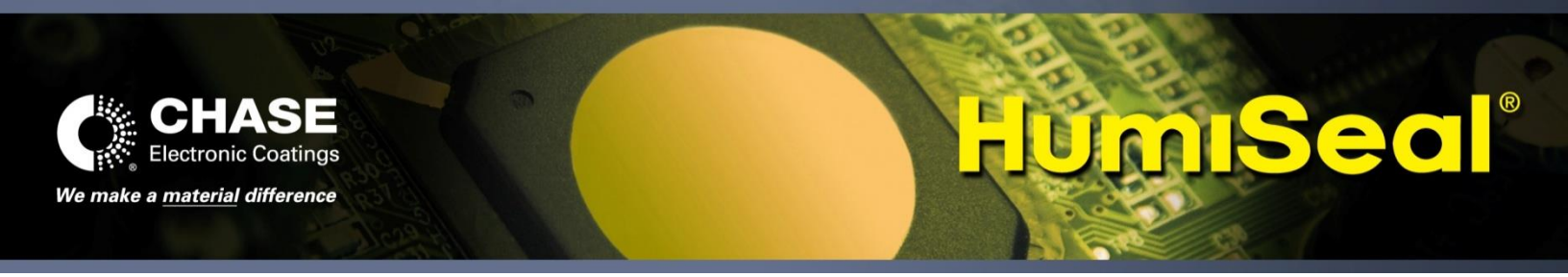

HumiSeal® UV500
UV Curable Conformal Coating
Technical Data Sheet

HumiSeal® UV500 is a high solids UV dual cure elastomeric acrylate conformal coating. HumiSeal® UV500 exhibits excellent flexibility, moisture resistance and electrical insulation properties as well as good chemical resistance. The formulation allows chemical stripping using a dedicated stripper. HumiSeal® UV500 is tack free after exposure to UV light and the secondary moisture cure mechanism will fully cure any unexposed areas of the coating within 7 days at ambient conditions. Cured HumiSeal® UV500 has a higher flexibility compared to other UV curable conformal coatings, giving improved performance in thermal cycling tests. The coating fluoresces under UV light to allow coating inspection and can be applied by all selective coating equipment. HumiSeal® UV500 is recognized under UL File Number E105698. HumiSeal® UV500 is compliant with EU RoHS Directive 2015/863 and China RoHS 2.

Typical Properties of HumiSeal® UV500

Density	1.0 to 1.1 g/cm^3
Minimum Solids Content	98%
Viscosity, per Fed-Std-141, Meth. 4287	275 to 375 centipoise
Recommended Coating Thickness	25 - 125 microns
Recommended UV Cure	See Curing Below
Shelf Life at Room Temperature, DOM	6 Months
Glass Transition Temperature - DSC	-43°C
Coefficient of Thermal Expansion - TMA	137ppm/°C Below Tg 311ppm/°C Above Tg
Modulus – DMA	0.4MPa @ 25°C
Flammability per UL94	V-0
Thermal Conductivity	0.505 W/mK
Dielectric Withstand Voltage, per MIL-I-46058C	> 1500 V
Dielectric Constant at 10 GHz per ASTM D-2520	3.07
Surface Resistivity per ASTM D-257	2.0 x 10^{11} ohms
Volume Resistivity per ASTM D-257	8.0 x 10^{12} ohm.cm
Insulation Resistance, per MIL-I-46058C	4.5 x 10^{11} ohms
Moisture Insulation Resistance, per MIL-I-46058C	1.6 x 10^{10} ohms
Surface Insulation Resistance (per IPC J-STD-004 (mod.))	8.9 $\log_{10}$ ohms
Resistance to Chemicals	Good
Fungus Resistance, per IPC-TM-650 2.6.1.1	Pass

Application of HumiSeal® UV500

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® UV500 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 (nitrogen or argon) 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.

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Brushing

HumiSeal® UV500 may be applied by brush for rework or touch up only. Brush must be cleaned with solvent promptly after use.

Curing

HumiSeal® UV500 is a highly crosslinked coating. In order to achieve maximum crosslinking density, the product must be exposed to the correct spectral output. Humiseal has modelled the performance of UV500 using Arc and Microwave based UV curing equipment. The table below outlines the required dosage and irradiance values necessary to render HumiSeal® UV500 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
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*

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® 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® UV500 contains a reliable secondary moisture cure mechanism which will cure any shadow areas on the assembly within 7 days at ambient moisture.

HumiSeal® UV500 was designed to be cured using a microwave UV oven equipped with an “H” style bulb. Arc systems can cure HumiSeal® UV500 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® UV500, non-alcohol based solvents should be used. HumiSeal® Thinner 521 or Thinner 521EU is recommended.

Rework

HumiSeal® UV500 is a highly crosslinked 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® UV500. Humiseal Stripper 1072 and 1100 can be used effectively to remove UV500 after full moisture cure.

Storage

HumiSeal® UV500 is photosensitive. The product should not be exposed to direct sunlight or full spectrum fluorescent lighting. HumiSeal® UV500 should be stored cool below 20°C, to maximize shelf life. Prior to use, allow the product to equilibrate for 24 hours at room temperature. HumiSeal® UV500 is a moisture curing material and care should be taken to protect process vessels and partial containers from moisture.

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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 SDS prior to use.

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