

# CuAl10

## Cu-based Alloy Powder for Additive Manufacturing 53/20 µm, Gas Atomized Designed for LMD

**Chemical composition similar to UNS C95300, DIN 2.0937**

### DESCRIPTION

CuAl10 is a gas atomized powder engineered for Additive Manufacturing (AM). This material is an aluminium bronze alloy characterized by its high thermal conductivity and corrosion resistance. This material forms a stable passivation oxide layer on its surface that makes it suitable for harsh corrosive and sea water environments.

The properties of aluminium bronze alloys are leveraged in applications where thermal management is required, and performance in corrosive environments, including seawater exposure. The use of this material in AM also allows for unique multi-material combinations with other alloys that enhances heat dissipation, leading to faster cooling times and enhanced mold lifespans.

### KEY PROPERTIES

- Excellent thermal conductivity
- Excellent corrosion resistance
- Good seawater resistance
- Low frictional coefficient

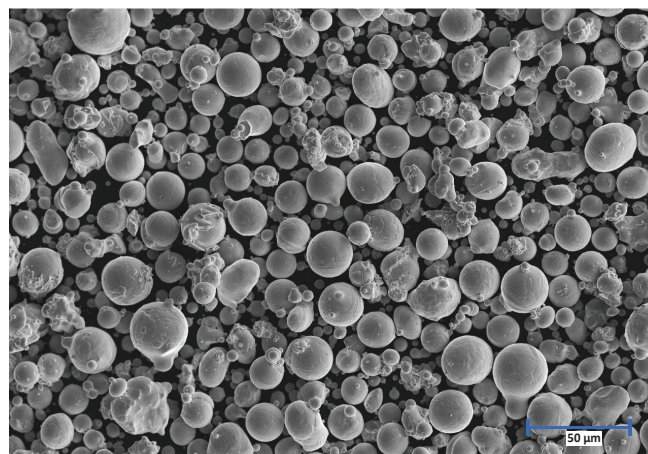
### APPLICATIONS

- Marine and offshore applications
- Dies and molds

### POWDER CHEMICAL COMPOSITION

Element	Min. (wt%)	Max. (wt%)
Cu	Bal.	Bal.
Al	9.50	10.50
Others	-	0.20

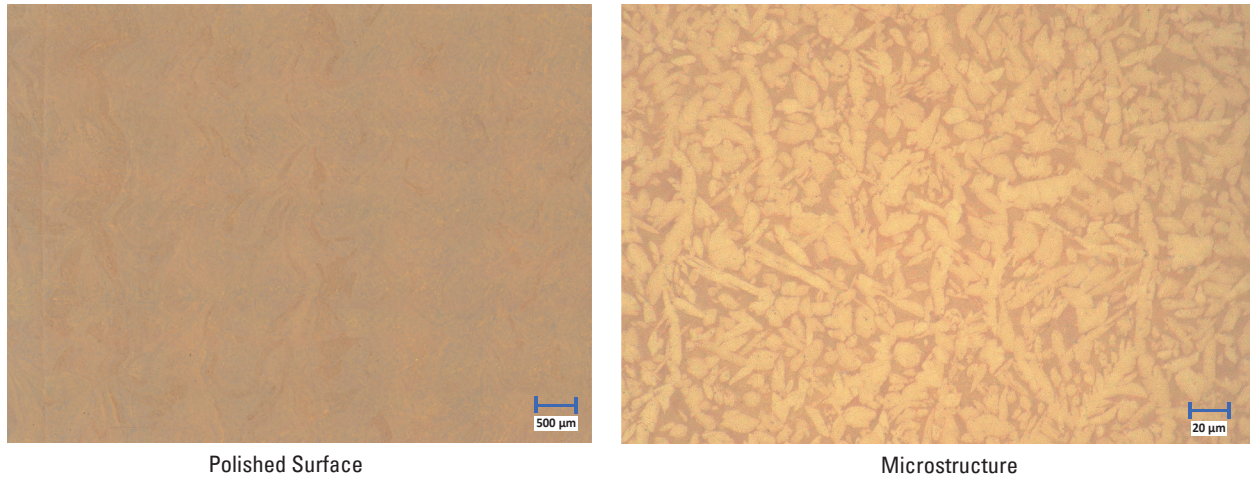
### SEM IMAGE



# POWDER PROPERTIES (ISO 4490, ISO 3923-1)

Particle Size Range (µm)	Hall Flow (s/50g)	Apparent Density (g/cm³)
20 – 53	20.9	4.12

# MICROGRAPHS



# PHYSICAL PROPERTIES (ISO 3369)

Average Defect Percentage (%)	Density (g/cm³)
< 0.10	> 7.51

# MECHANICAL PROPERTIES (ISO 6507-1, ISO 6508-1)

Orientation	Ultimate Tensile Strength (MPa)	0.2% Yield Strength (MPa)	Elongation at break (%)
Horizontal	708 ± 8	299 ± 8	25 ± 0
Vertical	713 ± 3	364 ± 4	20 ± 2

# MELTING POINT

Celsius (°C)	Fahrenheit (°F)	Hardness (HV <sub>0.5</sub> )
1040 - 1045	1904 - 1913	147 ± 7

## PROCESS INFORMATION:

The properties reported in this Technical Data Sheet are applicable to Makino AM powders tested and distributed by Makino and processed on Makino LMD machine utilizing parameters in accordance with relevant operating guidelines (inclusive of setup conditions and maintenance). The properties are obtained by following recommended protocols. Further information regarding the methods used by Makino can be provided upon inquiry.

