

Material Information



Copper 101

Introduction

Copper 101, also known as Oxygen-Free Electronic Copper or UNS C10100, is a high-purity copper alloy with a minimum copper content of 99.99%. It is known for its excellent electrical and thermal conductivity, good corrosion resistance, and high purity, making it suitable for CNC-machined components used in electrical, thermal, and precision applications.

Advantages

Excellent electrical and thermal conductivity, good corrosion resistance, and excellent cold-working capability. Copper 101 also provides good resistance to atmospheric, brackish-water, seawater, and non-oxidizing acid environments, making it suitable for applications where conductivity and corrosion resistance are both important.

Disadvantages

Copper 101 has relatively low machinability compared with free-cutting copper alloys and brass, which can make CNC machining more demanding. Its relatively high material density also results in heavier parts than equivalent components made from aluminum alloys.

Tolerance

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

Recommendation

The excellent electrical and thermal conductivity of Copper 101 makes it suitable for CNC machined electrical and thermal components, including busbars, conductors, connectors, heat-transfer components, and other precision parts where high conductivity is required. Its high purity also makes it appropriate for specialized electronic and vacuum applications.

Material Specifications (For reference only.)	
Tensile strength	69 to 365MPa
Fatigue strength	76 to 90MPa
Elongation at Break	5% to 55%
Hardness	65 to 90 HB

Density	8.89 to 8.94 g/cm ³
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Attention

Copper 101 has a relatively low machinability rating compared with free-cutting copper alloys, so machining parameters and tooling should be selected appropriately to achieve the required surface quality and dimensional accuracy. Copper 101 also performs well in many atmospheric and water environments but can be susceptible to galvanic corrosion when directly coupled with certain dissimilar metals, including iron, aluminum, magnesium, lead, tin, and zinc.

Applications

3DSPRO finds people using Copper 101 to make functional parts and prototypes in the following industries and applications.

Electrical components:

Busbars, bus conductors, electrical connectors, terminals, conductors, and other high-conductivity components.

Thermal management:

Heat-transfer components, thermal conductors, heat sinks, and other parts requiring excellent thermal conductivity.

Electronics and vacuum equipment:

Waveguides, coaxial components, vacuum seals, transistor components, and other specialized electronic parts.

Industrial and automotive equipment:

Rectifiers, electrical contacts, fittings, and other components where high electrical or thermal conductivity is important.