



# bedra ROD & BAR

BearMet® Wear Resistant and Corrosion Resistant Copper Alloy

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BearMet® ALLOYS

# BearMet® 350

## Product Characteristics

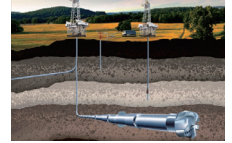
- Ultra-high strength: up to 1400MPa
- Resist galling, corrosion and wear: suitable to extremely harsh servicing conditions
- High fatigue strength: higher servicing life and reliability even under heavy load
- Outstanding processability
- Non-magnetic, Be-free & Pb-free

## Application Characteristics

- Provide sufficient strength, durability and stability in extreme load and wide temperature range
- Extremely low friction coefficient and minimum abrasion, endowing better reliability and longer service life

## Typical Application

- Marine, Oil & Gas  
MWD (measurement while drilling), LWD (logging while drilling), directional drilling tools, drill bit bearings, wellhead control and manifold systems, ROV, fluid control and landing systems
- Aviation  
Bearings and bushings in landing gears, wheel and brake components



High speed drill bit



MWD screw



MWD connector

## Chemical Composition

Cu	Rem.	%
Ni	14.5-15.5	%
Sn	7.5-8.5	%
Others	≤0.5	%

\*Similar to C72900 (CuNi15Sn8)

## Physical Properties

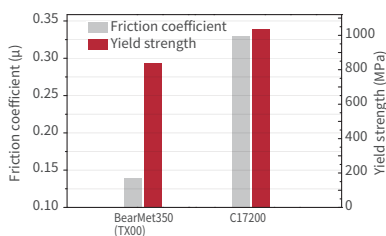
Density (g/cm <sup>3</sup> )	8.94
Electrical conductivity (%IACS)	9
Elastic modulus (GPa)	128
Coefficient of thermal expansion (10 <sup>-6</sup> /K)	16.0
Poisson's ratio	0.3

## Mechanical Properties

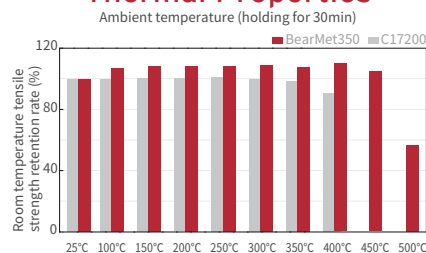
Temper	Diameter (mm)	Tensile strength MPa (min.)	Yield strength MPa (min.)	Elongation A% (min.)	Hardness HRC (min.)
TX00	16 ≤ Φ ≤ 92	910	738	5	30
TS02	20 < Φ ≤ 40	965	895	5	24
TS04	20 < Φ ≤ 80	1105	1035	3	34

\*The above table shows properties of typical tempers and dimensions

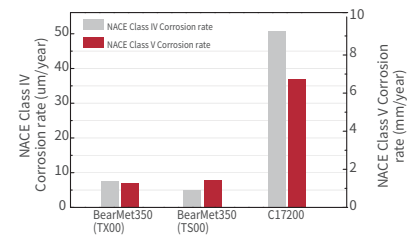
## Friction Properties



## Thermal Properties



## Corrosion Properties



# BearMet® 230

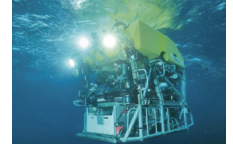
## Product Characteristics

- Outstanding mechanical strength
- Excellent wear & galling resistance
- Relatively low magnetic permeability
- Excellent seawater corrosion resistance
- Hydrogen embrittlement resistance and stress corrosion cracking resistance in seawater
- Good resistance to stress corrosion cracking in hydrogen sulphide conditions
- Anti-biofouling (lack of marine growth)

## Typical Application

- Offshore & Marine

Components used for ROV, AUV and wellhead, such as underwater sealing connectors, electrical & optical penetrators, submarine fasteners, pump and valve shafts, bearing bushes, hydraulic pistons, drill pipes and clamps



- Aviation

Landing bearings, flight refuelling connectors, non-magnetic bolts and control surface components



