Technical Data Sheet

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Silfluo LC-CC7900-150D

UV/Moisture Dual-Cure Conformal Coating

Description

Silfluo LC-CC7900-150D is a single-component, solvent-free polyurethane acrylate conformal coating with a UV/moisture dual-cure mechanism. UV exposure initiates rapid free-radical crosslinking of the acrylate network; a secondary moisture-cure reaction proceeds in shadowed areas where UV light cannot penetrate, completing crosslinking without additional process steps.

The solvent-free formulation eliminates VOC emissions during application and cure. A built-in fluorescent UV tracer allows coverage inspection under 365 nm UV blacklight. The cured film has an operating temperature range of −60°C to +135°C.

Application

1. PCB Environmental Protection

Applied to PCBs in smart metering, household consumer appliances, and automotive electronics to protect against moisture, condensation, salt spray, mildew, and corrosive gases. Elongation at break of 199% accommodates differential thermal expansion between the cured film and PCB substrate during thermal cycling from −60°C to +135°C without film cracking or delamination — relevant for automotive underhood and outdoor electronics applications.

2. Shadowed Component Protection

Dual-cure mechanism addresses the coverage limitation of UV-only coatings: components with shadowed areas (through-hole components, tall SMD components, connector housings) receive complete crosslinking via moisture cure without requiring repositioning for additional UV exposure passes. Basic cure in shadowed areas requires approximately 3 days at 23°C / 50% RH; ultimate mechanical and electrical properties are reached in 7–14 days.

Typical Uncured Liquid Properties:

Base Material	Polyurethane acrylate
Color	Colorless to pale yellow liquid
Viscosity (mPa·s)	150
Specific Gravity (@23°C)	1.10
Surface Dry Energy (mJ/cm²)	1000

Cured Film Profile & Electrical Properties:

Adhesion (Cross-Cut Test)	Class 0 (Excellent)
Hardness(Shore A)	60
Tensile Strength(MPa)	3.57
Elongation At Break(%)	199
Volume Resistivity (Ω·cm)	3.7×10^{14}
Dielectric Constant (1MHz)	3.2
Dielectric Strength (kV/mm)	23
Surface Resistance (Ω)	4.3×10^{14}
Flame Retardant Grade (UL 94)	V0
Operating Temperature (°C)	-60~135

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Standard conditions: temperature 23±2°C, relative humidity 50±5%RH.

Application & Curing Guidelines

Surface Preparation

Clean PCB surfaces of all flux residues, dust, grease, fingerprints, and ionic contaminants before coating. Verify cleanliness by ion contamination test (IPC-TM-650 2.3.25 or equivalent) on critical assemblies.

Application Methods

Manual brushing, automated selective spray coating, and dip coating. If material has been agitated, allow to stand until air bubbles dissipate before application. Maintain boards in horizontal position during coating and initial UV cure to prevent wet film flow on vertical surfaces.

UV Cure

Expose coated boards to UV light at the wavelength and intensity specified for the UV lamp system in use. Minimum surface dry energy: 1,000 mJ/cm². Actual cure speed depends on UV intensity (mW/cm²), wavelength, film thickness, and lamp-to-substrate distance — verify cure state by tack test after UV exposure. Tack-free state is reached immediately after adequate UV dose.

Moisture Cure (Shadowed Areas)

Moisture cure proceeds automatically at ambient conditions after UV exposure. Basic cure: approximately 3 days at 23°C / 50% RH. Ultimate properties (tensile strength, elongation, electrical): 7–14 days at 23°C / 50% RH. Higher temperature and relative humidity accelerate moisture cure rate; below 40% RH or below 15°C, extend cure time accordingly.

Multi-Layer Application

Apply second coat only after the first layer is fully tack-free following UV exposure. Do not apply over wet or partially moisture-cured films.

Inspection

Inspect under 365 nm UV blacklight after UV cure to verify coating coverage and identify skipped areas or pinholes. Rework uncured or inadequately covered areas by brush application before moisture cure begins in those zones.

Cleanup

Remove uncured material with IPA, MEK, or equivalent organic solvent before cure. Cured film removal requires mechanical abrasion or dedicated conformal coating remover.

Safety, Packaging & Storage

Packaging: 1 kg opaque metal cans; other pack sizes (e.g. 5 kg or larger) available on request.
Safety Precautions: Avoid skin contact with the uncured material. In case of eye contact, rinse immediately with plenty of water and seek medical attention.
Storage Conditions: Store tightly sealed in a cool, dry, and dark place. Maintain storage temperatures strictly between 8°C and 25°C.
Shelf Life: 6 months in original, unopened packaging.
Transport: Non-dangerous goods.

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