

Technical Data Sheet

Humiseal 1H20 UR5 Polyurethane Conformal Coating

System Description

1H20 UR5 is a water-based polyurethane conformal coating. It is available in two versions suitable for either dip, spray, brush or selective spray application methods. 1H20 UR5 is qualified to MIL-I-46058C and IPC-CC-830B Class B. It provides excellent moisture insulation resistance and can be chemically removed or soldered through for rework. The coating contains a UV tracer for ease of inspection.

Properties of Liquid HumiSeal 1H20 UR5

	UR5/D	UR5/S
Density (g/cm ³)	1.05	1.02
Solid Content	30%	30%
Flash Point	>100°C	>100°C
Viscosity (max)	250 cps	50 cps
Dry to Touch Time	30 minutes	30 minutes
Recommended Curing	1 hour at room temp, then 6 hours at 80°C	Process Dependent
Time to Reach Optimum Properties	7 days	7 days
Pot Life at Room Temp	6 months in dip tank	NA
Shelf Life at Room Temp	12 months	12 months

Properties of Cured HumiSeal 1H20 UR5

Thermal Properties

Continuous Use Operating Range °C
Thermal Shock, per MIL-I-46058C

-65°C to +125°C
Passes

Physical Properties

Clarity
Build per Dip, mils, per ASTM, Meth.D823
Flexibility, per MIL-I-46058C

Clear
1.5
Pass

Adhesion, per ASTM, Meth. D2197	Good
Flammability, per ASTM, Meth. D635	Self-Extinguishing
Weather Resistance	Very Good
Temperature & Humidity Aging per IPC-TM-650 2.6.11	Pass

Electrical Properties

Dielectric Withstand Voltage, volts per MIL-I-46058C	>1,500
Dielectric Breakdown Voltage, volts, per ASTM, Meth. D149	6925V
Dielectric Constant, at 1MHz and 25°C, per ASTM-D150-65T	2.5
Dissipation Factor, at 1MHz and 25°C, per ASTM-D150-65T	0.01
Insulation Resistance, ohms, per MIL-I-46058C	2.3×10^{13}
Moisture Resistance, ohms, per MIL-I-46058C	8.2×10^{10}

Chemical Properties

Main Constituent	Polyurethane Resin
Fungus Resistance, per ASTM-G21	Pass
Resistance to Chemicals	Good
Recommended Stripper	HumiSeal 1072

Values are not intended for use in preparation of specifications.

APPLICATION GUIDELINES

CAUTIONS!

Waterborne coatings should not be placed directly on bare/untreated steel. Applying waterborne coatings when the relative humidity is > 80% will adversely affect coating uniformity and cause poor adhesion.

General

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 and all other contaminants. Contamination under the coating will cause problems that may lead to assembly failures.

When 1H2O UR5 is first applied, it has a milky white appearance. This is normal and as the film dries, the white color fades until a clear, transparent film remains. In fact, the white color aids the operator's coverage inspection and serves as an indicator that the coating is dry to the touch. 1H2O UR5 includes a UV tracer to permit final inspection. It is recommended that the coating be allowed to reach a tack free condition, to ensure that the optimum film-forming process can occur, before using heat to accelerate the state of cure - if desired.

1H2O UR5/D - Automated Dip Application

The material has been formulated for dip application as supplied and requires no thinning. Thinning will reduce the application performance and increase curing time substantially and is not recommended.

Because it is a water based coating, evaporation of 1H2O UR5/D from the dip tank is very low. However, over a long period of time, the addition of a small amount of fresh 1H2O UR5/S is beneficial; to replace the low level of coalescing solvents that are lost along with some water. The coalescing solvents are essential to provide optimum film formation and the other physical and electrical properties of the resin.

A slightly slower immersion speed is recommended to reduce the possibility of air entrapment under components. The withdrawal speed depends on the complexity of the assembly being coated. Although the material has been formulated to lay down 1.5 mils in a single dip application; for densely populated assemblies, reducing the withdrawal speed or applying two successive thinner coatings will give better edge coverage and a better coating appearance.

1H2O UR5/S Spray Application

1H2O UR5/S has been formulated with the optimum levels of additives to enable the best application performance through a wide variety of spray equipment. Thinning is not recommended.

It is important to ensure that the spray equipment has been thoroughly purged of all solvents and previous coatings prior to the application of water-based products.

If the equipment has previously been used for solvent based coatings, the following cleaning procedure is recommended.

1. Flush the equipment with solvent thinner until there is no further sign of UV tracer in the output.
2. Flush with IPA or other water miscible solvent.
3. Flush with DI water.
4. Finally, purge with 1H2O UR5 until the output stream is homogenous.

The equipment is now ready for successful application of 1H2O UR5.

1H2O UR5/S Brush Application

1H2O UR5/S can be also applied by brush. The finish quality obtained depends on operator technique and the thickness of coating applied. For best results, the material should be “flowed” from the brush onto the board and the coating should be applied as thinly as possible. It is always possible to add an additional layer if more coating is required.

Provided the material is transferred from bulk to a small pot for application purposes, no thinners are necessary. 1H2O UR5 has a pot life of 1 week in the brush pot. Brushes can be cleaned promptly after use with DI water.

Storage

HumiSeal 1H2O UR5 should be stored in its original container in temperature between 5-25C. Avoid freezing, since this will compromise performance of the product.

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