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Which application method should I choose? Do I dip, spray or brush?

Application selection for conformal coating depends on several criteria such as material selection, volume of PCBs, budget, throughput speed, coating coverage required and ease of masking. Unfortunately, it can be a combination of factors that effect choice and it is important to look at all the information collectively.

The first question that should be asked is what material is to be used? This is critical since some coatings lend themselves to spray processing compared to dip and vice versa. For example, a moisture cure coating is not ideal for dipping since eventually the whole dip tank will cure whereas a water based coating is perfect.

Other factors like volume and throughput are very important. It would be easy to choose selective coating, assuming an automation process would be cost effective. However, set up and programming costs and suitability for the application need to be considered.

Also, an important point with robotic systems is whether the board design is suitable for selective spray? If the board is 3D in nature or has areas which are critical as no go areas for coating then it may be too difficult an option and at least some of the process may have to be manual.



Also, design layout of the board must be considered. Some boards lend themselves to be dipped easily whereas dipping other types would be a process disaster and spraying is a solution.

Finally, budget is very important. It may be that cost of capital equipment cannot be returned easily and lower cost solutions may need to be found such as subcontracting the work out.

In the end it is the balance of factors which matters. This is the reason SCH have 60 different conformal coatings from Humiseal and a variety of application methods available such as robotic application and batch spray dip for both in house set up or subcontract coating service since there is no perfect way to coat all boards.

What do we provide?

SCH Technologies can offer conformal coating services, equipment, consultation and Humiseals great range of conformal coating materials. We will be happy to answer any of your questions and we've got the experience to solve any of your conformal coating headaches. Don't hesitate to contact us with the details on the following page and we'll help to ease the pain of conformal coating.

What problems could I see if I do not use cleaning before the conformal coating process?

Cleaning is always a good idea from a reliability point of view, especially if you are using liquid fluxes. Also, it is our experience that with solder pastes, solvent-containing coatings generally interact with the paste residues more than solvent-free coatings such as UV40 which can lead to unexpected failure modes. The main failure mechanisms typically seen are:

- Rosin from paste melting at $T > 80^{\circ}\text{C}$ and phase change (solid/liquid) resulting in increased volume, which stresses coating, causes and causes cracks. This is a point of ingress for water and a possible failure site.
- Solvent in coating leaches activators from the rosin, free acids in coating or surface of board which can cause failures.
- Residues cause coating to de-wet, with no coating present in certain areas.

As long as the bare boards are of good quality (ionically clean, free of surfactants) and the solder process is under control then the vast majority of pastes are compatible with coatings. For combinations of flux & coating, we can check our database for any compatibility issues.



My coating will not stick to the PCB. What can I do?

There are a couple of options to take. The first option to consider is to clean the PCB. This could improve the performance. However, there is no guarantee that this will work. For instance, some solder resists give poor adhesion whatever you do and it is just an incompatibility with the coating. Also, if you are running a no-clean process then this option isn't so to speak.

An alternative to cleaning is to heat the PCB to approx 50°C before applying the coating. The coating is applied whilst the PCB is hot and the film forming nature of the coating is accelerated. This can solve your problems in certain cases.

However, if this doesn't work then another option is to change coatings! Sometimes it is just an incompatibility and changing coatings completely eliminates the issue. Humiseal have coatings such as 1R32A2 and 1B31S that are specifically designed to stick to difficult boards.