

# *Belmont*

## Casting Alloys for Sculpture, Jewelry, and Decorative Products

COPPER BASE • ZINC BASE • TIN BASE • LEAD BASE

bar - cut bar - cubes - ingot - pigs - polished & unpolished shot - specials

Belmont Metals Inc. has been a major producer of quality non ferrous alloys since 1896. We offer a greater variety of non ferrous metals than any other producer in the U.S., utilizing our modern, in-house laboratory to assure high quality. In addition, we have the technical expertise required to customize our products to meet particular needs, and create new alloys and shapes as necessary.

Belmont offers extensive experience in the production of standard and custom alloys for the casting of sculpture, jewelry, and decorative products. Our capability covers standard and special tin-, lead-, zinc-, and copper-base formulations and shapes suitable for a broad variety of applications. This allows us not only to serve special casting needs, but also to help our customers comply with OSHA and EPA regulations, metal price considerations, and other factors that influence metal choice. For example, our copper base alloys have been used as cost-effective gold substitutes.

We have the flexibility and knowhow to experiment with refining processes and other production techniques as necessary to meet customer requirements. For example, our Special OAF (ductility and fluidity) Treatment has been especially useful in the production of antimonial lead casting alloys. Ductility tests on OAF-treated alloys vs. standard alloys have shown an increase of about 30% in flexibility. Fluidity tests, at the same metal and mold temperature, have shown an increase of 40 -50%. Meanwhile, we have also been able to reduce casting temperatures by about 50°F without sacrificing original fluidity. Thus, our customers can gain more detail at the same temperature, or work at reduced temperatures with original fluidity, allowing savings on energy costs and mold replacement. In addition, OAF-treated alloys oxidize much slower than standard alloys after repeated melts, giving the caster a cleaner, brighter metal to work with. Typically, a mirrorlike, silver surface remains after ladling.

The properties summary that follows covers data for many of our tin-, lead-, zinc-, and copper-base alloys. Feel free to inquire about others, or specials. While the data is based on the latest available information, actual results may vary due to design and casting conditions. Thus, the data is intended to serve only as a valuable aid in alloy selection. Feel free to call us for help.

### **Belmont:** *The Non Ferrous Specialists*

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

Custom shapes and compositions available.



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# COPPER-BASE GROUP

Belmont Alloy Number	Name	Fluidity	Tensile Strength p.s.i.	Brinell Hardness Number	Ductility	Density lbs./cu. in.	Pouring Temperature Range °F.	Color	Comments
46316	Art Casters' Brass	Good	50,000	80	Good	.300	1700-1900	Bright Yellow	Offers bright golden color of regular yellow brass, with cleaner melting, less fume, and better fluidity for easy casting.
4951	Everdur Silicon Bronze	Very Good	55,000	85	Good	.302	1850-2250	Gold	Good fluidity, low dropping, medium solidification range. Long used for various types of castings requiring good corrosion resistance.
4582	Jewelers' Manganese Bronze	Fairly Good	60,000	95	Fair	.301	1700-2100	Bright Gold	Proprietary alloy developed to provide jewelry casters with base metal that could be centrifugal cast into refractory mold.
4977	Beryllium Copper	Excellent	80,000	150	Excellent	.292	1850-2050	Pink Gold	Excellent fluidity. Used for general engineering applications; molds well for ornamental and jewelry parts.
4587	White Bronze	Excellent	55,000	90	Good	.290	1650-1850	Silvery	Proprietary alloy developed to provide low melting range and white color.

# ZINC-BASE GROUP

Belmont Alloy No. Name/Comp.	Fluidity	Tensile Strength p.s.i.	Brinell Hardness Number	Ductility	Density lbs./cu. in.	Casting Range °F	Comments
8934 <b>Superdie I</b> (4% Al, 3% Cu, 93% Zn)	Good	35,000	90	Very Good	0.245	780-835	Best standard alloy for rubber mold casting; good castability, strength, ductility.
8952 <b>Zinc 955</b> (5% Al, 95% Zn)	Good	25,000	70	Below Average	0.240	735-835	Now castable in silicone rubber molds. Good fluidity for fine detail and thin walls.

