

## **AlBeCast® - Investment Cast Aluminum Beryllium Materials**

Materion offers customers a variety of pure beryllium grades and beryllium containing alloys. In addition to our powder metallurgy based product offerings, we also offer two versatile aluminum-beryllium alloys for investment cast products. These alloys constitute our AlBeCast® product line for precision cast components.

Investment casting offers several important advantages over other fabrication methods. Casting is a near net shape process. The amount of alloy needed to make a part by casting is often significantly less than what is needed when fabricating by conventional machining. Furthermore, the amount of machining time needed for cast parts is greatly reduced compared to other fabrication methods. The combination of reduced material and fabrication costs can be quite substantial.

### **AlBeCast® 910**

AlBeCast® 910 is a ternary Be-Al-Ni alloy developed and patented by Materion (U.S. Patent 5,667,600). It has a high specific modulus, good ductility and reasonably good strength. The addition of the nickel to the beryllium-aluminum alloy reduces the alloy's thermal expansion coefficient and increases tensile properties. This alloy is relatively low-cost because of a lack of exotic alloying elements.

### **AlBeCast® 920**

AlBeCast® 920 material is Materion's equivalent of AMS 7918. This is an aluminum beryllium alloy containing Ag, Co, and Ge. Silver and cobalt are added to increase the alloy's strength, while germanium is added for improved castability. AlBeCast® 920 has higher specific strength than 910 but it has reduced ductility and a higher and more variable cost.



MAC-012

#### **BRUSH BERYLLIUM & COMPOSITES**

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#### **MATERION CORPORATION**

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Property Description	Units	AlBeCast® 910	AlBeCast® 920	AM162 HIP'd
Density	g/cm³ @ 25°C Lbs/in³ @ 77°F	2.17 0.078	2.16 0.078	2.10 0.076
Coefficient of Thermal Expansion	µm/m (ppm) @ 25°C µm/in (ppm) @ 77°F	14.6 8.1	14.2 7.9	13.9 7.7
Specific Heat	J/kg-K @ 25°C Btu/h-ft-° @ 77°F	1560 0.36	1250 0.30	1560 0.36
Thermal Conductivity	W/m-K @ 25°C Btu/h-ft-° @ 77°F	110 64	105 61	210 121
Modulus of Elasticity in Tension	GPa @ 25°C Mpsi @ 77° F	193 28.0	202 29.3	192 28.5
Yield Strength	MPa @ 25°C Ksi @ 77° F	165 24	220 32	227 33
Ultimate Tensile Strength	MPa @ 25°C Ksi @ 77° F	211 31	269 39	305 44
% Elongation	% @ 25°C / % @ 77° F	5	4	4.7
Axial Fatigue (R = -1), 107 cycles	MPa @ 25°C Ksi @ 77° F	86.2 12.5	117.2 17.0	124.0 18.0



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