MATERIAL DATA SHEET

Aluminum 2024-T851 bare plate, 6.35-25.4 mm (MIL-HDBK-5H)

Historical public-release 2024 alloy reference preserving T851, bare plate, material direction, and thickness scope.

Field	Value
Material ID	milhdbk-2024-t851-bare-plate-6-35-25-4-mm
Category	Metal
Condition	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm) | bare 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 3.2.3.0(b2), PDF page(s) 368 (handbook page(s) 3-72); 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-T851; bare plate; 0.250-1.000 in (6.35-25.4 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Notes	Historical reference only; design release is explicitly disabled.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	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm)
Temper	T851
Heat treatment	2024-T851 heat-treatment condition; verify the applicable procurement specification
Product form	bare plate
Thickness / diameter range	0.250-1.000 in (6.35-25.4 mm)
Test direction	L and LT material axes; lower tabulated values retained where bands are combined
Processing route	wrought heat-treatable aluminum alloy
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-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values

Mechanical

Property	Value	Unit	Type	Applies to
Ultimate tensile strength, L	455.054	MPa	Historical Public Release Table Value	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values; L direction
Tensile yield strength, L	399.896	MPa	Historical Public Release Table Value	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values; L direction
Ultimate tensile strength, LT	455.054	MPa	Historical Public Release Table Value	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values; LT direction
Tensile yield strength, LT	399.896	MPa	Historical Public Release Table Value	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values; LT direction
Compressive yield strength, L	399.896	MPa	Historical Public Release Table Value	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values; L direction
Compressive yield strength, LT	399.896	MPa	Historical Public Release Table Value	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values; LT direction
Ultimate shear strength	255.106	MPa	Historical Public Release Table Value	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values
Elongation, LT	5	%	Historical Public Release Table Value	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values; LT direction

Property	Value	Unit	Type	Applies to
Young's modulus	73.774	GPa	Historical Nominal	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values
Compression modulus	75.153	GPa	Historical Nominal	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values
Shear modulus	27.579	GPa	Historical Nominal	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values
Poisson's ratio	0.33	-	Historical Nominal	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values
Ramberg-Osgood exponent, tension L	28	-	Historical Public Release Table Value	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values; L direction; typical room-temperature curve; bare plate thickness 0.250-1.000 in
Ramberg-Osgood exponent, tension LT	24	-	Historical Public Release Table Value	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values; LT direction; typical room-temperature curve; bare plate thickness 0.250-1.000 in
Ramberg-Osgood exponent, compression L	22	-	Historical Public Release Table Value	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values; L direction; typical room-temperature curve; bare plate thickness 0.250-1.000 in

Property	Value	Unit	Type	Applies to
Ramberg-Osgood exponent, compression LT	22	-	Historical Public Release Table Value	2024-T851; bare plate; 0.250-1.000 in (6.35-25.4 mm); lower of A-basis 0.250-0.499 in and S-basis 0.500-1.000 in values; LT direction; typical room-temperature curve; bare plate thickness 0.250-1.000 in

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