MATERIAL DATA SHEET

Aluminum 7010-T7451 plate, 12.7-38 mm (MIL-HDBK-5H)

Historical public-release 7010-T7451 plate reference.

Field	Value
Material ID	milhdbk-7010-t7451-plate-12-7-38-mm
Category	Metal
Condition	7010-T7451; plate; 12.7-38 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 3.7.1.0(b1), PDF page(s) 578 (handbook page(s) 3-282); 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	7010-T7451; plate; 12.7-38 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Notes	Historical reference only; design release is explicitly disabled.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	7010-T7451; plate; 12.7-38 mm
Temper	T7451
Heat treatment	solution heat treated, stress relieved by stretching and overaged to T74 condition
Product form	plate
Thickness / diameter range	0.500-1.496 in (12.7-38 mm), within the 0.250-2.000 in table bands
Test direction	L and LT
Processing route	wrought heat-treatable aluminum-zinc 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	2823	kg/m^3	Historical Nominal	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in

Mechanical

Property	Value	Unit	Type	Applies to
Ultimate tensile strength, L	489.528	MPa	Historical Public Release Table Value	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in; L direction
Tensile yield strength, L	427.475	MPa	Historical Public Release Table Value	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in; L direction
Ultimate tensile strength, LT	496.423	MPa	Historical Public Release Table Value	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in; LT direction
Tensile yield strength, LT	427.475	MPa	Historical Public Release Table Value	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in; LT direction
Compressive yield strength, L	420.58	MPa	Historical Public Release Table Value	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in; L direction
Compressive yield strength, LT	434.37	MPa	Historical Public Release Table Value	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in; LT direction
Ultimate shear strength	282.685	MPa	Historical Public Release Table Value	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in
Elongation, L	9	%	Historical Public Release Table Value	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in; L direction
Elongation, LT	6	%	Historical Public Release Table Value	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in; LT direction
Ramberg-Osgood exponent, tension L	12	-	Historical Public Release Table Value	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in; L direction; typical room-temperature curve; plate thickness 0.500-1.500 in
Ramberg-Osgood exponent, tension LT	10	-	Historical Public Release Table Value	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in; LT direction; typical room-temperature curve; plate thickness 0.500-1.500 in
Ramberg-Osgood exponent, compression L	14	-	Historical Public Release Table Value	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in; L direction; typical room-temperature curve; plate thickness 0.500-1.500 in

Property	Value	Unit	Type	Applies to
Ramberg-Osgood exponent, compression LT	17	-	Historical Public Release Table Value	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in; LT direction; typical room-temperature curve; plate thickness 0.500-1.500 in
Young's modulus	70.327	GPa	Historical Nominal	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in
Compression modulus	73.084	GPa	Historical Nominal	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in
Shear modulus	26.89	GPa	Historical Nominal	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in
Poisson's ratio	0.33	-	Historical Nominal	7010-T7451; plate; 12.7-38 mm; S-basis across 0.500-1.500 in

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