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Handling and Precautions Guideline

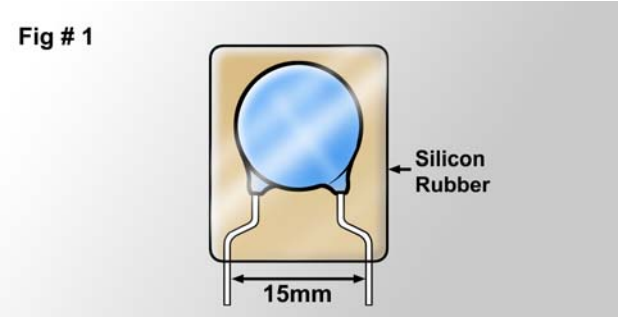
Product: High Voltage (≥10, 000VDC Rated) Radial Leaded Ceramic Disc Capacitors

- Concern: Potential component failure could occur if component is not processed with insulation or encapsulation. Short circuit could occur on PCB if capacitor dielectric element is not protected from impact of high voltage. Continuous voltage applied may result in temperature rising of ceramic capacitor heating and potentially resulting in burning or blowout.

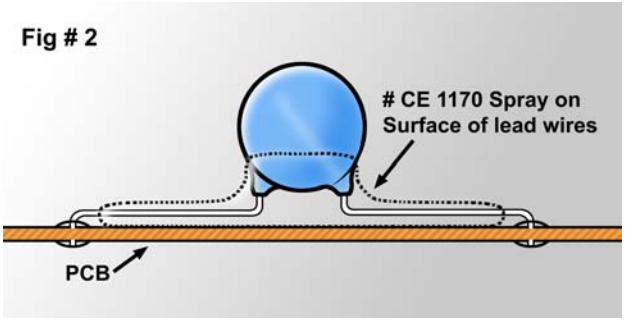
- Ref: Testing method for high voltage capacitor during manufacture of this component
Capacitor are immersed in insulating liquid during dielectric withstand voltage testing in order to avoid air arcing between leads. External continuous sparking may damage epoxy coating, which could lead to failure of internal capacitor dielectric element (i.e. Cracking and Epoxy failure).

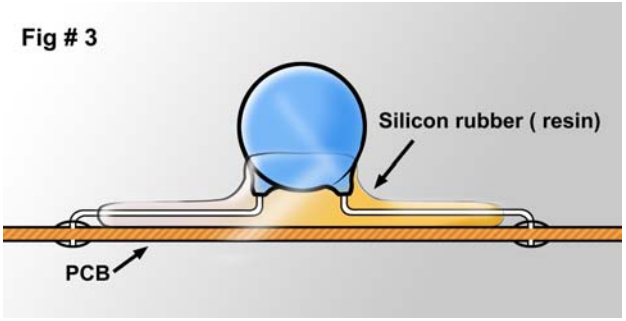
Precautions to be taken by PCB assembler:

1. If capacitor is used individually, portion of lead wire with lead spacing less then 15mm should be encapsulated with silicon rubber as illustrated in Fig #1.



2.. When capacitor is inserted directly into PCB board, exposing lead wires and soldering portions of soldering pads on the board should be protected with insulator, #CE-1170 Resin from Conap, Inc is recommended with spray coating in this process as illustrated in Fig # 2, or the lead wire should be coated with silicon rubber as illustrated in Fig # 3.





Coating Application:

Based upon Conap, Inc suggested methods of application of #CE-1170, we summarize as follows:

+ Spray coating is a practical and is likely the most widely used method.

+ Generally, a 2.0 mil thickness (+/-0.5 mil) will give the best protection.

+ Suggested conditions in coating area: 70-80 degF at 30-50 % Relative Humidity.

+ Please note that boards and components must be clean, oil-free and dry.

Suggested Cleaning Procedure:

1) After wave solder or assembly, vapor degrease the printed circuit assembly (PCA) in acetone or other suitable degreasing solvent.
2) Rinse thoroughly with clean isopropyl alcohol or other cleaning solvent.
3) Air-dry PCA for 15-30 minutes.
4) PCA should be coated as soon as after stabilizing at room temperature.

+ Cure Coating: Curing of the film is dependent upon evaporation of solvents. The coating will dry tack-free in 15 minutes at 25°C or 10 minutes at 60°C. CE-1170 will fully cure in 24 hours at 25°C or 45 minutes at 60°C.

For more details, see pages 3& 4 or visit Conap's web site: www.conap.com

CONAP® CE-1170

- QUALIFIED TO MIL-I-46058C, TYPE AR -

CONAP® CE-1170 is a single-component air drying room temperature curing acrylic conformal coating that meets the requirements of MIL-I-46058-C for Type AR coatings.

