MATERIAL DATA SHEET

Aluminum 7050-T74 die forging, <=75 mm (MIL-HDBK-5H)

Historical public-release S-basis die-forging reference through 75 mm heat-treatment thickness.

Field	Value
Material ID	milhdbk-7050-t74-die-forging-75-mm
Category	Metal
Condition	7050-T74; die forging; <=75 mm thickness at heat treatment | die forging
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 3.7.3.0(c1), PDF page(s) 607 (handbook page(s) 3-311); 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	7050-T74; die forging; <=75 mm thickness at heat treatment
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Notes	Historical reference only; design release is explicitly disabled.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	7050-T74; die forging; <=75 mm thickness at heat treatment
Temper	T74
Heat treatment	solution heat treated and overaged to T74 by the supplier
Product form	die forging
Thickness / diameter range	<=2.953 in (75 mm), within the <=4.000 in table bands
Test direction	L and transverse-to-flow directions; lower listed value across applicable size bands
Processing route	die-forged heat-treatable aluminum-zinc 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	2823	kg/m^3	Historical Nominal	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm

Mechanical

Property	Value	Unit	Type	Applies to
Ultimate tensile strength, L	489.528	MPa	Historical Public Release Table Value	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm; L direction
Tensile yield strength, L	420.58	MPa	Historical Public Release Table Value	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm; L direction
Compressive yield strength, L	434.37	MPa	Historical Public Release Table Value	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm; L direction
Ultimate shear strength	289.58	MPa	Historical Public Release Table Value	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm
Elongation, L	7	%	Historical Public Release Table Value	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm; L direction
Ultimate tensile strength, T	461.949	MPa	Historical Public Release Table Value	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm; T direction
Tensile yield strength, T	379.212	MPa	Historical Public Release Table Value	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm; T direction
Compressive yield strength, T	406.791	MPa	Historical Public Release Table Value	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm; T direction; handbook footnote states transverse Fcy is based on the ST direction

Property	Value	Unit	Type	Applies to
Elongation, T	4	%	Historical Public Release Table Value	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm; T direction
Ramberg-Osgood exponent, tension L	11	-	Historical Public Release Table Value	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm; L direction; typical room-temperature curve; die-forging thickness <=6.000 in
Ramberg-Osgood exponent, tension ST	7.3	-	Historical Public Release Table Value	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm; ST direction; typical room-temperature curve; die-forging thickness <=6.000 in
Ramberg-Osgood exponent, compression L	12	-	Historical Public Release Table Value	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm; L direction; typical room-temperature curve; die-forging thickness <=6.000 in
Ramberg-Osgood exponent, compression ST	18	-	Historical Public Release Table Value	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm; ST direction; typical room-temperature curve; die-forging thickness <=6.000 in
Young's modulus	70.327	GPa	Historical Nominal	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm
Compression modulus	73.774	GPa	Historical Nominal	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm

Property	Value	Unit	Type	Applies to
Shear modulus	26.89	GPa	Historical Nominal	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm
Poisson's ratio	0.33	-	Historical Nominal	7050-T74; die forging; <=75 mm thickness at heat treatment; S-basis lower value across <=4.000 in, limited here to <=75 mm

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