MATERIAL DATA SHEET

Aluminum 2024-T4 bar/rod, 3.175-138 mm (MIL-HDBK-5H)

Historical public-release S-basis T4 bar/rod reference conservatively combined through 138 mm.

Field	Value
Material ID	milhdbk-2024-t4-bar-rod-3-175-138-mm
Category	Metal
Condition	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm | rolled, drawn or cold-finished bar or rod
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(i2), PDF page(s) 378 (handbook page(s) 3-82); 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-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 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Notes	Historical reference only; design release is explicitly disabled.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-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm
Temper	T4
Heat treatment	solution heat treated and naturally aged; source warns T4 is obsolete for new design
Product form	rolled, drawn or cold-finished bar or rod
Thickness / diameter range	0.125-5.433 in (3.175-138 mm), within the 0.125-6.000 in table bands
Test direction	L and LT where available; lower listed value across applicable size bands
Processing route	wrought heat-treatable aluminum bar or rod
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-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.

Mechanical

Property	Value	Unit	Type	Applies to
Ultimate tensile strength, L	427.475	MPa	Historical Public Release Table Value	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.; L direction
Tensile yield strength, L	275.79	MPa	Historical Public Release Table Value	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.; L direction
Ultimate tensile strength, LT	358.527	MPa	Historical Public Release Table Value	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.; LT direction
Tensile yield strength, LT	248.211	MPa	Historical Public Release Table Value	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.; LT direction
Compressive yield strength, L	220.632	MPa	Historical Public Release Table Value	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.; L direction
Ultimate shear strength	255.106	MPa	Historical Public Release Table Value	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.
Elongation, L	10	%	Historical Public Release Table Value	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.; L direction

Property	Value	Unit	Type	Applies to
Ramberg-Osgood exponent, tension L	50	-	Historical Public Release Table Value	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.; L direction; typical room-temperature curve; rolled bar/rod/shape thickness <=5.500 in
Ramberg-Osgood exponent, compression L	10	-	Historical Public Release Table Value	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.; L direction; typical room-temperature curve; rolled bar/rod/shape thickness <=5.500 in
Young's modulus	72.395	GPa	Historical Nominal	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.
Compression modulus	73.774	GPa	Historical Nominal	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.
Shear modulus	27.579	GPa	Historical Nominal	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.
Poisson's ratio	0.33	-	Historical Nominal	2024-T4; rolled, drawn or cold-finished bar/rod; 3.175-138 mm; Historical T4 temper; the handbook explicitly says it is obsolete and should not be specified for new designs.

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