Incoloy 825 Cold-Drawn Bar (UNS N08825 / W.Nr. 2.4858) — Technical Data Sheet

Cold-Drawn Bar supplied to ASTM B425 and ASME SB425 for UNS N08825 — the standard sets one annealed condition for rod and bar, with DIN 17752, BS 3076 NA16, ISO 9723 and VdTÜV 432 covering European and international orders.

Chemical Composition — ASTM B425 limits, UNS N08825

Element	Content
Nickel (Ni)	38.0–46.0%
Chromium (Cr)	19.5–23.5%
Iron (Fe)	22.0% min.
Molybdenum (Mo)	2.5–3.5%
Copper (Cu)	1.5–3.0%
Titanium (Ti)	0.6–1.2%
Carbon (C)	0.05% max.
Manganese (Mn)	1.00% max.
Silicon (Si)	0.50% max.
Aluminium (Al)	0.20% max.
Sulfur (S)	0.03% max.

Minimum Mechanical Properties (ASTM B425, annealed)

Condition and Grade	Tensile Strength, min.	Yield Strength (0.2%), min.	Elongation, min.
Annealed — UNS N08825	≥85 ksi (586 MPa)	≥35 ksi (241 MPa)	30%

Physical Properties (Approx.)

Property	Value
Density	Approx. 8.14 g/cm³
Melting range	Approx. 1370–1400 °C
Specific heat at 20 °C	Approx. 440 J/kg·K
Modulus of elasticity at 20 °C	Approx. 196 GPa
Shear modulus at 20 °C	Approx. 76 GPa
Poisson's ratio	Approx. 0.29
Thermal conductivity at 25 °C	Approx. 11.1 W/m·K
Thermal expansion, 20–100 °C	Approx. 14.1 µm/m·K
Electrical resistivity at 25 °C	Approx. 1.13 µΩ·m
Curie temperature	Below –196 °C
Relative permeability at 200 oersted	1.005
Magnetic behaviour	Non-magnetic at ambient temperature

Standards and Designations

Standard	Product or Application
ASTM B425 / ASME SB425	Nickel-iron-chromium-molybdenum-copper rod and bar, UNS N08825
DIN 17752 / BS 3076 NA16	European and British bar documents
VdTÜV 432 / ISO 9723	German data sheet and international bar document

Heat Treatment (solution anneal and release)

Condition	Typical Treatment
Solution Annealed	Held at 927–1010 °C (1700–1850 °F), then cooled rapidly to restore full corrosion resistance
Hot-Worked	Delivered as-rolled or as-forged, with the solution anneal agreed where the order calls for it
Cold-Drawn	Drawn after annealing, with the reduction recorded so the higher yield strength is documented
Sour-Service Release	NACE MR0175 orders carry a per-lot hardness record against the 35 HRC ceiling

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.
Annealed and Pickled	Annealing followed by acid descaling leaves this cold-drawn bar scale-free for sulfuric and seawater duty.

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.