

HumiSeal® 1A33

Urethane Conformal Coating

Technical Data Sheet

HumiSeal® 1A33 is a single component, polyurethane conformal coating, suitable for general printed circuit board applications.

HumiSeal® 1A33 coating meets the following requirements:

- MIL-I-46058C
- IPC-CC-830B
- IEC60664-3
- UL746E and UL94 V-0
- Compliant to Reach and RoHS Directive EU 2015/863
- Recognized under UL file number E105698
- Passes salt spray test according to IEC61086 / IEC60068-2-11

HumiSeal® 1A33 has the following advantages:

- Contains no free isocyanates
- Protection against moisture, salt / corrosive environments and dirt
- Easy application with automated systems
- Low moisture vapor permeability
- Fluoresces under UV for ease of inspection and is easily repaired.
- Excellent chemical resistance
- Range of Pre-blend thinners available for different application methods

Properties of HumiSeal® 1A33 Liquid Coating

Density, per ISO2811-1	0.95 ± 0.02 g/cm ³
Solids Content, % by weight per ISO3251	44 ± 2 %
Viscosity, per ASTM D2196	180 ± 20 centipoise
VOC	531 grams/litre
Drying Time to Handle per ASTM D1640	15 minutes
Recommended Thinner (dipping, brushing)	HumiSeal® Thinner 503
Recommended Thinner (spraying)	HumiSeal® Thinner 521, 521EU, 600
Shelf Life at Room Temperature, DOM	24 months

Properties of HumiSeal® 1A33 Cured Coating

Recommended Coating Thickness	25 - 75 microns
Optional Curing Conditions to Reach Optimum Properties	30 days at RT
	30 hours @ 76°C
	20 hours @ 88°C
Recommended Stripper	HumiSeal® Stripper 1063
Thermal Shock, 50 cycles per MIL-I-46058C	-65°C to 125°C
Glass Transition Temperature - DMA	54°C
Coefficient of Thermal Expansion - TMA	92 ppm/°C (below T _g)
	851 ppm/°C (above T _g)

Modulus - DMA

354 MPa @ -40°C

143 MPa @ 0°C

27.2 MPa @ 40°C

Flammability, per UL 94

V-0

Dielectric Withstand Voltage, per MIL-I-46058C

>1500 volts

Dielectric Breakdown Voltage, per ASTM D149-09

515 volts/mil

Dielectric Constant, at 1MHz and 25°C per ASTM D150

3.6

Dissipation Factor, at 1MHz and 25°C per ASTM D150

0.03

Insulation Resistance, per MIL-I-46058C

2.0×10^{14} ohms (200TΩ)

Moisture Insulation Resistance, per MIL-I-46058C

1.6×10^{10} ohms (16GΩ)

Fungus Resistance, per ASTM G21

Passes

Application of HumiSeal® 1A33

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.

Dipping

Depending on the complexity, density and configuration of components on the assembly, it may be necessary to reduce the viscosity of HumiSeal® 1A33 with HumiSeal® Thinner 503 in order to obtain a uniform film. Once optimum viscosity is determined, a controlled rate of immersion and withdrawal (5-15 cm/min) will further ensure even deposition of the coating and ultimately a uniform film. During the application, evaporation of solvent causes an increase in viscosity that should be adjusted by adding small amounts of HumiSeal® Thinner 503. Viscosity in the dip tank should be checked regularly, using a simple measuring device such as a Zahn or Ford viscosity cup.

Spraying

HumiSeal® 1A33 can be sprayed using conventional spraying equipment. Spraying should be done in an environment with adequate ventilation so that the vapour and mist are carried away from the operator. The addition of HumiSeal® Thinner 521 or 521EU is necessary to ensure a uniform spray pattern resulting in pinhole-free film. The amount of thinner and spray pressure will depend on the specific type of spray equipment used and operator technique. The recommended ratio of HumiSeal® 1A33 to HumiSeal® Thinner 521 or 521EU is 4:1 by volume; however the ratio may need to be adjusted to obtain a uniform coating.

Brushing

HumiSeal® 1A33 may be applied by brush. Uniformity of the film depends on component density and operator's technique.

Storage

HumiSeal® 1A33 should be stored away from excessive heat or cold, in tightly closed containers. HumiSeal® products may be stored at temperatures of 0 to 35°C. Prior to use, allow the product to equilibrate for 24 hours at a room temperature of 18 to 32°C.

Caution

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

The solvents in HumiSeal® 1A33 are flammable. Material should not be used in presence of open flame or sparks. 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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