

HumiSeal[®] 1H2OAR3/S Acrylic Conformal Coating

Technical Data Sheet

HumiSeal[®] 1H2OAR3/S is a water-based acrylic conformal coating, suitable for most brush or spray application methods. The coating contains a UV tracer for ease of inspection. HumiSeal[®] 1H2OAR3/S provides excellent moisture insulation resistance and can be chemically removed or soldered through for rework. HumiSeal[®] 1H2OAR3/S coating is RoHS Directive EU 2002/95/EC compliant.

Properties of HumiSeal[®] 1H2OAR3/S

Density, per ASTM D1475	1.05 ± 0.05 g/cm ³
Solids Content, % by weight per Fed-Std-141, Meth. 4044	30 ± 2 %
Viscosity, per Fed-Std-141, Meth. 4287	30 ± 20 centipoise
Recommended Coating Thickness	25 - 75 microns
Drying Time to Handle per Fed-Std-141, Meth. 4061	20 min
Recommended Curing Conditions	1 hr @ RT and 6 hrs @ 80°C
Time required to Reach Optimum Properties	7 days
Recommended Stripper	HumiSeal [®] Stripper 1020
Pot life at Room Temperature	6 months in a dip tank
Shelf Life at Room Temperature, DOM	12 months
Thermal Shock, 50 cycles per MIL-I-46058C	-65°C to 125°C
Temperature and Humidity Aging per IPC-TM-650 2.6.11	Pass
Flammability, per ASTM D-635	Self-extinguishing
Dielectric Withstand Voltage, per MIL-I-46058C	>1500 volts
Dielectric Breakdown Voltage, per ASTM D149	6925 volts
Dielectric Constant, at 1MHz and 25°C per ASTM D150-98	2.5
Dissipation Factor, at 1MHz and 25°C per ASTM D150-98	0.01
Insulation Resistance, per MIL-I-46058C	2.3 x 10 ¹³ ohms (23TΩ)
Moisture Insulation Resistance, per MIL-I-46058C	8.2 x 10 ¹⁰ ohms (82GΩ)
Fungus Resistance, per ASTM G21	Passes

Application of HumiSeal[®] 1H2OAR3/S

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.

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 can cause poor adhesion.

When HumiSeal[®] 1H2OAR3/S is first applied it has a milky white appearance. As the film dries, the white colour fades until a clear, transparent film remains. The white color aids the operator's coverage inspection and the color change serves as an indicator that the coating is dry to the touch. It is recommended that the coating be allowed to reach a tack-free condition before using heat to accelerate the cure process.

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Brushing

HumiSeal[®] 1H2OAR3/S can be applied by brush. The finished 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. HumiSeal[®] 1H2OAR3/S has a pot life of 1 week in the brush pot. Brushes can be cleaned promptly after use with DI water.

Spraying

HumiSeal[®] 1H2OAR3/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 HumiSeal[®] 1H2OAR3/S until the output stream is homogenous.

Hand Spray Equipment:

The equipment settings for spraying are dependent on ambient conditions and equipment design. However, an atomization pressure of around 40-60 psi is recommended. Using lower pressures increases the success of applications of coatings that are free from bubbles. It is best to keep the nozzle wet when not in use to prevent coating from curing in the nozzle head. If the gun is to be left unused for more than 15 minutes, make sure that the head is submerged in water.

It is recommended that the coating be applied in four distinct steps. This is achieved by spraying the board from one direction with a side-to-side motion. The board is then rotated 90° and the process repeated, until the board has passed through 360°, thus ensuring optimum edge coverage.

Automated Spray Equipment:

HumiSeal[®] 1H2OAR3/S can also be successfully applied using the various types of selective coating equipment available including Nordson/Asymtek, PVA, Speedline, SCS and Ultrasonic Systems.

Storage

HumiSeal[®] 1H2OAR3/S should be stored in its original container in cool, dry conditions. Avoid freezing, since this will compromise performance of the product.

Caution

Application of HumiSeal[®] Conformal Coatings should be carried out in accordance with local and National Health and Safety regulations.

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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