# AFA

## Aromatic-Free Acrylic Coating

## DESCRIPTION

**AFA** is an acrylic conformal coating formulated without the use of hazardous aromatic solvents. It has been designed for the protection of electronic circuitry and meets the requirements of many industry standards. **AFA** is also UL approved, achieving flame retardancy to UL94 V-0.

READ ENTIRE TECHNICAL BULLETIN BEFORE USING THIS PRODUCT

## FEATURES AND BENEFITS

- Transparent coating with excellent clarity and UV resistance; ideal for LED applications
- Reduces operational hazardous; free from aromatic solvents such as Toluene and Xylene
- Fast touch dry time at room temperature for efficient coating application
- Ideal for applications requiring rework; can be removed using ULS

## APPROVALS

| Standard | Status |
|---|---|
| RoHS Compliant (2015/863/EU) | Yes |
| IPC-CC-830 | Meets Requirements |
| UL Approval | UL746-QMJU2 (File:  E138403) |

## PRODUCT INFORMATION

For available packaging sizes please visit:

electrolube.com

## PHYSICAL PROPERTIES

| Category | Results |
|---|---|
| **Liquid Properties** | |
| Appearance | Pale Colored Liquid |
| Density @ 25 °C (g/mL)<br>Bulk<br>Aerosol | <br>0.91<br>0.78 |
| VOC Content<br>Bulk<br>Aerosol | <br>67 ± 3 %<br>85% |
| Flash Point (°C) | Approximately -7 |
| Solid Content<br>Bulk<br>Aerosol | <br>30 ± 2 %<br>15 % |
| Viscosity (mPa.s @ 25 °C) | 260 ± 30 |
| Touch Dry | 5 to 10 minutes |
| Cure Time<br>20 °C<br>70 °C | <br>24 hours<br>30 minutes |
| Coverage @ 25µm | 14 $m^2$/L<br>2.4 $m^2$/L (200 mL Aerosol) |
| **Dry Film Coating** | |
| Color | Colorless |
| Operating Temperature Range (°C) | -65 to 125 |
| Flammability | UL94 V-0 Approved |
| Thermal Cycling (MIL-1-46058C) | Meets Requirements |
| Coefficient of Expansion (ppm) | 130 |
| Dielectric Strength (kV/mm) | 45 |
| Dielectric Constant | 2.5 |

| Category | Results |
|---|---|
| Surface Insulation Resistance (Ω) | $1 \times 10^{15}$ |
| Comparative Tracking Index (Volts) | >300 |
| Dissipation Factor @ 1MHz, 25 °C | 0.01 |
| Moisture Resistance (MIL-1-46058C) | Meets Requirements |
| BONO Test (Corrosion Factor) | Pass (2.3%) |

## APPLICATION GUIDELINES

AFA 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 its application. As is the case for all solvent based conformal coatings, adequate extraction should be used (refer to SDS for further information).

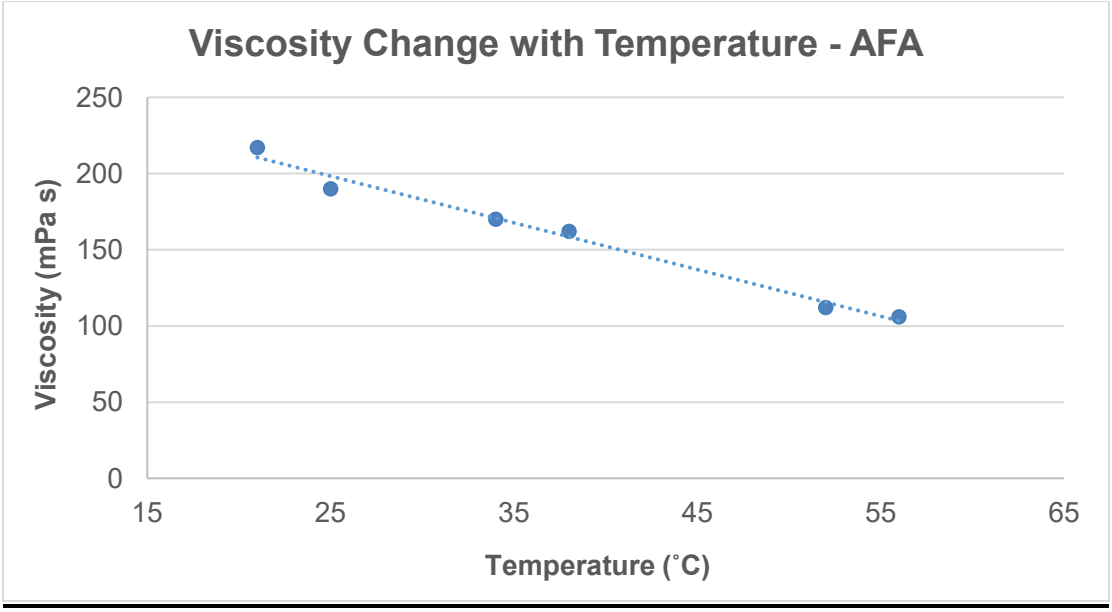
Substrates should be thoroughly cleaned before coating. This is required to ensure that satisfactory adhesion to the substrate is achieved and to prevent flux residues causing corrosion on the PCB. We manufacture a range of cleaning products using both hydrocarbon solvent and aqueous technology, which all produce results within military specification.

