

ALLOY SPECIFICATION: CuSn8 (CW453K / C52100)

CuSn8 Bronze Bushings: Premium Phosphor Bronze for Heavy-Load, Low-Speed Applications

Phosphor Bronze

Self-Lubricating

Heavy Load

1. Material Overview

CuSn8 (also known as CW453K and material number 2.1030) is a premium tin bronze containing approximately 8% tin. This high-strength phosphor bronze is designed for self-lubricating bushings that operate optimally under heavy-load and low-speed conditions. It is widely recognized for its excellent cold-forming behavior, stable elastic response, and strong anti-wear performance.

Equivalent Designations: CuSn8, CW453K, 2.1030, C52100 (Also referenced as CuSn8P when phosphorus is explicitly listed)

2. Chemical Composition

The addition of phosphorus (often denoted in the CuSn8P designation) acts as a highly effective deoxidizer, helping to improve the stiffness and fatigue behavior of the material.

Element	Specification Limits (%)
Cu	Remainder
Sn	7.5 - 8.5
P	0.01 - 0.40
Zn	d 0.20
Ni	d 0.20
Fe	d 0.10
Pb	d 0.02
Other	d 0.20 others

3. Physical Properties

Understanding the physical data of 2.1030 CuSn8 helps engineers precisely match the material to the duty cycle, operating temperature, and loading profile of their specific application.

Property	Value
Density	8.80 g/cm ³
Melting Range	880 - 1030 °C
Electrical Conductivity	10 - 12 % IACS
Thermal Conductivity	50 - 60 W/(m·K)
Modulus of Elasticity	110 - 115 GPa

4. Mechanical Properties (R450 Condition)

CuSn8 is commonly available in high-strength states, such as the R450 condition, which provides excellent mechanical properties for demanding bearing applications.

Property	Value
Tensile Strength (Rm)	e 450MPa
Yield Strength (Rp0.2)	e 350MPa
Elongation (A)	e 8 %
Hardness	120 - 160 HBW



5. Technical Characteristics

CuSn8 phosphor bronze is renowned for its exceptional performance in demanding environments:

- ▮ **Wear & Friction:** Highly suitable for heavy-load, low-speed sliding

▮ **High Strength:** Available in R450 high-strength condition

▮ **Corrosion Resistant:** Excellent in seawater and industrial atmospheres
- ▮ **Cold Forming:** Excellent cold-forming behavior

▮ **Elastic Response:** Stable elastic properties under load

▮ **Fatigue Resistance:** Phosphorus improves fatigue behavior

6. Typical Applications

Due to its excellent mechanical and technical properties, CuSn8 bronze is used extensively in various industries:

- ▮ Wrapped bronze bushings

▮ Self-lubricating sliding bearings

▮ Custom wear plates

▮ Continuous-duty equipment
- ▮ Precision-machined bushings

▮ Spring components

▮ Electrical connectors

▮ Marine hardware

7. Material Standards & Equivalents

CuSn8 bronze conforms to multiple international standards, ensuring quality and consistency:

Standard	Designation
EN	CuSn8 (CW453K)
DIN	2.1030
UNS	C52100
JIS	C5210

8. Quality Assurance

All Precision Bronze products are manufactured in accordance with international standards and undergo rigorous quality control testing including:

- ▮ Chemical composition analysis via spectrometry

▮ Mechanical property testing (tensile, hardness)

▮ Dimensional inspection and surface quality assessment

▮ Material traceability and certification

CuSn8 (CW453K) phosphor bronze is the ideal choice for self-lubricating bushings requiring excellent wear resistance, high strength, and reliable performance under heavy loads and low speeds. Contact Precision Bronze today for custom specifications and quotes.

Contact Us

For technical inquiries, custom orders, or quotations: