

# HumiSeal®

CONFORMAL COATINGS

## Product Selector Guide

Conformal Coatings Tailored to Specific PCB Applications



# TempSeal



**HumiSeal TS300:** A water based liquid material specifically formulated for use as a temporary mask during the conformal coating process. Applied easily from an applicator bottle, dispensing equipment or by brush. Cures at room temperature in approximately one hour or under 30 minutes in an oven. Color changes from pink to translucent red when cured. Will not tarnish gold, copper or phosphor bronze. Contains no ammonia. Is easily and completely peeled off without leaving any residue to interfere with subsequent operations.

Can also be used as temporary solder mask during wavesoldering.

# HumiTape



**HumiSeal HT500:** High performance masking tape will protect finger contacts, connectors, terminals, unsealed components, etc., from conformal coatings. Tape is a polyester film with rubber resin and pressure sensitive adhesive. It is silicone-free and contains no chemical

release coat. As a result there is no residue when tape is removed. Available by the roll in a variety of widths, and as dots, squares and rectangles in a variety of sizes as well as in custom shapes.

**HumiSeal HT600:** Anti-static version of the HumiTape.

# Strippers



**HumiSeal 1063:** A non-acidic, non-destructive, selective liquid stripper. Dissolves all cured HumiSeal polyurethane coatings without effecting most PC boards and components. Safe to use with copper, gold, silver and nickel platings; amine cured epoxy; diallyl phthalate; neoprene; phenolic; Kynar, Teflon, polyethylene and most vinyl coated wires.

**HumiSeal 1063 Gel:** Similar to above but in gel form for partial, localized removal of polyurethane film.

**HumiSeal 1071:** Reactive solvent for dissolving polyether and polyester urethanes such as HumiSeal 1A20.

**HumiSeal 1080:** VOC compliant. Dissolves all HumiSeal Acrylic coatings. Contains no ozone depleting chemicals. Meets EPA 33/50. Safe for all PC boards.

**HumiSeal 1090:** Fast acting, non corrosive silicone stripper. Safe for PC board components.

# No Clean Flux



These fluxes have been specifically formulated to be compatible with HumiSeal and most other conformal coatings without cleaning. Boards meet MIL-P-28890A ionic contamination requirements.

**HumiSeal NCF100:** Halide-free. Combination of very low resin content and special solvent blend that provides a wide process window and optimum wetting. Foam, spray or wave application.

**HumiSeal NCF200:** Low VOC, resin and halide-free flux. Emission less than 0.1 lbs./hr. under normal soldering conditions. Wave or spray application.

**HumiSeal NCF300:** No VOC's. Resin and halide-free. Complies with all existing air quality requirements for VOC emission. Wave or spray application.

# Aerosol Coatings



A series of aerosols based on standard HumiSeal formulations but with a non-ozone depleting propellant delivery system.

**HumiSeal 1B73:** Fast drying, clear acrylic. Air dries to a hard, yet flexible film. Cured coating may be soldered through leaving no residue. Contains UV tracer. UL recognized. Qualified to MIL-I-46058C.

**HumiSeal 1B15H:** Acrylic. Air dries to a hard durable, yet flexible film.

**HumiSeal 1A33:** Air cure, single component, clear polyurethane. Forms a tough resilient film. UV tracer. UL recognized. Qualified to MIL-I-46058C.

**HumiSeal 1A27:** Air cure, single component, clear polyurethane. Forms a tough resilient film. UL recognized.

*The above information is for quick reference and comparison.  
Request detailed data sheets for specific properties and applications.*



# The HumiSeal® Advantage

**KRAYDEN, INC.**  
AUTHORIZED DISTRIBUTOR  
[HTTP://KRAYDEN.COM](http://KRAYDEN.COM) 1-800-448-0406

HumiSeal makes conformal coatings to protect virtually any printed circuit assembly against contamination. These coatings provide a secure envelope around a circuit board and its components and act as a barrier against moisture, fungus, dust and other environmental contaminants. When applied properly conformal coatings also can enhance circuit reliability by eliminating detrimental conditions such as leakage from high impedance circuits, and allowing closer circuit traces required with high component density.