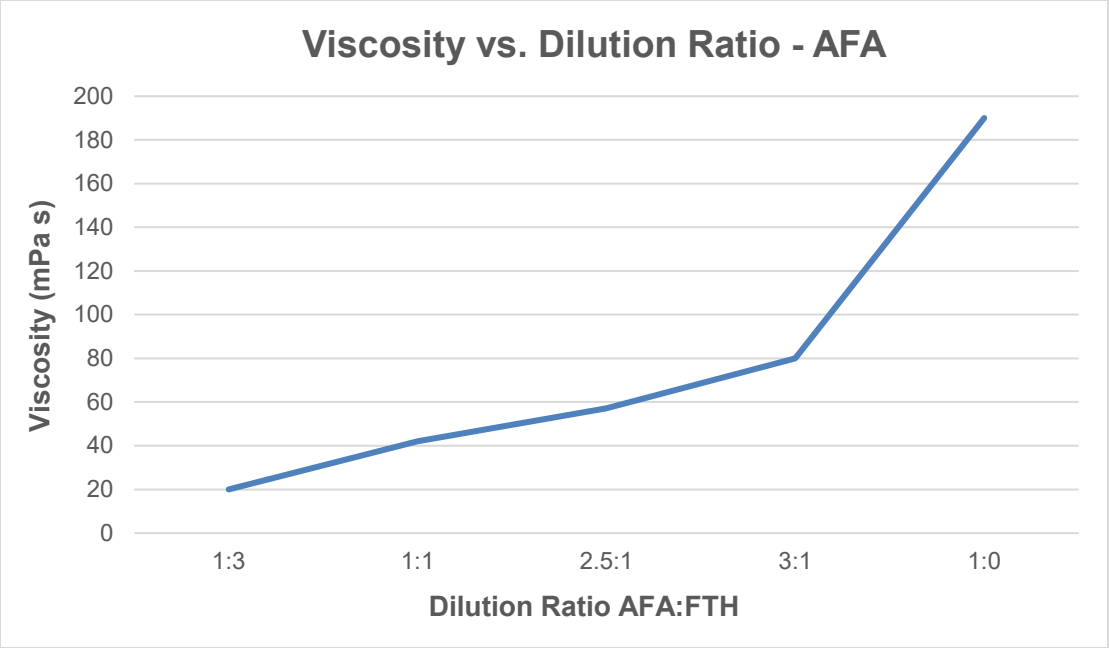
## APPLICATION GUIDELINES - BULK

### Spraying – Bulk

AFA needs to be diluted with the appropriate thinner (FTH) before spraying. The optimum viscosity to give coating quality and thickness depends on the spray equipment and conditions, but normally a dilution ratio of 1.5:1 or 2:1 (AFA:FTH) is required. Suitable spray viscosity is typically 40 to 70 mPa.s. If bulk coating material has been agitated, allow to stand until air bubbles have dispersed before use.

AFA 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 275 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.


Viscosity Change with Temperature - AFA
Viscosity (mPa s)
250
200
150
100
50
0
15
25
35
45
55
65
Temperature (˚C)


Viscosity vs. Dilution Ratio - AFA
Viscosity (mPa s)
200
180
160
140
120
100
80
60
40
20
0
1:3
1:1
2.5:1
3:1
1:0
Dilution Ratio AFA:FTH

### Spraying - Aerosol

When applying AFA 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 200 mm 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

AFA has been formulated to a suitable viscosity for dip coating (175 ± 25 mPa.s @ 25 °C*)*. The coating material should be checked periodically using a viscometer or "flow cup" and FTH added as required to replace the solvent lost by evaporation and maintain the viscosity.

The board assemblies should be immersed in the 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 2 mm/s) 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 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

AFA 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 375 nm should be used for inspection.

## ADDITIONAL INFORMATION

Shelf Life

| Description | Shelf Life |
|---|---|
| AFA Conformal Coating | 24 Months |
| FTH Fast Dry Thinners | 24 Months |
| ULS Removal Solvent<br>Bulk<br>Aerosol | <br>72 Months<br>36 Months |
| AFA Gel | 12 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** | **Europe** | **Asia** |
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Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE . Emergency safety directory assistance: US 1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588