The Brock Metal Company Limited

BROCK ZL-12

PRESSURE DIE CASTING FOUNDRY ALLOY

ZL12 is a 12% Aluminium – Zinc alloy which conforms to EN 1774 1998. It has been developed for use as a general-purpose foundry alloy. Its unique properties enable it to be cast using any of the conventional gravity casting processes. ZL12 is a strong, sound alloy capable of casting thin sections and intricate details. The economical ZL12 has low initial and conversions costs. It can be cold chamber pressure die cast using a similar process to that used for making Aluminium pressure castings.

The casting properties of ZL12 enable it to compete favourably with other cast metals such as Iron, Brass, Bronze and Aluminium Alloys. ZL12 has excellent machining characteristics, good corrosion resistance and requires only the minimum of surface preparation for easy electroplating or painting. The original specification for this alloy was developed by the International Lead Zinc Research Organisation Inc. New York USA. ZL12 was known as Kayem 12 and ZA12 in the past. ZL12 is the EN 1774 equivalent of these alloys.

Mechanical

Mechanical		Sand Cast	Permanent Mould(Gravity Die)
Tensile	N/mm^2	276-310	345-380
	$(lbf/in^2 x 10^3)$	(40-45)	(50-55)
Elongation	% in 2 in	3-4	4-7
Impact Strength	J	5.4-10.8	17.6
(unnotched samples)	(ft.lbf)	(4-8)	(13)
Hardness	BHN	105-125	

Physical

Density	g/cm^3	603	
	(lb/in^3)	(0.218)	
Pattern Makers Shrinkage	cm/m (in/ft)	1.30 ($^3/_{32}$)	1.04 ($^1/_8$)
Electrical Conductivity	%age IACS	25	

Thermal

Melting Range	°C	380-430
Casting Temperature	°C	475-520
Thermal Conductivity at 24 °C	W/m°C	0.21-0 22

Comparison of Typical Properties

		ZL12	Brass BS 1400 SCB3	Aluminium Alloy LM6	Grey Cast Iron
Tensile Strength	N/mm^2	276-380	185-250	160-185	165-345
Elongation	%	3-7	15-30	5-7	<0.5
Hardness	BHN	105-125	45-65	55-60	200-250
Density	g/cm^3	6.03	8.5	2.65	7-7.5
Melting Range	°C	380-430	920-1000	580-640	1090-1260
Thermal Conductivity	W/m°C	0.21	0.26	0.34	0.1-0.12
Electrical Conductivity	%age IACS	25	25	37	-
Machinability Rating		Very Good	Very Good	Fair	Fair
Finishing Characteristics		Very Good	Very Good	Fair	Poor

Properties vary for different processes. Further data available in the technical resource area on brockmetal.com

Advantages

- Economical alloy cost with clean low-cost melting & low metal loss
- Insensitive to different cooling rates allowing it to be cast by all gravity casting processes
- Excellent castability giving pressure tightness, thin sections, intricate detail.
- Low shrinkage & gas porosity, high sand reclamation.
- Existing pattern equipment and gravity dies can be used
- Excellent machining properties
- Excellent buffing and polishing characteristics
- Easily electroplated, painted or lacquered.
- Good corrosion resistance
- Excellent tensile strength and hardness at ambient temperatures
- Non-sparking alloy suitable for hazardous environments
- Good bearing and wear properties for lightly loaded applications

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