The selection of the correct coating for a particular application can be a critical factor in the overall performance of the circuit or assembly. It can affect the service performance of the product as well as weigh heavily in the efficiency of the manufacturing operation. To provide the best conformal coating for the need, HumiSeal manufactures over 60 coatings for a vast number of uses including high temperature and air pollution regulations, EPA and VOC requirements, plus custom coatings for specific needs.

In general, HumiSeal coatings are offered in one and two-component systems in acrylic, polyurethane, silicone and "U.V." coatings, available in bulk and aerosol containers. Most are military approved and UL recognized. The charts within contain most of

the information required to select a coating type according to the properties or characteristics wanted or required, including application method—dip, brush or spray. You are invited to call HumiSeal directly for more complete information or guidance about the best coating for your particular product or problem.

Our reputation for quality and leadership in the conformal coatings industry goes beyond materials alone. The availability of high quality technical assistance and services to the users of HumiSeal coatings is unique in the industry. Over 50 sales locations are ready, willing and able to provide any customer or company considering or currently using conformal coatings with immediate and complete application information and guidance. Customers are also invited to contact our main office for technical assistance on how to select or apply or remove a conformal coating for optimum results.

## HumiSeal®

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# HumiSeal® range of products:

- Widest selection of materials to meet electrical & environmental requirements
- Over 60 coatings, thinners, strippers and masking materials
- Custom versions available

## Acrylics

- ▶ High moisture resistance
- ▶ Excellent dielectric properties
- ▶ Selective chemical resistance
- ▶ Excellent reparability

HumiSeal Type		1B12	1B31	1B31LSE	1B73	1B73LSE
MIL-I-46058C / IPC-CC-830		No	Yes	Yes	Yes	Yes
UL Approved		No	No	No	Yes	Yes
Liquid Properties	Specific Weight (lbs. per gal.) <sup>1</sup>	7.3	7.6	7.7	7.7	8.0
	Solids Content (% by wt.) <sup>2</sup>	20	35	33	30	30
	Viscosity (centipoise) <sup>3</sup>	32	200	420	270	400
	Flash Point (°F) <sup>4</sup>	30	30	32	30	30
	VOC <sup>5</sup> grams/liter	701	592	130	647	240
	Drying Time for Handling <sup>6</sup>	10 min.	10 min.	25 min.	30 min.	25 min.
	Recommended Curing Conditions	24 hrs. RT or 30 min. 170°F	24 hrs. RT or 30 min. @ 170°F		24 hrs. RT or 2 hrs. 170°F	24 hrs. RT or 30 min. 170°F
	Time for Optimum Properties	7 days	7 days		7 days	
	Pot Life at Room Temperature	12 months	12 months		12 months	
	Shelf Life at RT - Store below 80°F	12 months	12 months		12 months	
	Coverage per gal. (sq. ft.)	530	240	220	210	190
Physical	Continuous Use Temp. Range °C	-65 +125	-65 +125		-65 +125	
	Thermal Shock Test <sup>7</sup>	Passes	Passes		Passes	
	Flammability <sup>8</sup> (self extinguishing)	Yes	Yes		Yes	
	TCE in/in/°C <sup>9</sup>	5.6 x 10 <sup>-5</sup>	5.5 x 10 <sup>-5</sup>		5.5 x 10 <sup>-5</sup>	
	Young's Modulus <sup>10</sup> psi	1400	1260		1606	
	Tg °C <sup>11</sup>	32	15		43	
Electrical	Dielectric Constant <sup>12</sup>	2.8	2.5		2.6	
	Dissipation Factor <sup>13</sup>	.01	.01		.01	
	Dielectric Withstand <sup>14</sup> (volts)	>1,500	>1,500		>1,500	
	Insulation Resistance <sup>15</sup> (teraohms)	250	800		550	
	Moisture Resistance <sup>16</sup> (gigaohms)	30	60		72	
Resistance to Solvents <sup>17</sup>		Poor	Poor		Poor	
Recommended Thinner		503/521	503/521	801	73	801
Recommended Stripper		1080		1082	1080	1082

