ELECTROLUBE

TECHNICAL BULLETIN

HPA

High Performance Acrylic

DESCRIPTION

HPA is a high performance acrylic conformal coating specifically designed to meet the demanding requirements of many applications found in the defence and aerospace industries. **HPA** is approved to MIL-I-46058C and has been formulated for professional use only.

READ ENTIRE TECHNICAL BULLETIN BEFORE USING THIS PRODUCT

FEATURES AND BENEFITS

- Excellent performance in a wide range of challenging conditions; military approved
- Transparent coating with excellent clarity; ideal for LED applications and those exposed to UV light
- High adhesion to a wide variety of substrates and resistant to mold growth
- Ideal for applications requiring rework; can be removed with Electrolube ULS

APPROVALS

Standard	Status
RoHS Compliant (2015/863/EU)	Yes
MIL Approval (MIL-1-46058C)	Approved (Reference: 46058-562-90)
IPC-CC-830	Meets Approval
NATO Stock Number	6850992608540 (HPA200H)

PRODUCT INFORMATION

For available packaging sizes please visit:

electrolube.com

PHYSICAL PROPERTIES

Category	Results
Liquid Properties	
Appearance	Pale Color Liquid
Density @ 20 °C (g/mL) Bulk Aerosol	 0.91 0.78
VOC Content Bulk Aerosol	 65 % 85 %
Flash Point Bulk Aerosol	 -7 °C -4 °C
Solid Content Bulk Aerosol	 35 % 15 %
Viscosity (mPa s @ 20 °C)	300 to 350
Touch Dry	10 to 15 minutes
Recommended Curing Time 20 °C 60 °C 90 °C	 24 hours 4 hours 2 hours
Coverage @ 25µm Bulk Aerosol	 14 m^2/L 2.4 m^2 (200 mL Aerosol)
Cured Film Coating	
Color	Colorless
Operating Temperature Range (°C)	-55 to 130
Flammability	Meets UL94 V-1
Thermal Cycling (MIL-1-46058C)	Pass
Coefficient of Expansion (ppm)	130

Category	Results
Dielectric Strength (kV/mm)	45
Dielectric Constant @ 1MHz	2.5
Surface Insulation Resistance	1 x 10^{15} Ω
Comparative Tracking Index	>300 Volts
Dissipation Factor @ 1MHz, 25 °C	0.01
Moisture Resistance (MIL-1-46058C)	Pass

APPLICATION GUIDELINES

HPA can be sprayed, dipped or brushed. The thickness of the coating depends on the method of application (typically 25 to 75 microns). Temperatures of less than 16 °C or relative humidity in excess of 75% are unsuitable for the application of HPA. As is the case for all solvent based conformal coatings, adequate extraction should be used (refer to MSDS for further information).

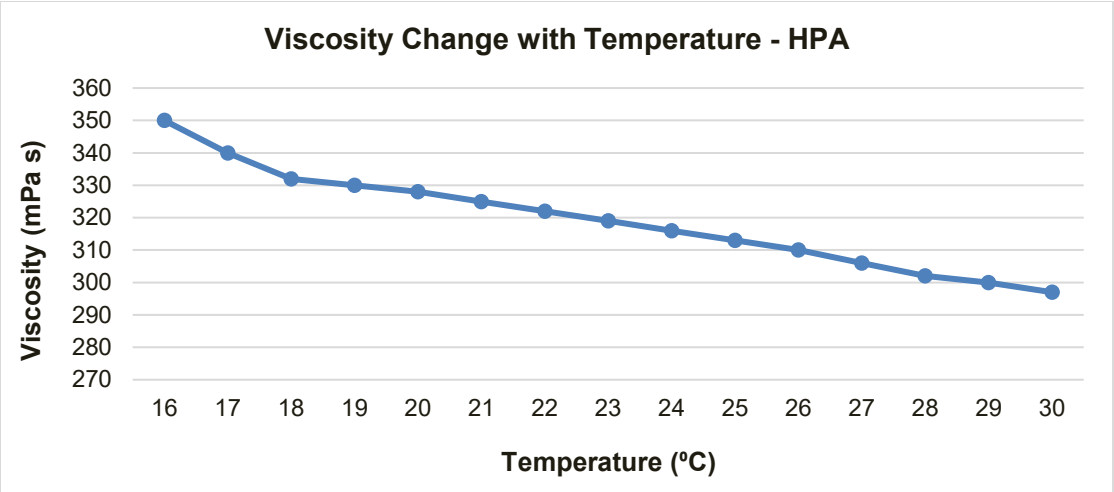
Substrates should be thoroughly cleaned before coating. This is required to ensure that satisfactory adhesion to the substrate is achieved. Also, all flux residues must be removed as they may become corrosive if left on the PCB. We manufacture a range of cleaning products using both hydrocarbon solvent and aqueous technology. Our cleaning products produce results within Military specification.

