

## ER2188 Epoxy Resin

ER2188 is a UL approved, general purpose, two-part potting and encapsulating compound. The system utilises a hardener free of DDM or other aromatic amines. The flame retardant technology used is of a 'clean' type leading to relatively low toxicity fumes and low smoke emission.

- General purpose resin ideal for many applications; cost effective protection
- UL approved; UL94 V-0 flame retardancy rating
- Excellent electrical properties; offers protection in a wide range of conditions
- Does not contain abrasive fillers; low wear on dispensing machinery

**Approvals**                      **RoHS Compliant (2015/863/EU):**                      **Yes**  
**UL Approval:**                      **UL94 V-0 (File: E100107)**

### Typical Properties

|                    |   |   |
|--------------------|---|---|
| Liquid Properties: | Base Material   | Epoxy                                   |
|                    | Density Part A - Resin (g/ml)   | 1.83                                    |
|                    | Density Part B - Hardener (g/ml)  | 0.92                                    |
|                    | Part A Viscosity (mPa s @ 23°C)   | 150000                                  |
|                    | Part B Viscosity (mPa s @ 23°C)   | 200                                     |
|                    | Mixed System Viscosity (mPa s @ 23°C)   | 9000                                    |
|                    | Mix Ratio (Weight)  | 10.97:1                                 |
|                    | Mix Ratio (Volume)  | 5.53:1                                  |
|                    | Usable Life (20°C)  | 60 mins                                 |
|                    | Gel Time (23°C)   | 150 mins                                |
|                    | Cure Time (23°C)  | 24 hours                                |
|                    | Cure Time (60 °C)   | 2 hours                                 |
|                    | Cure Time (100 °C)  | 20 minutes                              |
|                    | Colour Part A - Resin   | Black                                   |
|                    | Colour Part B - Hardener  | Amber                                   |
|                    | Storage Conditions  | Dry Conditions: Above 15°C, Below 35°C  |
|                    | Shelf Life  | 24 Months (bulk) 18 months (resin pack) |
|                    | Exotherm<br><small>(Measured on 100ml sample; cylinder of diameter 49.4mm @ 23°C)</small> | < 35°C                                  |
|                    | Shrinkage   | < 1%                                    |

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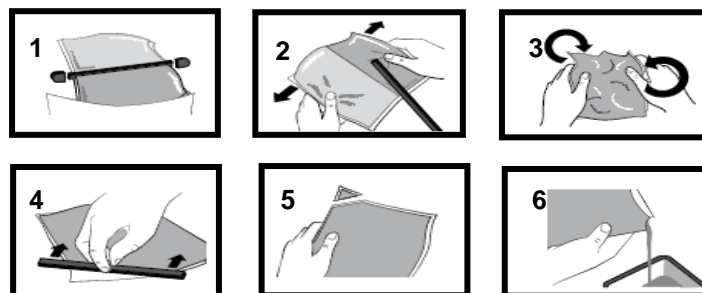
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|               |   |                  |
|---------------|---|------------------|
| Cured System: | Thermal Conductivity (W/m.K)  | 0.91             |
|               | Cured Density (g/ml)  | 1.69             |
|               | Temperature Range (°C)  | -40 to +120      |
|               | Max Temperature Range (Short Term (°C)/30 Mins)<br>(Application and Geometry Dependent) | +140             |
|               | Relative Thermal Index (°C) (UL File #E100107)  | +130             |
|               | Dielectric Strength (kV/mm) (ASTM D149-09)  | 16.6             |
|               | Volume Resistivity (ohm-cm)   | 10 <sup>14</sup> |
|               | Breakdown Voltage (kV) (ASTM D149-09; 3.3mm)  | 56.5             |
|               | Shore Hardness  | D85              |
|               | Colour (Mixed System)   | Black            |
|               | Flame Retardancy  | Yes              |
|               | Tensile Strength (MPa)  | 50               |
|               | Compressive Strength (MPa)  | 120              |
|               | Deflection Temperature (°C)   | 50               |
|               | Coefficient of Expansion (ppm/°C)   | 40               |
|               | Loss Tangent @ 50 Hz  | 0.04             |
|               | Permittivity @ 50 Hz  | 4.00             |
|               | Comparative Tracking Index  | >850 Volts       |
|               | Water Absorption (9.7mm thick disk, 51mm diameter)<br>10 days @ 20°C / 1 hour @ 100°C   | < 0.5% / < 1%    |
|               | Elongation At Break   | 0.4%             |

