

# Epoxy Potting and Encapsulating Compound



RoHS  
Compliant

## Description

This potting and encapsulating compound is a general purpose, hard, black, two-part epoxy that offers extreme environmental, mechanical and physical protection for printed circuit boards and electronic assemblies.

Due to its low mixed viscosity, this can easily penetrate small gaps and cavities. It also provides excellent electrical insulation and protects components from static discharges, vibration, abrasion, thermal shock, environmental humidity, salt water, fungus, and many harsh chemicals.

This epoxy has a convenient 1:1 volume mix ratio, making it compatible with most dispensing equipment. It can be cured at room temperature or higher.

## Features and Benefits

- Convenient 1A:1B volume mix ratio
- Low mixed viscosity of 4 100 cP
- Extremely high compressive and tensile strength
- Excellent adhesion to a wide variety of substrates including metals, composites, glass, ceramics, and many plastics
- Excellent electrical insulating characteristics
- Broad service temperature range -40 to 150 °C (-40 to 302 °F)
- Extreme resistance to water and humidity (allows for submersion where needed)
- Solvent-free

## Usage Parameters

Properties	Value
Working life @ 22°C [72°F]	45 min
Shelf life	5 y
Full cure @ 22°C [72°F]	24 h
Full cure @ 65°C [149°F]	2 h
Full cure @ 80 °C [176°F]	1 h
Full cure @ 100°C [212°F]	20 min

## Temperature Ranges

Properties	Value
Constant service temperature	-40°C to 150°C [-40°F to 302°F]
Intermittent temperature limit <sup>a)</sup>	-50°C to 175°C [-58°F to 347°F]
Storage temperature of unmixed parts	16°C to 27°C [61°F to 81°F]

<sup>a)</sup> Temperature range that can be withstood for short periods without sustaining damage.

## Cured Properties

Physical Properties	Method	Value <sup>a)</sup>
Colour	Visual	Black
Density @ 25°C [77°F]	ASTM D 1475	1.07 g/mL
Hardness	Shore D Durometer	80D
Tensile strength	ASTM D 638	32 N/mm <sup>2</sup> [4 600 lb/in <sup>2</sup> ]

Newark.com/exclusive-brands  
Farnell.com/exclusive-brands  
Element14.com/exclusive-brands



# Epoxy Potting and Encapsulating Compound



Physical Properties	Method	Value <sup>a)</sup>
Young's Modulus	ASTM D 638	2100 N/mm <sup>2</sup> [300000 lb/in <sup>2</sup> ]
Compressive Strength	ASTM D 695	75 N/mm <sup>2</sup> [11000 lb/in <sup>2</sup> ]
Lap shear strength (Stainless Steel)	ASTM D 1002	21 N/mm <sup>2</sup> [3100 lb/in <sup>2</sup> ]
Lap shear strength (Aluminium)	ASTM D 1002	14 N/mm <sup>2</sup> [2000 lb/in <sup>2</sup> ]
Lap shear strength (Copper)	ASTM D 1002	15 N/mm <sup>2</sup> [2200 lb/in <sup>2</sup> ]
Lap shear strength (Brass)	ASTM D 1002	11 N/mm <sup>2</sup> [1600 lb/in <sup>2</sup> ]
Lap shear strength (ABS)	ASTM D 1002	3.9 N/mm <sup>2</sup> [560 lb/in <sup>2</sup> ]
Lap shear strength (Polycarbonate)	ASTM D 1002	2.1 N/mm <sup>2</sup> [300 lb/in <sup>2</sup> ]

**Note:** Specifications are for epoxy samples cured at 80 °C for 1 hour and conditioned at ambient temperature and humidity.

<sup>a)</sup> N/mm<sup>2</sup> = mPa; lb/in<sup>2</sup> = psi

## Cured Properties

Electrical Properties	Method	Value <sup>a)</sup>
Breakdown voltage @ 2.5mm		
Dielectric strength @ 2.5mm		
Breakdown voltage @ 3.175mm [1/8"]		
Dielectric strength @ 3.175mm [1/8"]		
Volume resistivity @ 2.4mm		
Volume conductivity @ 2.4mm		
Dielectric dissipation, D @ 1 MHz		
Dielectric constant, k' @1 MHz		
Thermal Properties	Method	Value
Glass transition temperature (Tg)	ASTM D 3418	41°C [106°F]
CTE <sup>b)</sup> prior Tg	ASTM E 831	73ppm/°C [41 ppm/°F]
after Tg	ASTM E 831	207ppm/°C [115 ppm/°F]
Thermal conductivity @25°C [77°F]	ASTM E 1461 92	0.27 W/(m·K)
Thermal diffusivity @ 25°C [77°F]	ASTM E 1461 92	0.12 mm <sup>2</sup> /s
Specific heat capacity @ 25°C [77°F]	ASTM E 1269 01	2.0 J/(g·K)

**Note:** Specifications are for epoxy samples cured at 80 °C for 1 hour and conditioned at ambient temperature and humidity.

<sup>a)</sup> To allow comparison between products, the dielectric strength was recalculated with the Tautscher equation fitted to 5 experimental values and extrapolated to a standard thickness of 1/8" (3.175 mm).

