

ES501 Underfill Resin

ES 501 is an underfill resin designed to improve adhesive strength of devices during mechanical stress, whilst not degrading the thermal cycle performance. Its high flexibility provides enhanced reparability and is ideal for high volume assembly processes.

- Fast, void-free underfill of area array devices; snap curable
- Re-workable and highly flexible; allows efficient repair work to be completed
- Excellent adhesion to substrates; maintains strength when thermally cycled
- Good electrical characteristics; high insulation resistance

Approvals **RoHS-2 Compliant (2011/65/EU):** **Yes**

Typical properties

Liquid Properties:	Raw material	Epoxy
	Appearance	Canary yellow liquid
	Density (g/ml)	1.16
	Viscosity @ 25°C (mPa s)	2000 - 4000
	Flow rate @ 50°C, 250µm gap	
	10mm travel on Glass, seconds	35
	15mm travel on Glass, seconds	60
	Shelf Life @-20°C	6 months
	@ 3°C	30 days
	@ 25°C	10 days
Cured Properties:	Density (g/ml)	1.16
	Coefficient of Thermal Expansion, <small>ASTM D696, K⁻¹</small>	65ppm
	Glass Transition Temperature <small>ASTM D 4065, (°C)</small>	≥60
	Thermal Conductivity, <small>ASTM C177, (W/m K)</small>	0.20
	Water absorption, 25°C /24 hours, (%)	0.26
	Halogen content, ppm	<900
	Surface Resistivity, <small>ASTM D257, (Ω)</small>	10 ¹⁴
	Volume Resistivity, <small>ASTM D257, (Ω-cm)</small>	10 ¹⁴

Description
 Underfill Resin

Packaging
 30ml syringe

Order Code
 ES501-40GS

Shelf Life
 See Above

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All information is given in good faith but without warranty. Properties are given as a guide only and should not be taken as a specification.

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Directions for Use

Application Information:

1. After storage in a refrigerator the adhesive must return to ambient temperature before use; 2 to 4 hours is recommended.
2. While it is not essential, the underfill area should be cleaned of contaminants and obstructions to optimize the speed and quality of the underfill.
3. Preheat assembly to between 75°C and 90°C. Higher temperatures reduce underfill times.
4. Recommended dispense pressure: 0.1~0.3MPa, dispense speed:2.5-12.5mm/s.
5. Syringe tip heating is not needed, but can be used.
6. Very large devices may require multiple beads of underfill, but for most no second or 'fillet pass' is required.
7. Uncured adhesive can be cleaned from the board with IPA or Safewash Total.
8. Material removed from containers may be contaminated during use. Do not return product to the original container.

Typical Curing:

Recommended conditions for curing are as follows:

90 °C	35-40 minutes
100 °C	20 minutes
120 °C	5 minutes
150 °C	3 minutes

The above cure profile is a guideline recommendation. Cure conditions (time and temperature) may vary based on specific application requirements, curing equipment, oven loading and actual oven temperatures.

Rework Procedure:

1. Remove the component from the substrate by using local application of heat onto the component.
2. The recommended heat profile is identical to the profile used during initial assembly.
3. Once the solder has reached temperatures above its reflow temperatures and then holding the temperature for 30~90seconds, lift the component off by using a slight twisting motion.
4. The site should be cleaned, removing any excess underfill and solder remaining on the PCB site.
5. Total time required for component removal is about 5 to 7 minutes.

Storage:

- Product is required to store in the unopened container in a dry location.
- Optimal Storage: -20°C. Storage below -20°C or greater than minus -20°C can adversely affect product properties.

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