



Thermal Curing of Conformal Coatings

By Wes Noble

Curing the Coating

When it comes to the application of conformal coating, curing the coating plays a key role in the circuit assembly and selective conformal coating process. Curing conformal coating occurs after the coating spray/dispense process is complete. The coating is considered “cured” when the conformal coating on the circuit assembly is sufficiently tack-free to be handled. Curing can sometimes be accomplished at room temperature but takes a considerable amount of time to dry. Accelerated conformal coating curing decreases this drying period, the cure process reaches either the tack-free or a fully dried state but not quite having fully cured properties. Accelerated curing techniques include one or a combination of heat, moisture, UV light, and chemical reaction curing. This article focuses primarily on thermal or heat curing.

Fully curing means achieving complete hardness for the conformal coating. This occurs when the coating has reached optimum electrical and mechanical properties for full performance protection of the circuit assembly.

By the time a circuit assembly reaches the conformal coating stage, a considerable amount of time and money has gone into the creation of the board. Tight process control is critical to the success of the selective conformal coating operation to avoid quality rejection at this late stage in the assembly process.

How does TrioTek address the Challenges of Conformal Coating?

Due to the amount of work in progress it is often necessary or desirable to accelerate the cure. Accelerated heat curing minimizes the risk of contamination in the coating. Accelerating the curing process has its own challenges and can often lead to surface skinning, solvent entrapment, bubbles, and blistering.

By using TrioTek these risks are essentially eliminated. Radiant energy (heat) passes through the conformal coating, warming the circuit assembly, and dries the coating from the inside out. Vapors from the conformal coating are off-gassed and removed. The conformal coating is cured from the inside out by conduction from the circuit board. Thermal curing technology from TrioTek produces a cured conformal coating without any bubbles, scabbing or blistering.