00 to 26.00	19.00 to 21.00	22.50 to 25.00
Molybdenum	5.00 to 6.70	2.00 to 3.00	3.50 to 5.00
Copper	2.00 to 4.00	3.00 to 4.00	0.50 to 1.50
Columbium (Nb) + tantalum	...	8 × carbon–1.00	0.15 to 0.35
Nitrogen	0.10 to 0.16	...	...
Iron	remainder[A]	remainder[A]	remainder[A]

[A] By difference

TABLE 2 Mechanical Property Requirements[A]

Condition	Diameter or Thickness, in. (mm)	Tensile Strength, min		Yield Strength, min		Elongation in 2 in. (50.8 mm), min, %	Reduction of area, min, %
		ksi	MPa	ksi	MPa		
Annealed, hot finished or cold finished	All	80	551	35	241	30.0[B]	50.0
Annealed, strain-hardened	Up to 2 (50.8) incl	90	620	60	415	15.0	40.0

[A] For wire only, tensile strength 90 to 120.0 ksi (620 to 830 MPa); no requirements on yield strength, elongation, and reduction of area.
[B] Cold-finished shapes require only 15 %, minimum, elongation.

TABLE 3 Permissible Variations in Size of Hot-Rolled Round and Square Bars

	Permissible Variations from Specified Size, in. (mm)		Out-of-Round[A] or Out-of-Square,[B] in. (mm)
	Over	Under	
¼ (6.35) to 5⁄16 (7.94), incl[C,D]	[E]	[E]	[E]
Over 5⁄16 (7.94) to 7⁄16 (11.11), incl[C,D]	0.006 (0.15)	0.006 (0.15)	0.009 (0.23)
Over 7⁄16 (11.11) to 5⁄8 (15.88), incl[C,D]	0.007 (0.18)	0.007 (0.18)	0.010 (0.25)
Over 5⁄8 (15.88) to 7⁄8 (22.22), incl	0.008 (0.20)	0.008 (0.20)	0.012 (0.30)
Over 7⁄8 (22.22) to 1 (25.40), incl	0.009 (0.23)	0.009 (0.23)	0.013 (0.33)
Over 1 (25.40) to 1 1⁄8 (28.58), incl	0.010 (0.25)	0.010 (0.25)	0.015 (0.38)
Over 1 1⁄8 (28.58) to 1¼ (31.75), incl	0.011 (0.28)	0.011 (0.28)	0.016 (0.41)
Over 1 ¼ (31.75) to 1 3⁄8 (34.92), incl	0.012 (0.30)	0.012 (0.30)	0.018 (0.46)
Over 1 3⁄8 (34.92) to 1 ½ (38.10), incl	0.014 (0.36)	0.014 (0.36)	0.021 (0.53)
Over 1 ½ (38.10) to 2 (50.80), incl	1⁄64 (0.40)	1⁄64 (0.40)	0.023 (0.58)
Over 2 (50.80) to 2 ½ (63.50), incl	1⁄32 (0.79)	0	0.023 (0.58)
Over 2 ½ (63.50) to 3 ½ (88.90), incl	3⁄64 (1.19)	0	0.035 (0.89)
Over 3 ½ (88.90) to 4 ½ (114.30), incl	1⁄16 (1.59)	0	0.046 (1.17)
† Over 4 ½ (114.30) to 5 ½ (139.70), incl	5⁄64 (1.98)	0	0.058 (1.47)
Over 5 ½ (139.70) to 6 ½ (165.10), incl	1⁄8 (3.18)	0	0.070 (1.78)
Over 6 ½ (165.10) to 8 (203.20), incl	5⁄32 (3.97)	0	0.085 (2.18)

[A] Out-of-round is the difference between the maximum and minimum diameters of the bar, measured at the same cross section.
[B] Out-of-square section is the difference in the two dimensions at the same cross section of a square bar, each dimension being the distance between opposite faces.
[C] Size tolerances have not been evolved for rounds in the size range of ¼ to 5⁄16 in. (6.35 to 7.94 mm), inclusive. Size tolerances have not been evolved for round sections in the size range of ¼ in. to approximately 5⁄8 in. (6.35 to 15.88 mm) in diameter which are produced on rod mills in coils.
[D] Variations in size of coiled product made on rod mills are greater than size tolerances for product made on bar mills.
[E] Squares in this size are not produced as hot-rolled products.
† Editorially corrected.

