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

Round Rod 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 Rod)

Surface Condition	Typical Use
Cold Drawn	Drawn stock giving this round rod close diameter control with a smoother skin.
Centreless Ground	Ground diameter and straightness on this round rod for pump spindles and seal faces.
Polished	A reduced-roughness surface on this round rod for product-contact and visible parts.

Typical Supply Dimensions — Round Rod

Product Form	Typical Supply	Length
Round Rod	7.94–50 mm dia.	Cut to length
Cold-Drawn Round Rod	7.94–25 mm dia.	Cut to length
Solution-Annealed Round Rod	7.94–50 mm dia.	Cut to length
Straightened Round Rod	7.94–50 mm dia.	Cut to length
Cut-to-Length Round Rod	7.94–50 mm dia.	Cut to length
Custom Round Rod	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.