

HumiSeal® UV40 UV Curable Conformal Coating

Technical Data Sheet

HumiSeal® UV40 is a single component, high solids, UV curable, acrylated polyurethane conformal coating that possesses excellent chemical resistance, surface hardness, flexibility and moisture resistance. The material 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 for coating inspection and can be applied by selective coating equipment. HumiSeal® UV40 coating is recognized under UL File Number E105698, and is MIL-I-46058C qualified, and IPC-CC-830 and RoHS Directive 2011/65/EC compliant.

Typical Properties of HumiSeal® UV40

Density	1.10 ± 0.05 g/cm ³
Minimum Solids Content	95 %
Viscosity, per Fed-Std-141, Meth. 4287	650 ± 150 centipoise
Recommended Coating Thickness	25 - 125 microns
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 _g 197 ppm/°C Above T _g
Modulus - DMA	10360 MPa @ -40°C 4280 MPa @ 25°C 66 MPa @ 80°C
Flammability, per UL-94	V-0
Dielectric Withstand Voltage, per MIL-I-46058C	>1500 volts
Dielectric Constant, at 1MHz and 25°C per ASTM D150-98	2.5
Dielectric Constant, at 10GHz and 22°C per ASTM D2520	3.21
Dissipation Factor, at 1MHz and 25°C per ASTM D150-98	0.01
Insulation Resistance, per MIL-I-46058C	8.0 x 10 ¹⁴ ohms (800TΩ)
Moisture Insulation Resistance, per MIL-I-46058C	4.7 x 10 ¹⁰ ohms (47GΩ)
Fungus Resistance, per ASTM G21	Pass
Resistance to Chemicals	Excellent

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

**Stripper 1100 is not available in the EU

Application of HumiSeal® UV40

Cleanliness of the substrate is extremely important to the successful application of a conformal coating. Surfaces should be free of moisture, dirt, wax, grease and all other contaminants. Otherwise, ionic or organic residues on the substrate could be trapped under the coating and cause problems with adhesion or electrical properties. The highest long term reliability for a coated printed circuit assembly will be when the conformal coating is applied over a clean, dry substrate.

The application of conformal coatings over no clean flux is a common practice. The user should perform adequate testing to confirm compatibility between the conformal coating and their particular assembly materials and process conditions. Please contact HumiSeal for additional information.

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Spraying

HumiSeal® UV40 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® UV40 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® UV40, non-alcohol based solvents should be used. HumiSeal® Thinner 600 is recommended.

Curing

HumiSeal® UV40 is a highly cross linked coating. In order to achieve maximum cross linking density the product must be exposed to the correct spectral output. The table below outlines the required dosage and irradiance values necessary to properly cure HumiSeal® UV40. After UV exposure and return to room temperature the coating should be tack free.

	DOSE J/cm2				IRRADIANCE W/cm2			
	UV A	UV B	UV C	UV V	UV A	UV B	UV C	UV V
MIN	0.700	0.700	0.150	0.750	0.700	0.700	0.150	0.700
MAX	3.000	3.000	0.600	3.500	1.150	1.150	0.240	1.300

Values measured with a Powerpuck II UV radiometer

HumiSeal® UV40 was designed to be cured using a microwave UV oven equipped with an “H” style bulb. Arc systems can cure HumiSeal® UV40 however care must be taken during the equipment selection process to ensure minimum dosage and irradiance values can be obtained. For additional cure information please contact HumiSeal technical assistance.

Rework

HumiSeal® UV40 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® Stripper 1100 are suitable options for rework of HumiSeal® UV40.

Storage

HumiSeal® UV40 is photosensitive. The product should not be exposed to direct sunlight or full spectrum fluorescent lighting. HumiSeal® UV40 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® UV40 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 MSDS/SDS prior to us

Contact HumiSeal®

HumiSeal North America

201 Zeta Drive
Pittsburgh, PA 15238
USA
Tel: +1 412-828-1500
Toll Free (US only): 866-828-5470
sales@humiseal.com

HumiSeal Technical Center

295 University Avenue
Westwood, MA 02090
USA
Tel: +1 781-332-0734
Fax: +1 781-332-0703
techsupport@humiseal.com

HumiSeal Europe

505 Eskdale Road, IQ Winnersh
Berkshire RG41 5TU
UK
Tel: +44 (0)1189 442 333
Fax: +44 (0)1189 335 799
europesales@chasecorp.com

HumiSeal Europe Support

Tel: +44 (0)1189 442 333
Fax: +44 (0)1189 335 799
europetechsupport@chasecorp.com

HumiSeal S.A.R.L

4/6 Avenue Eiffel
78420 Carrieres-Sur-Seine
France
Tel: +33 (0) 1 30 09 86 86
Fax: +33 (0) 1 30 09 86 87
humiseal.sarl@chasecorp.com

HumiSeal Asian Support

Tel: 852-9451-6434
Fax: 852-2413-6289
asiatechsupport@humiseal.com

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