CE-1170 is a solvent-based coating designed for thin-film applications on components and printed circuitry. It was developed specifically for its fast drying time and reparability, as well as to provide the ultimate in humidity resistance and hydrolytic stability, while retaining excellent flexibility to prevent fracturing of fragile components during thermal cycling. Its electrical properties are outstanding.

Cured films maintain excellent adhesion to phenolic and epoxy-glass laminates even in adverse environmental conditions. Components may be removed by heating the coating with a soldering iron, or the entire coating may be removed with a suitable solvent. A tracer dye has been incorporated to aid inspection under ultraviolet light.

TYPICAL PRODUCT CHARACTERISTICS

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

Appearance	Amber, Slight Haze
Brookfield Viscosity @ 25°C, cps	400 cps
Specific Gravity @ 25°C	0.95
Solids Content, %	31
Flashpoint (Closed Cup), °F	55
Shelf Life @ 25°C (original, unopened containers) from date of manufacture	15 months

TYPICAL CURED PROPERTIES

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

Physical Properties

Appearance	Clear, colorless
Solvent Resistance	Fair (See Reparability, page 2)
Hydrolytic Stability	After aging 120 days at 160°F and 95% R.H., there was no evidence of discoloration, softening, tackiness, reversion to a liquid state, chalking, blistering, cracking, or loss of adhesion (per MIL-I-46058C).
Flexibility	No cracking or crazing in bend over c" diameter mandrel (per MIL-I-46058-C).
Thermal Shock	No cracking, blistering, wrinkling, or peeling when cycled from -65°C to 125°C (per MIL-STD-810B).
Flame Resistance	Self-extinguishing (per FED STD-406)
Fungus Resistance	Rating 0 (MIL-STD-810B)
Solderability	Excellent
Inspection	Invisible dye, fluorescent under ultraviolet light

Electrical Properties

Insulation Resistance, ohms (2.0 mil films)	
Initially @ 25°C and 50% R.H.	$>1.5 \times 10^{16}$
After 10 days @ 65°C and 95% R.H.	2.5×10^{12}
After conditioning 25 hours @ 25°C and 50% R.H.	1.0×10^{16}
Dielectric Withstand voltage, 1500 V.A.C.	No flashover or breakdown
Dielectric Constant, 100 Hz at 25°C	2.5 - 3.0
Dissipation Factor, 100 Hz @ 25°C	0.01
Dielectric Strength, vpm	3000 min
Volume Resistivity @ 25°C, ohm-cm	2×10^{15}

APPLICATION INFORMATION

CONAP® CE-1170 is a high-performance 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.***

CE-1170 may be applied by spraying, dipping, or brushing. If viscosity reduction is desired, dilutions of 10-20% by weight with ***CONAP® S-13*** Solvent are recommended for most applications.

PLEASE NOTE: For spray applications, dilutions up to 1 to 1 by volume may be necessary to avoid cobwebbing.

CE-1170 may be sprayed with most conventional air spray equipment.

Two coats are recommended for optimum protection. A total cured film thickness of 2 ± 1 mil is recommended. CE-1170 may be re-coated, if desired, after the previous film is tack-free.

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CURE: Curing of the film is dependent upon evaporation of solvents. The coating will dry tack-free in 15 minutes at 25°C or 10 minutes at 60°C. CE-1170 will fully cure in 24 hours at 25°C or 45 minutes at 60°C.

REPARABILITY: CE-1170 has only fair resistance to solvents. Fully cured films can easily be removed by immersion in solvents such as ***CONAP® S-8***, ***S-13***, toluene, or ketones. This facilitates repair of the coating and removal of damaged components.

After removing the coating, follow normal cleaning procedures and re-coat.

STORAGE AND HANDLING

Maintain containers at temperatures of 65°-85°F and keep securely closed when not in use. The shelf life of CONAP® CE-1170 is 15 months from date of manufacture when stored in the original, unopened containers at 65°-85°F.

CAUTION: Use only in well-ventilated areas. Adequate ventilation should be provided during and immediately after application. Avoid breathing of vapors or spray. Prevent skin contact - if contact occurs, wash with soap and water.

Material is flammable. Do not use in presence of open flames or sparks.

AVAILABILITY

CONAP® CE-1170 is available in quart, gallon, 5-gallon, and 55-gallon containers.

An EVALUATION KIT is available at a nominal cost.

"CONAP" is a registered trademark of Cytec Industries Inc.

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

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