

Zinc ZA-12 (Zn-11Al-1Cu-0.025Mg), Sand Cast

Categories: [Metal](#); [Nonferrous Metal](#); [Zinc Alloy](#)

Material Notes: Used in bearing applications. ZA-12 has a higher bearing load capacity than bronze bearing alloys, although its environment (both temperature and corrosive) is more limited.

Key Words: UNS Z35630 (ingot); UNS Z35631 (Casting); ZA-12 Zinc Foundry Alloy; Previously ILZRO 12

Vendors: [Click here to view all available suppliers for this material.](#)

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Physical Properties	Metric	English	Comments
Density	6.04 g/cc	0.218 lb/in ³	
Mechanical Properties			
Hardness, Brinell	94	94	500 kg load; 10 mm hardened steel ball
Hardness, Knoop	119	119	Estimated from Brinell Value
Hardness, Rockwell A	39.5	39.5	Estimated from Brinell Value
Hardness, Rockwell B	59	59	Estimated from Brinell Value
Hardness, Vickers	106	106	Estimated from Brinell Value
Tensile Strength, Ultimate	299 MPa @Diameter 12.7 mm	43400 psi @Diameter 0.500 in	
Tensile Strength, Yield	205 MPa @Strain 0.200 %	29700 psi @Strain 0.200 %	
Elongation at Break	1.5 %	1.5 %	in 5 cm
Modulus of Elasticity	83.0 GPa	12000 ksi	
Compressive Strength	230 MPa	33400 psi	
Fatigue Strength	103 MPa @# of Cycles 5.00e+8	14900 psi @# of Cycles 5.00e+8	Reverse Bend
Fracture Toughness	14.5 MPa-m ^{1/2}	13.2 ksi-in ^{1/2}	
Shear Strength	253 MPa	36700 psi	
Charpy Impact, Unnotched	26.0 J @Thickness 6.35 mm	19.2 ft-lb @Thickness 0.250 in	square bar
Electrical Properties			
Electrical Resistivity	0.00000610 ohm-cm	0.00000610 ohm-cm	
Thermal Properties			
Heat of Fusion	118 J/g	50.8 BTU/lb	
CTE, linear	24.1 µm/m-°C @Temperature 20.0 °C	13.4 µin/in-°F @Temperature 68.0 °F	
Specific Heat Capacity	0.450 J/g-°C @Temperature 20.0 - 100 °C	0.108 BTU/lb-°F @Temperature 68.0 - 212 °F	
Thermal Conductivity	116 W/m-K	805 BTU-in/hr-ft ² -°F	
Melting Point	377 - 432 °C	711 - 810 °F	
Solidus	377 °C	711 °F	
Liquidus	432 °C	810 °F	
Processing Properties			
Casting Temperature	460 - 490 °C	860 - 914 °F	
Component Elements Properties			
Aluminum, Al	10.5 - 11.5 %	10.5 - 11.5 %	Addition, Casting
	10.8 - 11.5 %	10.8 - 11.5 %	Addition, Ingot form
Cadmium, Cd	<= 0.0050 %	<= 0.0050 %	Impurity, Ingot form
	<= 0.0060 %	<= 0.0060 %	Impurity, Casting
Copper, Cu	0.50 - 1.2 %	0.50 - 1.2 %	Addition, Casting
	0.50 - 1.2 %	0.50 - 1.2 %	Addition, Ingot form
Iron, Fe	<= 0.065 %	<= 0.065 %	Impurity, Ingot form
	<= 0.075 %	<= 0.075 %	Impurity, Casting
Lead, Pb	<= 0.0050 %	<= 0.0050 %	Impurity, Ingot form
	<= 0.0060 %	<= 0.0060 %	Impurity, Casting
Magnesium, Mg	0.015 - 0.030 %	0.015 - 0.030 %	Addition, Casting
	0.020 - 0.030 %	0.020 - 0.030 %	Addition, Ingot form
Tin, Sn	<= 0.0020 %	<= 0.0020 %	Impurity, Ingot form
	<= 0.0030 %	<= 0.0030 %	Impurity, Casting
Zinc, Zn	87.193 - 88.68 %	87.193 - 88.68 %	As balance; Ingot per ASTM B 669
	87.18 - 88.985 %	87.18 - 88.985 %	As balance; Castings per ASTM B 791

[References](#) for this datasheet.

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