

Electrolube® APL

Acrylic Protective Lacquer

DESCRIPTION

Electrolube® 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.

READ ENTIRE TECHNICAL BULLETIN BEFORE USING THIS PRODUCT

FEATURES AND BENEFITS

- 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 mold growth
- Provides excellent adhesion to a wide variety of substrates

APPROVALS

Standard	Status
RoHS Compliant (2015/863/EU)	Yes
MIL Approval (MIL-1-46058C)	Meets Approval
IPC-CC-830	Meets Requirement

PRODUCT INFORMATION

Please contact your customer service representative for information on available package sizes.

PHYSICAL PROPERTIES

Category	Results
Liquid Properties	
Appearance	Pale Colored Liquid
Density @ 20 °C (g/mL)	
Bulk	0.92
Aerosol	0.78
VOC Content	
Bulk	66 %
Aerosol	75 %
Flash Point (°C)	
Bulk	-7
Aerosol	-4
Solid Content	
Bulk	34 %
Aerosol	15 %
Viscosity (mPa.s @ 20 °C)	255 to 325
Touch Dry	10 to 15 minutes
Recommended Curing Time	
20 °C	24 hours
60 °C	4 hours
90 °C	2 hours
Coverage @ 25µm	
Bulk	14 m ² /L
Aerosol	5 m ² /L (400 mL)
Dry Film Coating	
Color	Colorless
Operating Temperature Range (°C)	-55 to 125
Flammability	Self-extinguishing (ASTM Method D635) Meets UL94-V1

Category	Results
Thermal Cycling (MIL-1-46058C)	Meets Approval
Coefficient of Expansion (ppm)	130
Dielectric Strength (kV/mm)	45
Dielectric Constant	2.5
Surface Insulation Resistance (Ω)	1×10^{15}
Comparative Tracking Index (Volts)	>300
Dissipation Factor @ 1MHz, 25 °C	0.01
Moisture Resistance (MIL-1-46058C)	Meets Approval

APPLICATION GUIDELINES

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

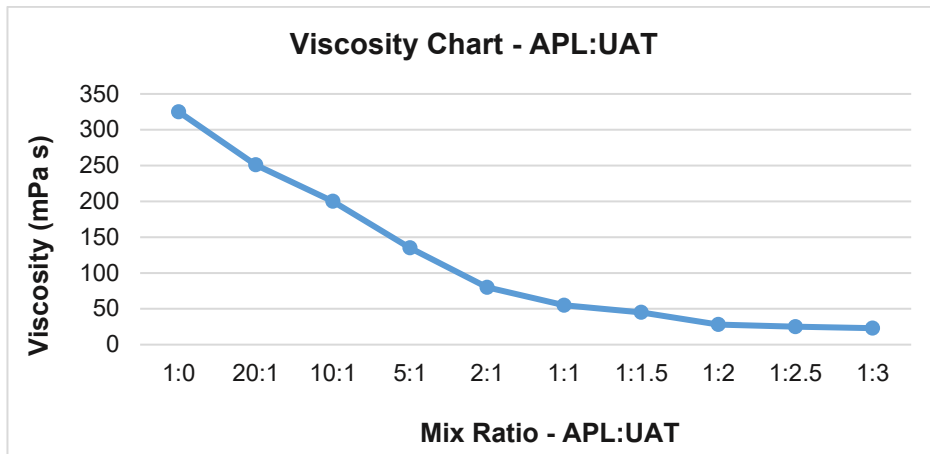
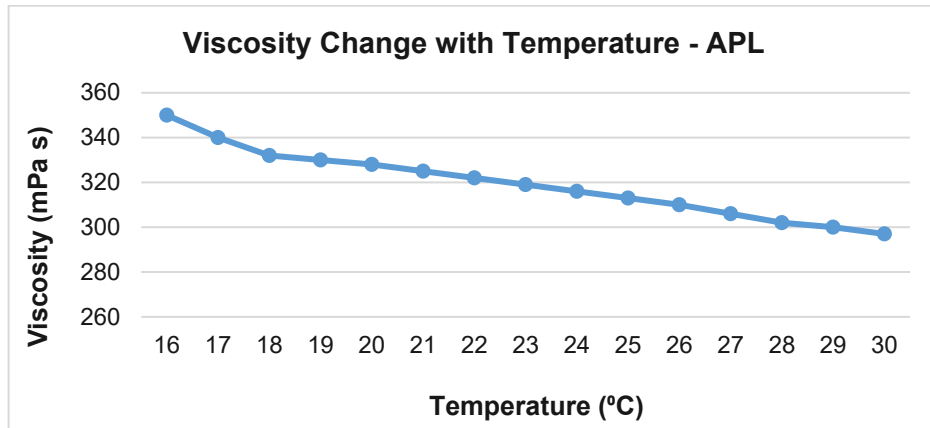
Substrates should be thoroughly cleaned before coating. This is required to ensure that satisfactory adhesion to the substrate is achieved. Also, all flux residues must be removed as they may become corrosive if left on the PCB. We manufacture a range of cleaning products using both hydrocarbon solvent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

TYPICAL PRODUCT APPLICATION

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 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 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.

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 to 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.

ADDITIONAL INFORMATION**Shelf Life**

Description	Shelf Life
APL Conformal Coating	
Small Bottle with Brush	48 Months
Aerosol	36 Months
Bulk	48 Months
UAT Universal Acrylic Thinners	72 Months
ULS Removal Solvent	
Bulk	72 Months
Aerosol	36 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

www.macdermidalpha.com

North America 140 Centennial Avenue Piscataway, NJ 08854 1.800.367.5460	Europe Ashby Park Coalfield Way Ashby de la Zouch Leicestershire, LE65 1JR, UK 44.01530.41960	Asia 8/F., Two Sky Parc 51 Hung To Road Kwun Tong, Kowloon, Hong Kong, SAR China 852.2500.5365
---	---	--

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

DISCLAIMER: All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed. No statement or recommendation shall constitute a representation unless set forth in an agreement signed by officers of seller and manufacturer. NO WARRANTY OF MERCHANTABILITY, WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY IS MADE. The following warranty is made in lieu of such warranties and all other warranties, express, implied, or statutory. Products are warranted to be free from defects in material and workmanship at the time sold. The sole obligation of seller and manufacturer under this warranty shall be to replace any noncompliant product at the time sold. Under no circumstances shall manufacturer or seller be liable for any loss, damage or expense, direct, indirect, incidental or consequential, arising out of the inability to use the product. Notwithstanding the foregoing, if products are supplied in response to a customer request that specifies operating parameters beyond those stated above, or if products are used under conditions exceeding said parameters, the customer by acceptance or use thereof assumes all risk of product failure and of all direct, indirect, incidental and consequential damages that may result from use of the products under such conditions, and agrees to exonerate, indemnify, defend and hold harmless MacDermid, Incorporated and its affiliates therefrom. No suggestion for product use nor anything contained herein shall be construed as a recommendation to use any product in a manner that infringes any patent or other intellectual property rights, and seller and manufacturer assume no responsibility or liability for any such infringement.

© 2019 MacDermid, Inc. and its group of companies. All rights reserved. "(R)" and "TM" are registered trademarks or trademarks of MacDermid, Inc. and its group of companies in the United States and/or other countries..