

Material Information



Zinc

Introduction

Zinc is a non-ferrous metal widely used in engineering and manufacturing because of its good machinability, corrosion resistance, dimensional stability, and relatively low melting point. Zinc alloys can also provide good strength, rigidity, and ductility while offering efficient machining and finishing characteristics, making them suitable for precision components and prototypes.

Advantages

Good machinability, good corrosion resistance, high dimensional stability, and good finishing characteristics. Zinc materials can be machined with low cutting forces and good tool life, while zinc alloys also offer good surface quality and can be finished through processes such as passivation, coating, and electroplating.

Disadvantages

Zinc has lower strength and higher density than many aluminum alloys, making it less suitable for applications where minimum weight is critical. Its relatively low melting temperature also limits its suitability for high-temperature applications, and the exact mechanical and thermal properties vary considerably depending on the zinc alloy selected.

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 machinability, corrosion resistance, dimensional stability, and good finishing characteristics makes Zinc suitable for CNC-machined components, prototypes, housings, fittings, and precision mechanical parts. It is particularly appropriate for applications where efficient machining, good surface quality, and corrosion resistance are more important than high strength or elevated-temperature performance.

Material Specifications (Zinc alloy 3. For reference only.)	
Tensile strength	208MPa

Fatigue strength	48MPa
Elongation at Break	10%
Hardness	82 HB
Density	6.6 g/cm ³

Attention

Zinc materials vary significantly in composition and performance, so the specific zinc alloy should be confirmed when mechanical strength, hardness, thermal performance, or dimensional requirements are critical. During machining, heat buildup at the cutting edge should be controlled through sharp tooling and suitable coolant, as excessive heat can negatively affect machining performance.

Applications

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

Automotive parts and supplies:

Housings, brackets, handles, fittings, gears, and other precision components.

Electrical and electronic equipment:

Connectors, housings, terminals, shielding components, and other parts requiring dimensional stability and good finishing characteristics.

Industrial equipment:

Valves, fittings, housings, machine components, and other precision parts requiring good machinability and corrosion resistance.

Consumer products:

Hardware, handles, knobs, locks, decorative components, and other products that benefit from zinc's machinability and surface finishing options.