

Electrolube® UVCL

UV Cure Conformal Coating

DESCRIPTION

Electrolube® UVCL is a low viscosity, single-part conformal coating, which cures rapidly on exposure to the correct dose of UV light. **UVCL** has a highly effective, moisture initiated secondary cure mechanism to ensure curing in shadowed areas. It has been specifically designed to offer the highest level of protection for electronic circuitry at high production throughputs. **UVCL** has been designed for application via selective spray equipment and demonstrates ease of automation, along with excellent storage stability and shelf-life.

READ ENTIRE TECHNICAL BULLETIN BEFORE USING THIS PRODUCT

FEATURES AND BENEFITS

- Dual cure system; secondary moisture cure for full cure, even in shadow areas
- Eliminates the use of solvents; VOC-free and non-flammable coating
- No dilution required; low viscosity, ready to use for selective spray application
- Ultimate protection in harsh environments, including high humidity, corrosive and chemical atmospheres

APPROVALS

Standard	Status
RoHS Compliant (2015/863/EU)	Yes
IPC-CC-830	Meets Requirements
IEC-61086	Meets Requirements
UL Approval	UL746-QMJU2 (File: E138403)

PRODUCT INFORMATION

Please contact your customer service representative for information on available package sizes.

PHYSICAL PROPERTIES

Category	Results
Liquid Properties	
Appearance	Pale Color Liquid
Base Material	Urethane Acrylate
Density @ 20 °C (g/mL)	1.1
VOC Content	0%
Flash Point (°C)	>90
Solid Content	100%
Viscosity (mPa s @ 25 °C)	225 to 400
Coverage @ 100 µm	10 m ² /L
Dry Film Coating	
Color	Colorless
Operating Temperature Range (°C)	-65 to 135
Flammability	UL94 V-0
Dielectric Strength (kV/mm)	27
Dielectric Constant @ 1MHz	2.5
Surface Insulation Resistance	1 x 10 ¹⁵ Ω
Dissipation Factor @ 1MHz, 25 °C	0.01
Moisture Resistance (IPC-CC-830)	7 x 10 ¹² Ω
Thermal Shock IPC-CC-830 (-65 to 125 °C) Additional (-40 to 125 °C)	Pass 100 Cycles Pass > 100 Cycles
Glass Transition Temperature (°C)	7
Tensile Strength (MPa @ 20 °C) (BS EN ISO 537)	2.7
Elastic Modulus (MPa) (BS EN ISO 537)	

Category	Results
-40°C	2940
25°C	2.2
130°C	2.2
Elongation at Break (BS EN ISO 537)	100%

APPLICATION GUIDELINES

Substrates should be thoroughly cleaned before coating to ensure satisfactory adhesion to the substrate. All flux residues should be removed as they may become corrosive or interfere with adhesion if left on the PCB. Electrolube manufacture a range of cleaning products using both hydrocarbon solvent and aqueous technology.

UVCL has been specifically designed for automated processes using selective spray technology however other spraying techniques and touch-up application via brush may also be employed. The coating application must be done away from the UV light source to prevent premature curing.

APPLICATION GUIDELINES – RESIN PACKS

Spraying – Bulk

UVCL is supplied at a viscosity suitable for selective spraying. Due to the secondary moisture curing capability of the product, it is advised that all storage tanks are kept sealed to protect from moisture, thereby ensuring product quality. Fluid transfer lines, nozzles and applicator heads should all be immersed in Industrial Machine Cleaner (IMC) when not in use.

A range of application thicknesses are possible with UVCL, depending on the spray equipment and parameters employed. Suitable coating thickness should be determined by the user, for each application, ensuring the required levels of protection for the PCB are met. However, typical thicknesses of 100 to 200µm are regularly used within the industry, providing high levels of resistance to moisture, chemicals and debris, whilst possessing a good balance between surface hardness and bulk flexibility.

TYPICAL PRODUCT APPLICATION

Brushing

As it is a manual process with many variables, brush coating is only advised for touch-up applications. Brushes should be clean and dry prior to use and exposure to UV light minimized to avoid premature curing.

Curing

The speed of UV cure depends on a number of factors, namely the wavelength, the intensity and the dosage of UV light used for curing, the applied coating thickness and the height of the components on the PCB. Once UVCL has been exposed to the recommended UV curing regime (see table below), a fully touch dry coating that is suitable for downstream processing will be obtained. Shadow areas, not exposed to UV light, are cured via a secondary moisture cure mechanism. The time for full cure of the whole coating therefore also depends on the environmental conditions of humidity and temperature.

For effective UV curing of UVCL, Electrolube recommend the use of standard mercury bulbs ('H' type) with typical conveyor speeds in the region of 1.0 to 1.5m/min. The minimum and maximum values for intensity (peak irradiance) and dosage (energy density) that should be used are as follows.

UV Lamp Outputs	Dosage (Energy Density), mJ/cm ²				Intensity (Peak Irradiance), mW/cm ²			
	UVA	UVB	UVC	UVV	UVA	UVB	UVC	UVV
Wavelength Range								
Minimum	1800	1500	400	1500	350	300	90	275
Maximum	2800	2500	600	2500	500	400	110	375

All values measured using an EIT 'Power Puck II' radiometer.

It is essential that the correct wavelength, intensity and dosage of UV light is determined for each application on a case by case basis, prior to commencement of production runs using UVCL. Appropriate process parameters for effective curing should be established at implementation of any UV curing system and monitored regularly to ensure continued compliance to those parameters. A portable, calibrated radiometer should be used for this purpose.

Further information is available on request.

INSPECTION

UVCL contains a fluorescent dye, which allows 'blacklight' inspection of the PCB after coating, to ensure complete and uniform coverage. The stronger the reflected UV light, the thicker the coating layer is. UV light in the region of 375nm should be used for inspection.

ADDITIONAL INFORMATION

Shelf Life

Description	Shelf Life
UVCL UV Cure Coating	12 Months
Industrial Machine Cleaner	36 Months

SAFETY & WARNING

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use. **Safety Data Sheets are available.**

CONTACT INFORMATION

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Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE. Emergency safety directory assistance: US 1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588

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