

Polyurethane Coating

Product Code: PUC

PRODUCT DESCRIPTION

Polyurethane Conformal Coating is a highly robust, modified polyurethane conformal coating with excellent mechanical and dielectric properties. Due to its resistance to aggressive liquids and environmental conditions this coating will meet the requirements of DEF STAN 59/47 SU-4 and MIL STD 46058C. PUC can be soldered through which makes it ideal for rework and repair. Alternatively DRG Remover Gel can be used to remove the coating to effect repair. Polyurethane Conformal Coating contains an Ultra Violet trace for ease of inspection.

FEATURES

- * Excellent adhesion under all climatic condition
- * Good mechanical strength
- * Fluoresces under UV light as an aid to inspection.
- * Wide temperature range -55°C to $+130^{\circ}\text{C}$
- * Non-corrosive to Cadmium and Zinc plate (contains no phenols).
- * Resistant to mould growth.
- * Can be totally removed with **Electrolube** Remover Gel **DRG**
- * Excellent resistance to a wide variety of chemicals including acids and alkalis
- * Excellent dielectric properties.

TYPICAL PROPERTIES

Liquid PUC

Colour:	Clear amber
Solids content:	50% bulk 29% Aerosol
Viscosity @ 20-25°C:	200-250 cPs
Specific Gravity @ 20°C:	0.9 (Bulk)
Flash Point:	38°C (Bulk) -4°C (Aerosol)
Drying Time:	50 min. @ 25°C or 10 mins @ 40°C tack free
Complete Cure	48 hours @ 25°C or 3 hours at 65°C or 1.5hours at 80°C
Coverage for 400ml aerosol	6 m ²

Cured PUC Coating

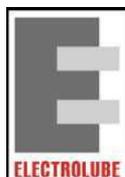
Colour:	Transparent
Electrical Resistivity:	3.15 Ohms/cm
Temperature Range:	-55°C to +130°C
Flammability:	Self-extinguishing
Dissipation Factor @ 1MHz @ 25°C:	0.01
Dielectric Strength	60Kv/mm
Dielectric Constant	3.6

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Surface Insulation Resistance 2×10^{15}

DIRECTIONS FOR USE

PUC can be sprayed, dipped or brushed. The final dry film thickness of the coating depends on the method of application. All PCBs, being composite materials, absorb moisture. If this is not removed, the conformal coating may not protect to its fullest extent. Pre-drying, or better still, vacuum desiccation, will remove most of the moisture.

PUC contains a UV trace that allows inspection of the PCB after coating to ensure complete and even coverage. The stronger the reflected light, the thicker the coating layer is.

Cleaning

Boards should be thoroughly cleaned before coating. This is required to ensure that satisfactory adhesion to the substrate is possible. Also all flux residues must be removed as they become corrosive if left on the PCB. Electrolube manufacture a range of 100% Ozone Friendly cleaning products in both the hydrocarbon solvent and aqueous fields. All products produce results within the Military specification. Please contact Electrolube for further information.

Dip Coating

Electrolube manufacture an automated **Dip Coating Machine (DCM)**, which is ideal for applying all of the **Electrolube** Conformal Coatings including **PUC**.

Allow the coating to de-aerate fully after initially filling the tank, leaving to stand for approximately 15 minutes should be sufficient, (depends on the volume of the tank used.)

Polyurethane Thinners (PTH) should be used to keep the **PUC** coating at a suitable viscosity for dipping (180 – 200cps @20°C). **PTH** is added periodically as the solvent evaporates. The viscosity should be checked using a viscosity meter or "flow cup".

The board assemblies should be immersed in the **PUC** dipping tank in the vertical position, or at an angle as close to the vertical as possible. Connectors should not be immersed in the liquid unless they are very carefully masked. **Electrolube Peelable Coating Mask (PCM)** is ideal for this application.

The required final dry film thickness can be controlled by the immersion and withdrawal speeds of the boards and the dilution and viscosity of the **PUC**. A good starting point is adding 2%w/w (2.5%v/v) **PTH** (Polyurethane Thinners) to **PUC** (Polyurethane Coating) and using the following dip coating conditions:

Immersion Speed 30 cm/min, Holding (Immersion Time) 1 minute, Withdrawal Speed 30 cm/min.

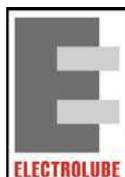
After coating, the boards should be placed in an air-circulating drying cabinet and left to dry.

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Spraying

The optimum viscosity to give coating quality and thickness depends on the spray equipment and ambient conditions the spraying is conducted in. Allow the diluted bulk coating to de-aerate fully after filling the spray equipment, before spraying starts.

For gravity fed spray guns **PUC** requires 5%w/w (6.25%v/v) addition of PTH. The same dilution is recommended for pressure pot systems in order to give finer control of coating thickness.

PUC is suitable both for use in manual spray guns and computer controlled selective coating spray equipment that only coat the required areas of the PCB, eliminating the need for masking.

The nozzle of the spray gun requires to be selected to give an even spray to suit the prevailing viscosity of the coating material. The normal spray gun pressure required is $27.6 \times 10^6 \text{ kN/m}^2$ to $34.5 \times 10^6 \text{ kN/m}^2$ (40 - 50 psi.)

To ensure penetration of the coating beneath the components and in confined spaces, spray the assembly from all directions to give an even coating. After spraying, the boards should be placed in an air-circulating drying cabinet and left to dry.

Brushing

The coating should be kept at ambient temperature. Gently apply the coating with a good quality brush so as not to leave brush marks and so that the components and wiring are not disturbed.

When the brushing operation is complete the boards should be placed in an air-circulating drying cabinet and left to dry.

Drying Times and Curing Conditions

PUC will be touch dry after 40-45 minutes at room temperature and does not require a thermal cure. The full properties of **PUC** will be obtained after a 48 hours at room temperature. This can be accelerated by the use of a thermal cure of 3 hours @ 65°C or 1.5 hours @ 80°C.

Double Coating

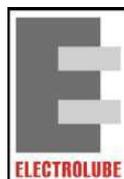
Two coats of **PUC** are not usually required. However if two coats are required, the second coating should be applied after the first coating is fully dry approximately 6 hours dependent on ambient conditions. This will ensure that the two coats will bond satisfactorily.

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PACKAGING

ORDER CODE

PUC Conformal Coating

400ml Aerosol (100% Ozone Friendly)
5 Litre Bulk

PUC400
PUC05L

Polyurethane Thinners

5 Litre

PTH05L

Removal Solvent

Remover Gel

DRG01I



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