### NEW PRODUCTS FOR MASKING PRIOR TO CONFORMAL COATING

TS300 Liquid Masking Material – Manual or Automatic Dispensing  
HT500 Super Thin Solvent Resistant Masking Tape and Dots for Fine Line Definition

# Urethanes

- High moisture resistance
- Excellent dielectric properties
- Excellent chemical resistance
- Repairable

HumiSeal Type	1A20	1A20LSE	1A27	1A27LSE	1A33	1A33LSE	2A64
MIL-I-46058C / IPC-CC-830	Yes	No	No	No	Yes	Yes	Yes
UL Approved	Yes	Pending	Yes	Yes	Yes	Yes	No
Liquid Properties	Specific Weight (lbs. per gal.) <sup>1</sup>	8.4	8.1	8.0	7.5	7.9	8.9
	Solids Content (% by wt.) <sup>2</sup>	50	44	50	50	44	55
	Viscosity (centipoise) <sup>3</sup>	100	100	5000	900	220	150
	Flash Point (°F) <sup>4</sup>	83	60	80	60	30	80
	VOC <sup>5</sup> grams/liter	510	167	480	225	530	480
	Drying Time for Handling <sup>6</sup>	60 min.	30 min.	25 min.	25 min.	15 min.	20 min.
	Recommended Curing Conditions	24 hrs. RT or 3 hrs. @ 170°F		30 days RT, 20 hrs. @ 190°F, or 30 hrs. @ 170°F			3 hrs. @ 170°F
	Time for Optimum Properties	7 days		7 - 30 days			7 days
	Pot Life at Room Temperature	30 days		12 months			8 hrs.
	Shelf Life at RT - Store below 80°F	6 months		12 months			6 months
	Coverage per gal. (sq. ft.)	300	380	150	146	300	318
Physical	Continuous Use Temp. Range °C	-65 +125		-65 +125			-65 +125
	Thermal Shock Test <sup>7</sup>	Passes		Passes			Passes
	Flammability <sup>8</sup> (self extinguishing)	Yes		Yes			Yes
	TCE in/in/°C <sup>9</sup>	5.1 x 10 <sup>-4</sup>		1.7 x 10 <sup>-4</sup>			1.4 x 10 <sup>-4</sup>
	Young's Modulus <sup>10</sup> psi	12994		3504		3915	10875
	Tg °C <sup>11</sup>	71		56			40
Electrical	Dielectric Constant <sup>12</sup>	3.5		3.6			3.5
	Dissipation Factor <sup>13</sup>	.028		.03			.024
	Dielectric Withstand <sup>14</sup> (volts)	>1,500		>1,500			>1,500
	Insulation Resistance <sup>15</sup> (teraohms)	300		200			450
	Moisture Resistance <sup>16</sup> (gigaohms)	48		12		16	48
Resistance to Solvents <sup>17</sup>		Excellent		Excellent			Excellent
Recommended Thinner		521	801	521	801	521	801
Recommended Stripper		1071		1063			1071

1. ASTM Method D1475  
 2. Fed Std 141 Method 4044  
 3. Fed Std Method 4287

4. ASTM Method D56  
 5. Volatile Organic Compounds  
 6. Fed Std 141 Method 4061

7. MIL-I-46058C  
 8. ASTM Method D635  
 9. HumiSeal Test Method

10. HumiSeal Test Method  
 11. HumiSeal Test Method  
 12. ASTM D1 50 65T

13. ASTM D1 50 65T  
 14. MIL-I-46058C  
 15. MIL-I-46058C

16. MIL-I-46058C  
 17. IPC CC 830  
 18. Purge with dry nitrogen

## Silicones

- ▶ High temperature resistance
- ▶ Good moisture resistance
- ▶ Good dielectric properties
- ▶ Repairable

