

Belmont

Copper

Copper was one of the first metals discovered and used by man; and it still finds wide application. Its high thermal and electrical conductivity lets Copper find broad use in both electrical and heating/cooling usage. Copper has outstanding corrosion resistance and is easy to form and fabricate, leading to wide use in fluid handling and plumbing applications.

Good ductility, high conductivity and the ease of joining make Copper the world's #1 choice for the transmission of electrical power to—and through—telephones, televisions, computers, and other electrically powered products that make our lives easier.

Copper is often alloyed with other metals such as Zinc, Silicon, Tin, Nickel, Chromium and Beryllium among others, to produce Brasses and Bronzes that are used to make a wide variety of artistic, jewelry, marine and industrial products.

Copper has always been recycled, and today remains the most widely recycled metal.

Nominal Chemical Composition

Copper: 99.7% Minimum - 99.9% Minimum - 99.95% Minimum plus Oxygen-Free Grades

Typical Physical Properties

Unless otherwise stated, measured at room temperature, 68°F (20°C).

Property	U.S.	Metric
Melting Point	1981°F	1083°C
Pouring Range	2050°F–2350°F	1122°F–1290°C
Density	0.323 lbs/cu. in.	8.94 g/cu. cm.
Specific Gravity	8.94	8.94
Thermal Conductivity	226.0 Btu/ft./hr./sq. ft./°F	391.0 W/m/°K
Electrical Conductivity	100% IACS	100% IACS

Typical Mechanical Properties (test bar values - C80100)

Unless otherwise stated, measured at room temperature, 68°F (20°C).

Property	U.S.	Metric
Tensile Strength	25000 lbs/sq. in.	172 MPa
Yield Strength 0.5% Extension	9000 lbs/sq. in.	62 MPa
Elongation in 2 in. (50 mm)	40%	40%
Brinell Hardness 10 mm ball 500 kg	44	44
Fatigue Strength at 10 ⁸ cycles	9000 lbs/sq. in.	62 MPa

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Belmont: The Non Ferrous Specialists

For maximum variety in non ferrous metals, alloys and shapes.

Custom shapes and compositions available.

data sheet

Casting Technique

A pure metal, Copper has medium fluidity and needs adequate connection to large risers, so large gates should be used.

Melting

Since pure Copper has a strong tendency to dissolve both hydrogen and oxygen, most melting practices suggest that the initial melting be with a "high" oxygen content, to limit the pickup of hydrogen and to oxidize any impurities. Once the metal is at temperature, Belmont's 2% Boron Copper or 2% Lithium Copper can be used to remove the absorbed oxygen prior to pouring. The use of other deoxidizers such as Phosphor Copper, Zinc or Silicon Copper should be avoided, since they will have a significant negative impact on conductivity.

Casting Characteristic

Pattern Maker's Shrinkage	1/4 in./ft.	Gassing	High
Effect of Section Size on Soundness and Mechanical Properties	Small	Fluidity	Fair to Medium
Drossing	Low	Solidification Shrinkage	High
		Casting Yield	Low

Joining

Suitability for being joined by:

Soldering	Excellent
Brazing	Excellent
Oxyacetylene Welding	Not Recommended
Gas Shielded Arc Welding	Fair
Coated Metal Arc Welding	Not Recommended

Fabrication Properties

Property	U.S.	Metric
Stress Relieving Temperature	500°F	260°C
Machinability Rating (free cutting Brass=100)	10	10

Forms/Shapes Available

Full and cut cathode, pigs, ingots, polished (Jeweler's Grade) and unpolished squares, unpolished and polished (Jeweler's Grade) shot, nuggets.

Patination

The admired blue-green color is a naturally developing surface patina. Its formation can be accelerated chemically, using one of several approaches. Typically, the final surface requires no protection.

Note: The information contained in this data sheet is the most accurate in our possession at the time of publication, and is based on our effort to meet industry references, standards, and specifications. However, Belmont cannot assume responsibility for in-service performance of these products due to our lack of control over, or supervision of, their use.



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