

# ASTM B473 / ASME SB473

## SPECIFICATION FOR UNS N08020, UNS N08024, AND UNS N08026 NICKEL ALLOY BAR AND WIRE

This specification covers UNS N08020, UNS N08026, and UNS N08024 bar and wire other than required for reforging.

### A. Heat Treatment :-

1. The product of UNS N08020 alloy shall be furnished in the stabilized-annealed condition.
2. 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.*
3. Bars shall be furnished annealed and either hot finished or cold finished. Strain-hardened material is available only as cold finished.
4. Wire will be furnished only as annealed and cold finished.

### B. Chemical Composition :-

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

**Table 1**

Element	UNS N08026	UNS N08020	UNS N08024
Carbon, max	0.03	0.07	0.03
Manganese, max	1.0	2.0	1.0
Phosphorus, max	0.03	0.045	0.035
Sulfur, max	0.03	0.035	0.035
Silicon, max	0.5	1.0	0.5
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 <sup>A</sup>	emairder <sup>A</sup>	emairder <sup>A</sup>

<sup>A</sup> By difference.

### C. Mechanical Properties :-

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

**Table 2<sup>A</sup>**

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	A11	80	551	35	241	30.0 <sup>B</sup>	50.0
Annealed, strain-hardened	Up to 2 (50.8) incl	90	620	60	415	15.0	40.0

<sup>A</sup> For wire only, tensile strength 90 to 120.0 ksi (620 to 830 MPa); no requirements on yield strength, elongation, and reduction of area.

<sup>B</sup> Cold-finished shapes require only 15%, minimum, elongation.

**D. Test Methods :-**

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:

<u>Test</u>	<u>ASTM Designations</u>
Chemical analysis	E 1473 <sup>A</sup>
Tension	E 8 <sup>A</sup>

<sup>A</sup> Iron shall be determined arithmetically by difference.

**E. Supplementary Tests :-**

1. Corrosion Tests for UNS N08020:

One intergranular corrosion test per heat shall be performed by the manufacturer on a sensitized specimen and tested in accordance with Practices A 262.

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