

Material Information



Aluminum 6082

Introduction

Aluminum 6082 is a heat-treatable aluminum alloy known for its good strength, corrosion resistance, and machinability. It offers higher strength than many commonly used 6000 series aluminum alloys while maintaining low density and good weldability. These properties make Aluminum 6082 suitable for structural components, precision-machined parts, frames, housings, and other functional applications where a balance of strength, weight, and machinability is required.

Advantages

Good strength-to-weight ratio. Good corrosion resistance. Good machinability. Good weldability. Suitable for structural and load-bearing components. Good dimensional stability for precision machining. Suitable for a wide range of CNC machining applications.

Disadvantages

Lower strength than some 7000 series aluminum alloys. Machining performance can vary depending on temper and part geometry. Welded areas may have reduced mechanical strength compared with the parent material. Anodized surfaces may show some variation in appearance depending on alloy condition and finishing process.

Tolerance

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

Recommendation

Aluminum 6082 is recommended for functional parts that require a good combination of strength, light weight, corrosion resistance, and machinability. It is particularly suitable for structural brackets, frames, housings, machine components, shafts, fittings, and other precision-machined parts used in industrial and engineering applications.

Material Specifications (For reference only.)	
Tensile strength	260MPa
Fatigue strength	97MPa

Elongation at Break	10% to 12%
Hardness	95 HB
Density	2.7 g/cm ³

Attention

Aluminum 6082 is commonly supplied in heat-treated conditions, and its mechanical properties can vary with temper. Machining parameters should be selected according to the material condition, part geometry, and required surface quality. For welded components, the potential reduction in strength within the heat-affected area should also be considered during design and manufacturing.

Applications

3DSPRO finds people using Aluminum 6082 to make functional parts and prototypes in the following industries and applications.

Industrial Equipment:

Machine frames, structural brackets, housings, mounting plates, shafts, fittings, and other mechanical components.

Automotive:

Chassis components, brackets, housings, suspension components, structural supports, and other lightweight mechanical parts.

Aerospace:

Structural components, brackets, housings, frames, fittings, and lightweight mechanical parts.

Marine:

Boat fittings, structural components, frames, brackets, and other parts requiring good corrosion resistance and low weight.

Consumer Supplies:

Bicycle components, sporting equipment, precision hardware, housings, frames, and other lightweight products.