

## **APL**

### **Acrylic Protective Lacquer**

APL is a flexible, fast drying transparent acrylic conformal coating, used for the protection of electronic circuitry. It has been formulated for professional use only and meets the requirements of a variety of international standards.

- Cost effective material with fast touch dry time, allowing efficient application processes
- Good clarity and high level of stability when exposed to UV light
- Offers good protection in humid environments and resistant to mould growth
- Provides excellent adhesion to a wide variety of substrates

|                          |                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                        |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Approvals</b>         | <b>RoHS Compliant (2015/863/EU):</b><br><b>MIL Approval (MIL-1-46058C):</b><br><b>IPC-CC-830:</b>                                                                                                                                                                                                                         | <b>Yes</b><br><b>Meets approval</b><br><b>Meets approval</b>                                                                                                                                                                           |
| <b>Liquid Properties</b> | Appearance:<br>Density @ 20°C (g/ml):<br>VOC Content:<br>Flash Point:<br>Solids Content:<br>Viscosity (mPa s @ 20°C):<br>Touch Dry:<br>Recommended Curing Time:                                                                                                                                                           | Pale Coloured Liquid<br>0.91 (Bulk), 0.78 (Aerosol)<br>65% (Bulk), 75% (Aerosol)<br>-7°C (Bulk), -4°C (Aerosol)<br>35% (Bulk), 15% (Aerosol)<br>300-350 (Bulk)<br>10-15 minutes<br>24 Hours @ 20°C<br>4 Hours @ 60°C<br>2 Hours @ 90°C |
|                          | Coverage @ 25µm:                                                                                                                                                                                                                                                                                                          | 14m <sup>2</sup> per litre (Bulk), 5m <sup>2</sup> (400ml Aerosol)                                                                                                                                                                     |
| <b>Dry Film Coating</b>  | Colour:<br>Operating Temperature Range:<br>Flammability:<br><br>Thermal Cycling (MIL-1-46058C):<br>Coefficient of Expansion:<br>Dielectric Strength:<br>Dielectric Constant:<br>Surface Insulation Resistance:<br>Comparative Tracking Index:<br>Dissipation Factor @ 1MHz @ 25°C:<br>Moisture Resistance (MIL-1-46058C): | Colourless<br>-55°C to +125°C<br>Self-extinguishing (ASTM Method D635)<br>Meets UL94-V1<br>Meets approval<br>130ppm<br>45kV/mm<br>2.5<br>1 x 10 <sup>15</sup> Ω<br>>300 Volts<br>0.01<br>Meets approval                                |

| <b><u>Description</u></b>                | <b><u>Packaging</u></b>         | <b><u>Order Code</u></b> | <b><u>Shelf Life</u></b> |
|------------------------------------------|---------------------------------|--------------------------|--------------------------|
| <b><u>APL Conformal Coating</u></b>      | 15 ml (small bottle with brush) | APL15ML                  | 48 Months                |
|                                          | 400ml Aerosol                   | APL400H                  | 36 Months                |
|                                          | 500ml Bulk                      | APL500ML                 | 48 Months                |
|                                          | 5 Litre Bulk                    | APL05L                   | 48 Months                |
| <b><u>Universal Acrylic Thinners</u></b> | 5 Litre                         | UAT05L                   | 72 Months                |
| <b><u>Removal Solvent</u></b>            | 200ml Aerosol                   | ULS200D                  | 36 Months                |
|                                          | 400ml Aerosol                   | ULS400D                  | 36 Months                |
|                                          | 1 Litre Bulk                    | ULS01L                   | 72 Months                |
|                                          | 5 Litre Bulk                    | ULS05L                   | 72 Months                |
|                                          | 25 Litre Bulk                   | ULS25L                   | 72 Months                |

### **Directions for Use**

APL can be sprayed, dipped or brushed. The thickness of the coating depends on the method of application (typically 25-75 microns). Temperatures of less than 16°C or relative humidity in excess of 75% are unsuitable for the application of APL. 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. Electrolube manufacture a range of cleaning products using both hydrocarbon solvent and aqueous technology. Electrolube cleaning products produce results within Military specification.

### **Spraying – Bulk**

APL 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 1:1 to 2:1 (APL:UAT) is required. Suitable spray viscosity is typically 50-80mPa s. If bulk coating material has been agitated, allow to stand until air bubbles have dispersed.

APL 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 413kPa (40 – 60 lbs/sq.inch). After spraying, the boards should be placed in an air-circulating drying cabinet and left to dry.

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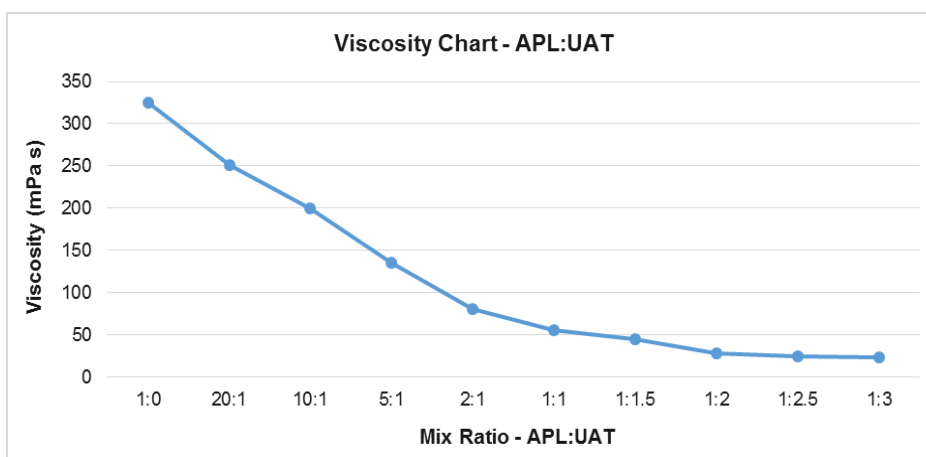
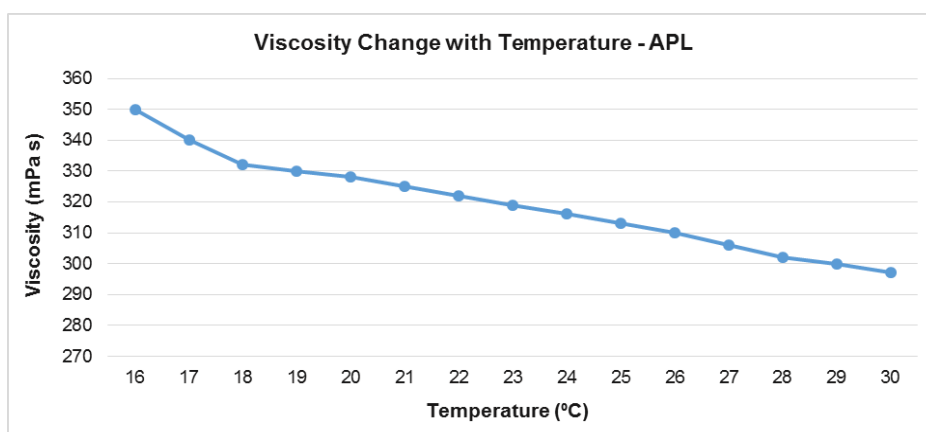
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BS EN ISO 9001:2008  
Certificate No. FM 32082



## **Spraying - Aerosol**

When applying APL 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 100mm/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.

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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.

### **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 APL coating at a suitable viscosity for dipping (200 – 300mPa 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 APL 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 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**

APL 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.

Revision 4: November 2018