8961 <b>Z-3</b> (4% Al, 96% Zn)	Fair	25,000	70	Below Average	0.240	750-850	Basically for pressure diecasting. Not often used in rubber molds; below-average castability.
8871 <b>ILZRO-12</b> (1% Cu, 11% Al, 88% Zn)	Fair	45,000	115	Fair	0.218	825-875	High strength and hardness, fair castability. Used when strength is major consideration.

## TIN-BASE GROUP

Belmont Alloy No. Name/Comp.	Fluidity	Tensile Strength p.s.i.	Brinell Hardness Number	Ductility	Density lbs./cu. in.	Casting Range °F	Comments
7921 <b>Britannia</b> (91.75% Sn, 8% Sb, 0.25% Cu)	Very Good	7,200	20	Excellent	0.263	525-625	The original lead-free pewter. Lightest tin-base alloy for jewelry casting, also highest degree of strength, whiteness, and brightness. Castings need not be plated. Especially suitable for intricate shapes, filigree, and textured surfaces, and for pronging and model-making.
7924 <b>Special High-Tin Pewter</b> (92% Sn, 4% Sb, 4% Pb)	Very Good	6,800	16	Excellent	0.270	525-625	Special Pewter for figurines, models, etc. with heavy sections – better casting characteristics than lead-free Britannia.
79010 <b>Levalloy I</b> (90% Sn, 2% Cd, 2% Sb, 6% Pb)	Excellent	6,800	18	Excellent	0.273	515-580	Specially formulated for castings with flat surfaces that require a high polish. Relatively low melting point lengthens mold life.
8707 <b>Levalloy II</b> (70% Zn, 30% Cd)	Excellent	12,000	30	Very Good	0.275	700-760	Tin-free, lowering cost, but maintains excellent end-use flexibility. May require use of silicone rubber molds for heavier pieces or longer production runs. Can be soldered using a reactive flux.
7604 <b>60% Pewter</b> (60% Sn, 37% Pb, 3% Sb)	Good	7,500	14	Good	0.304	475-550	Lowest melting point of this group, providing for longest mold life and lowest energy costs.

# LEAD-BASE GROUP

Belmont Alloy No. Name/Comp.	Fluidity	Tensile Strength p.s.i.	Brinell Hardness Number	Ductility	Density lbs./cu. in.	Casting Range °F	Comments
5632 <b>35% Pewter</b> (35% Sn, 3% Sb, 62% Pb)	Fair-good	7,800	13	Fair-good	0.341	510-600	Offers opportunity for cost savings where its relatively high weight is not a problem.
5731 <b>25% Pewter</b> (25% Sn, 3% Sb, 72% Pb)	Fair	6,200	12	Fair	0.357	550-675	Lowest cost. Used for inexpensive end use products and where its high weight is ok.
5841 <b>412 Metal</b> (4% Sn, 12% Sb, 84% Pb)	Good	10,000	22	Good	0.380	575-675	Good strength. As eutectic alloy of lead, antimony, and tin, offers lowest casting temperature of this group.
5877 <b>C-10 Metal</b> (3% Sn, 10% Sb, 87% Pb)	Excellent	9,000	16	Fair-good	0.375	590-680	Excellent low-cost alloy. High-antimony lead alloy specially treated to increase ductility and fluidity. Useful where castings may be subject to bending.
5866 <b>CT Metal</b> (1% Sn, 13% Sb, 1% As, 85% Pb)	Excellent	9,800	18	Fair	0.365	575-675	Particularly suitable for larger pieces such as decorative trim, and for trophies usually cast in bronze molds.
5933 <b>9% Antimony Lead</b> (1% Sn, 9% Sb, 90% Pb)	Good	7,500	16	Fair	0.370	600-700	Good castability. Somewhat brittle. Moderate cost.
5956 <b>401 Metal</b> (1% Sn, 4% Sb, 95% Pb)	Good	6,800	13	Fair	0.390	620-700	Low cost, no bending, high weight.