Hastelloy B-3 Round Bar (UNS N10675 / W.Nr. 2.4600) — Technical Data Sheet

Round Bar supplied to ASTM B335 and ASME SB335 for UNS N10675 — that document sets one solution-annealed condition for rod from 7.94 to 88.9 mm, its mechanical table carries no hardness ceiling against this grade, chromium held between 1.0 and 3.0% slows the embrittling phase, and DIN 17752 plus ISO 9723 cover the German and international bar routes.

Chemical Composition — ASTM B335 limits, UNS N10675

Element	Content
Nickel (Ni)	65.0% min.
Molybdenum (Mo)	27.0–32.0%
Chromium (Cr)	1.0–3.0%
Iron (Fe)	1.0–3.0%
Tungsten (W)	3.0% max.
Cobalt (Co)	3.0% max.
Manganese (Mn)	3.0% max.
Carbon (C)	0.01% max.
Silicon (Si)	0.10% max.
Phosphorus (P)	0.030% max.
Sulfur (S)	0.010% max.
Vanadium (V)	0.20% max.
Aluminum (Al)	0.50% max.
Titanium (Ti)	0.20% max.
Copper (Cu)	0.20% max.
Columbium (Nb)	0.20% max.
Tantalum (Ta)	0.20% max.
Zirconium (Zr)	0.10% max.
Nickel plus Molybdenum	**94.0–98.0%**

Minimum Mechanical Properties (ASTM B335, solution annealed)

Condition and Grade	Tensile Strength, min.	Yield Strength (0.2%), min.	Elongation, min.
Solution Annealed — UNS N10675	≥760 MPa (110 ksi)	≥350 MPa (51 ksi)	40%

Physical Properties (Approx.)

Property	Value
Density	Approx. 9.22 g/cm³
Melting range	Approx. 1370–1418 °C
Modulus of elasticity	Approx. 216 GPa
Modulus of rigidity	Approx. 83 GPa
Thermal conductivity at 20 °C	Approx. 11.2 W/m·K
Electrical resistivity at 20 °C	Approx. 1.37 µΩ·m
Thermal expansion, 25–100 °C	Approx. 10.6 µm/m·K
Magnetic behaviour	Essentially non-magnetic in the annealed condition
Strengthening route	Cold work only

Standards and Designations

Standard	Product or Application
ASTM B335 / ASME SB335	Nickel-molybdenum alloy rod with N10675 in the scope table
DIN 17752 / ISO 9723	German and international bar documents
ASTM B564 / ASME SB564	Forged bar and sections above the 88.9 mm rod ceiling

Heat Treatment (solution anneal and release)

Condition	Typical Treatment
Solution Annealed	Held near 1066 °C (1950 °F), then water quenched, because Ni3Mo begins to form close to 650 °C
Hot-Worked	Delivered as-rolled or as-forged, with the anneal agreed where the order calls for it
Cold-Drawn	Drawn after annealing, with the reduction logged so the higher proof stress is documented
Cold-Work Limit	Outer-fibre strain beyond roughly 7% sends the section back through the solution anneal before welding or service
Stress-Relief Caution	A relief pass inside the precipitation band still embrittles this grade, so residual-stress work needs a full anneal instead
Post-Weld Anneal	Most joints enter service as welded, because the slower Ni3Mo kinetics leave the as-welded zone usable

Surface Finishes (Round Bar)

Surface Condition	Typical Use
Solution Annealed and Pickled	Annealing followed by acid descaling leaves this round bar scale-free for hydrogen chloride service.
Polished	A reduced-roughness surface on this round bar for product-contact and visible parts.
Centreless Ground	Ground diameter and straightness on this round bar for pump spindles and seal faces.

Typical Supply Dimensions — Round Bar

Product Form	Typical Supply	Length
Round Bar	7.94–88.9 mm dia., solution annealed to ASTM B335	Cut to length or random
Pickled Round Bar	7.94–19.05 mm dia., clause 1.2.1	Cut to length or random
Ground Round Bar	19.05–88.9 mm dia., clause 1.2.2	Cut to length
Peeled Round Bar	20–88.9 mm dia.	Cut to length
Cold-Drawn Round Bar	7.94–60 mm dia.	Cut to length
Custom Round 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.