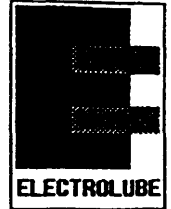


Technical Data Sheet

725-699



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| PRODUCT DESCRIPTION: | HPA Conformal Coating | DATE: | 04/96 |
| PRODUCT CODE: | HPA | PAGES: | 3 |

PRODUCT DESCRIPTION

High Performance Acrylic Conformal Coating is a flexible transparent acrylic coating for the protection of electronic circuitry formulated to meet the highest defence and aerospace requirements. HPA is designed to be removed with Electrolube Ultrasolve (100% Ozone Friendly). HPA is approved to US MIL-1-46058C, Qualification Reference 46058-562-90; and is 100% Ozone Friendly in both aerosol and bulk form.

FEATURES

- * Excellent adhesion under all climatic conditions.
- * Fluoresces under UV light as an aid to inspection.
- * Wide temperature range -55°C to +130°C.
- * Can be soldered through without fear of highly toxic gases being produced (contains no isocyanates).
- * Non-corrosive to Cadmium and Zinc plate (contains no phenols).
- * Resistant to mould growth.
- * Can be totally removed with Electrolube Ultrasolve.
- * Compatible with other high specification acrylic coatings.
- * Excellent Dielectric properties.

APPLICATION

HPA can be sprayed, dipped or brushed. The thickness of the coating depends on the method of application, but a dip coater normally deposits a film thickness of about 25 microns (single coat). Workshop temperatures of less than 16°C or relative humidities in excess of 75% are unsuitable for the application of HPA. All PCBs, being composite materials, absorb moisture. If this is not removed, the conformal coating may not protect to its fullest extent. Pre-drying, or better still, vacuum desiccation, will remove most of the moisture.

HPA contains a UV trace which allows inspection of the PCB after coating to ensure complete and even coverage. The stronger the reflected light, the thicker the coating layer is.

Cleaning

Boards should be thoroughly cleaned before coating. This is required to ensure that satisfactory adhesion to the substrate is possible. Also all flux residues must be removed as they become corrosive if left on the PCB. Electrolube manufacture a range of 100% Ozone Friendly cleaning products in both the hydrocarbon solvent and aqueous fields. All products produce results within the Military specification. Please contact Electrolube for further information.

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Dip Coating

Electrolube manufacture an automated Dip Coating Machine (DCM) which is ideal for applying all of the Electrolube Conformal Coatings including HPA.

Ensure that the coating material in the container has been agitated thoroughly and has been allowed to stand for at least 2 hours for all the air bubbles to disperse.

Universal Acrylic Thinners (UAT) should be used to keep the HPA coating at a suitable viscosity for dipping. DCT is added periodically as the solvent evaporates. The viscosity should be checked using a viscosity meter or "flow cup".

The board assemblies should be immersed in the HPA dipping tank in the vertical position, or at an angle as close to the vertical as possible. Connectors should not be immersed in the liquid unless they are very carefully masked. Electrolube Peelable Coating Mask (PCM) is ideal for this application.

Leave submerged for about 1 minute until the air bubbles have dispersed. The board or boards should then be withdrawn **VERY SLOWLY** so that an even film covers the surface. After withdrawing, the boards should be left to drain over the tank until the majority of residual coating has left the surface.

After the draining operation is complete, the boards should be placed in an air-circulating drying cabinet and left to dry.

Spraying

Bulk HPA needs to be thinned with UAT before spraying. The optimum viscosity to give coating quality and thickness depends on the spray equipment and conditions but a starting point could be 2 parts coating to 1 part thinners. If bulk coating material has been agitated, allow to stand until air bubbles have dispersed.

HPA is suitable both for use in manual spray guns and computer controlled airless spray equipment that only coats the required areas of the PCB, eliminating the need for masking.

The nozzle of the spray gun requires to be selected to give an even spray to suit the prevailing viscosity of the coating material. The normal spray gun pressure required is $27.6 \times 10^6 \text{ kN/m}^2$ to $34.5 \times 10^6 \text{ kN/m}^2$ (40 - 50 lbs/sq.inch)

To ensure penetration of the coating beneath the components and in confined spaces, spray the assembly from all directions to give an even coating.

After spraying, the boards should be placed in an air-circulating drying cabinet and left to dry.

Brushing

Ensure that the coating material has been agitated thoroughly and has been allowed to settle for at least 2 hours. The coating should be kept at ambient temperature. Gently apply the coating with a good quality brush so as not to leave brush marks and so that the components and wiring are not disturbed.

When the brushing operation is complete the boards should be placed in an air-circulating drying cabinet and left to dry.

Drying Times and Curing Conditions

HPA will be touch dry after 15 - 20 minutes at room temperature and does not require a thermal cure. The full properties of HPA will be obtained after a 24 hours at room temperature. This can be accelerated by the use of a thermal cure of 2 hours at 90°C or 4 hours at 60°C.

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Double Coating

Two coats of HPA are not usually required. However if two coats are required, the second coating should be applied after the first coating is dry. This will ensure that the two coats will bond satisfactorily.

TYPICAL PROPERTIES**Liquid HPA**

| | |
|--------------------------|---|
| Colour: | Pale coloured liquid |
| Non-volatile content: | 35% (Bulk) |
| Viscosity @ 21°C: | 2.4 - 3.7 Poise (Bulk) 2.00 Poise (Aerosol) |
| Specific Gravity @ 20°C: | 0.91 (Bulk) 0.78 (Aerosol) |
| Flash Point: | -7°C (Bulk) -4°C (Aerosol) |
| Drying Time: | 15-20 min. touch dry 24 hours optimum properties |

Cured HPA Coating

| | |
|-----------------------------------|----------------------------|
| Colour: | Transparent |
| Dielectric Strength: | 45 kV/mm |
| Electrical Resistivity: | 1×10^{14} Ohms/cm |
| Temperature Range: | -55°C to +130°C |
| Flammability: | Self-extinguishing |
| Dissipation Factor @ 1MHz @ 25°C: | 0.01 |

PACKAGING**ORDER CODE****HPA Conformal Coating**

200ml Aerosol (100% Ozone Friendly)
5 Litre Bulk

HPA200H
HPA05L

Universal Acrylic Thinners

5 Litre

UAT05L

Removal Solvent

Ultrasolve (100% Ozone Friendly, Flammable)

200ml Aerosol
400ml Aerosol
1 Litre Bulk
5 Litre Bulk
25 Litre Bulk

ULS200D
ULS400D
ULS01L
ULS05L
ULS25L

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