

SOUTHERLY ALLOY

Hastelloy B-3 Pipe and Tube | UNS N10675 | Werkstoff Nr. 2.4600 | NiMo29

ASTM B622 / B619 / B626 — Seamless and Welded Tubular Product

Product Description

Hastelloy B-3 pipe and tube carries UNS N10675 in seamless, welded, and exchanger-tube form. Welded routes are where the grade separates itself, since the chromium window lets most joints enter service without a post-weld anneal. ASTM B622 governs seamless product up to 88.9 mm outside diameter, B619 covers welded pipe in Schedule 5S through 80S and larger, and B626 covers welded exchanger tube from 3.2 to 88.9 mm. Every route ships solution annealed and descaled.

Chemical Composition

Element	Content (UNS N10675)	Element	Content (UNS N10675)
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 (Ni + Mo)	94.0–98.0%		

Chromium between 1 and 3% is the deliberate addition that puts this grade ahead of earlier B-type alloys, and carbon at 0.01% supports it. ASTM B335 and B333 share this one composition table, so every product form meets the same window.

Minimum Room-Temperature Mechanical Properties

Standard / Form and Condition	Tensile Strength, min.	Yield Strength (0.2%), min.	Elongation / Hardness, min.
Seamless pipe and tube, ASTM B622 – solution annealed and descaled	≥ 110 ksi (760 MPa)	≥ 45 ksi (310 MPa)	40%
Welded pipe, ASTM B619 – Class I, solution annealed	Per ASTM B619	Per ASTM B619	Per ASTM B619
Welded tube, ASTM B626 – solution annealed	Per ASTM B626	Per ASTM B626	Per ASTM B626

ASTM B622 limits seamless product to 88.9 mm outside diameter and lowers the yield floor to 45 ksi (310 MPa). B619 welded pipe and B626 welded tube print their own acceptance tables, so we quote those figures from the edition named on the purchase order rather than restate them here.

Physical Properties (typical values)

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-°C
Magnetic behaviour	Essentially non-magnetic in the annealed condition
Strengthening route	Cold work only

Typical room-temperature values drawn from the published Haynes data for the grade. They support design work rather than acceptance testing. Specific heat is omitted because the available sources disagree; confirm it with the mill when a design calculation needs it.

Applicable Standards

Standard / Designation	Scope
ASTM B622 / ASME SB622	Seamless pipe and tube to 88.9 mm outside diameter
ASTM B619 / ASME SB619	Welded pipe, Schedule 5S through 80S and larger
ASTM B626 / ASME SB626	Welded tube, 3.2–88.9 mm outside diameter
ASTM B829	General requirements for seamless pipe and tube
ASTM B775 / B751	General requirements for welded pipe and welded tube
ASTM B335 / B333	Rod, and plate, sheet, and strip in the same grade
ASTM B564 / B366	Forgings, and factory-made wrought fittings
DIN 17751 · ISO 6207	Seamless tube standards
NACE MR0175 / ISO 15156	Sour service review where the order requires it
SAE AMS	No aerospace specification covers this grade

Neither grade tolerates an oxidant, so ferric or cupric contamination and wet chlorine stay outside the envelope. No iron or copper may contact a hydrochloric acid circuit, because the salts that form attack the low-chromium matrix. Service temperature: roughly –200 to +400 °C depending on load and medium, and hotter duties need verification before ordering. Solution annealing sits near 1066 °C (1950 °F) followed by a rapid water quench, which dissolves any ordered phase that forming or welding introduced. Filler metal: ERNiMo-7 to AWS A5.14, or ENiMo-7 electrodes to AWS A5.11.

Typical Supply Dimensions

Product Form	Outside Diameter	Wall Thickness
Seamless pipe and tube, ASTM B622	Up to 88.9 mm	0.5–12.7 mm
Welded pipe, ASTM B619	Schedule 5S through 80S, 8 in nominal and larger	Per schedule
Welded tube, ASTM B626	3.2–88.9 mm	0.41–3.7 mm
U-bend tube	As drawn, bent to drawing	0.7–6 mm

ASTM B622 limits seamless product to 88.9 mm outside diameter, and welded sizes follow ANSI B36.19 schedules. Cut lengths carry the tolerance of the ordered condition.

Surface Finishes

Surface Condition	Typical Use
Solution annealed and pickled	Standard delivery for hydrochloric and sulfuric acid service
Bright annealed	Scale-free bore for instrument and clean circuits
Polished bore	Reduced roughness for product-contact lines
Mechanically descaled	Welded product cleaned without acid pickling

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