

## ER1122 Epoxy Resin

ER1122 is a general purpose, two-part, hot or cold curing resin with superior adhesive properties. The cured material is tough however flexibility can be adjusted by altering the amount of hardener used. Increasing the amount of hardener will produce a more flexible product and decreasing the amount of hardener will produce a more rigid product. However, this should only be carried out after careful testing; some mix ratios are provided below.

- Excellent adhesion to a wide variety of substrates
- Adjustable flexibility to suit a range of applications; very versatile in use
- Good bond strength even in harsh conditions, including certain chemical environments
- Excellent electrical properties; can be used for encapsulation as well as bonding applications

|                  |                                       |            |
|------------------|---------------------------------------|------------|
| <b>Approvals</b> | <b>RoHS-2 Compliant (2011/65/EU):</b> | <b>Yes</b> |
|                  | <b>UL Approval:</b>                   | <b>No</b>  |

### Typical Properties

|                    |                                                                |                                        |
|--------------------|----------------------------------------------------------------|----------------------------------------|
| Liquid Properties: | Base Material                                                  | Epoxy                                  |
|                    | Density Part A - Resin (g/ml)                                  | 1.16                                   |
|                    | Density Part B - Hardener (g/ml)                               | 0.97                                   |
|                    | Part A Viscosity (mPa s 23°C)                                  | 11000                                  |
|                    | Part B Viscosity (mPa s 23°C)                                  | 15000                                  |
|                    | Mixed System Viscosity (mPa s 23°C)                            | 12000                                  |
|                    | Mix Ratio (Weight)                                             | 1:1                                    |
|                    | Mix Ratio (Volume)                                             | 0.83:1                                 |
|                    | Usable Life (20°C)                                             | 1-2 hours                              |
|                    | Gel Time (23°C)                                                | 4 hours                                |
|                    | Cure Time (23 °C)                                              | 48 hours                               |
|                    | Cure Time (60 °C)                                              | 4 hours                                |
|                    | Cure Time (100 °C)                                             | 1 hour                                 |
|                    | Colour Part A - Resin                                          | Clear                                  |
|                    | Colour Part B - Hardener                                       | Amber                                  |
|                    | Storage Conditions                                             | Dry Conditions: Above 15°C, Below 30°C |
|                    | Shelf Life                                                     | 24 Months                              |
|                    | Exotherm                                                       | < 35°C                                 |
|                    | (Measured on 100ml sample; cylinder of diameter 49.4mm @ 23°C) |                                        |
|                    | Shrinkage                                                      | < 0.5%                                 |

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|               |                                                                                         |                  |
|---------------|-----------------------------------------------------------------------------------------|------------------|
| Cured System: | Thermal Conductivity (W/m.K)                                                            | 0.20             |
|               | Cured Density (g/ml)                                                                    | 1.05             |
|               | Temperature Range (°C)                                                                  | -40 to +120      |
|               | Max Temperature Range (Short Term (°C)/30 Mins)<br>(Application and Geometry Dependent) | +140             |
|               | Dielectric Strength (kV/mm)                                                             | 12               |
|               | Volume Resistivity (ohm-cm)                                                             | 10 <sup>14</sup> |
|               | Shore Hardness                                                                          | D80              |
|               | Colour (Mixed System)                                                                   | Clear Amber      |
|               | Flame Retardancy                                                                        | No               |
|               | Tensile Strength (MPa)                                                                  | 45-50            |
|               | Compressive Strength (MPa)                                                              | 90               |
|               | Deflection Temperature (°C)                                                             | 35               |
|               | Coefficient of Expansion (ppm/°C)                                                       | 100              |
|               | Loss Tangent @ 50 Hz                                                                    | 0.01             |
|               | Permittivity @ 50 Hz                                                                    | 45               |
|               | Comparative Tracking Index                                                              | Not Measured     |
|               | Water Absorption (9.7mm thick disk, 51mm diameter)<br>10 days @ 20°C / 1 hour @ 100°C   | < 0.5% / < 1%    |
|               | Elongation At Break                                                                     | 2.5%             |

### **Typical Properties of Cured Resin**

Tensile shear strength of bonded pickled light alloy:

| Mix Ratio<br>(Resin:Hardener) | Cured 7 Days<br>@ 25°C | Cured 20 mins<br>@ 150°C |
|-------------------------------|------------------------|--------------------------|
| 2.0 : 1                       | 170kg/cm <sup>2</sup>  | 300kg/cm <sup>2</sup>    |
| 1.5 : 1                       | 180kg/cm <sup>2</sup>  | 310kg/cm <sup>2</sup>    |
| 1.0 : 1                       | 180kg/cm <sup>2</sup>  | 350kg/cm <sup>2</sup>    |
| 0.67 : 1                      | 150kg/cm <sup>2</sup>  | 300kg/cm <sup>2</sup>    |

Tensile shear strength of bonded LD polyethylene (cured 7 days at room temperature):

| Mix Ratio<br>(Resin:Hardener) | Flame Treated<br>Polyethylene | Chromic Acid Pickled<br>Polyethylene |
|-------------------------------|-------------------------------|--------------------------------------|
| 0.67 : 1                      | 13.1kg/cm <sup>2</sup>        | 13.2kg/cm <sup>2</sup>               |

Chemical resistance: Bond strength is fully retained after 12 months immersion in diesel oil and substantially retained after 6 months immersion in water, ethanol or benzene.

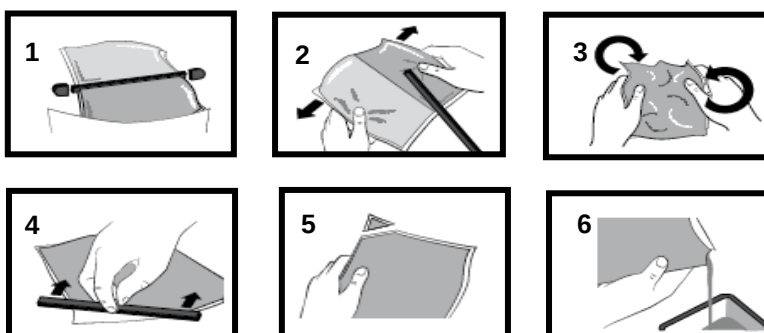
Effect of room temperature aging on bond strength of bonded pickled light alloy.  
Cured for 20 minutes @ 150°C, resin:hardener ratio 1:1:

| Not Aged              | 1 Month               | 3 Month               | 6 Month               | 18 Months             | 24 Months             | 60 Months             |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 330kg/cm <sup>2</sup> | 340kg/cm <sup>2</sup> | 280kg/cm <sup>2</sup> | 280kg/cm <sup>2</sup> | 300kg/cm <sup>2</sup> | 280kg/cm <sup>2</sup> | 210kg/cm <sup>2</sup> |

## **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 two 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.



### **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 will result in erratic or partial curing.

## **Additional Information**

- 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.
- 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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