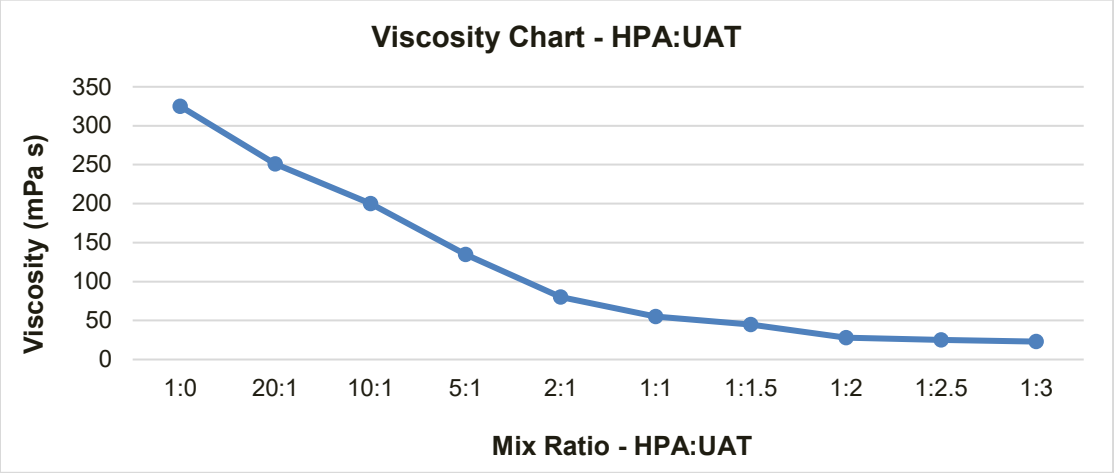
Spraying – Bulk

HPA needs to be diluted with the appropriate thinners (UAT) before spraying. The optimum viscosity to give coating quality and thickness depends on the spray equipment and conditions, but normally a dilution ratio of 2:1 (HPA:UAT) is required. Suitable spray viscosity is typically 50 to 80 mPa s. 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 selective coating equipment.

The selected nozzle should enable a suitable even spray to be applied in addition to suiting the prevailing viscosity. The normal spray gun pressure required is 274 to 413 kPa (40 to 60 lb./sq.in.). After spraying, the boards should be placed in an air-circulating drying cabinet and left to dry.





Spraying - Aerosol

When applying HPA in aerosol form care must be taken to ensure the can is not shaken before use. Shaking the can will introduce excessive air bubbles and will give a poor coating finish.

The can should be held at 45°, and 200mm from the substrate to be coated. The valve should then be depressed when the can is pointing slightly off target and moved at about 100 mm/s across the target. To ensure the best coating results are achieved try to use a smooth sweeping motion with small overlap for successive rows.

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.

TYPICAL PRODUCT APPLICATION

Dip Coating

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 (200 to 300 mPa s @ 20 °C). UAT 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. Our Peelable Coating Masks (PCM/PCS) are ideal for this application.

Leave submerged for approximately 10 seconds until the air bubbles have dispersed. The board or boards should then be withdrawn slowly (1 to 2s/mm) so that an even film covers the surface. After withdrawing, the boards should be left to drain over the tank or drip tray 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.

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.

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

INSPECTION

HPA contains a UV trace, which allows inspection of the PCB after coating to ensure complete and even coverage. The stronger the reflected UV light, the thicker the coating layer is. UV light in the region of 375nm should be used for inspection.

ADDITIONAL INFORMATION

Shelf Life

Description	Shelf Life
HPA Conformal Coating	
Aerosol	36 Months
Bulk	48 Months
Universal Acrylic Thinners	72 Months
Removal Solvent	
Aerosol	36 Months
Bulk	72 Months

SAFETY & WARNING

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use. **Safety Data Sheets are available.**

CONTACT INFORMATION

To confirm this document is the most recent version, please contact

TechnicalSupportTeam@hkw.co.uk

www.electrolube.com

North America
109 Corporate Blvd.
South Plainfield, NJ 07080, USA
1.800.367.5460

Europe
Ashby Park
Coalfield Way
Ashby de la Zouch
Leicestershire, LE65 1JR, UK
44.01530.41960

Asia
8/F., Paul Y. Centre
51 Hung To Road
Kwun Tong, Kowloon, Hong Kong
852.3190.3100