DIRECT METAL LASER SINTERING

Copper CuNi2SiCr

Product Specifications

Product Description

Copper (CuNi2SiCr) is an alloyed copper material, which combines good mechanical properties with enhanced thermal and electrical conductivity. This alloy can be used in rough environments where pure copper is not feasible. Copper is structurally stronger, harder, and has higher elongation when compared to AlSi10Mg, which also exhibits comparable thermal and electrical conductivity properties. Final parts built in CuNi2SiCr receive stress relief application.

Applications

Copper CuNi2SiCr is an excellent choice when high thermal and/or electrical conductivity is needed.
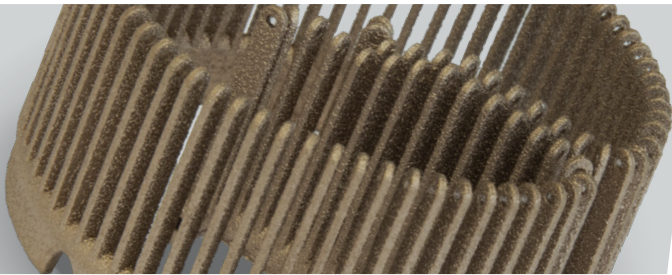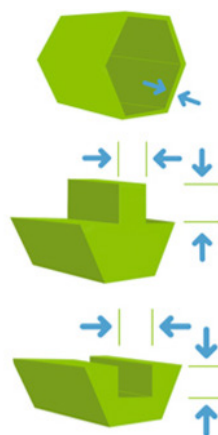
Key Product Benefits

▶ Good thermal and electrical conductivity

▶ Robust mechanical properties

Chemical Composition

According 2.0855; CW111C; C18000

Cu (balance)
Si (0.50 - 0.80 wt-%)
Mn (≤0.1 wt-%)
Cr (0.20 – 0.50 wt-%)
Ni (2.00 – 3.00 wt-%)
Fe (≤0.15 wt-%)
Pb (≤0.02 wt-%)

Geometrical Limits

Min. wall thickness 1.00mm - Min. feature size 1.00mm

Min. embossed details 0.5mm high and wide and 0.8mm for legible text and images

Min. engraved details 0.5mm deep and 0.6mm wide; 1.0mm wide for legible text and images

PROTOLABS

Properties

Heat Treatment	Tensile Strength	Yield Strength 0.2%	Elongation %	Hardness	Density
Precipitation Hardening	72 ksi	63 ksi	23%	HRB 87	> 99.5%

	As Built	Precipitation Hardening
Thermal Conductivity	90 W/mK	165 W/mK
Electrical Conductivity	8 MS/m	15 MS/m

Resolution

	Layer Thickness	Build Envelope	Min. Feature Size
High Resolution	0.02mm	100 × 100 × 100mm	1.00mm

Surface

	0°	45° bottom	45° top	90°
High Resolution	Ra 340 µin	Ra 490 µin	Ra 280 µin	Ra 230 µin

High Resolution 20 µin

Standard Tolerances:

Typically, for well-designed parts, with a designated build direction, tolerances of +/- 0.1mm to +/- 0.2mm + 0.005mm/mm are expected and achieved. Certain geometries may cause distortions due to internal stress which may lead to higher deviations.