

HumiSeal® 1B31EPA and 1B31EPA Pre-Blended Acrylic Conformal Coating Technical Data Sheet

HumiSeal® 1B31EPA is a fast drying, single component, acrylic conformal coating that provides excellent moisture and environmental protection for printed circuit assemblies. 1B31EPA is also produced as pre-blended products, at a range of viscosities, suitable for a variety of applications. The cured film demonstrates exceptional flexibility, fluoresces under UV light for ease of inspection and is easily repaired. HumiSeal® 1B31EPA coating is MIL-I-46058C qualified, IPC-CC-830, RoHS Directive 2011/65/EC and EPA 33/50 compliant.

After complete cure, the properties of HumiSeal® 1B31EPA Pre-Blends and HumiSeal® 1B31EPA are comparable as all solvents evaporate during the drying process.

Properties specific to HumiSeal® 1B31EPA Pre-Blended Products as Supplied

| Product | Viscosity, CPS | Solids Content, % | Density, g/cm ³ | VOC g/L |
|----------------------|----------------|-------------------|----------------------------|---------|
| 1B31EPA | 265.0-385.0 | 25.00-31.00 | 0.95 ± 0.03 | 684 |
| 1B31EPA/600 65CPS | 60.0-70.0 | 18.00-20.00 | 0.94 ± 0.01 | 761 |
| 1B31EPA/604 PB35 CPS | 30.0-40.0 | 14.00-16.00 | 0.93 ± 0.01 | 786 |

Properties of HumiSeal® 1B31EPA

| | |
|---------------------------------------------------------|--------------------------------------------------------------------|
| Density, per ASTM D1475 | 0.95 ± 0.03 g/cm ³ |
| Solids Content, % by weight per Fed-Std-141, Meth. 4044 | 28 ± 3 % |
| Viscosity, per Fed-Std-141, Meth. 4287 | 325 ± 60 centipoise |
| VOC | 684 grams/litre |
| Drying Time to Handle per Fed-Std-141, Meth. 4061 | 30 minutes |
| Recommended Coating Thickness | 25 - 75 microns |
| Recommended Curing Conditions | 24 hrs @ RT or 30 min @ 76°C |
| Time Required to Reach Optimum Properties | 7 days |
| Recommended Thinner (dipping, brushing) | HumiSeal® Thinner 604 |
| Recommended Thinner (spraying) | HumiSeal® Thinner 600 |
| Recommended Stripper | HumiSeal® Stripper 1080 |
| Shelf Life at Room Temperature, DOM | 24 months |
| Thermal Shock, 50 cycles per MIL-I-46058C | -65°C to 125°C |
| Coefficient of Thermal Expansion - TMA | 170 ppm/°C below T _g 340 ppm/°C above T _g |
| Glass Transition Temperature - DSC | 14°C |
| Modulus - DMA | 2000 MPa@ -40°C 1050 MPa@ 20°C 8.5 MPa@ 60°C |
| Flammability, per MIL-I-46058C | Self-Extinguishing |
| Dielectric Withstand Voltage, per MIL-I-46058C | >1500 volts |
| Dielectric Breakdown Voltage, per ASTM D149 | 6300 volts |
| Dielectric Constant, at 1MHz and 25°C, per ASTM D150-98 | 2.6 |
| Dissipation Factor, at 1MHz and 25°C, per ASTM D150-98 | 0.01 |
| Insulation Resistance, per MIL-I-46058C | 5.5 x 10 ¹⁴ ohms (550TΩ) |
| Moisture Insulation Resistance, per MIL-I-46058C | 7.0 x 10 ¹⁰ ohms (70GΩ) |
| Fungus Resistance, per ASTM G21 | Passes |

Application of HumiSeal® 1B31EPA and 1B31EPA Pre-Blended

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.

Dipping

Depending on the complexity, density and configuration of components on the assembly, it may be necessary to reduce the viscosity of HumiSeal® 1B31EPA with HumiSeal® Thinner 600 or 604 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 600 or 604. Viscosity in the dip tank should be checked regularly using a simple measuring device such as a Zahn or Ford viscosity cup.

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Spraying

HumiSeal[®] 1B31EPA 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 600 or 604 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[®] 1B31EPA to HumiSeal[®] Thinner 600 or 604 is 1:1 by volume; however the ratio may need to be adjusted to obtain a uniform coating.

Brushing

HumiSeal[®] 1B31EPA may be brushed with a small addition of HumiSeal[®] Thinner 600 or 604. Uniformity of the film depends on component density and operator's technique.

Storage

HumiSeal[®] 1B31EPA 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[®] Conformal Coatings 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

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