MATERIAL DATA SHEET

Aluminum 2024-T8510/T8511 extrusion, 6.35-38 mm (MIL-HDBK-5H)

Historical public-release S-basis T8510/T8511 extrusion reference through 38 mm quench thickness.

Field	Value
Material ID	milhdbk-2024-t851x-extrusion-6-35-38-mm
Category	Metal
Condition	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench | extruded bar, rod or shape
Unit system	Common SI
Unit contract	Material properties stored in SI engineering units.
Generated	2026-11-15 23:02

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 3.2.3.0(j1), PDF page(s) 380 (handbook page(s) 3-84); 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	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench
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Notes	Historical reference only; design release is explicitly disabled.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	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench
Temper	T8510 or T8511
Heat treatment	solution heat treated, stress relieved by stretching and artificially aged
Product form	extruded bar, rod or shape
Thickness / diameter range	0.250-1.496 in (6.35-38 mm), within the 0.250-1.499 in table column
Test direction	L and LT
Processing route	wrought heat-treatable aluminum extrusion
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	2768	kg/m^3	Historical Nominal	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column

Mechanical

Property	Value	Unit	Type	Applies to
Ultimate tensile strength, L	455.054	MPa	Historical Public Release Table Value	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column; L direction
Tensile yield strength, L	399.896	MPa	Historical Public Release Table Value	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column; L direction
Ultimate tensile strength, LT	441.264	MPa	Historical Public Release Table Value	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column; LT direction
Tensile yield strength, LT	393.001	MPa	Historical Public Release Table Value	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column; LT direction
Compressive yield strength, L	406.791	MPa	Historical Public Release Table Value	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column; L direction
Compressive yield strength, LT	406.791	MPa	Historical Public Release Table Value	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column; LT direction
Ultimate shear strength	248.211	MPa	Historical Public Release Table Value	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column
Elongation, LT	5	%	Historical Public Release Table Value	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column; LT direction

Property	Value	Unit	Type	Applies to
Ramberg-Osgood exponent, tension L	24	-	Historical Public Release Table Value	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column; L direction; typical room-temperature curve; extrusion thickness 0.250-1.499 in
Ramberg-Osgood exponent, tension LT	26	-	Historical Public Release Table Value	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column; LT direction; typical room-temperature curve; extrusion thickness 0.250-1.499 in
Ramberg-Osgood exponent, compression L	20	-	Historical Public Release Table Value	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column; L direction; typical room-temperature curve; extrusion thickness 0.250-1.499 in
Ramberg-Osgood exponent, compression LT	24	-	Historical Public Release Table Value	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column; LT direction; typical room-temperature curve; extrusion thickness 0.250-1.499 in
Young's modulus	74.463	GPa	Historical Nominal	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column
Compression modulus	75.842	GPa	Historical Nominal	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column
Shear modulus	28.269	GPa	Historical Nominal	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column

Property	Value	Unit	Type	Applies to
Poisson's ratio	0.33	-	Historical Nominal	2024-T8510/T8511; extruded bar, rod or shape; 6.35-38 mm thickness at quench; S-basis, 0.250-1.499 in T8510/T8511 column

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