## Low VOC

	HumiSeal Type	1C49	1C49LV	1C51	1C55
	MIL-I-46058C / IPC-CC-830	Yes	Pending	Yes	Pending
	UL Approved	Yes	Pending	Yes	Pending
Liquid Properties	Specific Weight (lbs. per gal.) <sup>1</sup>	8.1	8.1	7.9	7.9
	Solids Content (% by wt.) <sup>2</sup>	100	100	100	100
	Viscosity (centipoise) <sup>3</sup>	8000	300	550	250
	Flash Point (°F) <sup>4</sup>	215	215	250	250
	VOC <sup>5</sup> grams/liter	0	0	0	0
	Drying Time for Handling <sup>6</sup>	120 min.	30 - 60 min.	N/A	N/A
	Recommended Curing Conditions	24 hrs. RT or 30 min. 170°F	24 hrs. RT or 20 min. 170°F	10 min. @ 215°F	10 min. @ 215°F
	Time for Optimum Properties	7 days	7 days	10 min.	10 min.
	Pot Life at Room Temperature	7+ days <sup>18</sup>	7+ days <sup>18</sup>	>30 days	>30 days
	Shelf Life at RT - Store below 80°F	6 months	6 months	6 months	6 months
	Coverage per gal. (sq. ft.)	250	625	750	800
Physical	Continuous Use Temp. Range °C	-65 +200	-65 +200	-65 +200	-65 +200
	Thermal Shock Test <sup>7</sup>	Passes	Passes	Passes	Passes
	Flammability <sup>8</sup> (self extinguishing)	Yes	Yes	Yes	Yes
	TCE in/in/°C <sup>9</sup>	1.6 x 10 <sup>-4</sup>	1.6 x 10 <sup>-4</sup>	1.5 x 10 <sup>-4</sup>	1.9 x 10 <sup>-4</sup>
	Young's Modulus <sup>10</sup> psi	161	161	512	480
	Tg °C <sup>11</sup>	>200	>200	>200	>200
Electrical	Dielectric Constant <sup>12</sup>	2.5	2.5	2.4	2.4
	Dissipation Factor <sup>13</sup>	.01	.01	.01	.01
	Dielectric Withstand <sup>14</sup> (volts)	>1,500	>1,500	>1,500	>1,500
	Insulation Resistance <sup>15</sup> (teraohms)	500	500	500	500
	Moisture Resistance <sup>16</sup> (gigaohms)	100	100	80	80
Resistance to Solvents <sup>17</sup>		Good	Good	Good	Good
Recommended Thinner		N/A	N/A	N/A	N/A
Recommended Stripper		1090			

1H71	1122
Yes	No
Yes	Yes
8.3	8.4
35	35
2,300	2,300
>250	>250
102	412
20 min.	4.5 hrs.
30 min @ 185°F 20 min @ 212°F	30 min @ 170°F
2 days	7 days
12 months	12 months
12 months	12 months
300	300
-65 +125	-65 + 125
Passes	Passes
Yes	Yes
6.2 x 10 <sup>-5</sup>	1.2 x 10 <sup>-5</sup>
1325	2755
-40	-51
3.6	3.6
.03	.03
>1,500	>1,500
250	250
10	10
Poor	Good
De-Ionized Water	De-Ionized Water
1071	1063

### NEW HUMISEAL NO CLEAN FLUXES

NCF100 – NCF200 – NCF300 – PASS MIL-P-28809, MIL-F-14256E, BELLCORE, IPC  
 SUITABLE FOR USE WITH ALL HUMISEAL CONFORMAL COATINGS