MATERIAL DATA SHEET

9Ni-4Co-0.20C quenched-and-tempered plate (MIL-HDBK-5H)

Historical public-release S-basis plate reference for quenched-and-tempered 9Ni-4Co-0.20C steel.

Field	Value
Material ID	milhdbk-9ni-4co-0-2c-qt-plate
Category	Metal
Condition	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm | plate
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 2.4.2.0(b), PDF page(s) 130 (handbook page(s) 2-76); 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	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 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Notes	Historical reference only; design release is explicitly disabled.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	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm
Temper	quenched and tempered
Heat treatment	normalized, austenitized, quenched, sub-zero treated and double tempered per handbook section 2.4.2
Product form	plate
Thickness / diameter range	table covers <0.250 and >=0.250 in; handbook states through-hardening to at least 8 in
Test direction	L and LT
Processing route	quenched-and-tempered intermediate-alloy steel plate
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	7833	kg/m^3	Historical Nominal	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm; S-basis; lower elongation across the two listed thickness columns

Mechanical

Property	Value	Unit	Type	Applies to
Ultimate tensile strength, L	1282.425	MPa	Historical Public Release Table Value	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm; S-basis; lower elongation across the two listed thickness columns; L direction
Tensile yield strength, L	1192.793	MPa	Historical Public Release Table Value	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm; S-basis; lower elongation across the two listed thickness columns; L direction
Ultimate tensile strength, LT	1310.004	MPa	Historical Public Release Table Value	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm; S-basis; lower elongation across the two listed thickness columns; LT direction
Tensile yield strength, LT	1206.583	MPa	Historical Public Release Table Value	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm; S-basis; lower elongation across the two listed thickness columns; LT direction
Compressive yield strength, L	1296.214	MPa	Historical Public Release Table Value	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm; S-basis; lower elongation across the two listed thickness columns; L direction
Compressive yield strength, LT	1289.32	MPa	Historical Public Release Table Value	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm; S-basis; lower elongation across the two listed thickness columns; LT direction
Ultimate shear strength	786.002	MPa	Historical Public Release Table Value	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm; S-basis; lower elongation across the two listed thickness columns
Elongation, LT	5	%	Historical Public Release Table Value	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm; S-basis; lower elongation across the two listed thickness columns; LT direction

Property	Value	Unit	Type	Applies to
Young's modulus	198.569	GPa	Historical Nominal	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm; S-basis; lower elongation across the two listed thickness columns
Compression modulus	198.569	GPa	Historical Nominal	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm; S-basis; lower elongation across the two listed thickness columns
Shear modulus	76.532	GPa	Historical Nominal	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm; S-basis; lower elongation across the two listed thickness columns
Poisson's ratio	0.3	-	Historical Nominal	9Ni-4Co-0.20C; quenched and tempered; plate; <203.2 mm; S-basis; lower elongation across the two listed thickness columns

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