MATERIAL DATA SHEET

Aluminum 6061-T6 die forging (NASA historical reference)

Historical 6061-T6 die-forging minimum tensile properties plus selected room-temperature physical data from the public-use NASA handbook.

Field	Value
Material ID	nasa-6061-t6-die-forging-reference
Category	Metal
Condition	6061-T6 die forging; separately forged test bar; NASA historical minimums | die forging or separately forged test bar
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	Named historical alloy reference transcribed from an official public-use NASA handbook.
Citation	NASA-CR-123772, Materials Data Handbook: Aluminum Alloy 6061, 1972, NASA Technical Reports Server record 19720022808; property locations: PDF page 50 (handbook page 42), Table 7.111; PDF page 82 (handbook page 75), Chapter 9; https://ntrs.nasa.gov/citations/19720022808. NTRS marks the document 'Work of the US Gov. Public Use Permitted.'
Valid temperature	20 ... 100 degC (Mechanical values are handbook room-temperature minimums; physical-property temperatures are stated per property.)
Valid pressure	Pressure dependence is not represented by these solid reference values.
Valid phase / condition	6061-T6 die forging; separately forged test bar; NASA historical minimums
Uncertainty	Historical reference data transcribed with the stated property semantics and SI conversions. Confirm against the official PDF, a current procurement specification, the actual product form and thickness, and a material test report before engineering use.
Last reviewed	2026-08-01
Reviewer	scripts/import_nasa_public_metals.py
Review status	Checked

Field	Value
Review scope	Checked official NTRS public-use status, report identity and PDF hash, cited tables, minimum/nominal semantics, condition text, and SI conversions. No claim of current specification validity or design release is made.
Notes	Historical reference only; not a current supplier certificate or procurement allowable.
License ID	US-GOV-PUBLIC-USE
License URL	https://ntrs.nasa.gov/citations/19720022808
Attribution	National Aeronautics and Space Administration

Material Condition

Field	Value
Condition	6061-T6 die forging; separately forged test bar; NASA historical minimums
Temper	T6
Heat treatment	T6 precipitation heat treatment
Product form	die forging or separately forged test bar
Thickness / diameter range	maximum section thickness 4 in (101.6 mm)
Test direction	orientation A: test specimen parallel to forging flow lines
Processing route	wrought aluminum die forging
Temperature range	20 ... 100 degC
Notes	Historical reference data transcribed with the stated property semantics and SI conversions. Confirm against the official PDF, a current procurement specification, the actual product form and thickness, and a material test report before engineering use.

Properties

Physical

Property	Value	Unit	Type	Applies to
Density	2700	kg/m^3	Nominal	6061 alloy at 20 degC.

Thermal

Property	Value	Unit	Type	Applies to
Thermal conductivity	167.36	W/m/K	Nominal	T6 temper; converted from 0.40 cal/cm/s/degC.
Mean coefficient of thermal expansion	2.34e-05	1/K	Nominal	Average from 20 to 100 degC.
Specific heat capacity	962.32	J/kg/K	Nominal	At 100 degC; converted from 0.23 cal/g/K.

Mechanical

Property	Value	Unit	Type	Applies to
Ultimate tensile strength	262.001	MPa	Historical Specified Minimum	T6 die forging, orientation A, maximum 4 in section; converted from 38.0 ksi.
Tensile yield strength	241.317	MPa	Historical Specified Minimum	T6 die forging, orientation A, maximum 4 in section; converted from 35.0 ksi.
Elongation	7	%	Historical Specified Minimum	Minimum in 2 in or 4D, orientation A.

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