

## Electrolube® APL5050RT

### Acrylic Protective Lacquer – Reduced Toluene

#### DESCRIPTION

**Electrolube® APL5050RT** is a modified version of APL which provides a flexible, fast drying transparent acrylic conformal coating for the protection of electronic circuitry. **APL5050RT** has been formulated to meet many of today's commercial applications.

READ ENTIRE TECHNICAL BULLETIN BEFORE USING THIS PRODUCT

#### FEATURES AND BENEFITS

- Acrylic conformal coating; this blend allows for horizontal automated dip coating applications
- Improved flow characteristics; allows coating of difficult or inaccessible areas
- Excellent adhesion to a wide variety of substrates; resistant to mould growth
- Fluoresces under UV light for ease of inspection; can be removed with Electrolube ULS or ACT5050RT

#### APPROVALS

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

#### PRODUCT INFORMATION

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

**PHYSICAL PROPERTIES**

| Category  | Results                   |
|---|---------------------------|
| <b>Liquid Properties</b>                                      |                           |
| Appearance  | Clear Faint Yellow Liquid |
| Density (g/mL @ 20 °C)  | 0.877 to 0.892            |
| VOC Content (%)   | 75.5 to 77.0              |
| Solid Content (%)   | 23.0 to 24.5              |
| Flash Point (°C)  | -2.3                      |
| Viscosity (mPa·s @ 20 °C)                                     | 42 to 52                  |
| Touch Dry (minutes @ 20 °C)                                   | 2 to 10                   |
| Recommended Curing Time                                       |                           |
| 20 °C   | 24 hours                  |
| 60 °C   | 4 hours                   |
| 90 °C   | 2 hours                   |
| Coverage @ 25 µm  | 10 m <sup>2</sup> /L      |
| <b>Cured Film Coating</b>                                     |                           |
| Color   | Colorless                 |
| Operating Temperature Range (°C)                              | -55 to 125                |
| Recommended Coating Thickness (µm)                            | 25 to 75                  |
| Flexibility (IPC-CC-830C)                                     | Meets Requirement         |
| Shore Hardness [ASTM D2240-2005 (R2010)]                      | A80                       |
| Tensile Strength (MPa) (ISO37:2017)                           | 14                        |
| Elongation at Break (%) (ISO37:2017)                          | 289                       |
| Coefficient of Linear Thermal Expansion (ppm/°C) (ASTM E 831) | 126.1                     |
| Dielectric Strength (kV/mm) (IEC 60243-1:2013)                | 50                        |
| Surface Resistivity (Ω) (IEC 60093:2014)                      | 5.0 x 10 <sup>12</sup>    |

| Category   | Results              |
|--|----------------------|
| Volume Resistivity ( $\Omega \cdot \text{cm}$ ) (IEC 60093:2014) | $6.4 \times 10^{15}$ |
| Moisture and Insulation Resistance (IPC-CC-830C)                 | Meets Requirement    |
| Thermal Shock (IPC-CC-830C @ -65 to 125 °C)                      | Pass 100 cycles      |
| Salt Spray Test (IEC 60068-2-52 @ 35±2 °C, pH: 6.5 to 7.2)       | Pass 168 hours       |
| Flammability   | UL94 V-0             |

## APPLICATION GUIDELINES

APL5050RT can be sprayed, dipped, or brushed although primarily developed for close work dipping process. 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 APL5050RT. 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. Cleaning products produce results within Military specification.

## 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. ACT5050RT should be used to keep the APL5050RT coating at a suitable viscosity for dipping (50 to 80 mPa·s @ 20 °C). ACT5050RT is added periodically as the solvent evaporates. The viscosity should be checked using a viscosity meter.

The board assemblies should be immersed in the APL5050RT dipping tank in either the horizontal or vertical position, or at an angle that achieves the best results that suit the assembly configuration. Connectors should not be immersed in the liquid unless they are very carefully masked. Our Peelable Coating Mask (PCM) is ideal for this application. The immersion rate is very important, and tests should be conducted to ensure the optimal procedure for the application. A pneumatic (air or oil) semi-automatic dip coating machine is best suited for this method. Leave submerged for approximately 5 to 10 seconds until the air bubbles have

dispersed. The board or boards should then be withdrawn slowly (0.5 to 2 mm / second) 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.

## INSPECTION

APL5050RT 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

| Description                 | Shelf Life |
|-----------------------------|------------|
| APL5050RT Conformal Coating | 48 Months  |
| ACT5050RT Thinners          | 72 Months  |
| ULS Removal Solvent         | 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**

[www.macdermidalpha.com](http://www.macdermidalpha.com)

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

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