TABLE 4 Permissible Variations in Size of Hot-Rolled Hexagonal and Octagonal Bars

Specified Sizes Measured Between Opposite Sides, in. (mm)	Permissible Variations from Specified Size, in. (mm)		Maximum Difference in 3 Measurements for Hexagons only, in. (mm)
	Over	Under	
¼ (6.35) to ½ (12.70), incl	0.007 (0.18)	0.007 (0.18)	0.011 (0.28)
Over ½ (12.70) to 1 (25.40), incl	0.010 (0.25)	0.010 (0.25)	0.015 (0.38)
Over 1 (25.40) to 1 ½ (38.10), incl	0.021 (0.53)	0.021 (0.53)	0.025 (0.64)
Over 1 ½ (38.10) to 2 (50.80), incl	1⁄32 (0.79)	1⁄32 (0.79)	1⁄32 (0.79)
Over 2 (50.80) to 2 ½ (63.50), incl	3⁄64 (1.19)	3⁄64 (1.19)	3⁄64 (1.19)
Over 2 ½ (63.50) to 3 ½ (88.90), incl	1⁄16 (1.59)	1⁄16 (1.59)	1⁄16 (1.59)

17. Certification

17.1 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.

18. Product Marking

18.1 Each bundle or box shall be properly tagged with metal tags showing heat number, grade, condition, specification number and size to assure proper identification.

19. Packaging and Package Marking

19.1 Bars or wire shall be bundled or boxed in such a manner as to assure safe delivery to their destination when properly transported by any common carrier.

20. Keywords

20.1 bar; UNS N08020; UNS N08024; UNS N08026; wire

TABLE 5 Permissible Variations in Thickness and Width for Hot-Rolled Flat Bars

Specified Width, in. (mm)	Permissible Variations in Thickness for Thicknesses Given, in. (mm)					
	⅛ (3.18) to ½ (12.70), incl		Over ½ (12.70) to 1 (25.40), incl		Over 1 (25.40) to 2 (50.80), incl	
	Over	Under	Over	Under	Over	Under
To 1 (25.40), incl	0.008 (0.20)	0.008 (0.20)	0.010 (0.25)	0.010 (0.25)	...	...
Over 1 (25.40) to 2 (50.80), incl	0.012 (0.30)	0.012 (0.30)	0.015 (0.38)	0.015 (0.38)	0.031 (0.79)	0.031 (0.79)
Over 2 (50.80) to 4 (101.60), incl	0.015 (0.38)	0.015 (0.38)	0.020 (0.51)	0.020 (0.51)	0.031 (0.79)	0.031 (0.79)
Over 4 (101.60) to 6 (152.40), incl	0.015 (0.38)	0.015 (0.38)	0.020 (0.51)	0.020 (0.51)	0.031 (0.79)	0.031 (0.79)
Over 6 (152.40) to 8 (203.20), incl	0.016 (0.41)	0.016 (0.41)	0.025 (0.64)	0.025 (0.64)	0.031 (0.79)	0.031 (0.79)
Over 8 (203.20) to 10 (254.00), incl	0.021 (0.53)	0.021 (0.53)	0.031 (0.79)	0.031 (0.79)	0.031 (0.79)	0.031 (0.79)
	Over 2 (50.80) to 4 (101.60), incl		Over 4 (101.60) to 6 (152.40), incl		Over 6 (152.40) to 8 (203.20), incl	
	Over	Under	Over	Under	Over	Under
To 1 (25.40), incl	...	...	...	...	...	...
Over 1 (25.40) to 2 (50.80), incl	...	...	...	...	...	...
Over 2 (50.80) to 4 (101.60), incl	0.062 (1.57)	0.031 (0.79)	...	...	...	...
Over 4 (101.60) to 6 (152.40), incl	0.062 (1.57)	0.031 (0.79)	0.093 (2.36)	0.062 (1.57)	...	...
Over 6 (152.40) to 8 (203.20), incl	0.062 (1.57)	0.031 (0.79)	0.093 (2.36)	0.062 (1.57)	0.125 (3.18)	0.156 (3.96)
Over 8 (203.20) to 10 (154.00), incl	0.062 (1.57)	0.031 (0.79)	0.093 (2.36)	0.062 (1.57)	0.125 (3.18)	0.156 (3.96)

