# UR5118
## Polyurethane Resin

UR5118 is an ultra-high performance resin system, which offers very high protection in a range of harsh environments. It has low moisture sensitivity during cure and its low viscosity allows the resin to flow around complex geometries.

- Good electrical properties; used for encapsulating radio frequency transmitter devices
- High toughness and tear resistance; maintains flexibility down to -60°C
- Low water absorption, high resistance to sea water; offers enhanced protection under harsh conditions
- Excellent oxidation resistance and very good adhesion to most substrates

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| **Approvals** | **RoHS Compliant (2015/863/EU):** | **Yes** |
| | **UL Approval:** | **No** |

**Typical Properties**

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|---|---|---|
| Liquid Properties: | Base Material | Polyurethane |
| | Density Part A - Resin (g/ml) | 0.92 |
| | Density Part B - Hardener (g/ml) | 1.22 |
| | Part A Viscosity (mPa s @ 23ºC) | 3390 |
| | Part A Viscosity (mPa s @ 40ºC) | 1600 |
| | Part A Viscosity (mPa s @ 60ºC) | 780 |
| | Part B Viscosity (mPa s @ 23ºC) | 150 |
| | Mixed System Viscosity (mPa s @ 23ºC) | 2300 |
| | Mixed System Viscosity (mPa s @ 40ºC) | 1630 |
| | Mixed System Viscosity (mPa s @ 60ºC) | 860 |
| | Mix Ratio (Weight) | 2.77:1 |
| | Mix Ratio (Volume) | 3.66:1 |
| | Usable Life (20°C)* | 25-30 mins |
| | Usable Life (40°C)* | 12-17 mins |
| | Usable Life (60°C)* | 7-12 mins |
| | Gel Time (20°C)* | 40-45 mins |
| | Gel Time (40°C)* | 30-35 mins |
| | Gel Time (60°C)* | 12-17 mins |
| | Cure Time (23 °C)* | 36 hours |
| | Colour Part A - Resin | Black |
| | Colour Part B - Hardener | Brown |
| | Storage Conditions | Dry Conditions: Above 15ºC, Below 30ºC |
| | Shelf Life | 12 months |

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|---|---|---|
| | Exotherm<br>(Measured on 100ml sample in a cylinder of diameter 49.4mm @ 23ºC) | < 35ºC |
| | Shrinkage | < 1% |

* Dependent upon quantity and temperature; these figures are typical of 150g mass.

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| Cured System: | Thermal Conductivity (W/m.K) | 0.2 |
| | Cured Density (g/ml) | 0.99 |
| | Temperature Range (°C) | -60 to +125 |
| | Max Temperature Range (Short Term (°C)/30 mins)<br>(Application and Geometry Dependent) | +130 |
| | Dielectric Strength (kV/mm) | 18 |
| | Volume Resistivity (ohm-cm) | $10^{15}$ |
| | Shore Hardness (@ 20°C) | A80 |
| | Shore A Hardness (@ 100°C) | A40 |
| | Colour (Mixed System) | Black |
| | Flame Retardancy | No |
| | Dissipation Factor | 0.01 |
| | Dielectric Constant (50°C-150°C @ 25Hz-1MHz) | 3.1 |
| | Coefficient of Thermal Expansion (0ºC) | ~150 ppm |
| | Water Absorption | ≤ 0.5% |
| | Modulus (kPa s) | 1000 |
| | Tensile Strength (psi) | ~800 |
| | Tensile Elongation | ~50% |
| | Halides Content | 4 ppm |
| | Sulphur Content | ≤ 1ppm |

## Mixing Procedures

### Resin Packs

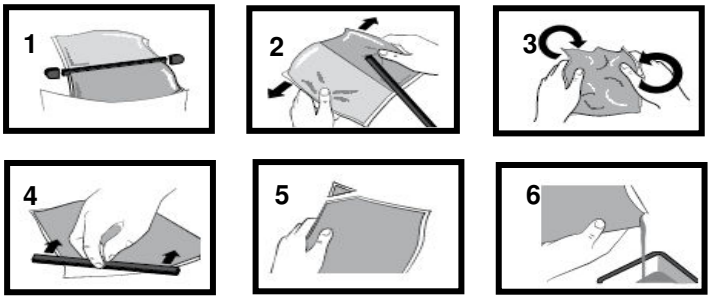
When in Resin pack form, the resin and hardener are mixed by removing the clip and moving the contents around inside the pack until thoroughly mixed. To remove the clip, remove both end caps, grip each end of the pack and pull apart gently. By using the removed clip, take special care to push unmixed 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 (Polyurethane 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.

## 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.

**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

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