

HumiSeal[®] 1A33 Pre-blends

Urethane Conformal Coatings

Technical Data Sheet

HumiSeal[®] 1A33 is a single component, polyurethane conformal coating, suitable for general printed circuit board applications. HumiSeal[®] 1A33 is also produced as pre-blended products, at a range of viscosities, suitable for a variety of application methods. Once fully cured the properties of 1A33 and its pre-blends are equivalent.

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 Pre-blend Products as Liquid Coating

| Product | Viscosity (cPs) | Solids (%) | Density (g/cm ³) | VOC (g/L) | Shelf Life (DOM, months) |
|--------------------|--------------------|---------------|---------------------------------|--------------|-----------------------------|
| 1A33 | 180 ± 20 | 44 ± 2 | 0.95 ± 0.02 | 532.0 | 24 |
| 1A33/600/AP2 | 22.5 ± 5 | 30 ± 3 | 0.945 ± 0.025 | 661.5 | 12 |
| 1A33 PB 23 CPS | 23 ± 5 | 34 ± 1 | 0.92 ± 0.02 | 607.2 | 12 |
| 1A33 PB 48.3 CPS | 48.3 ± 5 | 38 ± 1 | 0.93 ± 0.02 | 576.6 | 12 |
| 1A33 PB 55 CPS | 55 ± 5 | 39 ± 1.5 | 0.93 ± 0.03 | 567.3 | 12 |
| 1A33 PB 64 CPS | 64 ± 5 | 39 ± 2 | 0.93 ± 0.02 | 567.3 | 24 |
| 1A33 PB 80 CPS | 80 ± 5 | 40 ± 2 | 0.94 ± 0.02 | 564.0 | 24 |
| 1A33 PB 100 CPS | 100 ± 5 | 41 ± 2 | 0.94 ± 0.02 | 554.6 | 24 |
| 1A33/521 PB 25 CPS | 25 ± 3 | 36 ± 1 | 0.93 ± 0.02 | 595.2 | 24 |
| 1A33/521 PB 65 CPS | 67.5 ± 2.5 | 40 ± 2 | 0.93 ± 0.02 | 558.0 | 24 |

Drying Time to Handle per Fed-Std-141, Meth. 4061

15 minutes

Properties of HumiSeal® 1A33 and its Pre-blend Products as 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 |
| Coefficient of Thermal Expansion - TMA | 193 ppm/°C |
| Glass Transition Temperature - DSC | 26°C |
| Modulus - DMA | 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 | 7500 volts |
| Dielectric Constant, at 1MHz and 25°C per ASTM D150-98 | 3.6 |
| Dissipation Factor, at 1MHz and 25°C per ASTM D150-98 | 0.03 |
| Insulation Resistance, per MIL-I-46058C | 2.0 x 10 ¹⁴ ohms (200TΩ) |
| Moisture Insulation Resistance, per MIL-I-46058C | 1.6 x 10 ¹⁰ ohms (16GΩ) |
| CTI, PLC per UL746E @ 600 volts | 0 |
| Fungus Resistance, per ASTM G21 | Passes |

Application of HumiSeal® 1A33 Pre-blend Products

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” 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.

HumiSeal® 1A33 Pre-blend Products are specifically diluted to a viscosity for immediate use. No additional dilution is required. Customers should establish which pre-blend is suitable for their equipment and application method before commercial use. HumiSeal® Technical Support should be contacted if any further advice on pre-blends and equipment is required.

Dipping

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 a suitable HumiSeal® Thinner. 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 Pre-blend Products are available which 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 specific pre-blend and spray pressure will depend on the specific type of spray equipment used and operator technique.

Brushing

HumiSeal® 1A33 Pre-blend Products are available which may be brushed onto surfaces. Uniformity of the film depends on specific pre-blend chosen and operator’s technique.

Storage

HumiSeal® 1A33 Pre-blend Products 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 Pre-blend Products 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 SDS prior to use.

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