



Belmont
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DATA SHEET

BB-4

BELMONT SPECIAL "H" SILICON BRONZE ALLOY 4939

Belmont Special "H" Silicon Bronze Alloy 4939 has gained increased popularity in recent years with art and jewelry casters, primarily because of its excellent fluidity, low-drossing tendency, sharp detail reproduction, minimal finishing requirements, high ductility, and suitability as a cost-effective alternative to tin bronzes.

Previously, its good corrosion resistance, close to that of pure copper, and high strength, comparable to low- and medium-carbon steels, established its use for a variety of industrial applications, including bearings, valve parts, rocker arms, pump parts, bells, small propellers, and gears.

Applicable casting techniques include centrifugal, investment, permanent mold, plaster, and sand.

FORMS/SHAPES AVAILABLE

20-lb. ingot; 2-section, 5-lb. ingot; cut bar, approx. 3/4" wide x 1/2" thick x 2" long; polished 1/2" cubes; shot, 1/2" and down; specials.

NOMINAL CHEMICAL COMPOSITION

	<u>%</u>
Copper	92
Silicon	4
Zinc	4

TYPICAL PHYSICAL PROPERTIES

Melting Range	1580-1780 ⁰ F(860-971 ⁰ C)
Pouring Range	light castings, 2050-2250 ⁰ F(1121-1232 ⁰ C); heavy castings, 1900-2050 ⁰ F(1038-1121 ⁰ C)
Density	0.302 lbs/in ³ @ 68 ⁰ F(8.4 g/cm ³ @ 20 ⁰ C)
Specific Gravity	8.4
Thermal Conductivity	16.4 btu/ft ² /ft/hr/ ⁰ F @ 68 ⁰ F(0.068 cal/cm ² /cm/sec/ ⁰ C @20 ⁰ C)
Electrical Conductivity	6.0% I.A.C.S. @ 68 ⁰ F(0.035 Megmho-cm @ 20 ⁰ C)

TYPICAL MECHANICAL PROPERTIES(test bar values)

Tensile Strength	55,000 lbs/in ² (38,700 g/mm ²)
Yield Strength (.5% exten. under load)	25,000 lbs/in ² (17,600 g/mm ²)
Elongation in 2 inches(50mm)	30%
Hardness(Brinell, 500kg)	85
Shear Strength	28,000 lbs/in ² (19,700 g/mm ²)
Impact Strength(Izod)	33

-continued on reverse-

FABRICATION PRACTICES

Stress Relieving Temperature	500 ⁰ F(260 ⁰ C)
Machinability Rating(free cutting brass= 100)	40

CASTING CHARACTERISTICS

Patternmaker's Shrinkage	1/4"/ft
Effect Of Section Size On Soundness and Mechan. Props.	Medium
Drossing	Low
Gassing	High
Fluidity	High
Shrinkage	Medium
Casting Yield	Medium
Casting Structure	Fine-Grained, Dense

MELTING

Belmont Special "H" Silicon Bronze Alloy 4939 should be melted rapidly, and poured as soon as it reaches casting temperature. In a fuel-fired furnace, a slightly oxidizing atmosphere should be maintained. Overheating should be avoided to minimize gas pickup. Although deoxidizers are usually unnecessary, phosphorus copper(2 oz/100 lbs) can be added to enhance fluidity.

Contamination of other alloys with silicon-containing alloys must be avoided. Similar care must be taken to keep silicon bronze alloys free of contamination. Melting loss is negligible due to relative freedom from drossing. The alloy suffers no serious change in composition during melting, so it can normally be re-melted several times without need for metal additions.

JOINING

Suitability for being joined by:

Soldering	Not Recommended
Brazing	Fair
Oxyacetylene Welding	Good
Carbon Arc Welding	Poor
Gas Shielded Arc Welding	Fair
Coated Metal Arc Welding	Fair

PATINATION

Belmont Special "H" Silicon Bronze Alloy 4939 takes a wide range of patinas, from black to light colors. It will tarnish when exposed outdoors, and should be coated with Inctalac or another clear, transparent lacquer and wax if the original color is to be preserved.

Belmont: The Non Ferrous Specialists

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

Custom shapes and compositions available.