MATERIAL DATA SHEET

Inconel 718 ST investment casting, <=12.7 mm (MIL-HDBK-5H)

Historical public-release S-basis investment-casting reference.

Field	Value
Material ID	milhdbk-inconel718-st-casting-12-7-mm
Category	Metal
Condition	Inconel 718; ST; investment casting; <=12.7 mm | investment casting
Unit system	Common SI
Unit contract	Material properties stored in SI engineering units.
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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 6.3.5.0(d), PDF page(s) 1056 (handbook page(s) 6-54); 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 718; ST; investment casting; <=12.7 mm
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Notes	Historical reference only; design release is explicitly disabled.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 718; ST; investment casting; <=12.7 mm
Temper	ST
Heat treatment	heat treated to AMS 5383 ST condition
Product form	investment casting
Thickness / diameter range	<=0.500 in (12.7 mm)
Test direction	any location within casting, subject to the handbook table note
Processing route	investment-cast nickel-base superalloy
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	8221	kg/m^3	Historical Nominal	Inconel 718; ST; investment casting; <=12.7 mm; S-basis

Mechanical

Property	Value	Unit	Type	Applies to
Ultimate tensile strength, L	827.371	MPa	Historical Public Release Table Value	Inconel 718; ST; investment casting; <=12.7 mm; S-basis; L direction
Tensile yield strength, L	723.95	MPa	Historical Public Release Table Value	Inconel 718; ST; investment casting; <=12.7 mm; S-basis; L direction
Compressive yield strength, L	723.95	MPa	Historical Public Release Table Value	Inconel 718; ST; investment casting; <=12.7 mm; S-basis; L direction
Ultimate shear strength	606.739	MPa	Historical Public Release Table Value	Inconel 718; ST; investment casting; <=12.7 mm; S-basis
Elongation, L	3	%	Historical Public Release Table Value	Inconel 718; ST; investment casting; <=12.7 mm; S-basis; L direction
Young's modulus	202.706	GPa	Historical Nominal	Inconel 718; ST; investment casting; <=12.7 mm; S-basis
Compression modulus	213.048	GPa	Historical Nominal	Inconel 718; ST; investment casting; <=12.7 mm; S-basis
Shear modulus	78.6	GPa	Historical Nominal	Inconel 718; ST; investment casting; <=12.7 mm; S-basis
Poisson's ratio	0.29	-	Historical Nominal	Inconel 718; ST; investment casting; <=12.7 mm; S-basis

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