# Incoloy 825 Bright Bar (UNS N08825 / W.Nr. 2.4858) — Technical Data Sheet

Bright 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 (Bright Bar)

| Surface Condition | Typical Use |
|---|---|
| Cold Drawn | Drawn stock giving this bright bar close diameter control and a smooth bright skin. |
| Centreless Ground | Ground diameter and straightness on this bright bar for pump shafts and plungers. |
| Polished | Reduced roughness on this bright bar for product-contact and visible components. |

## Typical Supply Dimensions — Bright Bar

| Product Form | Typical Supply | Length |
|---|---|---|
| Bright Bar | 6–150 mm dia. | Cut to length or random |
| Bright-Drawn Bar | 6–80 mm dia. | Cut to length |
| Peeled Bar | 20–100 mm dia. | Cut to length |
| Centreless-Ground Bar | 3–100 mm dia. | Cut to length |
| Precision-Ground Bar | 3–80 mm dia. | Cut to length |
| Polished Bar | 6–100 mm dia. | Cut to length |
| Custom Bright 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.