

HumiSeal® 2A53 Epoxy Conformal Coating Technical Data Sheet

HumiSeal® 2A53 is a two component epoxy conformal coating supplied as Parts A and B, suitable for general printed circuit boards and applications where exceptional resistance to solvents or other chemicals is required. HumiSeal® 2A53 fluoresces under UV light for inspection purposes. HumiSeal® 2A53 coating is MIL-I-46058C qualified and IPC-CC-830 and RoHS Directive 2002/95/EC compliant.

Properties of Mixed HumiSeal® 2A53

Density, per ASTM D1475	0.93 ± 0.03 g/cm³
Solids Content, % by weight per Fed-Std-141, Meth. 4044	54 ± 5 %
Viscosity, per Fed-Std-141, Meth. 4287	350 ± 150 centipoise
VOC	455 grams/litre
Recommended Coating Thickness	25 - 75 microns
Drying Time to Handle per Fed-Std-141, Meth. 4061	5 hrs
Time Required to Reach Optimum Properties	7 days
Optional Curing Conditions to Reach Optimum Properties	2 hrs @ 93°C
Recommended Thinner	HumiSeal® Thinner 535
Pot Life at Room Temperature	24 hours
Shelf Life at Room Temperature, DOM	12 months
Thermal Shock, 50 cycles per MIL-I-46058C	-65°C to 125°C
Coefficient of Thermal Expansion - TMA	56 ppm/°C
Glass Transition Temperature - DSC	19°C
Modulus - DMA	32.2 MPa
Flammability, per MIL-I-46058C	Self-Extinguishing
Dielectric Withstand Voltage, per MIL-I-46058C	>1500 volts
Dielectric Breakdown Voltage, per ASTM D149	8000 volts
Dielectric Constant, at 1MHz and 25°C per ASTM D150-98	3.0
Dissipation Factor, at 1MHz and 25°C per ASTM D150-98	0.03
Insulation Resistance, per MIL-I-46058C	2.0×10^{14} ohms (200TΩ)
Moisture Insulation Resistance, per MIL-I-46058C	2.8×10^{10} ohms (28GΩ)
Fungus Resistance, per ASTM G21	Passes
Resistance to Chemicals	Excellent

Application of HumiSeal® 2A53

Cleanliness of the substrate is of extreme importance for the successful application of a conformal coating. Surfaces must be free of moisture, dirt, wax, grease, flux residues and all other contaminants. Contamination under the coating could cause problems that may lead to assembly failures.

Mixing ratio of Part A to Part B is 1:1 by volume. Prior to application, HumiSeal® 2A53 Parts A and B should be thoroughly mixed until a homogenous blend is achieved. Vigorous mixing is not recommended. The mixed coating should be allowed to settle for 30 minutes prior to use, so that any air bubbles formed during blending can escape.

Brushing

Prepared HumiSeal® 2A53 may be applied by brush with a small addition of HumiSeal® Thinner 535. Uniformity of the film depends on component density and operator's technique.

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Dipping

Depending on the complexity, density and configuration of components on the assembly, it may be necessary to reduce the viscosity of the prepared HumiSeal® 2A53 with HumiSeal® Thinner 535, 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 535. Viscosity in the dip tank should be checked regularly, using a simple measuring device such as a Zahn or Ford viscosity cup.

Spraying

HumiSeal® 2A53 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 535 to prepared HumiSeal® 2A53 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 prepared HumiSeal® 2A53 to HumiSeal® Thinner 535 is 1:1 by volume; however the ratio may need to be adjusted to obtain a uniform coating.

Storage

HumiSeal® 2A53 Parts A and B 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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