# HumiSeal® UV50
# UV Curable Conformal Coating
# Technical Data Sheet

HumiSeal UV50 is a one-part, high solids dual-cure acrylated polyurethane conformal coating which has been specifically developed to:

- Cure tack free with Microwave or Arc UV light
- Have a viscosity suitable for use with selective coating equipment.
- Have secondary cure mechanism that will fully cure any unexposed areas of the coating within 7 days at ambient conditions*
- Fluoresce under UV light to allow coating inspection and can be applied by all selective coating equipment.
- Have a higher flexibility compared to other UV curable conformal coatings, giving improved adhesion and performance in thermal cycling tests.
- Have excellent chemical and moisture resistance.

*At higher temperature or humidity levels, this time may be reduced.

UV50 is non-flammable, contains no VOCs or solvent, and is RoHS Directive 2015/863 compliant.

## Typical Properties of HumiSeal® UV50

| | |
|---|---|
| Density | 1.0 to 1.1 g/cm$^3$ |
| Minimum Solids Content | 95 % |
| Viscosity, per Fed-Std-141, Meth. 4287 | 300 to 450 centipoise |
| Recommended Coating Thickness | 25 to 130 microns |
| Shelf Life at Room Temperature, from DOM | 12 months |
| Recommended UV Cure | See curing section below |
| Thermal Shock, 50 cycles per MIL-I-46058C | -65°C to 125°C |
| Shore Hardness A / D | 88 / 34 |
| Flammability, per UL-94 | V-0 |
| Dielectric Withstand Voltage, per MIL-I-46058C | >1500 V |
| Surface Insulation Resistance, per IPC-J-STD-004 (mod.) | 8.9 $\log_{10}$ Ohms |
| Moisture Insulation Resistance, per IPC-CC830 | 8.9 $\log_{10}$ Ohms |
| Moisture Resistance, per MIL-I-46058C | Pass |
| Resistance to Chemicals | Excellent |
| Resistance to Bleach Vapors | Excellent |

## Application of HumiSeal® UV50

Conformal coatings can be successfully applied to substrates that have been cleaned prior to coating and also to substrates assembled with low residue, 'no clean' assembly materials. Users should perform adequate testing to confirm compatibility between the conformal coating and their particular assembly materials, process conditions and cleanliness level. Please contact Humiseal for additional information

HumiSeal® UV50 is specifically formulated for immediate use. No additional dilution is required.

**Spraying**
HumiSeal® UV50 can be applied via standard selective coating equipment or by conventional hand spray equipment. The source air used for spraying must be dry (a dry inert gas is highly recommended) to prevent premature curing of the secondary cure mechanism. The spraying should be done with adequate ventilation so that the vapor and mist are carried away from the operator.

**Brushing**
HumiSeal® UV50 may be applied by brush for rework or touch up only. Brush must be cleaned with solvent promptly after use.

**Clean Up**
To flush equipment and clean uncured HumiSeal® UV50, nonalcohol-based solvents should be used. HumiSeal® Thinner 521/Thinner 521EU is recommended.

**Curing**
HumiSeal® UV50 is a highly cross-linked coating. In order to achieve maximum cross-linking density, the product must be exposed to the correct spectral output. Conveyor speed and lamp height have an influence on coating cure level. Users should perform adequate testing to ensure appropriate cure with their selected equipment set. HumiSeal has modelled the performance of UV50 using Arc and Microwave based UV curing equipment. The table below outlines the required dosage and irradiance values necessary to render HumiSeal® UV50 tack free post UV exposure with both equipment types. The maximum recommendation represents highest tested values by HumiSeal. The cure recommendations may change as curing technology develops.

| | | Dose J/cm2* | | | Irradiance W/cm2* | | |
|---|---|---|---|---|---|---|---|
| | | UVA | UVB | UVC | UVA | UVB | UVC |
| Min | Arc System | 1.5 | 1.5 | 0.40 | 0.50 | 0.50 | 0.10 |
| Min | Microwave System | 2.0 | 2.0 | 0.40 | 0.70 | 0.70 | 0.15 |
| Max | Arc System | 2.8 | 2.7 | 0.80 | 0.90 | 0.80 | 0.20 |
| Max | Microwave System | 3.0 | 3.0 | 0.60 | 1.15 | 1.15 | 0.24 |

*values measured with a Powerpuck II UV radiometer*

**Rework**
HumiSeal® UV50 is a highly cross-linked UV cured coating. The cured film has a high degree of environmental and chemical resistance and will be more difficult to remove than traditional conformal coatings. Thermal displacement and mechanical abrasion are suitable options for rework of HumiSeal® UV50.

**Storage**
HumiSeal® UV50 is photosensitive. The product should not be exposed to direct sunlight or full spectrum fluorescent lighting. HumiSeal® UV50 should be stored away from excessive heat, in tightly closed opaque containers at 0 to 25°C to ensure maximum shelf life is achieved. Prior to use, allow the product to equilibrate for 24 hours at room temperature. HumiSeal® UV50 is a moisture curing material and care should be taken to protect process vessels and partial containers from moisture. Partial containers must be purged with a dry, inert gas such as dry air, nitrogen or argon before closure, otherwise premature polymerization by atmospheric moisture will occur.

**Caution**
Application of HumiSeal® Conformal Coatings should be carried out in accordance with local and National Health and Safety regulations.

Use only in well-ventilated areas to avoid inhalation of vapours or spray. Avoid contact with skin and eyes.

**Consult MSDS/SDS prior to use.**


## Contact HumiSeal®

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