ALLOY SPECIFICATION

CuSn10-C (CC480K) EN 1982

Exploring the Versatility of CuSn10 Bronze Bearings: A Comprehensive Guide

Bronze alloys have long been celebrated for their exceptional mechanical properties, corrosion resistance, and versatility in demanding applications. Among these, **CuSn10 bronze** (also known as CC480K or C90700) stands out as a high-performance material, particularly for bearing applications. In this blog post, we'll dive into the specifications, mechanical properties, international standards, and unique characteristics of CuSn10 bronze bearings, highlighting why this alloy is a top choice for engineers and manufacturers worldwide.

1. - Requirements

What is CuSn10 Bronze?

CuSn10 is a tin bronze alloy composed primarily of copper (Cu) and tin (Sn), with small amounts of other elements to enhance its properties. According to the **EN 1982 standard**, the chemical composition of CuSn10 is as follows:

This composition ensures a balance of strength, wear resistance, and corrosion resistance, making CuSn10 ideal for high-load and high-stress applications.

Chemical Composition (%)												
	Cu	Ni	P	Pb	Sn	Al	Fe	Mn	S	Sb	Si	Zn
Min.	88,0	-	-	-	9,0	-	-	-	-	-	-	-
Max.	90,0	2,0	0,2	1,0	11,0	0,01	0,2	0,10	0,05	0,2	0,02	0,5

Incluyendo Ni.

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These properties make CuSn10 bronze bearings capable of withstanding high static loads, fatigue, and abrasive environments, even under low or high-speed conditions with proper lubrication.

Mechanical properties (Minimun values)				
Casting process and designation	Tensile strength R_m (MPa)	0,2% proof strength $R_{p0,2}$ (MPa)	Elongation 5D A (%)	HBW (10-1000)
Continuous(GC)	280	170	10	80
Centrifugal (GZ)	280	160	10	80

2. - International Standards for CuSn10 Bronze

CuSn10 bronze is recognized and standardized across various global markets. Here's a quick overview of its closest international equivalents:

Standard		Alloy	Status
Europe	BS 1400 DIN 1705	PB1 CuSn10	Withdrawn
USA	ASTM B505	C90700 (SAE 65) C92700 (SAE 63)	Active
Australia	AS 1565	C90250	Active
Japan	JIS H5121 JIS H5120	CAC502C CAC502	Active
ISO	1338	CuSn10	Withdrawn

3. - Optional Heat Treatments

To further enhance the performance of CuSn10 bronze bearings, manufacturers can apply optional heat treatments at the client's request. These include:

• **Stress Relieving**: Reduces internal stresses caused by machining or casting, improving dimensional stability and fatigue resistance.
• **Phase Transformation**: Alters the microstructure of the alloy to optimize its mechanical properties for specific applications.

These treatments allow for customization based on the operational demands of the bearing, ensuring optimal performance in even the most challenging environments.

4. - Technical Characteristics of CuSn10 Bronze Bearings

CuSn10 bronze bearings are renowned for their exceptional technical characteristics, which include:

• **High Load Capacity**: Ideal for applications involving high static loads, such as heavy machinery and industrial equipment.
• **Wear and Fatigue Resistance**: Excellent resistance to abrasive wear, erosion, and cavitation, ensuring a long service life.
• **Corrosion Resistance**: Highly resistant to atmospheric corrosion, spring water, and seawater, making it suitable for marine and outdoor applications.
• **Versatility**: Performs well under both low and high-speed conditions when properly lubricated.
• **Machinability**: Easy to machine and fabricate, allowing for precise manufacturing of complex bearing designs.

5. - Applications of CuSn10 Bronze Bearings

Thanks to its unique combination of properties, CuSn10 bronze is widely used in various industries, including:

- **Marine Engineering**: Propeller shafts, rudder bearings, and pump components.
- **Heavy Machinery**: Gears, bushings, and thrust washers.
- **Automotive**: Suspension components and engine parts.
- **Industrial Equipment**: High-load bearings and sliding surfaces.

6. - Conclusion

CuSn10 bronze bearings are a testament to the enduring value of bronze alloys in modern engineering. With their excellent mechanical properties, corrosion resistance, and adaptability to various applications, they remain a preferred choice for industries worldwide. Whether you're designing heavy machinery, marine equipment, or automotive components, CuSn10 bronze offers the reliability and performance you need.

If you're considering CuSn10 bronze for your next project, don't hesitate to consult with your supplier about optional heat treatments and customizations to maximize its potential. With the right approach, CuSn10 bronze bearings can deliver unmatched performance and durability for years to come.

Have you used CuSn10 bronze bearings in your projects? Share your experiences and insights in the comments below!