



ALLOY SPECIFICATION: CuSn12-C (CC483K)  
EN 1982

CuSn12 Bronze Bearings: A High-Strength Alloy for Demanding Applications

- High-Tin Bronze
- Wear Resistant
- High Load Capacity

Bronze alloys are widely recognized for their exceptional mechanical properties, wear resistance, and versatility in demanding applications. Among these, CuSn12 bronze (also known as CC483K or C90700) stands out as a high-performance material, particularly for bearing applications.

1. Chemical Composition & Material Overview

CuSn12 is a high-tin bronze alloy composed primarily of copper (Cu) and tin (Sn), with small amounts of other elements to enhance its properties. The addition of tin (Sn) significantly enhances the alloy's strength and wear resistance, making it ideal for high-load applications.

Chemical Composition (%)

| Element | Min. (%) | Max. (%) |
|---------|----------|----------|
| Cu      | 85.0     | 88.5     |
| Sn      | 11.0     | 13.0     |
| Ni      | -        | 2.0      |
| P       | -        | 0.60     |
| Pb      | -        | 0.7      |
| Zn      | -        | 0.5      |
| Fe      | -        | 0.2      |
| Mn      | -        | 0.2      |
| Sb      | -        | 0.15     |
| S       | -        | 0.05     |
| Al      | -        | 0.01     |
| Si      | -        | 0.01     |

Processing Note: For continuous castings and centrifugal castings, the minimum tin content shall be 10.5% and the maximum copper content shall be 89.0%.

2. Mechanical Properties

CuSn12 bronze exhibits impressive mechanical properties, which vary slightly depending on the casting process used. The mechanical property requirements given below apply to sizes up to and including 300 mm external diameter. For larger continuous castings, the mechanical property requirements should be agreed between the supplier and the purchaser.

**Mechanical Properties (Minimum Values)**

| Casting Process  | Rm (MPa) | Rp0.2 (MPa) | A (%) | HBW |
|------------------|----------|-------------|-------|-----|
| Continuous (GC)  | 300      | 150         | 6     | 90  |
| Centrifugal (GZ) | 280      | 150         | 5     | 90  |



3. Technical Characteristics

CuSn12 bronze is renowned for its exceptional technical characteristics, which include:

- High Strength and Hardness: Ideal for applications involving high static and dynamic loads.
- Wear and Fatigue Resistance: Excellent resistance to wear, making it suitable for high-stress environments.
- Self-Lubricating Properties: The addition of lead (Pb) improves self-lubrication, reducing friction in bearing applications.
- Corrosion Resistance: Offers good corrosion resistance, especially against seawater and industrial chemicals.
- High Temperature Performance: Maintains its mechanical properties at elevated temperatures.
- Excellent Machinability: Easy to machine, allowing for precise manufacturing of complex bearing shapes.
- Good Castability: Suitable for both continuous and centrifugal casting processes.

4. Typical Applications

Due to its excellent mechanical and technical properties, CuSn12 bronze is used extensively in various industries:

- |                           |                      |
|---------------------------|----------------------|
| Heavy machinery bearings  | Worm gear wheels     |
| Pump and valve components | Sliding elements     |
| Marine equipment          | Bushings and sleeves |
| Hydraulic systems         | Thrust washers       |
| Gear components           | Flanged bearings     |

CuSn12 (CC483K) bronze is the ideal choice for demanding bearing applications requiring high strength, excellent wear resistance, and reliable performance under heavy loads. Contact Precision Bronze today for custom specifications and quotes.

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