Incoloy 800 / 800H / 800HT Cold-Drawn Bar (UNS N08800 / N08810 / N08811) — Technical Data Sheet

Cold-Drawn Bar supplied to ASTM B408 and ASME SB408 for UNS N08800, N08810 and N08811 — the minimums below follow the rod and bar table split by condition and designation; AMS 5766 reaches the grade 800 chemistry only.

Chemical Composition — ASTM B408 limits, three designations

Element	Alloy 800 (UNS N08800)	Alloy 800H (UNS N08810)	Alloy 800HT (UNS N08811)
Nickel (Ni)	30.0–35.0%	30.0–35.0%	30.0–35.0%
Chromium (Cr)	19.0–23.0%	19.0–23.0%	19.0–23.0%
Iron (Fe)	39.5% min.	39.5% min.	39.5% min.
Carbon (C)	0.10% max.	0.05–0.10%	0.06–0.10%
Aluminium (Al)	0.15–0.60%	0.15–0.60%	0.25–0.60%
Titanium (Ti)	0.15–0.60%	0.15–0.60%	0.25–0.60%
Aluminium + Titanium	0.30–1.20%	0.30–1.20%	0.85–1.20%
Copper (Cu)	0.75% max.	0.75% max.	0.75% max.
Manganese (Mn)	1.50% max.	1.50% max.	1.50% max.
Silicon (Si)	1.00% max.	1.00% max.	1.00% max.
Sulfur (S)	0.015% max.	0.015% max.	0.015% max.
Annealed Grain Size	Not specified	ASTM 5 or coarser	ASTM 5 or coarser

Minimum Mechanical Properties (ASTM B408, by condition)

Condition and Grade	Tensile Strength, min.	Yield Strength (0.2%), min.	Elongation, min.
Hot-worked, as-hot-worked — UNS N08800	≥80 ksi (550 MPa)	≥35 ksi (240 MPa)	25%
Cold-worked and hot-worked, annealed — UNS N08800	≥75 ksi (515 MPa)	≥30 ksi (205 MPa)	30%
Annealed — UNS N08810 / N08811	≥65 ksi (450 MPa)	≥25 ksi (170 MPa)	30%

Physical Properties (Approx.)

Property	Value
Density	Approx. 7.94 g/cm³
Melting range	Approx. 1357–1385 °C
Specific heat, 0–100 °C	Approx. 460 J/kg·°C
Modulus of elasticity at 20 °C	Approx. 196.5 GPa
Thermal conductivity at 20 °C	Approx. 11.5 W/m·K
Thermal expansion, 20–100 °C	Approx. 14.4 µm/m·°C
Electrical resistivity at 20 °C	Approx. 0.989 µΩ·m
Curie temperature	Approx. –115 °C
Magnetic behaviour	Non-magnetic at ambient temperature
Hardness, annealed	Approx. 138 HB

Standards and Designations

Standard	Product or Application
ASTM B408	Nickel-iron-chromium rod and bar, UNS N08800, N08810, N08811
ASME SB408	ASME counterpart for pressure equipment
DIN 17752 / BS 3076 NA15	European and British bar documents

Heat Treatment (coarse-grain solution anneal)

Condition	Typical Treatment
Solution Annealed (800H)	Held at 1121 °C (2050 °F) minimum, then cooled to set ASTM 5 or coarser grain
Solution Annealed (800HT)	Held at 1149 °C (2100 °F) minimum for the 0.85–1.20% Al+Ti window
Grade 800 Anneal	Annealed without a grain-size requirement, keeping the higher room-temperature strength
Stress Relieved	A low-temperature relief that holds straightness without dwelling in the 425–815 °C sensitization band

Surface Finishes (Cold-Drawn Bar)

Surface Condition	Typical Use
Cold Drawn	Drawn stock giving this cold-drawn bar close diameter control and a smooth bright skin.
Bright Annealed	Protective-atmosphere annealing leaves this cold-drawn bar oxide-free and ready to draw.
Pickled	Acid cleaning descaled this cold-drawn bar after the anneal.

Typical Supply Dimensions — Cold-Drawn Bar

Product Form	Typical Supply	Length
Cold-Drawn Bar	6–100 mm dia.	Cut to length
Cold-Drawn Round Bar	6–100 mm dia.	Cut to length
Cold-Drawn Hex Bar	10–80 mm A/F	Cut to length
Cold-Drawn Square Bar	10–80 mm	Cut to length
Straightened Bar	6–80 mm dia.	Cut to length
Annealed Drawn Bar	6–80 mm dia.	Cut to length
Custom Cold-Drawn Bar	To drawing	Custom

Values are for reference; the mill test certificate prevails for final acceptance. Designations, heat-treatment conditions, and surface finishes are confirmed at quotation.