

Material Information



Aluminum 6063

Introduction

Aluminum 6063 is a 6000 series aluminum alloy containing magnesium and silicon as its principal alloying elements. It is known for its excellent extrudability, good corrosion resistance, attractive surface finish, and strong response to anodizing, making it suitable for CNC-machined parts produced from aluminum profiles and other semi-finished stock.

Advantages

Excellent corrosion resistance, good surface finish, and excellent anodizing performance. Aluminum 6063 also has very good extrusion characteristics, allowing complex profiles and thin sections to be produced efficiently before CNC machining is used to add holes, threads, slots, and other precision features.

Disadvantages

Aluminum 6063 generally has lower strength than alloys such as 6061-T6 and 7075, making it less suitable for heavily loaded structural components. Its machinability is also rated lower than that of some commonly machined aluminum alloys, particularly in softer tempers, where its ductility can contribute to gummy chips and built-up edge during machining.

Tolerance

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

Recommendation

The combination of corrosion resistance, surface quality, extrudability, and anodizing performance makes Aluminum 6063 suitable for CNC-machined components where appearance and lightweight construction are important. It is particularly appropriate for housings, frames, brackets, rails, covers, heat-sink profiles, and other components that start from extruded aluminum stock.

Material Specifications (For reference only.)	
Tensile strength	210MPa
Fatigue strength	68MPa

Elongation at Break	12%
Hardness	75 HB
Density	2.7 g/cm ³

Attention

Aluminum 6063 is available in different tempers, including O, T5, and T6, and its mechanical and machining characteristics vary with temper. When strength or machining performance is critical, the required temper should be specified. For visible parts, 6063 is also well suited to anodizing, although the final appearance can be affected by the condition and surface history of the material and by the machined areas.

Applications

3DSPRO finds people using Aluminum 6063 to make functional parts and prototypes in the following industries and applications.

Architectural components:

Window frames, door frames, curtain-wall components, rails, trim, and other lightweight architectural parts.

Industrial equipment:

Machine frames, equipment covers, brackets, rails, heat-sink bodies, and other components made from extruded aluminum profiles.

Electromechanical equipment:

Enclosures, housings, lighting components, display structures, and equipment frames.

Consumer supplies:

Furniture components, display fixtures, handles, frames, decorative hardware, and other lightweight products requiring a clean surface and attractive anodized finish.