Specified Width, in. (mm)	Permissible Variations in Width, in. (mm)	
	Over	Under
To 1 (25.40), incl	0.015 (0.38)	0.015 (0.38)
Over 1 (25.40) to 2 (50.80), incl	0.031 (0.79)	0.031 (0.79)
Over 2 (50.80) to 4 (101.60), incl	0.062 (1.57)	0.031 (0.79)
Over 4 (101.60) to 6 (152.40), incl	0.093 (2.36)	0.062 (1.57)
Over 6 (152.40) to 8 (203.20), incl	0.125 (3.18)	0.156 (3.96)
Over 8 (203.20) to 10 (254.00), incl	0.156 (3.96)	0.187 (4.75)

TABLE 6 Permissible Variations in Size of Cold-Finished Round Bars

Specified Size, in. (mm)	Permissible Variations from Specified Size, in. (mm)[A,B]	
	Over	Under
Over ½ (12.70) to 1 (25.40), excl	0.002 (0.05)	0.002 (0.05)
1 (25.40) to 1 ½ (38.10), excl	0.0025 (0.06)	0.0025 (0.06)
1 ½ (38.10) to 4 (101.60), incl[C]	0.003 (0.08)	0.003 (0.08)

[A] Unless otherwise specified, size tolerances are over and under as shown in the above table. When required, however, they may be specified all over and nothing under, or all under and nothing over, or any combination of over and under, if the total spread in size tolerance for a specified size is not less than the total spread shown in the table.

[B] When it is necessary to heat treat or heat treat and pickle after cold finishing, size tolerances are double those shown in the table.

[C] Cold-finished bars over 4 in. (101.60 mm) in diameter are produced; size tolerances for such bars have not been evolved.

TABLE 7 Permissible Variations in Size of Cold-Finished Hexagonal, Octagonal, and Square Bars

Specified Size, in. (mm)	Permissible Variations from Specified Size, in. (mm)[A]	
	Over	Under
Over ½ (12.70) to 1 (25.40), incl	0	0.004 (0.10)
Over 1 (25.40) to 2 (50.80), incl	0	0.006 (0.15)
Over 2 (50.80) to 3 (76.20), incl	0	0.008 (0.20)
Over 3 (76.20)	0	0.010 (0.25)

[A] When it is necessary to heat treat or heat treat and pickle after cold finishing, size tolerances are double those shown in the table.

TABLE 8 Permissible Variations in Width and Thickness of Cold-Finished Flat Bars

Width, in. (mm)	Permissible Variations in Width, over and under, in. (mm)[A]	
	For Thicknesses ¼ (6.35) and Under	For Thicknesses Over ¼ (6.35)
⅜ (9.52) to 1 (25.40), incl	0.004 (0.10)	0.002 (0.05)
Over 1 (25.40) to 2 (50.80), incl	0.006 (0.15)	0.003 (0.08)
Over 2 (50.80) to 3 (76.20), incl	0.008 (0.20)	0.004 (0.10)
Over 3 (76.20) to 4 ½ (114.30), incl	0.010 (0.25)	0.005 (0.13)

Thickness, in. (mm)	Permissible Variations in Thickness, over and under, in. (mm)[A]
⅛ (3.18) to 1 (25.40), incl	0.002 (0.05)
Over 1 (25.40) to 2 (50.80), incl	0.003 (0.08)
Over 2 (50.80) to 3 (76.20), incl	0.004 (0.10)
Over 3 (76.20) to 4 ½ (114.30), incl[B]	0.005 (0.13)

[A] When it is necessary to heat treat and pickle after cold finishing, size tolerances are double those shown in the table.

[B] Cold-finished flat bars over 4½ in. (114.30 mm) wide or thick are produced; width and thickness tolerances for such bars have not been evolved.

TABLE 9 Permissible Variations in Length of Hot-Finished or Cold-Finished Bars

NOTE 1—The order should specify random lengths or specific lengths. When random lengths are ordered, the length tolerance is not less than 24 in. (609.60 mm). When specific lengths are ordered, Table 9 or Table 10 shall apply.