Underwater sealing connectors



Electrical & optical penetrators



Underwater coaxial connector

## Chemical Composition

Cu	Rem.	%
Ni	13-16	%
Al	2.0-4.0	%
Mn	≤1.0	%
Fe	≤2.5	%
Others	≤1.0	%

\*Similar to C72400 (CuNi14Al3)

## Physical Properties

Density (g/cm <sup>3</sup> )	8.5
Specific heat capacity (J/(g·K))	0.416
Thermal conductivity (W/(m·K))	45.0
Electrical conductivity (%IACS)	11
Coefficient of thermal expansion (10 <sup>-6</sup> /K)	16.0
Poisson's ratio	0.33

## Mechanical Properties

Diameter (mm)	Tensile strength MPa (min.)	Yield strength MPa (min.)	Elongation A% (min.)	Hardness HV (min.)
Φ≤65	850	630	10	240
Φ>65	770	550	10	230

\*The above table shows properties of typical tempers and dimensions

# BearMet® 220

## Product Characteristics

BearMet® 220 is a special high strength nickel-aluminum-bronze alloy. This alloy offers unique combined properties of high strength, good fatigue, excellent corrosion resistance in sea water, non-sparking and wear resistance properties, which makes it an excellent choice for applications involving heavy loads, abrasive wear resistant and corrosion. It is widely used in aerospace and marine application.

## Typical Application

Typical applications for BearMet® 220 includes aerospace landing gear components, wing flap bearing, thrust washers, gears, control bushings and faucet balls in aerospace industries. BearMet® 220 is also suitable for non-sparking safety tooling, valve spindles and pump components, valve balls, valve guides, valve seats, wear plates, welding clamps, submarine fasteners and bearing bushings in marine industries.



X-tree valve



Submerged pump



Relief valve

# BearMet® 220

## Chemical Composition

Cu	Rem.	%
Al	9.0-11.0	%
Fe	2.0-4.0	%
Ni	4.0-5.5	%
Mn	≤1.5	%

\*Similar to C63000 (CuAl10Ni5Fe3)

## Physical Properties

Density (g/cm <sup>3</sup> )	7.6
Melting point (°C)	1054
Electric conductivity (%IACS)	7
Coefficient of thermal conductivity (W/(m·K))	39.1
Coefficient of thermal expansion (10 <sup>-6</sup> /K)	15.6
Elastic modulus (GPa)	121

## Mechanical Properties

Temper	Diameter (mm)	Tensile strength MPa (min.)	Yield strength MPa (min.)	Elongation A% (min.)
HR50	8.0≤φ<25	690	345	5
	25≤φ<50	620	310	6
	50≤φ≤80	585	295	10
M30	80≤φ≤120	550	275	12

\*The above table shows properties of typical tempers and dimensions

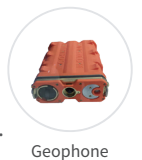
# BearMet® 180

## Product Characteristics

BearMet® 180 is a special high strength nickel-aluminum-bronze alloy. This alloy offers unique combined properties of high strength, good fatigue, excellent corrosion resistance in sea water, non-sparking and wear resistance properties.

## Typical Application

BearMet® 180 is typical used as shell and fasteners for seismic acquisition systems. It is also widely used in marine applications for its unique combination of wear resistance and corrosion resistance.



## Chemical Composition

Cu	Balance	%
Al	8.0~11.0	%
Ni	4.0~6.0	%
Fe	0.5~1.5	%
Mn	≤1.5	%

\*Similar to CuAl9Ni5Fe2

## Physical Properties

Density (g/cm <sup>3</sup> )	7.48
Melting temperature (°C)	1045
Electrical conductivity (%IACS)	9.0
Thermal conductivity (W/(m·K))	49.9
Modulus of elasticity (GPa)	93.0

## Mechanical Properties

Temper	Diameter (mm)	Tensile strength MPa (min.)	Yield strength MPa (min.)	Elongation A% (min.)	Hardness HV5 (min.)
H02	8≤φ≤12	650	500	12	220
M30	50≤φ≤70	600	400	15	210
M05	170≤φ≤200	600	270	13	/

\*The above table shows properties of typical tempers and dimensions

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