

## HumiSeal 1C49

### Silicone Conformal Coating

#### System Description

A moisture curing, high build, 100% solids single component silicone coating providing excellent moisture and environmental protection for printed circuit assemblies. Solvent free, 1C49 has no significant VOC. The final film demonstrates excellent flexibility and is repairable. This coating is qualified to MIL-I-46058C, Type SR and is UL recognized File No. E105698. Fluoresces under UV light for ease of inspection. The coating can be cured at room temperature, or elevated temperature with a pan of water to greatly accelerate the curing.

#### Properties of Liquid HumiSeal

Density, (g/cm <sup>3</sup> ) per ASTM, Meth. D1475	0.96 ± 0.035
Solids Content, % by weight per Fed-Std-141, Meth.4044	95 minimum
Viscosity, centipoise per Fed-Std-141, Meth.4287	7500 ± 1000
Cure Mechanism	Moisture
Recommended Coating Thickness	2-8 mils
Drying Time to Handle per Fed-Std-141, Meth.4061	2 hours
Recommended Curing Conditions	24 hrs. @RT or 30 min.@ 76-121°C, 60%RH
Place a pan of water in the oven, it will greatly accelerate curing	
Time required to Reach Optimum Properties	7 days
Thinner needed	Thinner 73 or 521
Recommended Stripper	Mechanical removal
Pot Life at Room Temperature	7 days+(Purged with dry Ar or N2 Gas)
Shelf at Room Temperature	6 months

#### Properties of Cured HumiSeal

##### Thermal Properties

Continuous Use Operating Range °C	-65 to 200
Thermal Shock, MIL-I-46058C	Passes
Solderability	Fair
Coefficient of Thermal Expansion - DMA	168ppm
Glass Transition Temperature - TMA	79 °C
Young's Modulus - DMA	160psi

##### Physical Properties

Clarity	Transparent
Build per Dip, mils, per ASTM, Meth.D823	5
Flexibility, MIL-I-46058C	Excellent
Adhesion, per ASTM, Meth.D2197	Excellent
Flammability, per ASTM, Meth. D635	Self
Weather Resistance	Very

##### Electrical Properties

Dielectric Withstand Voltage, volts per MIL-I-46058C	>1,500
Dielectric Breakdown Voltage, volts, per ASTM, Meth. D149	7000
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	500 x 10 <sup>12</sup>
Moisture Resistance, ohms, per MIL-I-46058C	100 x 10 <sup>9</sup>

##### Chemical Properties

Main Constituent	Silicone
Fungus Resistance, per ASTM-G21	Pass
Chemical Resistance	Good

## APPLICATION

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, which may lead to assembly failures.

### **HumiSeal 1C49 may be applied by brush, dip, or spray.**

#### **Brushing**

Uniformity of the film depends on component density and operator's technique. 10 to 20% dilution with HumiSeal thinner 800 is beneficial for getting 1C49 in between and beneath components

#### **Dipping**

Depending on the complexity, density and configuration of the components on the assembly it may be desirable to reduce the viscosity of HumiSeal 1C49 with HumiSeal thinner 800. A controlled rate of immersion and withdrawal (2" to 6" per minute) will insure even deposition of the coating and ultimately a uniform film. Dip tank viscosity of diluted HumiSeal 1C49 should be regularly checked using a simple measuring device such as Zahn or Ford viscosity cup. Blanketing dip tanks with dry gas like nitrogen can extend pot life.

The chart below gives dilution guidelines. Since cure is dependent upon relative humidity and the viscosity of the coating itself is variable, actual dry coating thickness may differ slightly from the chart. (% is by weight).

% 1C49	viscosity	thickness from dipping (cured 1C49)
90	3265cps	3.1 mils
80	1388cps	1.8 mils
70	800cps	1.5 mils
60	400cps	1.2 mils
50	190cps	0.5 mils

#### **Spraying**

HumiSeal 1C49 may be sprayed using some types of spraying equipment designed for high viscosity coatings. Conventional spray equipment may leave bubbles in cured HumiSeal 1C49 coatings regardless of the amount of thinner used. When in doubt, test spray equipment before spraying production boards. Spraying should be done under an exhaust hood so that the mist is carried away from the operator.

#### **Storage**

HumiSeal Type 1C49 should be stored at 5-25°C, away from excessive heat, in tightly closed containers. If coating is partially used, the container should be purged with dry nitrogen prior to resealing. Refrigeration of unused material will significantly extend shelf life. Avoid direct sunlight. Prior to use, allow the product to equilibrate for 24 hours at room temperature.

#### **Caution**

Avoid inhalation of spray. Use only in well-ventilated areas. Avoid contact with skin and eyes. If contact occurs, wash with soap and water. If swallowed, call a physician immediately. Refer to MSDS before use.

Technical support coatings: [Europetechsupport@humiseal.com](mailto:Europetechsupport@humiseal.com)

Sales: [Europeansales@humiseal.com](mailto:Europeansales@humiseal.com)



**Humiseal Europe**  
2C Albany Park, Frimley Road,  
Camberley, Surrey,  
GU16 7PH  
Phone +44 (0) 1276 691100  
Fax +44 (0) 1276 691227  
Web: [www.humiseal.com](http://www.humiseal.com)

All technical data in this bulletin is based on test results and is believed to be correct. However, since the end use of HumiSeal materials (and the manner of storing and handling them) is beyond our control, we make no warranty-expressed or implied as to the fitness of use, results to be obtained from or effects of use with respect to these materials. Their use shall be solely by the judgment of and at the risk of the user notwithstanding any statement in this bulletin. © Copyright 1992 CHASE CORPORATION.