Specified Size of Rounds, Squares, Hexagons, and Octagons and Widths of Flats,[A] in. (mm)	Permissible Variations in Length, in. (mm)			
	For Lengths Up to 12 ft (3,658 mm), incl		For Lengths Over 12 (3,658 mm) to 25 ft (7,620 mm), incl	
	Over	Under	Over	Under
To 2 (50.80), incl	½ (12.70)	0	¾ (19.05)	0
Over 2 (50.80) to 4 (101.60), incl	¾ (19.05)	0	1 (25.40)	0
Over 4 (101.60) to 6 (152.40), incl				
Over 6 (152.40) to 9 (228.60), incl	1(25.40)	0	1 ¼ (31.75)	0
Over 9 (228.60) to 12 (304.80), incl	1 ¼ (31.75)	0	1 ½ (38.10)	0
	1 ½ (38.10)	0	2 (50.80)	0

[A] The maximum width of bar flats is 10 in. (254.00 mm).

TABLE 10 Permissible Variations in Length of Hot-Finished or Cold-Finished Bars Machine Cut After Machine Straightening

NOTE 1—The order should specify random lengths or specific lengths. When random lengths are ordered, the length tolerance is not less than 24 in. (609.60 mm). When specific lengths are ordered. Table 9 or Table 10 shall apply.

Specified Size of Rounds, Squares, Hexagons, and Octagons and Widths of Flats,[A] in. (mm)	For Lengths Up to 12 ft (3,658 mm), incl		For Lengths Over 12 (3,658 mm) to 25 ft (7,620 mm), incl	
	Over	Under	Over	Under
To 3 (76.20), incl	⅛ (3.18)	0	3⁄16 (4.76)	0
Over 3 (76.20) to 6 (152.40), incl	3⁄16 (4.76)	0	¼ (6.35)	0
Over 6 (152.40) to 9 (228.60), incl				
Over 9 (228.60) to 12 (304.80), incl	¼ (6.35)	0	5⁄16 (7.94)	0
	½ (12.70)	0	½ (12.70)	0

[A] The maximum width of bar flats is 10 in. (254.00 mm).

TABLE 11 Permissible Variations in Straightness of Machine Straightened Hot-Finished or Cold-Finished Bars

Measurement is taken on the concave side of the bar with a straight edge. Unless otherwise specified, hot-finished or cold-finished bars for machining purposes are furnished machine straightened to the following tolerances:

Hot finished:

⅛ in. (3.18 mm) in any 5 ft (1524 mm), but may not exceed ⅛ in. (3.18 mm) × (length in feet (mm))/(5 ft (1524 mm))

Cold finished:

1⁄16 in. (1.59 mm) in any 5 ft (1524 mm), but may not exceed 1⁄16 in. (1.59 mm) × (length in feet (mm))/(5 ft (1524 mm))

TABLE 12 Diameter and Out-of-Round Tolerances for Round Wire (Drawn, Polished, Centerless Ground, Centerless Ground and Polished)[ABC]

Specified Diameter, in. (mm)	Diameter Tolerance, in. (mm)	
	Over	Under
0.5000 (12.70)	0.002 (0.05)	0.002 (0.05)
Under 0.5000 (12.70) to 0.3125 (7.94), incl	0.0015 (0.04)	0.0015 (0.04)
Under 0.3125 (7.94) to 0.0440 (1.12), incl	0.001 (0.03)	0.001 (0.03)
Under 0.0440 (1.12) to 0.0330 (0.84), incl	0.0008 (0.02)	0.0008 (0.02)
Under 0.0330 (0.84) to 0.0240 (0.61), incl	0.0005 (0.013)	0.0005 (0.013)
Under 0.0240 (0.61) to 0.0120 (0.30), incl	0.0004 (0.010)	0.0004 (0.010)
Under 0.0120 (0.30) to 0.0080 (0.20), incl	0.0003 (0.008)	0.0003 (0.008)
Under 0.0080 (0.20) to 0.0048 (0.12), incl	0.0002 (0.005)	0.0002 (0.005)
Under 0.0048 (0.12) to 0.0030 (0.08), incl	0.0001 (0.003)	0.0001 (0.003)

[A] Diameter tolerances are over and under as given in this table. Also, round wire can be produced to tolerances all over and nothing under, or all under and nothing over, or any combination over and under, if the total spread in diameter tolerances for a specified diameter is not less than the total spread given in this table.

