CHASE Electronic Coatings
We make a material difference

HumiSeal®

HumiSeal® UV550
UV Curable Conformal Coating

HumiSeal® UV550 is a solvent free, UV curable elastomeric acrylate conformal coating, with higher flexibility compared to other UV curable conformal coatings. HumiSeal® UV550 has been designed to withstand at least 1000 cycles of thermal shock in areas of high thickness between adjacent components. The SIR characteristics are stable for over 1000 hours. The material can be cured by LED or using an Arc or Microwave systems.

HumiSeal® UV550 has been specifically developed to:

- Have excellent flexibility and adhesion.
- Have excellent moisture resistance.
- Have high electrical insulation properties which are stable over time.
- Have good chemical resistance.
- Withstand at least 1000 cycles of thermal shock in areas of high thickness between adjacent components on populated boards.
- Fluorescence under UV light to allow coating inspection.
- Have a secondary cure mechanism that will fully cure any unexposed areas of the coating within 7 days at ambient conditions.
- Exhibits minimal yellowing after high temperature exposure.
- Be silicone free.

HumiSeal® UV550 meets the following standards:

- Compliant with RoHS Directive EU 2015/863
- Compliant with China RoHS 2
- Compliant to China Standard GB30981-2020

Properties of HumiSeal® UV550 Liquid Coating

Density	1.03 ± 0.03 g/cm^3
Minimum Solids Content, % by weight	95%
Viscosity, at 25°C	650 to 900 Centipoise
Shelf Life at Room Temperature, DOM	12 Months
Recommended UV or LED Cure	See Curing Below

Properties of HumiSeal® UV550 Cured Coating

Coating Thickness, as recommended by IPC guidelines	25 - 125 microns
Time to reach optimum properties	7 days after UV or LED cure
Operating temperature range	-65°C to 150°C
Thermal Shock, per IPC-TM-650 2.6.7.1, Class 3	-65°C to 125°C
Thermal Shock, 1000 cycles on populated boards at 125 microns	-40°C to 125°C
Glass Transition Temperature - DSC	-40°C
Elongation	> 100%
Shore Hardness, A / D at 20°C	55 / 12
Dielectric Withstand Voltage (Per MIL-I-46058C)	>1500V
Surface Insulation Resistance (per IPC J-STD-004 (mod.))	10.0 $\log_{10}$ Ohms
Flammability, per UL-94	TBD
Dielectric Constant at 1MHz and 22C Per ASTM D150-18	5.48
Dissipation Factor at 1MHz and 22C Per ASTM D150-18	0.07

Application of HumiSeal® UV550

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® UV550 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 air supply or 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.

Curing

HumiSeal® UV550 is a highly crosslinked coating. To achieve maximum crosslinking density, the product must be exposed to the correct spectral output. HumiSeal has modelled the performance of UV550 using Arc and Microwave based UV curing equipment as well as 385 and 395nm LED lamp units. The table below outlines the required dosage and irradiance values to sufficiently cure HumiSeal® UV550.

To minimize surface tack a higher dose is recommended. The surface tack is more pronounced when curing by LED due to the presence of oxygen. 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*

		Dose J/cm²***
		UVA
Min	LED System	15
Max	LED System	30

****Values measured with a EIT LED 385nm 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.

HumiSeal® UV550 contains a reliable secondary moisture cure mechanism which will cure any shadow areas on the assembly within 7 days at ambient moisture.

HumiSeal® UV550 has been designed to be cured using a microwave UV oven equipped with an “H” style bulb or using Arc systems. HumiSeal® UV550 can be cured using 385 and 395nm LED units however care must be taken

during the equipment selection process to ensure minimum dosage values can be obtained will to adequately 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® UV550, non-alcohol based solvents should be used. HumiSeal® Thinner 521 or Thinner 521EU is recommended.

Rework
HumiSeal® UV550 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® UV550. Contact HumiSeal Technical Support for advice on suitable strippers.

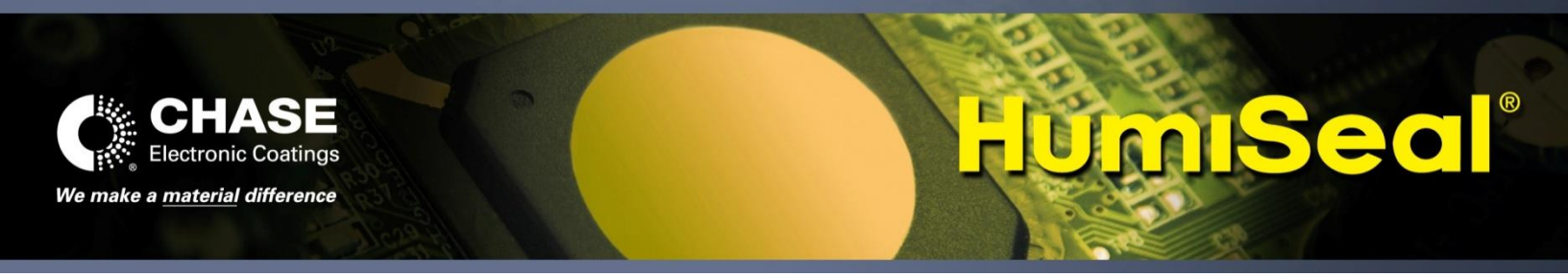
Storage
HumiSeal® UV550 is photosensitive. The product should not be exposed to direct sunlight or full spectrum fluorescent lighting. HumiSeal® UV550 should be stored cool below 20°C, to maximize shelf life. Prior to use, allow the product to equilibrate for 24 hours at room temperature. HumiSeal® UV550 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 vapors or spray.

Avoid contact with skin and eyes.

Consult SDS prior to use.



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