

## HumiSeal® UV40HV UV Curable Conformal Coating Technical Data Sheet

HumiSeal® UV40HV is a single component, high solids, UV curable, acrylated polyurethane conformal coating that has been formulated specifically for dispensing and jetting applications. The material possesses excellent chemical resistance, surface hardness, flexibility, moisture resistance and is tack-free after exposure to UV light. A secondary moisture cure mechanism will cure unexposed areas of the coating within 2-3 days at ambient conditions. The coating fluoresces under UV light to allow coating inspection. HumiSeal® UV40HV is in full compliance with the RoHS Directive 2011/65/EU.

### Properties of HumiSeal® UV40HV

Density	1.05 – 1.15 g/cm <sup>3</sup>
Minimum Solids Content	95 %
Viscosity, per Fed-Std-141, Meth. 4287	3,700 +/- 1,300 centipoise
Recommended UV Cure*	See curing section below
Shelf Life at Room Temperature, DOM	12 months
Recommended Stripper **	HumiSeal® Stripper 1100
Thermal Shock, 50 cycles per MIL-I-46058C	-65°C to 125°C
Glass Transition Temperature - DSC	45°C
Coefficient of Thermal Expansion - TMA	85 ppm/°C below T <sub>g</sub> 197 ppm/°C above T <sub>g</sub>
Dielectric Withstand Voltage, per MIL-I-46058C	>1500 volts
Dielectric Constant, at 1MHz and 25°C per ASTM D150-98	2.5
Dissipation Factor, at 1MHz and 25°C per ASTM D150-98	0.01
Insulation Resistance, per MIL-I-46058C	8.0 x 10 <sup>14</sup> ohms (800TΩ)
Moisture Insulation Resistance, per MIL-I-46058C	4.7 x 10 <sup>10</sup> ohms (47GΩ)
Fungus Resistance, per ASTM G21	Pass

\*Microwave UV cure ovens equipped with "H" style bulbs recommended

\*\*Stripper 1100 is not available in the EU

### Application of HumiSeal® UV40HV

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.

#### Spraying

HumiSeal® UV40HV 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® UV40HV may be applied by brush for rework or touch up only. Brush must be cleaned with solvent promptly after use.

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### Curing

HumiSeal<sup>®</sup> UV40HV is a highly cross linked coating. In order to achieve maximum cross linking density, the product must be exposed to the correct spectral output. Humiseal has modelled the performance of UV40HV using Arc and Microwave based UV curing equipment. The table below outlines the required dosage and irradiance values necessary to render HumiSeal<sup>®</sup> UV40HV tack free post UV exposure with both equipment types. Minimum figures should provide a tack free surface. 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
<b>Min</b>	<b>Arc System</b>	<b>1.5</b>	<b>1.5</b>	<b>0.40</b>	<b>0.50</b>	<b>0.50</b>	<b>0.10</b>
<b>Min</b>	<b>Microwave System</b>	<b>2.0</b>	<b>2.0</b>	<b>0.40</b>	<b>0.70</b>	<b>0.70</b>	<b>0.15</b>
<b>Max</b>	<b>Arc System</b>	<b>2.8</b>	<b>2.7</b>	<b>0.80</b>	<b>0.90</b>	<b>0.80</b>	<b>0.20</b>
<b>Max</b>	<b>Microwave System</b>	<b>3.0</b>	<b>3.0</b>	<b>0.60</b>	<b>1.15</b>	<b>1.15</b>	<b>0.24</b>

\*Values measured with a Powerpuck II UV radiometer

Heat is also an important component with UV cure, and different systems produce different heat outputs. Higher heat levels allow UV cure at lower dose/irradiance levels. Consequently, Humiseal recommend that curing is discussed with HumiSeal<sup>®</sup> Technical staff to ensure the exact customer process being used will meet the coating cure requirements. After UV exposure and return to room temperature the coating should be tack free.

HumiSeal<sup>®</sup> UV40HV contains a reliable secondary moisture cure mechanism which will cure any shadow areas on the assembly within 7 days at ambient moisture.

HumiSeal<sup>®</sup> UV40HV was designed to be cured using a microwave UV oven equipped with an “H” style bulb. Arc systems can cure HumiSeal<sup>®</sup> UV40HV however care must be taken during the equipment selection process to ensure minimum dosage and irradiance values obtained will properly cure the coating. Because of the variations possible in curing equipment type and configuration, it is strongly recommended that you contact HumiSeal Technical Support to discuss your equipment and process in detail.

### Clean Up

To flush equipment and clean uncured HumiSeal<sup>®</sup> UV40HV, non-alcohol based solvents should be used. HumiSeal<sup>®</sup> Thinner 521 or Thinner 521EU is recommended.

### Rework

HumiSeal<sup>®</sup> UV40HV 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, mechanical abrasion and, where available, HumiSeal<sup>®</sup> Stripper 1100 are suitable options for rework of HumiSeal<sup>®</sup> UV40HV.

### Storage

HumiSeal<sup>®</sup> UV40HV is photosensitive. The product should not be exposed to direct sunlight or full spectrum fluorescent lighting. HumiSeal<sup>®</sup> UV40HV 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<sup>®</sup> UV40HV 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.

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### 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 SDS prior to use.

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