



Belmont
M E T A L S I N C.

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DATA SHEET

ZN-12

ZA-12 (ILZRO 12) 8871 ZINC BASE ALLOY

ZA-12 Zinc Base alloy is suitable for casting in sand, permanent, investment, plaster, and silicon rubber molds where it develops "as cast" properties similar to high pressure die cast alloys. Some of the advantages of ZA-12 alloy are relative insensitivity to cooling rate; excellent machinability; more faithful reproduction of pattern detail due to excellent castability; platability similar to zinc die cast parts; economic advantage by virtue of lower material costs and lower casting temperature than competitive copper base alloys. ZA-12 is often used to produce prototype or short run parts that may be eventually die cast. It is also used to replace parts cast in non ferrous alloys, particularly copper base alloys and some ferrous castings. ZA-12 is useful in producing engineered castings in silicon rubber molds where higher properties are required.

CHEMICAL COMPOSITION (ASTM 791-88 UN8 Z35631) (wt %)

Aluminum	10.5-11.5	Lead	0.006 MAX
Copper	0.5-1.25	Cadmium	0.006 MAX
Magnesium	0.015-0.030	Tin	0.003 MAX
Iron	0.075 MAX	Zinc	Balance

TYPICAL PHYSICAL PROPERTIES

Melting Range	710-810°F(377-432°C)
Pouring Range	850-950°F(455-538°C)
Density	0.218 lbs/in ³ @ 70°F (6.03 g/cm ³ @ 20°C)
Specific Gravity	6.03
Thermal Conductivity	67.1 BTU/ft/hr/°F @ 75°F
Electrical Conductivity	28.3% I.A.C.S. @ 68°F

TYPICAL MECHANICAL PROPERTIES

	<u>Sand Cast</u>	<u>Chill Cast</u>
Tensile Strength	40,000-45,000 psi	45,000-50,000 psi
Yield Strength (0.2% Offset)	30,000-31,000 psi	31,000-32,000 psi
Elongation in 2 inches	1-3.5%	5-6%
Hardness (Brinell 500 kg)	95-110	105-120
Shear Strength	36,000-38,000 psi	36,000-38,000 psi
Impact Strength (Charpy 1/4" x 1/4" bar untouched)	12 ft lbs.	12 ft lbs.

- See Reverse -

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FABRICATION PRACTICES

Stress Relieving Temperature
Machinability is excellent

212°F(100°C) for 3-6 hours, air cool

CASTING TECHNIQUE

Since ZA-12 alloy does not dross readily, gating systems such as used for red brasses or aluminum alloys are suitable. Likewise the riser practice used for red brass or aluminum can be used. Contrary to most non ferrous alloys, surface shrinkage tends to occur on the underside(drag) as opposed to the upperside (cope) surface. Therefore important surfaces should be on the upperside (cope).

CASTING CHARACTERISTICS

Pattern Maker's Shrinkage	5/32 in/ft
Drossing	Low
Gassing	Low
Fluidity	Excellent
Shrinkage	Low (solidification shrinkage 1.2%)
Casting Yield	High
Casting Structure	Fine Grained & Dense

MELTING

ZA-12 should be melted as rapidly as possible using a clay-graphite or other refractory pot. Iron pots should be avoided due to possible iron contamination. Deoxidation or degassing is not necessary. To prevent possible aluminum segregation, a gentle stirring of the melt followed by skimming is recommended. If possible keep the pouring temperature below 930°F(500°C).

JOINING

ZA-12 can be joined to itself by TIG welding. If filler metal is required it should be of ZA-12 composition.

Soldering of ZA-12 with tin lead solders or other conventional solders is not possible. It has been reported that cadmium-zinc solders will solder ZA-12 to itself or other alloys, but due to the potential health hazards of Cadmium containing solder, this should only be attempted with approved methods using the recommended protective equipment.

CORROSION RESISTANCE

ZA-12 is considered to have the corrosion resistance of zinc die castings. If appearance is important, ZA-12 castings can be protected by chromium plating, chromate conversion coating, anodizing, paints, or other means.

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 in-service performance of these products due to our lack of control over, or supervision of, their use.