MATERIAL DATA SHEET

Inconel 625 annealed bar, 12.7-100 mm (MIL-HDBK-5H)

Historical public-release S-basis annealed-bar reference conservatively combined through 100 mm.

Field	Value
Material ID	milhdbk-inconel625-annealed-bar-12-7-100-mm
Category	Metal
Condition	Inconel 625; annealed bar; 12.7-100 mm | bar
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 6.3.3.0(c), PDF page(s) 1038 (handbook page(s) 6-36); 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 625; annealed bar; 12.7-100 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
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.

Field	Value
Notes	Historical reference only; design release is explicitly disabled.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 625; annealed bar; 12.7-100 mm
Temper	annealed
Heat treatment	annealed at 1700-1900 degF for time commensurate with section per handbook section 6.3.3
Product form	bar
Thickness / diameter range	0.500-3.937 in (12.7-100 mm), within the 0.500-3.999 in table bands
Test direction	L and ST where available; lower listed value across applicable size bands
Processing route	wrought solid-solution-strengthened 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	8442	kg/m^3	Historical Nominal	Inconel 625; annealed bar; 12.7-100 mm; S-basis lower value across 0.500-3.999 in

Mechanical

Property	Value	Unit	Type	Applies to
Ultimate tensile strength, L	827.371	MPa	Historical Public Release Table Value	Inconel 625; annealed bar; 12.7-100 mm; S-basis lower value across 0.500-3.999 in; L direction
Tensile yield strength, L	413.685	MPa	Historical Public Release Table Value	Inconel 625; annealed bar; 12.7-100 mm; S-basis lower value across 0.500-3.999 in; L direction
Compressive yield strength, L	365.422	MPa	Historical Public Release Table Value	Inconel 625; annealed bar; 12.7-100 mm; S-basis lower value across 0.500-3.999 in; L direction
Ultimate shear strength	544.686	MPa	Historical Public Release Table Value	Inconel 625; annealed bar; 12.7-100 mm; S-basis lower value across 0.500-3.999 in
Elongation, L	30	%	Historical Public Release Table Value	Inconel 625; annealed bar; 12.7-100 mm; S-basis lower value across 0.500-3.999 in; L direction
Ultimate tensile strength, ST	813.581	MPa	Historical Public Release Table Value	Inconel 625; annealed bar; 12.7-100 mm; S-basis lower value across 0.500-3.999 in; ST direction
Tensile yield strength, ST	393.001	MPa	Historical Public Release Table Value	Inconel 625; annealed bar; 12.7-100 mm; S-basis lower value across 0.500-3.999 in; ST direction
Compressive yield strength, ST	413.685	MPa	Historical Public Release Table Value	Inconel 625; annealed bar; 12.7-100 mm; S-basis lower value across 0.500-3.999 in; ST direction
Young's modulus	205.464	GPa	Historical Nominal	Inconel 625; annealed bar; 12.7-100 mm; S-basis lower value across 0.500-3.999 in
Compression modulus	205.464	GPa	Historical Nominal	Inconel 625; annealed bar; 12.7-100 mm; S-basis lower value across 0.500-3.999 in
Shear modulus	81.358	GPa	Historical Nominal	Inconel 625; annealed bar; 12.7-100 mm; S-basis lower value across 0.500-3.999 in
Poisson's ratio	0.28	-	Historical Nominal	Inconel 625; annealed bar; 12.7-100 mm; S-basis lower value across 0.500-3.999 in

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