## DISCLAIMER:

The data and information provided represent, to the best of our knowledge, standard or average values and do not constitute guarantees for upper and lower limit parameters. The recommended applications for the material disclosed are exclusively for illustrative purposes that help the reader to conduct their independent assessments. These suggestions are not intended to be expressed or implied warranties of suitability for the specified applications or any other purposes. The information included may be subject to change at any time without prior notification.

## CONTACT US:

Our Safety Datasheet (SDS) is available upon request. For more information or support please contact Makino at sales-am@makino.com.sg or visit [www.makino.com.sg](http://www.makino.com.sg)



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### DESCRIPTION

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The properties of aluminium bronze alloys are leveraged in applications where thermal management is required, and performance in corrosive environments, including seawater exposure. The use of this material in AM also allows for unique multi-material combinations with other alloys that enhances heat dissipation, leading to faster cooling times and enhanced mold lifespans.

### KEY PROPERTIES

- Excellent thermal conductivity
- Excellent corrosion resistance
- Good machinability

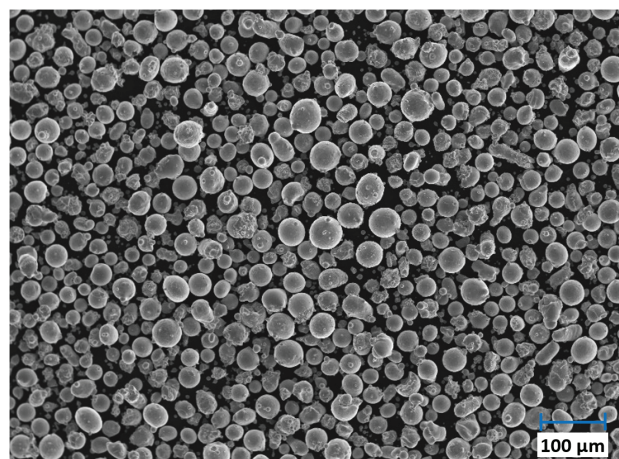
### APPLICATIONS

- Marine propellor components
- Die mold

### POWDER CHEMICAL COMPOSITION

Element	Min. (wt%)	Max. (wt%)
Cu	Bal.	Bal.
Al	9.50	10.50
Others	-	0.20

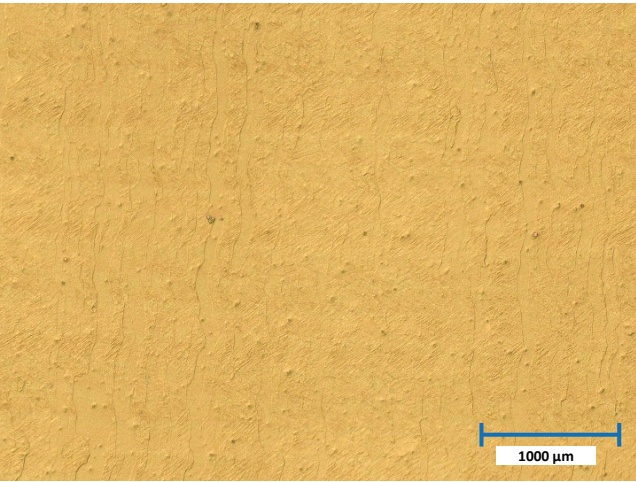
### SEM IMAGE



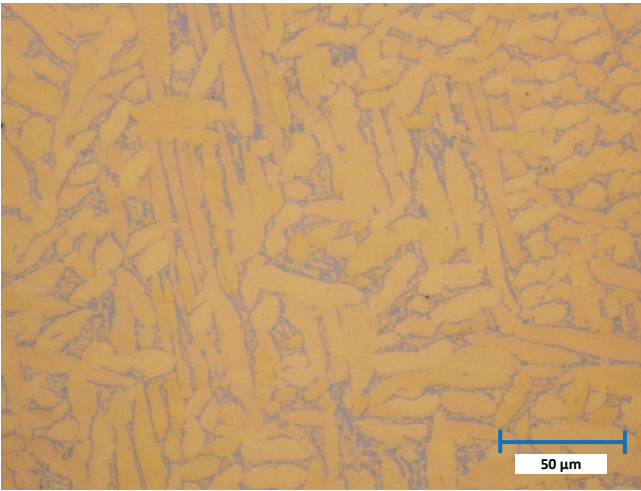
## POWDER PROPERTIES (ISO 4490, ISO 3923-1)

Particle Size Distribution (µm)	Hall Flow (s/50g)	Apparent Density (g/cm³)
20 – 53	20.9	4.12

## MICROGRAPHS



Polished Surface



Microstructure

## PHYSICAL PROPERTIES

Average Defect Percentage (%)
< 0.10

## MECHANICAL PROPERTIES (ISO 6892-1)

Orientation	Ultimate Tensile Strength (MPa)	0.2% Yield Strength (MPa)	Elongation at break (%)
Horizontal	654 ± 6	224 ± 12	36 ± 1
Vertical	757 ± 9	389 ± 22	16 ± 1

## MELTING POINT

Celsius (°C)	Fahrenheit (°F)
1040 - 1045	1904 - 1913

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