MATERIAL DATA SHEET

Inconel 706 AMS 5701 heat-treated bar, <50 mm (MIL-HDBK-5H)

Historical public-release S-basis bar reference for the AMS 5701 tensile heat treatment.

Field	Value
Material ID	milhdbk-inconel706-ams5701-bar-50-mm
Category	Metal
Condition	Inconel 706; heat treated per AMS 5701; bar; <50 mm public counterpart range | bar
Unit system	Common SI
Unit contract	Material properties stored in SI engineering units.
Generated	2026-11-15 23:15

Source and Validity

Field	Value
Quality	Catalog record
Design release allowed	No
Source family	Government materials handbook
Confidence	Reference-grade
License	Open
Source note	Independent transcription from an official public-release U.S. government handbook.
Citation	U.S. Department of Defense, MIL-HDBK-5H, Metallic Materials and Elements for Aerospace Vehicle Structures, 1 December 1998, Table 6.3.4.0(b), PDF page(s) 1048 (handbook page(s) 6-46); official DLA document record https://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=53876. The official PDF carries Distribution Statement A: Approved for public release; distribution is unlimited.
Valid temperature	21 ... 21 degC (Room-temperature historical handbook values. Applicability is limited to the exact alloy, temper/condition, product form, size band, material axis, statistical basis, and specification identified by the cited table.)
Valid pressure	Pressure dependence is not represented by these solid-material reference values.
Valid phase / condition	Inconel 706; heat treated per AMS 5701; bar; <50 mm public counterpart range
Uncertainty	Values are historical handbook table transcriptions with explicit SI conversion. They are not a substitute for a current material specification, supplier certificate, drawing allowable, or project approval.
Last reviewed	2026-08-02
Reviewer	scripts/import_milhdbk5h_public_metals.py
Review status	Checked

Field	Value
Review scope	Checked official DLA document identity, Distribution Statement A, PDF hash, table/page location, alloy/condition/form/size scope, basis semantics, and SI conversions.
Notes	Historical reference only; design release is explicitly disabled.
License ID	US-DOD-DISTRIBUTION-STATEMENT-A
License URL	https://www.dodcui.mil/Distribution-Statements/
Attribution	U.S. Department of Defense

Material Condition

Field	Value
Condition	Inconel 706; heat treated per AMS 5701; bar; <50 mm public counterpart range
Temper	AMS 5701 tensile heat treatment
Heat treatment	1800 degF solution treatment and precipitation treatment per the applicable AMS 5701 revision
Product form	bar
Thickness / diameter range	<1.969 in (50 mm), subset of the <2.500 in table column
Test direction	L
Processing route	vacuum-melted precipitation-hardened nickel-alloy bar
Temperature range	21 ... 21 degC
Notes	Room-temperature historical handbook values. Applicability is limited to the exact alloy, temper/condition, product form, size band, material axis, statistical basis, and specification identified by the cited table. Historical reference only; confirm the current procurement specification and material test report.

Properties

Physical

Property	Value	Unit	Type	Applies to
Density	8083	kg/m^3	Historical Nominal	Inconel 706; heat treated per AMS 5701; bar; <50 mm public counterpart range; S-basis, AMS 5701 <2.500 in column

Mechanical

Property	Value	Unit	Type	Applies to
Ultimate tensile strength, L	1172.109	MPa	Historical Public Release Table Value	Inconel 706; heat treated per AMS 5701; bar; <50 mm public counterpart range; S-basis, AMS 5701 <2.500 in column; L direction
Tensile yield strength, L	965.266	MPa	Historical Public Release Table Value	Inconel 706; heat treated per AMS 5701; bar; <50 mm public counterpart range; S-basis, AMS 5701 <2.500 in column; L direction
Compressive yield strength, L	1006.635	MPa	Historical Public Release Table Value	Inconel 706; heat treated per AMS 5701; bar; <50 mm public counterpart range; S-basis, AMS 5701 <2.500 in column; L direction
Ultimate shear strength	730.844	MPa	Historical Public Release Table Value	Inconel 706; heat treated per AMS 5701; bar; <50 mm public counterpart range; S-basis, AMS 5701 <2.500 in column
Elongation, L	12	%	Historical Public Release Table Value	Inconel 706; heat treated per AMS 5701; bar; <50 mm public counterpart range; S-basis, AMS 5701 <2.500 in column; L direction
Young's modulus	209.601	GPa	Historical Nominal	Inconel 706; heat treated per AMS 5701; bar; <50 mm public counterpart range; S-basis, AMS 5701 <2.500 in column
Compression modulus	209.601	GPa	Historical Nominal	Inconel 706; heat treated per AMS 5701; bar; <50 mm public counterpart range; S-basis, AMS 5701 <2.500 in column
Shear modulus	75.842	GPa	Historical Nominal	Inconel 706; heat treated per AMS 5701; bar; <50 mm public counterpart range; S-basis, AMS 5701 <2.500 in column
Poisson's ratio	0.38	-	Historical Nominal	Inconel 706; heat treated per AMS 5701; bar; <50 mm public counterpart range; S-basis, AMS 5701 <2.500 in column

Engineering note: seed solid-material values are reference values only. Verify against the project material specification or supplier data sheet before release.