

CONATHANE® CE-1155

Qualified to MIL-I-46058C, Type UR

CONATHANE® CE-1155 is a two-component, solvent-based polyurethane printed circuit board coating designed for use in adverse environments. CE-1155 provides outstanding resistance to moisture and good abrasion resistance.

The cured film is hard and tough and has excellent adhesion to phenolic and epoxy-glass laminates. When tested over printed circuit patterns according to MIL-I-46058-C, excellent results are obtained with 1.5 mil films. Defective components can be replaced in coated areas using ordinary repair procedures without degradation or discoloration. Spot re-coating can then be accomplished.

CE-1155 may be applied by spray, dip or brush techniques and will cure at room or elevated temperatures. The cured film is suitable for continuous operation up to 130°C. The system contains a fluorescent dye to aid inspection under ultraviolet light.

TYPICAL PRODUCT CHARACTERISTICS

(THESE ARE TYPICAL DATA AND ARE NOT MEANT TO SERVE AS SPECIFICATIONS.)

	<u>PART A</u>	<u>PART B</u>
Color	Clear Amber	Clear Amber
Brookfield Viscosity @ 25°C, cps	300	70
Specific Gravity @ 25°C	1.13	0.96
Solids Content, %	60	64-66
NCO Content, %	10.2 - 10.7	---
Flashpoint, °F, Seta Flash	81	45
Shelf Life @ 25°C (from date of manufacture when stored in the original, unopened containers)	15 months	15 months

TYPICAL CURED PROPERTIES

PHYSICAL PROPERTIES

Color	Clear
Abrasion Resistance.....	Excellent
Chemical and Solvent Resistance.....	Excellent
Hardness, Sward Rocker.....	70
Pencil.....	HB
Hydrolytic Stability - No change in hardness observed after 28 days exposure to 100°C and 98 to 100% Relative Humidity.	
Appearance - No blistering, wrinkling, cracking or peeling of film after thermal shock or after moisture resistance cycling when tested per MIL-I-46058C.	
Flexibility - No cracking or crazing of film in bend over 1/8" mandrel per MIL-I-46058-C.	
Ruggedization - No cracking or crazing of film nor lifting or breaking of components.	
Fungus Resistance - Non-Nutrient per MIL-E-5272C and MIL-STD-810B.	
Inspection - Invisible dye, fluorescent under black light.	

ELECTRICAL PROPERTIES

Insulation Resistance, ohms.....	(1.5-2.0 mil film)
Initial @ 25°C - 50% R.H.....	>2.5 x 10 ¹³
1st Cycle @ 65°C - 95% R.H.....	3.7 x 10 ¹¹
4th Cycle @ 65°C - 95% R.H.....	1.4 x 10 ¹¹
7th Cycle @ 65°C - 95% R.H.....	8.8 x 10 ¹⁰
10th Cycle @ 65°C - 95% R.H.....	6.1 x 10 ¹⁰
24 hours after 10th Cycle @ 25°C - 50% R.H.....	6.0 x 10 ¹²
Note: The films maintained excellent adhesion to the panels (epoxy-glass) during the ten-day humidity cycling tests. No under-film corrosion of the copper conductors was observed.	
Dielectric Withstanding Voltage, 1500 volts, 60 Hz - No flashover or breakdown BEFORE or AFTER thermal shock and moisture exposure.	
Dielectric Constant @ 25°C, 100 Hz	3.50
1 KHz	3.43
1 MHz	3.21
Dissipation Factor @ 25°C, 100 Hz	0.0142
1 KHz	0.0138
1 MHz	0.0162
Volume Resistivity @ 25°C, ohm-cm	1.18 x 10 ¹⁶
Surface Resistivity @ 25°C, ohms	5.66 x 10 ¹⁴
Dielectric Strength, vpm, 0.002" film	3000
0.022" film	1045

BULLETIN: C-106(o)

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APPLICATION AND PROCESSING INFORMATION

Mix Ratio by weight, Part A/Part B 100/70

<u>Mixed Viscosity @ 25° C</u>	<u>Brookfield, cps</u>	<u>#4 Ford Cup, sec.</u>
Initial	72	20.5
1 Hour	92	24.5
3 Hours	172	40.5
6 Hours	432	105.0

Pot Life, 400 grams mass @ 25°C 6 hours

Cure: One of the following cure schedules is recommended to obtain optimum properties -

<u>Temperature</u>	<u>Tack-Free Time</u>	<u>Cure Time</u>
25°C	4-5 hours	5-7 days
60°C	30-45 minutes	3 hours
100°C	10-15 minutes	1 hour

Mix the two components together thoroughly. Air bubbles introduced through mixing will normally dissipate in a few minutes.

Specific substrates to be used in production should be thoroughly evaluated. For example: There may be differences in performance on G-10, G-11 or other laminates. Cleanliness of the substrates is a major factor in promoting adhesion and preventing under-film corrosion. Boards **MUST** be clean, oil-free and dry. Request technical *Bulletin C-115* for specific cleaning recommendations prior to coating.

Because CE-1155 is a solvent-based system, it is not recommended that more than 2 to 2.5 mils of wet film thickness be applied during any one given application. This will prevent the possibility of solvent entrapment. If more than one coat is desired, allow 2 hours at room temperature or 1/2 hour at 60°C before re-coating.

CONATHANE® CE-1155 may be applied by spraying, dipping, or brushing. CE-1155 may be thinned with *CONAP® S-8* solvent to lower the viscosity or to adjust film thickness. Dilutions of 10-20% are recommended for most applications, although higher dilutions may be used which will result in thinner films per application.

STORAGE AND HANDLING

CONATHANE® CE-1155 should be stored at temperatures of 65°-85°F in tightly closed containers. If containers are opened and the contents only partially used, the container should be flushed with dry nitrogen (see *CONAP® Dri-Purge*) or dry air before being re-sealed.

The shelf life of CE-1155, Part A and Part B is 15 months from date of manufacture when stored in the original, unopened containers at the above recommended temperatures.

Note: CE-1155 Part A may crystallize when subjected to lower temperatures. If this occurs, heat the container for 2-4 hours at 50-60°C until it clears. Allow to cool to room temperature to use.

CE-1155 Part A contains traces of monomeric isocyanate. Adequate ventilation should be provided during and immediately after application. The use of masks suitable for organic vapors is recommended. Ovens should be vented to the atmosphere. Avoid breathing of vapors or spray and prevent contact with the skin and eyes. If contact does occur, wash with water or soap and water.

AVAILABILITY

CONATHANE® CE-1155 is available in quart, gallon, 5-gallon and 55-gallon drum units. Each UNIT consists of pre-weighed quantities of Part A and Part B packaged in individual containers. An EVALUATION KIT available at a nominal fee.

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SEE *Conformal Coatings Comparison Chart* for other Cytec conformal coatings.

The information presented here is based on carefully conducted laboratory tests and is believed to be accurate. However, results cannot be guaranteed and it is suggested that customers confirm results in their own laboratory before plant tests are made. Nothing contained in this bulletin shall be construed as a recommendation to use any product or process in violation of the claims of any patent now in effect.

NOTICE: Precautionary labels and Materials Safety Data Sheet(s) for all materials referred to, whether the materials are produced by Cytec Industries Inc. or other manufacturers, should be fully read and understood by all supervisory personnel and employees before using. For additional safety and health information, contact Cytec Industries Inc. Purchaser has the responsibility for determining any applicability of and compliance with federal, state, and local laws and/or regulations involving labeling, use, and waste disposal, particularly in making consumer products.