## **Mixing Procedures**

### **Resin Packs**

When in Resin pack form, the resin and hardener are mixed by removing the clip and moving the contents around inside the pack until thoroughly mixed. To remove the clip, remove both end caps, grip each end of the pack and pull apart gently. By using the removed clip, take special care to push unmixed material from the corners of the pack. Mixing normally takes from three to four minutes depending on the skill of the operator and the size of the pack. Both the resin and hardener are evacuated prior to packing so the system is ready for use immediately after mixing. The corner may be cut from the pack so that it may be used as a simple dispenser. There is also a YouTube video ([Epoxy Mixing Instructions](#)) available on the Electrolube channel to show the mixing process.



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### Bulk Mixing

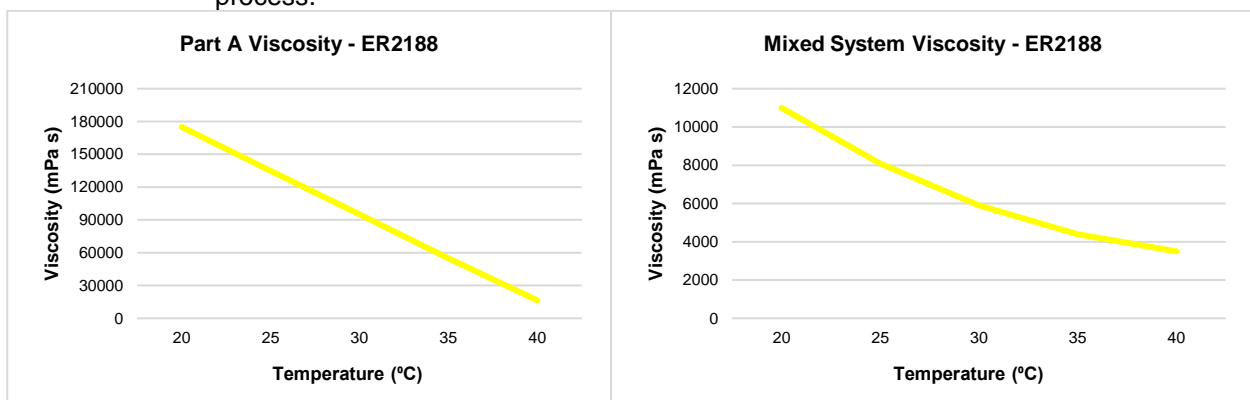
When mixing, care must be taken to avoid the introduction of excessive amounts of air. Automatic mixing equipment is available which will not only mix both the resin and hardener accurately in the correct ratio but do this without introducing air. Containers of Part A (Resin) and Part B (Hardener) should be kept sealed at all times when not in use to prevent the ingress of moisture. Bulk material must be thoroughly mixed before use. Incomplete mixing or use of the wrong mix ratio will result in erratic or partial curing.

### General

Sedimentation of the resin has been minimised by careful attention to the formulation. However, any sediment which may have occurred over long periods of time must be dispersed before removing any material from the container. This dispersion can be carried out (if necessary) by stirring with a broad bladed spatula or gently rolling the can. Take care not to introduce excessive amounts of air during this operation or it may be necessary to re-evacuate the resin. Sedimentation will be accelerated by storage at high temperatures. Sedimentation found in resin packs forms no problem since the sediment is re-mixed when the pack is used.

### Additional Information

**Viscosity:** Heat can be used to reduce the viscosity of the resin to aid flow during the potting process.



**Cleaning:** It is far easier for machines & containers to be cleaned before the resin has been allowed to cure. Electrolube's RRS is suitable for cleaning machines and containers and cured resin may be slowly softened and removed by soaking in our RRS.

**Curing:** Do not heat cure large volumes immediately. Allow these to gel at room temperature and post-cure at high temperature if required (refer to liquid properties for details). Small volumes (250ml) may be heat cured immediately.

**Storage:** When storing under very cold conditions, the hardener may crystallise. If this occurs, simply warm (40°C) the container gently until all crystals have re-melted.

**Health & Safety:** Always refer to the Health & Safety data sheet before use. These can be downloaded from [www.electrolube.com](http://www.electrolube.com)

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