



UV40 GEL

Preliminary Technical Data Sheet

System Description

HumiSeal UV40 GEL is a one-part high solids dual cure acrylated urethane gel. UV40 GEL is a highly thixotropic version of HumiSeal's innovative UV40. The gel is designed to provide coverage and encapsulation over high profile components, connectors and component leads. Since it employs the same innovative chemistry as HumiSeal UV40 conformal coating, UV40 GEL has the same excellent chemical resistance, surface hardness, flexibility and moisture resistance. The material is tack free after exposure to UV light and the secondary moisture cure mechanism will fully cure any unexposed areas within 2-3 days at ambient conditions. The secondary cure can also be accelerated by baking at 60-80 °C with a small pan of water placed in the oven to increase chamber humidity. The gel fluoresces under UV light to allow inspection. HumiSeal UV40 GEL is in full compliance with the RoHS Directive (Directive 2002/95/EC).

Properties of Liquid HumiSeal UV40 GEL

Density	1.06 g/cm ³
Solids Content	100%
Viscosity (max)	Thixotropic paste
Flashpoint, °C (°F)	80 (176)
Recommended Coating Thickness	1-5 mils
Recommended UV Curing Conditions	10-40 mW/cm ² *
*Using Fusion "H" style bulb with power output of 120 W/cm, total power 1800W)	
Secondary Cure (for shadow areas)	2-3 days at ambient or 2-4 hrs at 60-80°C*
(*Place open pan of water in oven during curing)	
Recommended Removal Method	Thermal burn-through
Shelf Life at Room Temperature	6 months from date of shipment

Properties of Cured HumiSeal UV40 GEL

Thermal Properties

Continuous Use Operating Range	-65°C (-85°F) to +135°C (275°F)
Thermal Shock, per MIL-I-46058C	-65°C (-85°F) to +125°C (227°F)
Solder Through for Rework?	Yes

Physical Properties

Clarity	Translucent
Flexibility, per MIL-I-46058C	Excellent
Adhesion, per ASTM, Meth. D2197	Excellent
Weather Resistance	Very Good

Electrical Properties

Dielectric Withstand Voltage, volts per MIL-I-46058C	>7,500
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	8.0 x 10 ¹⁴ (800T)
Moisture Resistance, ohms, per MIL-I-46058C	6.0 x 10 ¹⁰ (60G)

Chemical Properties

Main Constituents	Urethane, Acrylic
Resistance to Chemicals	Excellent

Values are not intended for use in preparation of specifications.

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 that may lead to assembly failures.

Syringe Application

UV40 GEL is designed to be applied by hand syringes or automated needle dispensing such as PVA FC100 needle valve, Asymtek SC-300 in monofilament mode or other automated dispense equipment.

Brushing

HumiSeal UV40 GEL may be applied by brush. The actual uniformity of the finished coating will depend on component density and operator technique. Brushed may be cleaned promptly using solvent.

Clean Up

To clean uncured UV40 GEL, organic solvents such as methyl ethyl ketone, t-butylacetate, glycol ether acetates etc. can be used.

Rework

HumiSeal UV40 GEL is a highly crosslinked UV cured encapsulant. The cured material has a high degree of environmental and chemical resistance and will be more difficult to remove than traditional conformal coatings. The following options are available for rework of UV40 GEL.

Thermal Removal: The most effective method for removal of UV40 GEL for selective rework applications is to burn through the cured gel directly using a hot soldering iron. The high temperature of the soldering iron (typically 300-400 °C) softens and decomposes the gel and allows it to be easily displaced from the substrate. This allows access to the underlying solder connections for component removal and replacement. A hot air desoldering tool may also be used also. Apply heat to the desired area and the gel can be removed mechanically after it softens. Care should be taken to avoid damage to any heat sensitive components.

Mechanical Removal: This method involves the use of "micro-blasting" equipment that safely removes the cured gel by using a pressurized abrasive. After removal, the abrasive can be removed from the assembly surface without damage to the components. HumiSeal UV40 GEL has been successfully removed using the Micro-Blaster System from Comco Inc. (800-796-6626, www.comcoinc.com), but there are several companies that supply similar systems.

Chemical Removal: If the UV40 GEL has been UV cured only and not allowed to undergo any further moisture curing, HumiSeal Stripper 1072 could be used to remove the UV-cured film. Extended dwell times and periodic mechanical agitation could be required.

Storage

Refer to MSDS to insure proper storage conditions. HumiSeal UV40 GEL should be stored at 0-100 °F, away from excessive heat, in tightly closed opaque containers. Prior to use allow the product to equilibrate for 24 hours at room temperature. Since UV40 GEL is photosensitive, the product should not be exposed to direct sunlight or full spectrum fluorescent lighting. UV40 GEL is a moisture curing material and care should be taken to protect process vessels and partial containers from moisture. Partial, opened containers should be purged with a dry, inert gas such as dry air, nitrogen or argon before closure, otherwise premature polymerization by atmospheric moisture will occur.

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.

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