# 4200UV

## UV Curable Conformal Coating

4200UV is a 1-part, UL-certified conformal coating formulated for rapid cure upon exposure to UV light. It is a low viscosity coating that retains high fluorescence after curing for ease of inspection, curing to a smooth, glass-like finish. The coating contains a secondary moisture cure mechanism that allows for curing in shadowed areas.

4200UV is a cost-effective option for large volume projects where both fast turn-around and higher throughput are required. It creates a rugged barrier protecting circuits from humidity, corrosion, fungus, dust, thermal shock and high voltage arcing.


## Features & Benefits

Certified UL746E

Certified IPC-CC-830C

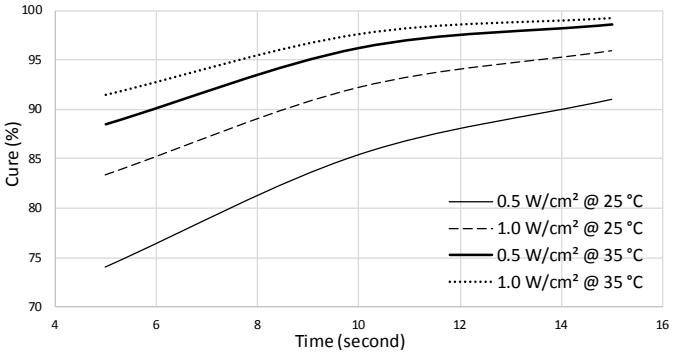
Secondary moisture cure for shadowed areas

Low viscosity, works well with automated dispense equipment

Maintains high fluorescence after curing

## Cure Instructions

Cure settings depend on the correct UV light intensity and wavelength bandwidth, along with variables like temperature and humidity. To achieve a tack-free surface, expose the coating to the dosages shown in the table below. Higher temperatures accelerate curing and reduce the required UV exposure. Cure behaviour was tested between 320-500 nm, covering both UVA and UVB bands and is designed for use with standard 'H' or 'H+' type bulbs. A secondary moisture cure mechanism ensures shadowed areas cure within 24 hours at ambient moisture.




| Temperature | Irradiance | Dose |
|---|---|---|
| 25 °C | 0.5 W/cm² (min) | 3.6 J/cm² |
| | 1.0 W/cm² (max) | 3.6 J/cm² |
| 35 °C | 0.5 W/cm² (min) | 0.99 J/cm² |
| | 1.0 W/cm² (max) | 0.97 J/cm² |

## Available Packaging

| Part # | Packaging | Net Vol. | Net Wt. |
|---|---|---|---|
| 4200UV-945ML | Can | 945 mL | 1.00 kg |
| 4200UV-3.78L | Can | 3.78 L | 4.02 kg |
| 4200UV-20L | Pail | 18.9 L | 20.1 kg |

## Storage and Handling

Store between 4 and 27 ˚C in a in a dry area, away from sunlight (see SDS).

# 4200UV

## Liquid Properties

| | | |
|---|---|---|
| Recommended Film Thickness | 50–125 µm | — |
| Density | 1.1 g/mL | ASTM D1475 |
| Viscosity @ 25 ˚C | 160 cP | Brookfield Engineering labs Inc.<br>IPCTM-65- Method 2.4.24.4 |
| Percent Solids | 96% | — |
| Theroretical Coverage @ Recommended Thickness | 186 900 $cm^2$/L | Calculated |
| Calculated VOC | 585 g/L | — |
| Shelf Life | 3 y | — |

## Cured Properties

| | | |
|---|---|---|
| UL | UL746E | — |
| IPC-CC-830 | C revision | — |
| Color | Amber | — |
| Resistivity | 3.4 x $10^{14}$ Ω·cm | ASTM D257 |
| Breakdown Voltage<br>Dielectric Strength | >1 500 V<br>1 000 V/mil | ASTM D149 |
| Dielectric Constant @ 1 MHz<br>Dissipation Factor @ 1 MHz | 3.3<br>0.03 | ASTM D150 |
| Insulation Resistance | 1 x $10^{13}$ Ω·cm | IPC-TM-650 2.5.7.1 |
| Glass Transition Temperature ($T_g$) | 72 ˚C | ASTM E1545 |
| Coefficient of Thermal Expansion (CTE) | 78 ppm/˚C (Prior $T_g$) | ASTM E831 |
| Service Temperature Range | -65–150 ˚C | — |

# 4200UV

## Application Instructions

Read the product SDS before using this product (downloadable at www.mgchemicals.com).

## Recommended Preparation

Clean the substrate with MG #824 99.9% Isopropyl Alcohol, so the surface is free of oils, dust, and other residues.

## Brush

This product can be applied by brush for rework or touch-ups. Thinning is not required for most brush applications. Desired coating thickness can be achieved in a single application. Applied coating can be cured immediately.

## Manual Spray Guns

4200UV can be readily sprayed using conventional spray guns. Ensure air lines are dry to prevent any premature curing. Use a standard fluid nozzle gun with a minimum tip diameter of 0.8–1.0 mm. The settings listed below are recommendations; however, performance will vary with different brands:

| Inlet | Air Flow | Air Cap |
|---|---|---|
| 20–40 psi | 10–15 SCFM | 8–10 psi |

## Dip Coat

Due to the dual curing nature of this coating, it is important to control exposure to light and moisture to prevent premature curing. Use a Ford or Zahn cup to monitor the viscosity of the coating, as the solvent will evaporate over time.

1. Hang the PCB on a dipping arm.
2. Slowly lower the PCB into a tank and leave immersed in the coating for 2 min to allow penetration.
3. Slowly withdraw the PCB from the tank at a rate of approximately 6" per minute.
4. Applied coating can be cured immediately.

## Selective Coating

For higher volume applications, coating can be applied via selective coating equipment. The settings listed below are recommendations and performance will vary with different brands.

| Settings | PVA | Nordson Asymtek |
|---|---|---|
| Platform | PVA 650 | SL 940E |
| Valve | FCS300-ES | SC-350 |
| Dilution | None | None |
| Air Pressure | 1.5 psi | 4 psi |
| Fluid Pressure | 20 psi | 5 psi |
| Dispense Height | 10 mm | 13 mm |
| Pass Width | 4 mm | 2.5 mm |
| Coating Speed | 100 mm/s | 559 mm/s |

## Clean-up

Clean spray system and equipment with MEK or acetone, MG #434.