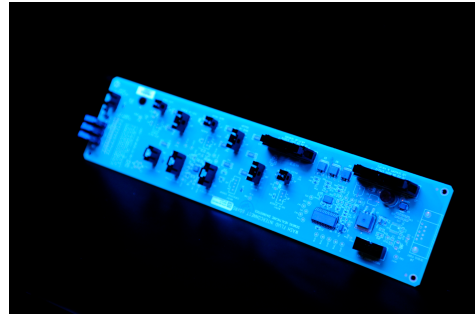




Bright Shield Conformal Coating Application Guide

General Information

Conformal coating is a protective non conductive dielectric layer that is applied onto the printed circuit board assembly to protect the electronic assembly from damage due to contamination, salt spray, moisture, fungus, dust and corrosion caused by harsh or extreme environments.



It is usually used on electronic products that are exposed to adverse environments where heat, chemicals and / or moisture are prevalent. Coating also can prevent damage from rough handling, installation and reduction of mechanical and thermal stress. It can prolong the life of the product during its operation and at the same time, it can help to increase the dielectric strength between conductors enabling the design of the PCB to be more compact and small. Finally, it also acts to protect circuitry and components from abrasion and solvents.

When coated, it is clearly visible as a clear and shiny material. Some coatings are hard, while others have a slightly rubbery texture. Most coatings include a marker that appears greenish white when view under UV light. This marker enables easy inspection of the coating thoroughness checking during production.

For further information on the Bright Shield Range of Conformal Coatings please review the Technical and Material Safety Datasheets.

Technical Support

Technical support is always available directly through Bright Shield Coatings and our distribution network.

Please contact us directly to discuss how we can help you and have our technical experts advise you on how to proceed.

We can produce coated board samples for evaluation of a coating's protective abilities. Based on our extensive industry experience, we can advise you on the best methods and conditions for your process.

Equipment Compatibility

Bright Shield conformal coatings can be used in all application technologies including selective robot, dipping, and batch spraying and brushing. Follow the specific instructions on material handling in the application process section.

Safety Recommendations

Please read the Material Safety Datasheets for each coating which will explain everything relevant to the safety precautions, environmental requirements, handling, waste disposal, storage and transport.

Also review the legal requirements for the country the material is used to ensure that all needs are met.

Ensure that the equipment the material is being used in is suitable for the conformal coating.

Compatibility

Conformal coatings can be incompatible with certain materials that are susceptible to solvents. Please check the Material Safety Datasheets for the relevant details on the coating solvents to check the compatibility with the circuit boards to be coated.

Coating Preparation

Pot life

The pot life of the conformal coating is dependent on the environment that the coating is stored within. Refer to the Technical Datasheet of the individual conformal coating for further details.

Viscosity Adjustment

The conformal coating viscosity can be adjusted by mixing with Bright Shield Protective Coating Thinners. This dilution will depend on the application process and the equipment used. It is possible to dilute the coating and monitor its viscosity using a flow cup. Further advice can be given directly depending on the application.

Environmental Considerations

Ensure the conformal coating is at room temperature before use.

Cleaning Before Coating

To achieve the best performance with conformal coatings it is best to clean the circuit board before application. However, with the use of no clean flux processing this may not be possible. Contamination of any type may be detrimental both in the short term for processing where the coating cannot adhere correctly or in the long term where reliability of the product could be an issue due to the residues on the board.

Advice should be taken if in doubt and tests carried out to check whether the residues will cause problems to the board.

Application Processes

Brushing

Application of the conformal coating can be achieved easily with a brush. It may be advantageous to dilute 5-10% with thinners before application to allow the coating to flow easier.

Dipping

Dip coating is a high-speed process that can produce highly repeatable results. Bright Shield conformal coatings can be used in small, medium and large dip coating systems with excellent results.

Normally, the conformal coating is used in its bulk form without dilution. However, the coating can be diluted to achieve a different coating thickness. Monitoring the coating thickness and the viscosity on regular occasions will guide on the process controls needed to ensure a repeatable process.

The conformal coating thickness is related to several variables including viscosity of coating, withdrawal speed of the coating dip system, the geometry of the circuit board and the temperature of the environment.

Batch Spraying

Batch spraying using an aerosol or hand spray gun is an easy process with Bright Shield Coatings. The guidelines for using the coating is as follows:

- 1) Dilute 50:50 with thinners. Mix thoroughly and apply a test pattern to ensure gun is flowing properly. If “spider webs” occur, dilute further
- 2) Position clean board (free of flux) horizontally
- 3) Hold gun at 45° angle and at a recommended distance of 20 to 25 cm
- 4) Spray a thin and uniform coat onto the board with an even motion using “spray and release” strokes
- 5) Turn board 90° and repeat until board has completed one rotation
- 6) If a second coat is required, wait 2-3 minutes and repeat steps 4-5
- 7) Coating will dry to touch within 10-15 minutes, tack free within 30 minutes, and fully cure in 24 hours at room

Robotic Selective Coating

Bright Shield conformal coatings can be blended to meet the different viscosities required by the robot manufacturers and their valve technologies. Consult with Bright Shield to ensure we provide you the right blend for your robot process.

Drying / Curing

Conformal coating drying is where the printed circuit board is coated and is fit to be handled by the operators. This may only be a few minutes after application and depends on many factors including extraction rate, solvents used and coating thickness.

Conformal coating curing is where the optimum properties (electrical, mechanical) of the conformal coating are reached for full performance protection to the circuit assembly. This again depends on many factors including extraction rate, solvents used and coating thickness. If in doubt test the coating whilst in operation and determine the cure time required.

Both drying and curing can be accelerated by applying heat through an oven to the circuit board and coating up to 90C. Care should be taken to allow sufficient flash off time of the solvents before applying accelerated drying to avoid premature outgassing and bubbles in the coating.

Cleaning of Equipment

Bright Shield conformal coatings can easily be removed from equipment using the Bright Shield Protective Coating Thinners.

Removal from circuit boards

Bright Shield conformal coatings can easily be removed from circuit boards using the Bright Shield Protective Coating Thinners. Techniques including localized repair using cotton buds dipped in thinners and complete stripping of circuits by dipping in thinners are perfectly acceptable if no compatibility issues are found with the solvents in the thinners.

Inspection

All Bright Shield coatings have a UV trace within the coating, which fluoresces under UVA black light. This allows inspection of the coating coverage to be easily achieved.

Further Support

For further information please contact us directly at

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