

Hastelloy B-3 Bar and Rod — Technical Data Sheet

UNS N10675 | W.Nr. 2.4600 (NiMo29) | ASTM B335 / ASME SB335 | Nickel-Molybdenum Alloy

Chemical Composition (wt.%, per ASTM B335 for UNS N10675)

Element	Content
Nickel (Ni)	Balance (≥ 65%)
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

Mechanical Properties

Condition	Tensile Strength	Yield Strength (0.2%)	Elongation	Hardness
Solution Annealed — ASTM B335 minimum	≥110 ksi (760 MPa)	≥51 ksi (350 MPa)	40%	100 HRB max.
Solution Annealed — typical values	125 ksi (860 MPa)	60 ksi (420 MPa)	50%	≤100 HRB (≈230 HB)

B-3 is not age-hardenable; strength above the annealed minimum comes only from cold work. Room-temperature typical results reflect solution-annealed lots released for chemical-plant machining.

Physical Properties (typical, room temperature)

Property	Value
Density	Approx. 9.22 g/cm³
Melting range	Approx. 1370–1418 °C
Modulus of elasticity	Approx. 216 GPa
Thermal conductivity at 21 °C	Approx. 11.2 W/m·K
Coefficient of thermal expansion, 20–100 °C	Approx. 10.6 µm/m·K
Specific heat, 0–100 °C	Approx. 373 J/kg·K
Electrical resistivity at 21 °C	Approx. 1.37 µΩ·m
Magnetic behaviour	Essentially non-magnetic at ambient temperature

Standards and Designations

Standard / Designation	Scope
ASTM B335	Nickel-molybdenum alloy rod and bar — UNS N10675
ASME SB335	ASME edition for rod and bar
ASTM B333	Plate, sheet and strip in the same grade
ASTM B564 / ASME SB564	Nickel alloy forgings — UNS N10675
ASTM B366	Factory-made wrought fittings in the same grade
ASTM B619 / B622 / B626	Welded pipe, seamless tube and welded tube in the same grade
DIN 17752 / 17753 / 17754	Wrought nickel alloys — bar, wire and forging stock
UNS N10675	Material designation for Hastelloy B-3
W.Nr. 2.4600 / NiMo29	European designation for Alloy B-3

Dimensions (typical supply)

Product Form	Typical Supply	Length
Round Bar	6–300 mm dia.	Cut to length or random
Round Rod	3–100 mm dia.	Cut to length
Bright Bar	6–150 mm dia.	Cut to length or random
Square Bar	10–150 mm	Cut to length or random
Hex Bar	10–150 mm A/F	Cut to length or random
Flat Bar	3–100 mm thick × 10–300 mm wide	Cut to length
Forged Bar	100–500 mm dia. or forged section	Cut to length
Precision-Ground Rod	3–100 mm dia., tight tolerance	Cut to length

Surface Finishes

Surface Condition	Typical Use
Solution annealed and pickled	Standard delivery for reducing-acid service
Hot-worked (as-rolled or forged)	Parts that will be machined to size
Cold drawn	Close diameter control with a brighter surface
Peeled	Uniform diameter with a machined skin for further turning
Centerless ground	Tight diameter and straightness for shafting
Polished	Reduced roughness for product-contact and visible parts
Rough turned	Machining allowance held on large or forged bar

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

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