[B] The maximum out-of-round tolerance for round wire is one half of the total size tolerance given in this table.

[C] When it is necessary to heat treat after cold finishing because of special mechanical property requirements, tolerances are commonly double those shown.

TABLE 13 Size Tolerances for Drawn Wire in Hexagons, Octagons, and Squares

Specified Size,[A] in. (mm)	Size Tolerance, in. (mm)	
	Over	Under
½ (12.70)	0	0.004 (0.10)
Under ½ (12.70) to 5⁄16 (7.94), incl	0	0.003 (0.08)
Under (7.94) to ⅛ (3.18), incl	0	0.002 (0.05)

[A] Distance across flats.

TABLE 14 Length Tolerances for Round and Shape, Straightened and Cut Wire, Exact Length Resheared Wire

Diameter, in. (mm)	Length, ft (mm)	Tolerance, in. (mm)	
		Over	Under
0.125 (3.18) and under	Up to 12 (3,658), incl	1/16 (1.59)	0
0.125 (3.18) and under	Over 12 (3,658)	1/8 (3.18)	0
Over 0.125 (3.18) to 0.500 (12.70), incl	Under 3 (914)	1/32 (0.79)	0
Over 0.125 (3.18) to 0.500 (12.70), incl	3 (914) to 12 (3,658), incl	1/16 (1.59)	0
Over 0.125 (3.18) to 0.500 (12.70), incl	Over 12 (3,658)	1/8 (3.18)	0

TABLE 15 Size Tolerances for Wire for Which the Final Operation is a Surface Treatment for the Purpose of Removing Scale or Drawing Lubricant

Specified Size, in. (mm)	Tolerance, in. (mm)	
	Over	Under
1/2 (12.70)	0.004 (0.10)	0.004 (0.10)
Under 1/2 (12.70) to 5/16 (7.94), incl	0.003 (0.08)	0.003 (0.08)
Under 5/16 (7.94) to 0.044 (1.12), incl	0.002 (0.05)	0.002 (0.05)
Under 0.044 (1.12) to 0.033 (0.84), incl	0.0013 (0.03)	0.0013 (0.03)
Under 0.033 (0.84) to 0.024 (0.61), incl	0.0008 (0.02)	0.0008 (0.02)

TABLE 16 Thickness and Width Tolerances for Cold-Finished Flat Wire

Specified Width, in. (mm)	Thickness Tolerance, in. (mm), Over or Under, for Given Thicknesses, in. (mm)			Width Tolerance, in. (mm)	
	Under 0.029 (0.74)	0.029 (0.74) to 0.035 (0.89), excl	0.035 (0.89) to 3/16 (4.76), excl	Over	Under
Under 3/8 (9.52) to 1/16 (1.59), incl	0.001 (0.03)	0.0015 (0.04)	0.002 (0.05)	0.005 (0.13)	0.005 (0.13)

SUPPLEMENTARY REQUIREMENTS

The following supplementary requirements shall be applied only when specified by the purchaser in the inquiry, contract, or order.

S1. Corrosion Tests for UNS N08020

S1.1 One intergranular corrosion test per heat shall be performed by the manufacturer on a sensitized specimen and tested in accordance with Practices A262. When this supplementary requirement is specified, the specific practice (Practice B or Practice E) shall also be specified. If Practice B is specified, the specimen must pass with a rate of less than 0.002 in./month (ipm).

S1.1.1 In addition to the stabilize anneal, the specimen shall be sensitized for 1 h at 1250°F (677°C) before being subjected to corrosion testing.

S1.1.2 If any specimen selected to represent any heat fails to meet the test requirement, the material represented by such specimen may be reheat-treated and resubmitted for test.

SUMMARY OF CHANGES

Committee B02 has identified the location of selected changes to this standard since the last issue (B473 - 96 (2002)$^{\varepsilon 1}$) that may impact the use of this standard. (Approved May 1, 2007.)

(*1*) Added reference to Specification B880 in 6.2 and removed previous Table 2 and renumbered remaining tables.