MATERIAL DATA SHEET

# Aluminum D357.0-T6 casting, conservative area (MIL-HDBK-5H)

Historical public-release conservative S-basis casting reference using the nondesignated-area values.

| Field | Value |
|---|---|
| Material ID | milhdbk-d357-t6-casting-conservative |
| Category | Metal |
| Condition | D357.0-T6; casting; location and acceptance class must be established \| casting |
| Unit system | Common SI |
| Unit contract | Material properties stored in SI engineering units. |
| Generated | 2026-11-15 23:00 |

## 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 3.9.7.0(b), PDF page(s) 784 (handbook page(s) 3-488); 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 | D357.0-T6; casting; location and acceptance class 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| Notes | Historical reference only; design release is explicitly disabled.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 | D357.0-T6; casting; location and acceptance class must be established |
| Temper | T6 |
| Heat treatment | solution heat treated and artificially aged to T6 |
| Product form | casting |
| Thickness / diameter range | nondesignated-area table values; designated-area values limited to <=2.500 in |
| 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 | D357.0-T6; casting; location and acceptance class must be established; S-basis nondesignated-area values |

## Mechanical

| Property | Value | Unit | Type | Applies to |
|---|---|---|---|---|
| Ultimate tensile strength | 310.264 | MPa | Historical Public Release Table Value | D357.0-T6; casting; location and acceptance class must be established; S-basis nondesignated-area values |
| Tensile yield strength | 248.211 | MPa | Historical Public Release Table Value | D357.0-T6; casting; location and acceptance class must be established; S-basis nondesignated-area values |
| Compressive yield strength | 248.211 | MPa | Historical Public Release Table Value | D357.0-T6; casting; location and acceptance class must be established; S-basis nondesignated-area values |
| Ultimate shear strength | 193.053 | MPa | Historical Public Release Table Value | D357.0-T6; casting; location and acceptance class must be established; S-basis nondesignated-area values |
| Elongation | 2 | % | Historical Public Release Table Value | D357.0-T6; casting; location and acceptance class must be established; S-basis nondesignated-area values |
| Ramberg-Osgood exponent, tension L | 16 | - | Historical Public Release Table Value | D357.0-T6; casting; location and acceptance class must be established; S-basis nondesignated-area values; L direction; typical room-temperature curve; typical designated-area D357.0-T6 casting curve |
| Young's modulus | 71.705 | GPa | Historical Nominal | D357.0-T6; casting; location and acceptance class must be established; S-basis nondesignated-area values |
| Compression modulus | 72.395 | GPa | Historical Nominal | D357.0-T6; casting; location and acceptance class must be established; S-basis nondesignated-area values |
| Shear modulus | 26.89 | GPa | Historical Nominal | D357.0-T6; casting; location and acceptance class must be established; S-basis nondesignated-area values |
| Poisson's ratio | 0.33 | - | Historical Nominal | D357.0-T6; casting; location and acceptance class must be established; S-basis nondesignated-area values |

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