



TECHNICAL DATA SHEET

VTECH
MATERIALS LIBRARY

Aluminum 6061-T6

Heat-Treatable Structural Aluminum Alloy

Document Control

Document No.	TDS-AL-6061-T6-B221	Revision	A
Issue Date	2026-04-07	Owner	Engineering
Specification	ASTM B221 / ASTM B209 by product form	Product Form / UNS	Extrusions, plate, bar, and sheet by spec / UNS A96061

Engineering use note: Starter-library values are intended for engineering screening and template standardization. Verify against the latest governing specification, drawing, PO, and MTR before production release.

1. General Description

6061-T6 is one of the most widely used structural aluminum alloys because it offers a practical balance of strength, corrosion resistance, weldability, and machinability. It is commonly used for frames, tooling, brackets, and general-purpose precision components.

2. Chemical Composition (wt%)

Property	Value
Magnesium (Mg)	0.8-1.2
Silicon (Si)	0.4-0.8
Copper (Cu)	0.15-0.40
Chromium (Cr)	0.04-0.35
Iron (Fe)	<=0.70
Manganese (Mn)	<=0.15
Zinc (Zn)	<=0.25
Titanium (Ti)	<=0.15
Aluminum (Al)	Balance

3. Mechanical Properties

Property	Value
Condition	T6

Property	Value
Ultimate tensile strength	Approx. 310 MPa
0.2% yield strength	Approx. 276 MPa
Elongation	Approx. 8-12 % by product form
Hardness	Approx. 95 HB typical

4. Physical Properties

Property	Value
Density	2.70 g/cm ³
Elastic modulus	69 GPa
Thermal conductivity	167 W/m.K
Melting range	582-652 C

5. Heat Treatment / Processing

6061 is a heat-treatable alloy typically used in T4, T6, or T651 tempers depending on form. Welded zones lose strength locally unless re-heat treated or design allowables account for the softened condition.

6. Corrosion / Environmental Performance

Good corrosion resistance in atmospheric and many industrial environments, with very good general utility for structural service.

7. Key Characteristics

- Excellent all-round utility
- Good machinability
- Good weldability
- Widely available in many forms

8. Typical Applications

- Frames and brackets
- Tooling
- Fixtures
- Extruded structural members
- General machined parts

9. Standards & Equivalents

ASTM B221
ASTM B209
UNS A96061
AA 6061



10. Notes & Limitations

Strength values vary by product form and temper. For welded structures, account for heat-affected-zone softening in the design basis.