

LM2

Aluminium Casting Alloy (AL – Si10Cu2Fe) Colour Code – Red / White

Chemical composition

Copper	0.7 – 2.5
Magnesium	0.3 Max
Silicon	9.0 – 11.5
Iron	1.0 Max
Manganese	0.5 Max
Nickel	0.5 Max
Zinc	2.0 Max
Lead	0.3 Max
Tin	0.2 Max
Titanium	0.2 Max
Aluminium	Remainder

Mechanical Properties

	<u>Chill Cast</u>	<u>Die Cast</u>
0.2 % Proof Stress (N/mm ²)*	90 -130	130
Tensile Stress (N/mm ²)*	150 -200	300
Elongation (%)*	1 – 3	1 – 3
Impact Resistance. Charpy (Nm)	-	2.9
Brinell Hardness Number	65 -90	65 -90
Modulus of Elasticity (x10 ³ N/mm ²)	71	71

* The values shown are typical for chill cast bars produced to the requirements of BS 1490 or diecast 6mm diameter test bars; minimum specification requirements are in heavy type. Charpy test is for an un-notched test bar.

Strength at Elevated Temperatures

The reduction in strength of the alloy at elevated temperature depends upon composition. If the amounts of the elements present, particularly copper, nickel and manganese are low, the strength is greatly reduced at temperatures of the order of 250°C but if the maximum permissible amounts of these elements are present the alloy retains moderate strength at this temperature.

It should be noted however, that other factors may restrict the use of diecastings at elevated temperatures.

Physical Properties

Coefficient of thermal Expansion (per degree Centigrade at 20 – 30°C.)	0.000020
Thermal Conductivity (Cal / cm ² / cm / °C / sec at 20°C)	0.24
Electrical Conductivity (% Copper Standard at 20°C)	26
Solidification Shrinkage (approx. %)	3.7
Specific Gravity	2.79
Freezing Range (°C) approx.	520 – 580

Figure for conductivity applies to Diecastings. Values are approximate and will vary with condition.

Machinability

This alloy is a little difficult to machine since the high silicon content causes rapid tool wear. It is, however, far easier than the LM6 and LM20 alloys as the tendency to drag is practically eliminated by the presence of copper and other elements.

Carbide-tipped tools are advocated but high speed steel tools give good results. A cutting lubricant and coolant should be employed.

Corrosion Resistance

Resistance to corrosion by ordinary atmospheric conditions is good and by marine atmosphere fairly good. It is inferior in this respect to LM6 but can be improved by anodic treatment.

Anodising

LM2 can be anodically treated to give a protective surface of a darkish grey colour to the surfaces of diecastings. However, they are not generally suitable for decorative anodising.

Casting Characteristics

FLUIDITY – Can be cast into thin and intricate sections with ease.

PRESSURE TIGHTNESS – Suitable for leak-tight castings.

HOT-TEARING – Castings exhibit virtual freedom from hot-tearing.

TYPICAL POURING TEMPERATURE – Pouring temperatures for diecastings depend very largely on the particular casting and the machine, and vary too widely for a typical temperature to provide useful guidance. The melt should not, however, be allowed to stand at temperatures only little above the freezing range or the bottom of the melt may become enriched in such elements as iron and manganese.

Heat Treatment

Castings in this alloy are not heat-treated.

Applications and General Notes

Essentially a diecasting alloy, LM2 is not normally used for other types of casting. As a general purpose alloy its applications are extremely varied and widespread and it may be used for almost any component which can be diecast, unless the service conditions demand a higher resistance to corrosion or slightly greater ductility, in which case LM6 or LM20 may be preferred.

For the vast majority of diecastings, the alloys LM2 and LM24 are equally suitable.

