

Material Information



Aluminum 6061

Introduction

Aluminum 6061 is a widely used 6000 series aluminum alloy containing magnesium and silicon as its principal alloying elements. It offers a good balance of strength, machinability, corrosion resistance, and workability, making it a popular choice for CNC-machined parts and prototypes.

Advantages

Good machinability, relatively high strength, excellent corrosion resistance, and good joining characteristics. Aluminum 6061 also accepts a wide range of surface coatings and finishes, making it suitable for both functional and appearance-focused CNC-machined parts.

Disadvantages

Aluminum 6061 has lower strength than some higher-strength aluminum alloys, such as 7075. Its strength and mechanical properties also vary with the material temper, so the required temper should be specified when consistent performance is important.

Tolerance

3DSPRO can manufacture and inspect to tight tolerances, including sub +/- 0.001" tolerances, per your drawing specifications and GD&T callouts.

Recommendation

The balanced properties of Aluminum 6061 make it suitable for CNC-machined functional parts, prototypes, and production components that require a combination of strength, machinability, corrosion resistance, and lightweight construction. It is widely used for mechanical components, fittings, housings, brackets, and other precision-machined parts.

Material Specifications (For reference only.)	
Tensile strength	430MPa
Yield strength	310MPa
Fatigue strength	98.5MPa
Elongation at Break	15%
Hardness	95 HB
Young's modulus	73GPa

Density	2.7 g/cm ³
Thermal conductivity	169 W/(m·°C)

Attention

Aluminum 6061 is available in different tempers, with 6061-T6 and 6061-T651 commonly used for higher-strength applications. The selected temper can affect the final mechanical properties of the machined part. Aluminum 6061 also has good acceptance of applied coatings, so anodizing and other surface finishing options can be considered when additional surface protection or appearance is required.

Applications

3DSPRO finds people using Aluminum 6061 to make functional parts and prototypes in the following industries and applications.

Aerospace components:

Aircraft fittings, brackets, couplings, mounts, and other lightweight structural and mechanical components.

Automotive parts and supplies:

Brake components, hydraulic components, brackets, shafts, housings, and other mechanical parts.

Electromechanical equipment:

Electrical fittings, connectors, valves, machine components, and equipment housings.

Consumer supplies:

Bicycle components, camera components, appliance fittings, decorative hardware, and other everyday products.