MATERIAL DATA SHEET

Aluminum A357.0-T6 casting, conservative class (MIL-HDBK-5H)

Historical public-release conservative S-basis casting reference using the lowest listed strength class.

Field	Value
Material ID	milhdbk-a357-t6-casting-conservative
Category	Metal
Condition	A357.0-T6; casting; strength class and location must be established | special-mold, permanent-mold or sand casting
Unit system	Common SI
Unit contract	Material properties stored in SI engineering units.
Generated	2026-11-15 23:01

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 3.9.6.0(b), PDF page(s) 781 (handbook page(s) 3-485); 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	A357.0-T6; casting; strength class and location must be established
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Notes	Historical reference only; design release is explicitly disabled.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	A357.0-T6; casting; strength class and location must be established
Temper	T6
Heat treatment	solution heat treated and artificially aged to T6
Product form	special-mold, permanent-mold or sand casting
Thickness / diameter range	configuration-dependent; no universal wall-thickness limit in table
Test direction	casting value, no wrought axis
Processing route	premium-quality cast aluminum-silicon-magnesium 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	2685	kg/m^3	Historical Nominal	A357.0-T6; casting; strength class and location must be established; S-basis; lowest value across designated/nondesignated strength classes

Mechanical

Property	Value	Unit	Type	Applies to
Ultimate tensile strength	262.001	MPa	Historical Public Release Table Value	A357.0-T6; casting; strength class and location must be established; S-basis; lowest value across designated/nondesignated strength classes
Tensile yield strength	193.053	MPa	Historical Public Release Table Value	A357.0-T6; casting; strength class and location must be established; S-basis; lowest value across designated/nondesignated strength classes
Compressive yield strength	193.053	MPa	Historical Public Release Table Value	A357.0-T6; casting; strength class and location must be established; S-basis; lowest value across designated/nondesignated strength classes
Ultimate shear strength	165.474	MPa	Historical Public Release Table Value	A357.0-T6; casting; strength class and location must be established; S-basis; lowest value across designated/nondesignated strength classes
Elongation	3	%	Historical Public Release Table Value	A357.0-T6; casting; strength class and location must be established; S-basis; lowest value across designated/nondesignated strength classes
Ramberg-Osgood exponent, tension L	16	-	Historical Public Release Table Value	A357.0-T6; casting; strength class and location must be established; S-basis; lowest value across designated/nondesignated strength classes; L direction; typical room-temperature curve; typical Class 1 designated-area A357.0-T6 casting curve
Young's modulus	71.705	GPa	Historical Nominal	A357.0-T6; casting; strength class and location must be established; S-basis; lowest value across designated/nondesignated strength classes

Property	Value	Unit	Type	Applies to
Compression modulus	72.395	GPa	Historical Nominal	A357.0-T6; casting; strength class and location must be established; S-basis; lowest value across designated/nondesignated strength classes
Shear modulus	26.89	GPa	Historical Nominal	A357.0-T6; casting; strength class and location must be established; S-basis; lowest value across designated/nondesignated strength classes
Poisson's ratio	0.33	-	Historical Nominal	A357.0-T6; casting; strength class and location must be established; S-basis; lowest value across designated/nondesignated strength classes

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