



TECHNICAL DATA SHEET

Formulated Resins

CONAP® CE-1164



DESCRIPTION

CONAP® CE-1164 is a single-component, air drying, room temperature curing, polyurethane conformal coating which meets the requirements of MIL-I-46058-C for Type UR coatings and appears on the Qualified Products List (QPL).

CONAP CE-1164 is a solvent-based coating designed for thin-film applications on electronic components and printed circuitry. It was developed specifically to provide the ultimate in humidity resistance and hydrolytic stability while retaining excellent flexibility to prevent fracturing of fragile components during thermal cycling.

Cured films maintain excellent adhesion to phenolic and epoxy glass laminates even in adverse environmental conditions. A tracer dye has been incorporated to aid inspection under ultraviolet light.

CHARACTERISTICS AND PROPERTIES

Table 1 | Product Description

Property	Value
Appearance	Clear Light Amber
Brookfield Viscosity @ 25°C (77°F), cps	100
Specific Gravity @ 25°C (77°F)	1.05
Solids Content, %	50
NCO Content, %	5.5
Flashpoint, (Closed Cup), °C (°F)	13°C (55°F)
Shelf Life @ 25°C (77°F) from date of manufacture when unopened in the original containers	18 months

Table 2 | Cured Properties

Property	Value
Color	Clear Light Amber
Chemical & Solvent Resistance	Excellent
Appearance	No blistering, wrinkling, cracking, or peeling of film nor discoloration of copper conductors or substrates after thermal shock, moisture resistance cycling, or hydrolytic stability testing (Per MIL-I-46058-C).
Hydrolytic Stability	After aging 120 days at 85°C (185°F) and 95% R.H., the only change in the appearance of the coating from the original was slight yellowing in color. There was no evidence of softening, tackiness, reversion to a liquid state, chalking, blistering, cracking, or loss of adhesion (per MIL-I-46058-C)
Flexibility	No cracking or crazing in bend over 1/8" diameter mandrel (per MIL-I-46058-C)

Property	Value
Thermal Shock	No cracking, blistering, wrinkling, or peeling when cycled from - 65°C to 125°C (149°F-257°F) (per MIL-STD-810B)
Fungus Resistance	Non-nutrient per ASTM G21
Solderability	Excellent
Inspection	Invisible dye, fluorescent under ultraviolet light

Table 3 | Electrical Properties

Property	Value
Insulation Resistance, ohms (2.0 mil films) Initially @ 25°C (77°F) and 50% R.H. After 10 days @ 65°C (149°F) and 95% R.H. After conditioning 24 hours @ 25°C (77°F) and 50% R.H.	2.5 x 10 ¹³ 1.3 x 10 ¹⁰ 4.5 x 10 ¹²
Dielectric Withstanding Voltage, 1500 V.A.C.	No Flashover or breakdown
Dielectric Constant, 1MHz @ 25°C (77°F)	2.70
Dissipation Factor, 1 MHz @ 25°C (77°F)	0.020
Dielectric Strength, VPM, 1 mil film	3500
Volume Resistivity @ 25°C (77°F), ohm-cm	1.5 x 10 ¹⁵

APPLICATION

CONAP® CE-1164 is a high-performance conformal coating specifically designed as an electrical insulating coating for printed circuitry and components. The ultimate performance of the cured film is dependent on process controls used in application of the coating. Cleanliness of the substrate is a major factor in promoting adhesion and preventing under-film corrosion. Assemblies must be clean, oil-free, and dry. For specific recommendations, please request **Technical Bulletin C-115**.

CONAP CE-1164 may be applied by spraying, dipping, or brushing. If viscosity reduction is desired, dilutions of 10%-20% by weight with CONAP® S8 solvent are recommended for most applications. It should be noted that CONAP CE-1164 reacts with moisture in the air, and dip tanks should be covered and blanketed with dry air or nitrogen when not in use to prevent waste of material in the tank.

Two coats are recommended for optimum protection. A total cured film thickness of 2 ± 1 mil is recommended. CONAP CE-1164 may be recoated, if desired, after the previous film is tack-free.

CURE

Curing of the film is dependent upon evaporation of solvents and subsequent reaction of the polymer with moisture in the air to effect cure. The coating will dry tack-free in approximately 20 - 30 minutes and will cure in 24 hours at room temperature. Optimum physical and electrical properties require a post-cure of 5 to 7 days at room temperature. (An alternate cure of 3 hours at 60°C plus 2 - 3 days at room temperature may also be used). NOTE: CONAP CE-1164 should not be used where humidity conditions are less than 30%.

CONAP S8 Solvent is recommended for cleaning equipment and for removing uncured CE-1164.

AVAILABILITY

CONAP® CE-1164 is available in quart, gallon, 5-gallon, and 55-gallon containers.

An EVALUATION KIT is available at a nominal fee.

See the **Conformal Coatings Comparison Chart** for other similar Cytec products.

HANDLING AND STORAGE INSTRUCTIONS

Maintain containers at temperatures of 65°F-85°F and keep securely closed when not in use. Moisture may cause polymerization. To extend shelf life once opened, containers should be flushed with nitrogen (see CONAP® Dri-Purge) each time they are opened unless the contents are used within one day.

CONAP CE-1164 has a minimum shelf life of 18 months from date of manufacture when stored in original unopened containers at 65°F-85°F.

CAUTION

Responsible handling of Cytec Industries Inc. products requires a thorough review of safety, health, and environmental issues prior to use. Review the Material Safety Data Sheets(s) for the specific Cytec Industries Inc. product(s) and container label information before opening containers. Ensure that employee exposure issues are understood, communicated to all workers, and controls are in place to prevent exposures above Permissible Exposure Limits (PELs). Review safety and environmental issues to be certain controls are in place to prevent injury to employees, the community, or the environment, and ensure compliance with all applicable Federal, State, and Local laws and regulations. For assistance in this review process, please call your Cytec Industries Inc. representative or our office noted below.

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