

SOUTHERLY ALLOY

Inconel X-750 Pipe and Tube | UNS N07750 | Werkstoff Nr. 2.4669 | NiCr15Fe7TiAl | GH4145

AMS 5582 / AMS 5583 — Seamless Precipitation-Hardenable Nickel Alloy Tubing

Product Description

Inconel X-750 seamless tube carries UNS N07750 to AMS 5582, with AMS 5583 covering vacuum-melted stock at the highest strength level. Outside diameter runs from 3.18 to 219 mm and wall from 0.38 to 12 mm, in straight lengths, coils, or U-bends. As-delivered tube stays at or below 965 MPa so that it can be bent and rolled, and the aging treatment at 704 °C for 20 h lifts the floor to 1069 MPa. No welded tube standard covers this grade, so every tube on this page is seamless. Grain size and eddy current inspection follow ASTM E112 and ASTM E426.

Chemical Composition

Element	Content (UNS N07750)	Element	Content (UNS N07750)
Nickel plus Cobalt (Ni + Co)	70.00% min.	Silicon (Si)	0.50% max.
Chromium (Cr)	14.00–17.00%	Copper (Cu)	0.50% max.
Iron (Fe)	5.00–9.00%	Cobalt (Co)	1.00% max.
Titanium (Ti)	2.25–2.75%	Carbon (C)	0.08% max.
Aluminum (Al)	0.40–1.00%	Tantalum (Ta)	0.05% max.
Niobium + Tantalum (Nb + Ta)	0.70–1.20%	Sulfur (S)	0.010% max.
Manganese (Mn)	1.00% max.		

ASTM B637, AMS 5542, AMS 5582, and AMS 5698 print one composition table for UNS N07750, and titanium, aluminum, and niobium together drive the precipitation reaction.

Minimum Room-Temperature Mechanical Properties

Product Form	Condition	Tensile Strength, min.	Yield Strength (0.2%), min.	Elongation, min.	Hardness
Seamless tube, AMS 5582	Solution treated, as delivered	≤140 ksi (965 MPa)	≤80 ksi (552 MPa)	30%	—
Seamless tube, AMS 5582	Aged at 704 °C for 20 h	≥155 ksi (1069 MPa)	≥100 ksi (689 MPa)	15%	—
Seamless tube, AMS 5583	Vacuum melted, solution treated, aged	≥170 ksi (1172 MPa)	—	—	—

The as-delivered ceiling in the first row is what keeps the tube formable for bending and rolling, and the aging cycle then lifts the floor above it. AMS 5583 covers vacuum-melted stock for the highest strength level. A dash means the document sets no requirement for that cell.

Physical Properties (typical values)

Property	Value
Density	Approx. 8.28 g/cm ³
Melting range	Approx. 1393–1427 °C
Curie temperature	Approx. –143 °C hot rolled; –125 °C fully heat treated
Modulus of elasticity / rigidity at 20 °C	Approx. 214 / 76 GPa; Poisson's ratio 0.29
Thermal conductivity at 20 °C	Approx. 12.0 W/m-K
Specific heat at 20 °C	Approx. 431 J/kg-K
Electrical resistivity at 20 °C	Approx. 1.22 μΩ-m
Thermal expansion, 20–100 °C	Approx. 12.6 μm/m-K
Strengthening route	Precipitation hardening only

Values are typical for the annealed condition at room temperature. The Curie point sits far below zero, so the alloy stays essentially non-magnetic in service.

Applicable Standards

Standard / Designation	Scope
AMS 5582	Seamless tubing, solution heat treated, precipitation hardenable to 1069 MPa
AMS 5583	Seamless tubing, vacuum melted, precipitation hardenable to 1172 MPa
ASTM B829 / ASTM B751	General requirements for seamless tube and for welded tube
AMS 2634	Ultrasonic inspection of thin materials
ASTM E426	Eddy current examination of seamless tubing
ASTM E112	Average grain size determination
NACE MR0175 / ISO 15156-3	Sour service qualification where the order requires it
UNS N07750 · W.Nr. 2.4669 · NiCr15Fe7TiAl; GB/T 14992 GH4145 · JIS NCF 750	Material and national designations
ASTM B163	This document does not list UNS N07750 in its scope

The grade is welded with matching fillers under an inert gas shield, and the joint takes the same aging treatment as the parent metal.

Typical Supply Dimensions

Product Form	Outside Diameter	Wall Thickness
Seamless tube, AMS 5582	3.18–219 mm	0.38–12 mm
Seamless tube, AMS 5583	Vacuum melted stock, sized to the order	Quoted per order
Coiled tube	3.18–25 mm	0.38–3 mm
U-bend tube	Bent to the bundle drawing	As drawn

AMS 5582 fixes the outside diameter and wall range, and AMS 5583 stock is sized to the order. Cut lengths carry the tolerance of the ordered condition.

Surface Finishes

Surface Condition	Typical Use
Solution treated and pickled	Standard delivery for high-temperature service
Bright annealed	Scale-free bore for instrument and clean circuits
Polished bore	Reduced roughness for product-contact lines
Ground outside diameter	Tight tolerance for tube-to-tubesheet joints
U-bent and stress relieved	Bundle form ready for assembly

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