

Description

LM138 is a lead-free, low-melt metal alloy with a sharp 138°C melting point and very low shrinkage, suitable for casting melt-out metal cores/mandrels for hollow composites moulding processes.

Key Features

- Low melt at 138°C
- Low volume change
- Reusable once melted out
- Suitable for pre-preg processes
- Lead free

Typical Uses

- Fusible core / lost core / melt-out core in composites or injection moulding
- Work holding / anchoring and support
- Press tools

LM138 is most typically used for casting solid cores or mandrels for a 'lost core' moulding process, in particular prepregs but also resin infusion, RTM and injection moulding providing that the resin systems used in the process will not be damaged by being heated to the 138°C melting point of the alloy.

Due to its low melting point, very low liquid-to-solid volume change and good mechanical properties, LM138 also finds uses as press tools, and anchoring or support material.

Specification

The recommended casting temperature for LM138 is 165°C - 190°C.

LM138 has excellent ductility and good fluidity. In common with all bismuth alloys, it undergoes gradual equilibrium following solidification, exhibiting slow dimensional changes, the rate of which is dependent on post solidification treatment.

Mechanical Properties

The table below shows typical properties:

Property	Unit	Value
Density	g/cm ³	8.6
Brinell Hardness	-	22
Melting Point	°C	138
Solidification Point	°C	138
Specific Heat (solid)	J/g°C	0.167
Specific Heat (liquid)	J/g°C	0.155
Thermal Conductivity	W/cm°C	0.209
Electrical Resistivity	mΩ.cm	59
Latent Heat of Fusion	J/g	49.1
Compressive Strength	MPa	46.7
Tensile Strength	MPa	42.1
Coefficient of Thermal Expansion	mm/°C	0.0004
Volume Change (liquid to solid)	%	+0.7
Dimensional Change After Solidification	%	0.00% 30 mins 0.01% 1 hour 0.03% 5 hour 0.06% 24 hour

Material composition:

Bismuth	58%
Tin	42%

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