<sup>b)</sup> Coefficient of Thermal Expansion (CTE) units are in ppm/°C = in/in/°C × 10<sup>-6</sup> = unit/unit/°C × 10<sup>-6</sup>

## Uncured Properties

Physical Properties	Mixture (A:B)
Colour	Black
Viscosity @ 25°C [77°F]	4100 cP [4.1 Pa·s] <sup>a)</sup>
Density	1.04 g/mL
Mix ratio by volume	1:1
Mix ratio by weight	1.22:1

Newark.com/exclusive-brands  
 Farnell.com/exclusive-brands  
 Element14.com/exclusive-brands



# Epoxy Potting and Encapsulating Compound



Physical Properties	Part A	Part B
Colour	Black	
Viscosity @ 25°C [77°F]	5900 cP [5.9 Pa·s] <sup>a)</sup>	2300 cP [2.3 Pa·s] <sup>b)</sup>
Density	1.15 g/mL	0.95 g/mL
Odor	Mild	Ammonia-like

<sup>a)</sup> Brookfield viscometer at 100 rpm with spindle LV S64

<sup>b)</sup> Brookfield viscometer at 50 rpm with spindle LV S63

## Compatibility

Adhesion — As seen in the substrate adhesion table, epoxy adheres to most plastics and metals used to house printed circuit assemblies. However, it is not compatible with contaminants like water, oil, or greasy flux residues that may affect adhesion. If contamination is present, first clean the surface to be coated with Isopropyl Alcohol.

## Storage

Store between 16°C and 27°C [61 and 81°F] in a dry area, away from sunlight. Storage below 16°C [61°F] can result in crystallization. If crystallization occurs, reconstitute the product to its original state by temporarily warming it to between 50°C and 60°C [122°F and 140°F]. To ensure full homogeneity, stir the warm product thoroughly. Make sure to reincorporate all settled material, close the lid, and then let cool before use.

## Substrate Adhesion (In Decreasing Order)

Physical Properties	Adhesion	
Steel	Stronger	
Aluminium		
Copper/Bronze		
Fibreglass		
Wood		
Paper, Fibre		
Glass		
Rubber		
Acrylic		
Polycarbonate		Weaker
Polypropylene		Does not bond
PTFE	Does not bond	

## Application Instructions

For best results, follow the procedure below.

### Manual mixing:

1. Scrape settled material free from the bottom and sides of the part A container; stir contents until homogenous.
2. Scrape settled material free from the bottom and sides of the part B container; stir contents until homogenous.
3. Measure 1 part by volume of the pre-stirred part A, and pour into the mixing container. Ensure all contents are transferred by scraping the container.
4. Measure 1 part by volume of the pre-stirred part B, and pour slowly into the mixing container while stirring. Ensure all contents are transferred by scraping the container.

Newark.com/exclusive-brands  
 Farnell.com/exclusive-brands  
 Element14.com/exclusive-brands



# Epoxy Potting and Encapsulating Compound



5. Thoroughly mix parts A and B together.
6. Let sit for 15 minutes to de-air. Or Put in a vacuum chamber at 25 inHg for 2 minutes to de-air.
7. If bubbles are present at the top, break and stir them gently with the mixing paddle.
8. Pour the mixture into a container holding the components to be protected.
9. Close the part A and B containers tightly between uses to prevent skinning.

## Note

Mixing >500 g at a time decreases working life and can lead to a flash cure. Limit the size of hand-mixed batches.

## Syringe or cartridge:

To insert the cartridge in the gun, see the Application Guide section for dispensing accessories.

1. Twist and remove the cap from the cartridge or syringe. Do not discard cap.
2. Dispense a small amount to ensure even flow of both parts.
3. (Optional) Attach a static mixer.
  - a. Dispense and discard 5 to 10 mL of the product to ensure a homogeneous mixture.
  - b. After use, dispose of static mixer.
4. Without a static mixer, dispense material on a mixing surface or container, and thoroughly mix parts A and B together.
5. To stop the flow, pull back on the plunger.
6. Clean nozzle to prevent contamination and material buildup.
7. Replace the cap on the cartridge or syringe.

## Cure Instructions

### Room temperature cure:

Let cure at room temperature for 24 hours.

### Heat cure:

Put in oven at 65°C [149°F] for 2 hours. Or Put in oven at 80°C [176°F] for 1 hour. Or Put in oven at 100°C [212°F] for 20 minutes.

### Note:

Due to exothermic reaction, heat cure temperatures should be at least 25% below the maximum temperature the most fragile PCB component can tolerate. For larger potting blocks, reduce heat cure temperature by greater margins.

## Packaging and Supporting Products

Part Number	Packaging	Net Volume	Packaged Weight
MC011535	Dual syringe	25 mL [0.8 fl oz]	0.08 kg [0.18 lb]

## Part Number Table

Description	Part Number
Encapsulating & Potting Compound, Dual Syringe, Black, 25ml	MC011535

**Important Notice :** This data sheet and its contents (the "Information") belong to the members of the AVNET group of companies (the "Group") or are licensed to it. No licence is granted for the use of it other than for information purposes in connection with the products to which it relates. No licence of any intellectual property rights is granted. The Information is subject to change without notice and replaces all data sheets previously supplied. The Information supplied is believed to be accurate but the Group assumes no responsibility for its accuracy or completeness, any error in or omission from it or for any use made of it. Users of this data sheet should check for themselves the Information and the suitability of the products for their purpose and not make any assumptions based on information included or omitted. Liability for loss or damage resulting from any reliance on the Information or use of it (including liability resulting from negligence or where the Group was aware of the possibility of such loss or damage arising) is excluded. This will not operate to limit or restrict the Group's liability for death or personal injury resulting from its negligence. Multicomp is the registered trademark of Premier Farnell Limited 2019.

Newark.com/exclusive-brands  
Farnell.com/exclusive-brands  
Element14.com/exclusive-brands

