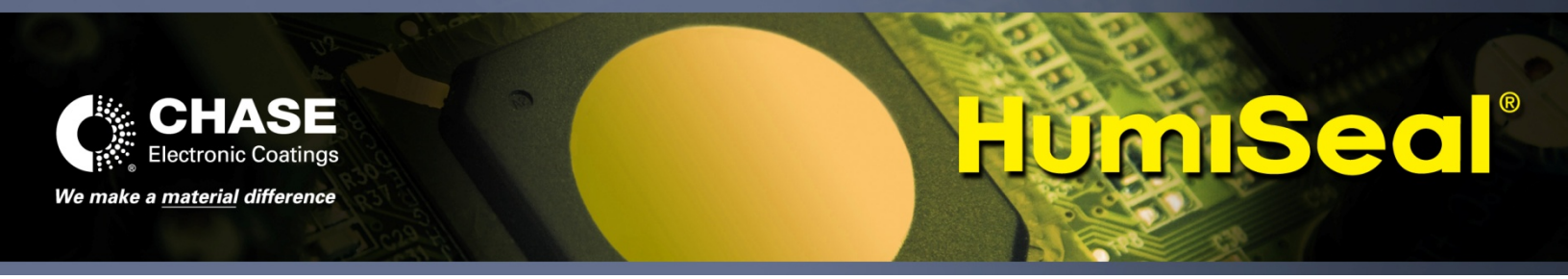

HumiSeal® 1A33 Urethane Conformal Coating Technical Data Sheet

HumiSeal® 1A33 is a single component, polyurethane conformal coating, suitable for general printed circuit board applications. HumiSeal® 1A33 contains no free isocyanates and fluoresces under UV light for inspection purposes. HumiSeal® 1A33 coating is MIL-I-46058C qualified, IPC-CC-830 and RoHS Directive 2002/95/EC compliant and recognized under UL File Number E105698.

Properties of HumiSeal® 1A33

Density, per ASTM D1475	0.95 ± 0.02 g/cm³
Solids Content, % by weight per Fed-Std-141, Meth. 4044	44 ± 2 %
Viscosity, per Fed-Std-141, Meth. 4287	180 ± 20 centipoise
VOC	531 grams/litre
Recommended Coating Thickness	25 - 75 microns
Drying Time to Handle per Fed-Std-141, Meth. 4061	15 minutes
Optional Curing Conditions to Reach Optimum Properties	30 days at RT 30 hours @ 76°C 20 hours @ 88°C
Recommended Thinner (dipping, brushing)	HumiSeal® Thinner 503
Recommended Thinner (spraying)	HumiSeal® Thinner 521, 521EU
Recommended Stripper	HumiSeal® Stripper 1063
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	193 ppm/°C
Glass Transition Temperature - DSC	26°C
Modulus - DMA	27.2 MPa
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	2.0×10^{14} ohms (200TΩ)
Moisture Insulation Resistance, per MIL-I-46058C	1.6×10^{10} ohms (16GΩ)
CTI, PLC per UL746E @ 600 volts	0
Fungus Resistance, per ASTM G21	Passes

Application of HumiSeal® 1A33

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.

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.

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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 1:1 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®

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
europeansales@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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