

MAZAK 12

ZnAl11Cu1

EN1774 ZL1110

A general purpose foundry alloy offering an excellent combination of physical and mechanical properties and castability. Notable are its hardness, tensile strength, machinability and bearing properties.

The alloy can be cast by a wide variety of methods, sand, gravity die and graphite mould being the most common, but cold chamber pressure diecasting, shell moulding, plaster casting and investment casting are also successful.

ZA12 is a useful replacement for ferrous materials, its higher first cost frequently being more than made up for by reductions in machining and finishing costs.

MECHANICAL PROPERTIES	AS-CAST	AGED	SAND	GRAVITY
Tensile Strength (MPa)	404	310	275 - 317	310 - 345
Yield Strength (MPa)	320	241	207	268
Shear Strength (MPa)	296	234	255	241
Elongation (% in 51mm)	4 - 7	10	1 - 2	1 - 2
Hardness (Brinell - 500Kg)	95 - 105	91	92 - 96	85 - 95
Impact Strength (Energy, Joules)	29	19	25	
Fatigue Strength 5 x 10 ⁸ cycles (MPa)	-		103	52

PHYSICAL PROPERTIES	
Density	6.0 Kg/dm ³ at 21°C
Solidification shrinkage	1.25%
Casting shrinkage	0.7% (pressure diecast)
Freezing range	377 - 432°C
Casting temperature	470 - 530°C
Specific heat capacity	448 J/Kg/°C at 20 - 100°C
Thermal expansion	24.2 x 10 ⁻⁶ linear per °C at 20 - 100°C
Thermal conductivity	116.1 W/m/hr/m ² /°C at 70 - 140°C
Electrical conductivity	28.3% IACS
Electrical resistance	6.1 μ ohm cm at 20°C

TYPICAL ANALYSIS

ALLOYING ELEMENTS	
Aluminum	11.1%
Copper	0.9%
Magnesium	0.025%

IMPURITIES	
Iron	< 0.05%
Lead	< 0.003%
Cadmium	< 0.003%
Tin	< 0.001%
Nickel	< 0.005%
Thallium	< 0.001%
Indium	< 0.0005%
Manganese	< 0.01%