



TECHNICALLY SPEAKING

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Choosing a Conformal Coating

What kind of conformal coating should I use on my circuit boards? You may get this question frequently, so it's a good idea to review the process for selecting a conformal coating. The first question that should be asked is "What conditions will the circuit board see during use?" Will the circuit board be exposed to humid, moist environments as it operates? Will the circuit board be subjected to vibration, corrosive chemical fumes, or extremes of temperature? Let's review the various external effects from which the circuit board should be protected, and the type of ITW Chemtronics conformal coating that should be selected to afford the proper protection in each case.

Circuit boards that will be exposed to extremes of temperature, from below freezing (32 °F) to above boiling (212 °F), should be coated with ITW Chemtronics Konform[®] SR silicone conformal coating. Konform[®] SR has a very low thermal conductivity and therefore insulates the circuit board from the effects of rapid temperature change. Konform[®] SR cures as a soft, flexible film that, unlike the hard, rigid coat produced by acrylic and urethane conformal coatings, will "move" with the board as it expands and contracts, without cracking or losing adhesion. The flexibility of the Konform[®] SR coating will also cushion the circuit board against vibration. Konform[®] SR is also the best coating available for protecting circuit boards from the effects of operating in high humidity or from exposure to moisture. The high dielectric strength of the Konform[®] SR silicone coating will prevent the circuit board from arcing or discharging in moist environments at up to 1000 volts per mil (0.001") of coating thickness. Konform[®] SR has fair abrasion resistance and good resistance to fungal growth in damp environments. The tough silicone coating also resists attack by corrosive chemical vapors and salt spray. Konform[®] SR can be easily removed during circuit board repair using the CircuitWorks[®] Conformal Coating Remover Pen or the Mighty Pen[™].

Konform[®] SR High Viscosity incorporates all the advantages of regular Konform[®] SR, but is a thicker liquid, with higher surface tension. The high surface tension of Konform[®] SR High Viscosity prevents it from running underneath elevated components, or through the connecting vias used in through-hole board technology. The higher viscosity formulation also offers the practical benefit of higher coating thickness with fewer applications, when used in production-line situations.



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ITW Chemtronics Konform[®] AR Acrylic Conformal Coating is the best choice for applications requiring a greater dielectric strength (8300volts/mil thickness). It should be used to coat boards that will carry high amounts of current and/or will operate in very humid or wet environments. Konform[®] AR resists fungal growth and offers limited protection against salt spray and other corrosive chemicals and gases. Konform[®] AR is very resistant to corrosive acid vapors and exposure to liquid acid solutions. Konform[®] AR, like all acrylic conformal coatings, has very poor resistance to organic solvent exposure, but for this reason it is easy to remove for circuit board repair and rework purposes.

Remember that all of the ITW Chemtronics conformal coatings can be stripped from the circuit board using Electro-Wash[®] Two Step or The Mighty Pen[™]. Also, all our conformal coatings contain a UV-activated fluorescent dye, to facilitate inspection of the circuit board for coating uniformity. All Konform[®] conformal coating products meet the requirements of MIL-I-46058C, for Type SR silicone coatings and Type AR acrylic coatings. All Konform[®] conformal coatings are UL (Underwriter's Laboratories) Recognized, and I can supply copies of the UL test documentation on request.

I also have available a simplified conformal coating selection guide, which I will be happy to send to you on request. This guide demonstrates the process of choosing an ITW Chemtronics conformal coating, and also addresses those conditions that require the use of different types of conformal coatings, which are not carried by ITW Chemtronics.

Michael Watkins
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