L-1017B

#### BI: BELMONT ELEMENTAL BISMUTH

## Typical End Uses

Belmont elemental bismuth, available as commercial-grade or high-purity, can be used in the production of fusible alloys (low melting point alloys); as a carbide stabilizer in the manufacture of malleable iron; and as an additive to low-carbon steel or aluminum, to improve machinability. Compounds of bismuth are used for catalysts, in pharmaceuticals, and for semiconductor applications.

### **Chemical Composition**

Commercial-grade bismuth has a typical analysis of bismuth, 99.995% (99.99% minimum); iron, 0.001% max.; lead, 0.001% max.; copper, 0.002% max.; silver, 0.001% max. Also available are 99.999% bismuth and 99.9% bismuth.

# Forms and Sizes Available

Belmont Elemental Bismuth is available in various sizes as feathered, coarse granular, ingot, lumps, mossy, needles, pellets in specific gram weights for inoculation of malleable iron, powder, shot, sticks, and special shapes.

### **BELMONT BISMUTH ALLOYS**

Belmont Bismuth Alloys feature bismuth-base low-melt alloys with melting points from 105°F to 520°F (see Belmont's LM series of data sheets for application and alloy details); and bismuth-base low-temperature solders. Standard and special compositions, including combinations, are available for:

Bismuth-Antimony
Bismuth-Cadmium

Bismuth-Copper Bismuth-Indium Bismuth-Lead Bismuth-Tin

#### Forms and Sizes Available

Belmont Bismuth Alloys are available in various sizes as bar, cakes, cast shapes, granular, ingot, lumps, mossy, powder, small shot, 1/4-lb. sticks, and special shapes.

- See Reverse -



#### Bi: BELMONT ELMENTAL BISMUTH - continued

### **Mechanical Properties**

Hardness: 7.0 HB; 2.5 Moh; Brinell, 500 kg: 73

Modulus of Elasticity: 4,600,000 p.s.i. (320,000 kg/cm<sup>2</sup>)

Elastic Modulus: Tension, 32 GPa

Liquid Suface Tension:

°C	mN/m:dynes per em		
300	376		
400	370		
500	363		

Tensile Strength: Approx. 6,400 p.s.i. (446.5 kg/cm<sup>2</sup>)

## **Physical Properties**

Melting Point: 520° F (271° C) Boiling Point: 2,840° F (1560° C)

Density: Solid, 9.80 g/cm<sup>3</sup> (0.354 lb/in<sup>3</sup>) at 68° F (20° C)

Liquid, 10.067 g/cm<sup>3</sup> (0.365 lb/in<sup>3</sup>)

Specific Volume: 0.102 cm3/g (0.174 in3/oz) at 68° F (20° C)

Solidification Expansion: 3.32%

Linear Coefficient of Thermal Expansion: 13.3 micro-in. per in. per ° C 13.2 \mu m/m • K at 68° F (20° C)

Specific Heat: solid, 0.0294 cal/g (0.85 cal/oz) at 68° F (20° C)

liquid, 0.0340 cal/g (0.99 cal/oz) at 518.5-752° F (271-400° C)

Latent Heat of Fusion: 12.5 cal/g (063.5 cal/oz); 53.976 kJ/kg

Latent Heat of Vaporization: 204.3 cal/g (5,925 cal/oz); 854.780 kJ/kg

Thermal Conductivity: 1.94% Ag:

<u>°C</u>	W/m•K	Temperature	cal/cm <sup>2</sup> /cm/sec/° C
0 300 400 500 600	8.2 11.3 12.3 13.3 14.5	68° F (20° C) 572° F (300° C) 1292° F (700° C)	0.020 0.041 0.037

Electrical Conductivity: 1.4% Ag

**Electrical Resistivity:** 

	Microhm-cm	°C	nΩ•m
solid, 32° F (0° C)	106.8	0	1050
liquid, 572° F (300° C)	128.9	300	1289
liquid, 1382° F (750° C)	153.5	700	1535

Color: tinny or silvery-white, tinged with red when not tarnished.

#### 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 accepted industry references, standards, and specifications. However, Belmont cannot assume responsibility for inservice performance of these products due to our lack of control over, or supervision of, their use.