

## Protecting your circuitboard from moisture and humidity

We all know what happens when moisture or humidity gets into contact with electronics devices - they stop working. Damage generally occurs at the circuit board level. Moisture and humidity can cause a short circuit. Short circuits occur when water creates a bridge across tracks and in some cases this has resulted in arcing and fires. Electronic devices may also malfunction from traces being corroded away.

### EFFECTS OF MOISTURE AND HUMIDITY ON TRACES

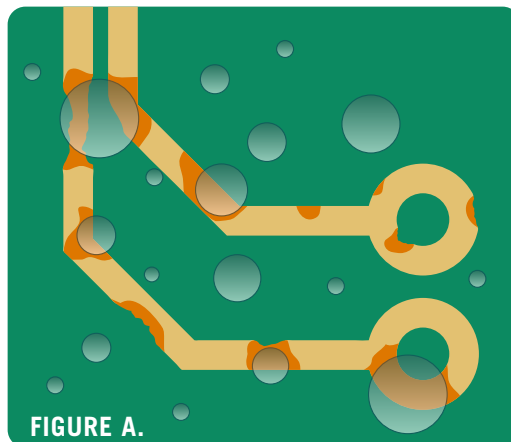


FIGURE A.

CORROSION OF COPPER CIRCUITRY

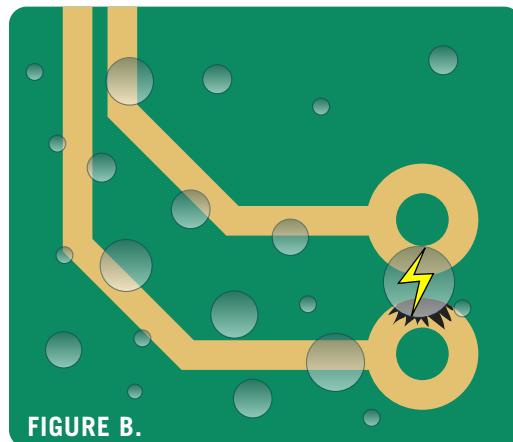


FIGURE B.

BURNT PCB RESULTING FROM ARCING

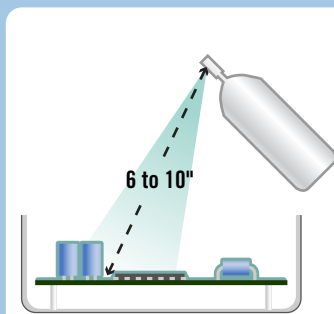
## SOLUTIONS

1

### Conformal Coating



Conformal Coatings are most commonly used. They are easy to apply and very effective at preventing your PCB from corroding, short circuiting, or arcing. Simply clean your board and spray or brush the product on. You will be left with a board that is coated with a transparent coating of approximately 1 mil thick (one coating).



#### Application Instructions

Shake well before using. Spray with an even sweeping motion 6 to 10 inches (15 to 25 cm) from surface. Spray from different angles for proper coverage. Apply 2 or 3 coats if extra coverage is desired, waiting 5 to 10 minutes between coats. For best results, apply at room temperature (20°C / 60°F). May also be applied in liquid form with a brush, or microtip pen.

### TYPES OF CONFORMAL COATING

#### ACRYLIC ▶ For general use

Mfg. Part No. 419B

- ▶ Dielectric strength 1500 V/mil
- ▶ Hard finish
- ▶ Meets IPC-TM-650 and Meets IPC-CC-830

#### SILICONE ▶ For high temp. environments

Mfg. Part No. 422

- ▶ Dielectric strength 2000 V/mil
- ▶ Flexible finish
- ▶ Meets IPC-TM-650

#### URETHANE ▶ For harsh environments

Mfg. Part No. 4223

- ▶ Dielectric Strength 2000 V/mil
- ▶ Hard flexible finish
- ▶ Harsh environments
- ▶ Solvent and chemically resistant
- ▶ Fungus Resistance MIL-V-173C-2

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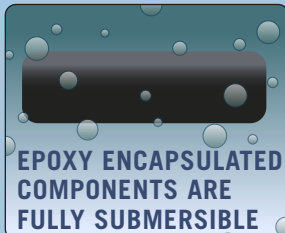
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## 2

### Epoxy



Epoxies are two part encapsulating compounds. They are mixed and then poured onto the circuit board. Once cured, the result is extremely hard and durable. Epoxy is most effective when board is cover with at least ¼ inch in thickness.

Epoxies provide excellent protection against impact, shock, conductivity, moisture, abuse, chemicals, and analysis. Provides technology security. Excellent for explosion proof components. Epoxies are extremely difficult to remove.



#### TYPES OF EPOXY

##### Black Epoxy (Mfg. Part No. 832B)

- ▶ Black in color
- ▶ General use
- ▶ Secure against technology theft

##### Clear Epoxy (Mfg. Part No. 832C)

- ▶ Amber in color
- ▶ Allows visual of board after cure

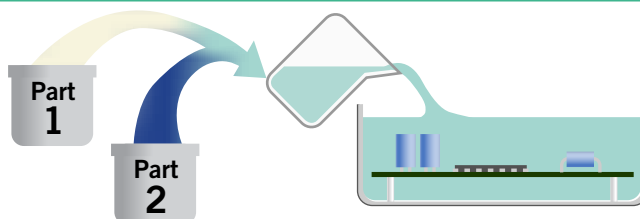
##### Thermally Conductive (Mfg. Part No. 832TC)

- ▶ Black in color
- ▶ Used to encapsulate boards with components that give off heat. Enables heat dissipation.

##### Flame Retardant Epoxy (Mfg. Part No. 832FRB)

- ▶ Black in color
- ▶ Used in environments where PCB may be subject to possible fire hazards

#### Potting and encapsulating with Epoxies and RTV Silicones

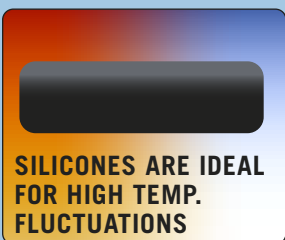


##### Application Instructions

Mix parts 1 and 2 of the RTV Silicone or epoxy in a separate container according to the product's mix ratio. Pour the mixed 2-part encapsulant into the enclosure, fully covering your circuitboard. Cure time will vary from product to product, please see product pages on website for details.

## 3

### RTV Silicone



RTV Silicones are Room Temperature Vulcanizing Silicones. Generally, 2-part flowable silicones are used for encapsulating. They are used in the same fashion as epoxies but is able to be removed when repairs have to be done later. RTV Silicones are ideal for environments exhibiting high temperature fluctuation.



#### TYPES OF RTV SILICONE

- ▶ General Use
- ▶ Optically Clear
- ▶ Thermally Conductive
- ▶ Extreme High Temperature
- ▶ Extreme Low Temperature
- ▶ Flame Retardant

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