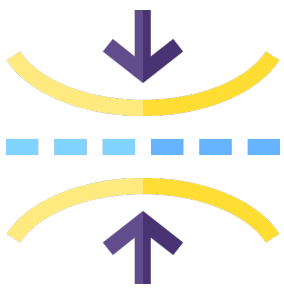
Silicone Conformal Coatings

Conformal coatings are applied to printed circuit boards (PCBs) to protect them from environmental stress such as salt, corrosion, humidity, and moisture, mitigate tin whiskers, and provide a barrier to electrically insulate components. A wide variety of conformal coating types are available, each with their own strengths and weaknesses.

Silicones are often used for very high- or low-temperature environments. They provide high humidity and corrosion resistance along with good thermal endurance but require thermal curing and have short pot lives. Silicone coatings are also prone to abrasion (low cohesive strength) and have high coefficients of thermal expansion.

Strengths

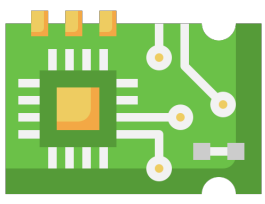
Stable Over Wide Temp. Range
(In General, -40ƒC to 200ƒC) [104ƒF to 392ƒF]



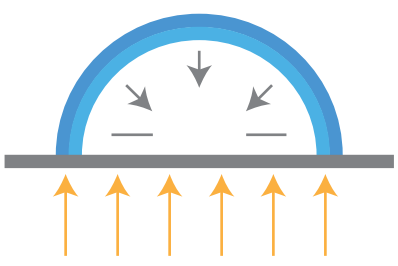
Flexible, Provides Dampening and Impact Protection

UV/Sunlight Resistance

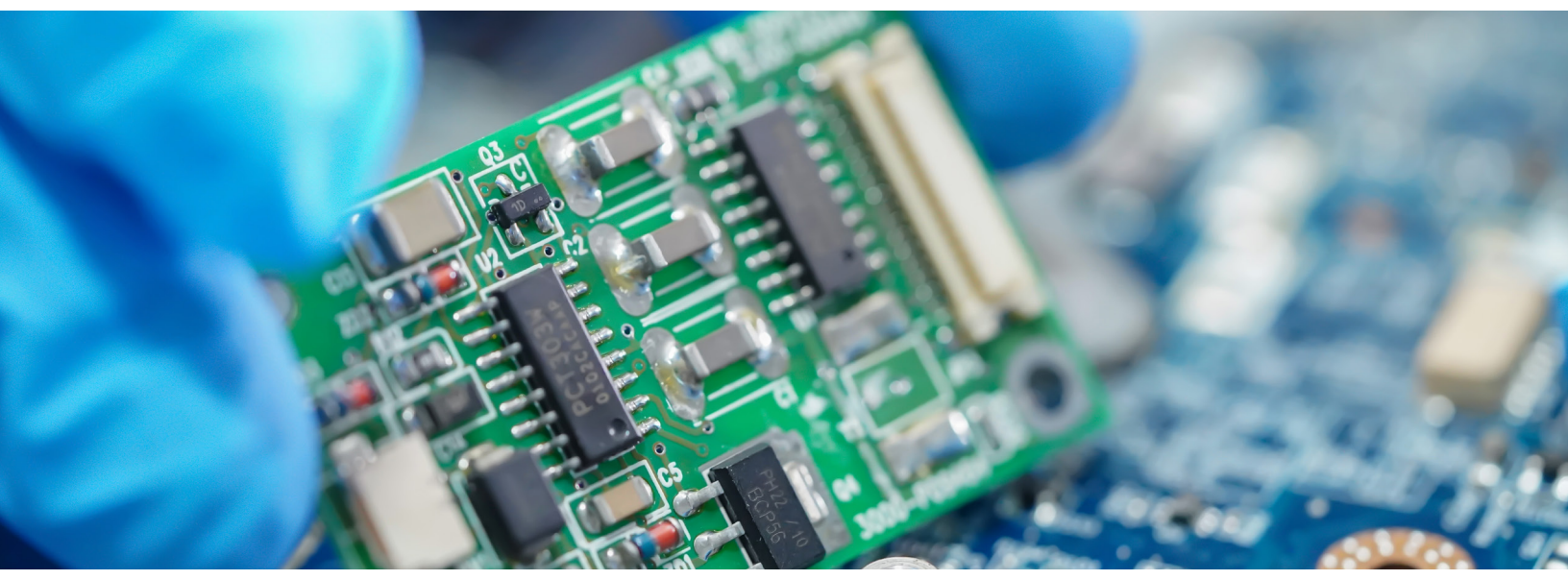
Good Moisture and Humidity Resistance



High Dielectric Strength



Low Surface Energy
(Enables Effective Penetration Under Components)



Weaknesses of Cure Type

Room Temperature Vulcanization (RTV)

- Requires humidity (minimum 20% RH) to cure and only intermittent solvent resistance
- Low abrasion resistance
- Short pot life
- TCE is ~300-350 ppm/ƒC
- If proper house keeping is not followed, there is a potential for cross contamination

UV Cure

- One-component coatings require accurate application material to avoid shadowed areas
- Potential for cure inhibition
- Low abrasion resistance
- UV intensity and wavelength affects cure
- Some secondary-cure mechanisms react with moisture, this can cause spray valves to become clogged

Catalyzed (Addition)

- Low abrasion resistance
- Potential for cure inhibition
- Adhesion may be difficult
- Only intermittent solvent resistance
- If proper house keeping is not followed, there is a potential for cross contamination

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