

Liquid Metal

Epoxy Repair Coating

Description

Liquid Metal is a metal-filled, two-part epoxy coating. It is brush applied to external surfaces of steel, other metals and most plastics. Once cured, it provides a smooth, metallic, hard-wearing outer coating which protects against corrosion and chemical attack. It is ideal for the protection and maintenance of pipework, pumps, valves, impellers, flange faces, tanks and metal castings.

In pipeline reinforcement and protection applications, Liquid Metal also protects against internal corrosion. The outer shell provided by Liquid Metal creates an impermeable membrane around pipework, capable of withstanding future breaches from inside and containing pipe content. When applied with a **SylWrap Pipe Repair Bandage**, Liquid Metal can be used as a load-transfer layer.

Aside from pipe repair and refurbishment, Liquid Metal is used to bond silicon carbide grit for the creation of non-slip surfaces. It has been used as an adhesive for the re-gritting of potato peeler drums. In the automotive industry, Liquid Metal is used for radiator core, intercooler, condenser and fuel tank repairs. It can also be poured into rubber moulds to create metal casts.

With a 90 minute gel time, Liquid Metal can be mixed and applied in large quantities without the worry of curing before application is complete. Its light consistency makes it easy to mix and apply with little sag. It is virtually odourless, with no unpleasant smell. It can be easily machined and is temperature resistant to 150°C.

Applications

- Protecting pipework, pumps, valves, flange faces and tanks from external and internal corrosion
- Increasing adhesion between pipe surface and composite wrap, creating a load transfer layer
- Maintenance of impellers, water box ends, metal castings, machinery, etc.
- Creating non-slip, gritted surfaces when used with silicon carbide grit
- Moulding into casts
- Bedding in/anchoring of bolts into concrete

Advantages

- Easy to mix and apply with a long working time for complex applications
- Excellent adhesion to metalwork and plastic
- Solvent free

Technical Data

Minimum shelf life (months @ 24°C)	24
Mix ratio (weight)	5:1
Mix ratio (volume)	3:1
Gel time (minutes)	90
Recoat time (hours)	4-6
Full cure (hours)	24
Thickness per coat (mm)	0.5-1.0
Shore D hardness (full cure, 24 hrs.)	>80
Tensile strength (MPa)	28
Compressive strength (MPa)	59
Flexural strength (MPa)	58
Density (gm/cm ³)	1.55
Shrinkage (%)	<1
Non-volatile content (%)	100
Heat distortion	
Cured at room temperature (°C)	50
Post cured (°C)	117
Maximum service temperature (°C)	150
Coverage (per kg)	
0.5mm thick (m ²)	1.2
0.20in thick (ft ²)	13

(values are typical and should only be used as a guideline)



Whilst all reasonable care is taken in compiling technical data on the Company's products, all recommendations or suggestions regarding the use of such products are made without guarantee, since the conditions of use are beyond the control of the Company. It is the customer's responsibility to satisfy themselves that each product is fit for the purpose for which they intend to use it, that the actual conditions of use are suitable and that in the light of our continual research and development programme the information relating to each product has not been superseded.

Directions for Use**Surface Preparation**

- Surfaces must be prepared prior to application.
- All surfaces must be dry and free of grease. Clean and roughen the surface for optimum adhesion.
- Remove all paint, rust and grime from the surface by abrasive blasting or with sandpaper.
- If applying to aluminium, remove oxidation from surface for optimal adhesion.
- Roughen the surface first, ideally by grit blasting (8-40 mesh grit) or through grinding with a coarse wheel or abrasive disc pad. An abrasive disc may be used provided white metal is revealed. Roughening the surface creates a "key" which improves the grip of the coating to the substrate.
- Metal which has been in contact with seawater or other salt solutions should be grit blasted, high pressure water blasted and then left overnight to allow salts in the metal to 'sweat' to the surface. Repeat this process if necessary to 'sweat out' all of the soluble salts.
 - Test for chloride contamination before application.
 - The maximum soluble salts left on the substrate should be no more than 40 ppm.
- Use a solvent cleaner to remove all traces of sandblasting, grit, oil, grease, dust or other foreign substances.
- In cold working conditions, it is recommended the repair area is heated to 37°C-43°C prior to application. This will dry off any moisture, contamination or solvents for maximum adhesion.
- Apply Liquid Metal as soon as possible after preparation to avoid oxidation or rusting.

Mixing Liquid Metal

- Measure 5 parts resin to 1 part hardener by weight or 3 parts resin with 1 part hardener by volume. For convenience when mixing an entire kit, Liquid Metal is supplied with Part A and Part B in the correct ratio. The resin container has enough room to dispense the hardener straight into it, meaning Liquid Metal can be applied straight from the pack.
- Mix with a brush or stirrer until the epoxy is streak free and a uniform colour.

Application as a Coating

- Apply Liquid Metal with a brush. Each coating should be 0.5mm-1.0mm thick. Apply at least two coats to ensure a pinhole-free coating.
- Ensure previous coating has fully hardened before applying next coat. Re-coat time is approximately 4-8 hours.
- Liquid Metal work time is 90 minutes. A tack free finish is achieved around four hours after application. A full cure is achieved in 24 hours. Exact cure time is dependent upon the thickness of the application and temperature at the time of the repair.
- Cure can be accelerated using heat after the coating has been allowed to harden at ambient temperature. Material will fully cure at 130°C in two hours.

Post Curing

- Heat resistance can be as high as 150°C. To achieve max temperature resistance, Liquid Metal should be post-cured:
- Cure at room temperature for 24 hours.
- Heat at 80°C for 2 hours.
- Heat at 130°C for 3 hours.
- Allow to cool.

Mould Making with Liquid Metal

- Coat the mould box with a Release Agent and allow to dry for 10 minutes. Apply second coat and allow to dry for 10 minutes.
- Use a small brush to apply a thin coat of Liquid Metal over the surface. This helps prevent air bubbles forming during curing.
- Pour Liquid Metal into the box. If possible, tilt the box slightly to one side to allow air to escape and prevent blow holes.
- De-mould when the product has cured at room temperature.
- Pre-heating the mould to 43°C will allow the epoxy to flow better and reduce air entrapment

Packaging

Product Code	Pack Size
PBS-500g	500g
PBS-4x500g	4 x 500g
PBS-2kg	2kg
PBS-5kg	5kg

Bulk sizes available on request. Please contact Sylmasta.

Storage

Liquid Metal should be stored out of direct sunlight in dry, frost free conditions at temperatures between 15°C and 20°C. Under such conditions, shelf life will be two years from the date of manufacture.

Health & Safety

Liquid Metal consists of epoxy resins and hardener systems. Please consult the individual Material Safety Data Sheet for hazard information. Wear eye protection and rubber or plastic coated gloves. Wash hands with soap and water immediately after use.

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