MATERIAL DATA SHEET

Aluminum 6061-T6510/T6511 extrusion, <=12.7 mm (MIL-HDBK-5H)

Historical public-release A-basis extrusion reference for sections <=12.7 mm at quench.

Field	Value
Material ID	milhdbk-6061-t651x-extrusion-12-7-mm
Category	Metal
Condition	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench | extruded rod, bar, or shape
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 3.6.2.0(f), PDF page(s) 556 (handbook page(s) 3-260); 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	6061-T6510/T6511; extrusion; <=12.7 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Notes	Historical reference only; design release is explicitly disabled.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	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench
Temper	T6510 or T6511
Heat treatment	solution heat treated, stress relieved by stretching, artificially aged
Product form	extruded rod, bar, or shape
Thickness / diameter range	<=0.500 in (12.7 mm), subset of the <=1.000 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	2713	kg/m^3	Historical Nominal	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench; A-basis, <=1.000 in table column, limited here to <=12.7 mm

Mechanical

Property	Value	Unit	Type	Applies to
Ultimate tensile strength, L	262.001	MPa	Historical Public Release Table Value	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench; A-basis, <=1.000 in table column, limited here to <=12.7 mm; L direction
Tensile yield strength, L	241.317	MPa	Historical Public Release Table Value	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench; A-basis, <=1.000 in table column, limited here to <=12.7 mm; L direction
Ultimate tensile strength, LT	255.106	MPa	Historical Public Release Table Value	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench; A-basis, <=1.000 in table column, limited here to <=12.7 mm; LT direction
Tensile yield strength, LT	227.527	MPa	Historical Public Release Table Value	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench; A-basis, <=1.000 in table column, limited here to <=12.7 mm; LT direction
Compressive yield strength, L	234.422	MPa	Historical Public Release Table Value	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench; A-basis, <=1.000 in table column, limited here to <=12.7 mm; L direction
Compressive yield strength, LT	241.317	MPa	Historical Public Release Table Value	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench; A-basis, <=1.000 in table column, limited here to <=12.7 mm; LT direction
Ultimate shear strength	179.264	MPa	Historical Public Release Table Value	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench; A-basis, <=1.000 in table column, limited here to <=12.7 mm
Elongation, L	8	%	Historical Public Release Table Value	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench; A-basis, <=1.000 in table column, limited here to <=12.7 mm; L direction

Property	Value	Unit	Type	Applies to
Young's modulus	68.258	GPa	Historical Nominal	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench; A-basis, <=1.000 in table column, limited here to <=12.7 mm
Compression modulus	69.637	GPa	Historical Nominal	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench; A-basis, <=1.000 in table column, limited here to <=12.7 mm
Shear modulus	26.2	GPa	Historical Nominal	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench; A-basis, <=1.000 in table column, limited here to <=12.7 mm
Poisson's ratio	0.33	-	Historical Nominal	6061-T6510/T6511; extrusion; <=12.7 mm thickness at quench; A-basis, <=1.000 in table column, limited here to <=12.7 mm

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