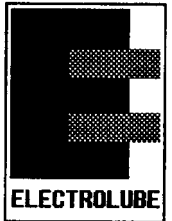


130-450

# Technical Data Sheet



<b>PRODUCT DESCRIPTION:</b>	<b>Acrylic Protective Lacquer</b>	<b>DATE:</b>	<b>01/98</b>
<b>PRODUCT CODE:</b>	<b>APL</b>	<b>PAGES:</b>	<b>3</b>

## PRODUCT DESCRIPTION

A flexible transparent acrylic Conformal coating for the protection of electronic and other assemblies. **APL** is designed to be fully removed with various solvents such as **Electrolube 100% Ozone Friendly Ultrasolve (ULS)**. **APL** is 100% Ozone Friendly in both bulk and aerosol form and due to fast cure at room temperature is suitable for service and production uses.

If a Military specification is required, please ask for details on **Electrolube High Performance Acrylic (HPA)** and **SCC3 (DCA)**. These coatings hold various European and American Defence Approvals.

## PRODUCT USE

To protect electronic assemblies within the commercial sector from harmful environments, i.e., humidity, salt spray etc. Offers good electrical characteristics. Also provides excellent protection to metal windings and similar assemblies, resisting rusting over long periods.

## FEATURES

- \* 100% Ozone Friendly
- \* Excellent adhesion to all substrates
- \* Good temperature range
- \* Good dielectric properties - prevents arcing
- \* May be safely soldered through, allowing easy repair
- \* Resistant to mould growth
- \* May be totally removed by solvents
- \* Compatible with other acrylic coatings
- \* Available in bulk and aerosol form

## APPLICATION

**APL** can be sprayed, dipped or brushed. The thickness of the coating depends on the method of application, but a dip coater normally deposits a film thickness of about 25 microns (single coat). Workshop temperatures of less than 16°C or relative humidities in excess of 75% are unsuitable for the application of **APL**. All PCBs, being composite materials, absorb moisture. If this is not removed, the conformal coating may not protect to its fullest extent. Pre-drying, or better still, vacuum desiccation, will remove most of the moisture.

**APL** contains a UV trace which allows inspection of the PCB after coating to ensure complete and even coverage. The stronger the reflected light, the thicker the coating layer is.

## Cleaning

Boards should be thoroughly cleaned before coating. This is required to ensure that satisfactory adhesion to the substrate is possible. Also all flux residues must be removed as they become corrosive if left on the PCB. **Electrolube** manufacture a range of 100% Ozone Friendly cleaning products in both the hydrocarbon solvent and aqueous fields. All products produce results within the Military specification. Please contact **Electrolube** for further information.

Cont'd...2

### **Dip Coating**

**Electrolube** manufacture an automated **Dip Coating Machine (DCM)** which is ideal for applying all of the **Electrolube Conformal Coatings** including **APL**.

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. **DCT** 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 Mask (PCM)** is ideal for this application.

Leave submerged for about 1 minute until the air bubbles have dispersed. The board or boards should then be withdrawn **VERY SLOWLY** so that an even film covers the surface. After withdrawing, the boards should be left to drain over the tank 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.

### **Spraying**

Bulk **APL** needs to be thinned with **UAT** before spraying. The optimum viscosity to give coating quality and thickness depends on the spray equipment and conditions but a starting point could be 2 parts coating to 1 part thinners. 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 computer controlled airless spray equipment that only coats the required areas of the PCB, eliminating the need for masking.

The nozzle of the spray gun requires to be selected to give an even spray to suit the prevailing viscosity of the coating material. The normal spray gun pressure required is  $27.6 \times 10^6$  kN/m<sup>2</sup> to  $34.5 \times 10^6$  kN/m<sup>2</sup> (40 - 50 lbs/sq.inch)

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.

### **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. Gently apply the coating with a good quality brush so as not to leave brush marks and so that the components and wiring are not disturbed.

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

### **Drying Times and Curing Conditions**

**APL** will be touch dry after 15 - 20 minutes at room temperature and does not require a thermal cure. The full properties of **APL** will be obtained after a 24 hours at room temperature. This can be accelerated by the use of a thermal cure of 2 hours at 90°C or 4 hours at 60°C.

Cont'd...3

**Double Coating**

Two coats of APL are not usually required. However if two coats are required, the second coating should be applied after the first coating is dry. This will ensure that the two coats will bond satisfactorily.

**TYPICAL PROPERTIES****Uncured Material**

Colour	Clear water white
Non-volatile content	35% (bulk material)
Viscosity (20°C)	2.4 - 3.7
Specific gravity (20°C)	0.92
Flash point	-7°C bulk, -4°C aerosol
Coverage (400 ml aerosol)	16,000 cm <sup>2</sup> @ 25 micron thickness
Drying time	15 to 20 minutes (touch dry) 24 hours (optimum properties)

**Cured Material**

Dielectric strength	45 kV/mm
Electrical Resistivity	10 <sup>14</sup> Ohms/cm
Flammability	Self extinguishing
Temperature range	-55°C to +125°C

**PACKAGING****ORDER CODE****APL**

15 ml bottle	APL15ML
400 ml Aerosol	APL400H
500 ml Bulk	APL500ML
5 Litre Bulk	APL05L

**Universal Acrylic Thinners**

5 Litre Bulk	UAT05L
--------------	--------

**Removal Solvents**

Ultrasolve (100% Ozone Friendly)

200 ml Aerosol	ULS200D
400 ml Aerosol	ULS400D
1 Litre Bulk	ULS01L
5 Litre Bulk	ULS05L
25 Litre Bulk	ULS25L

**Copyright Electrolube 1998**

All information is given in good faith but without warranty. Properties are given as a guide only and should not be taken as a specification. Electrolube cannot be held responsible for the performance of its products within any application determined by the customer, who must satisfy themselves as to the suitability of the product

# SAFETY DATA SHEET

PAGE: 1 of 4

PRINT DATE: 12/05/1997

REF: APL - BULK

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

**Product name:** ACRYLIC CONFOMAL COATING  
**Product code:** APL - BULK  
**Supplier:** ELECTROLUBE  
H.K. Wentworth Ltd.,  
Wentworth House, Blakes Road,  
Wargrave, Berkshire, RG10 8AW, United Kingdom.  
**Emergency telephone number:** 0118 9404031 **Fax No:** 0118 9403084

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

### Identification of the preparation

Chemical Name	CAS-No	EEC-No	Class	Weight %
METHYL ETHYL KETONE	78-93-3	201-159-0	F; R11 Xi; R36/37	<30
TOLUENE	108-88-3	203-625-9	F; R11 Xn; R20	<50
NON HAZARDOUS CONSTITUENTS				<40

## 3. HAZARDS IDENTIFICATION

**Most important hazards:** Highly flammable. Harmful.  
**Specific hazards:** Harmful by inhalation. Irritating to eyes, respiratory system and skin. Excessive exposures may affect human health, as follows: Liver and kidney injuries may occur; Blood disorder may occur after ingestion

## 4. FIRST AID MEASURES

**General advice:** Remove from exposure, lie down.  
**Inhalation:** Move to fresh air in case of accidental inhalation of vapours. Consult a physician after significant exposure.  
**Skin contact:** Wash off with soap and water. Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and badly.  
**Eye contact:** Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
**Ingestion:** Immediately give large quantities of water to drink. Call a physician immediately.

## 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media:** Extinguish with carbon dioxide, dry chemical, foam or waterspray.  
**Extinguishing media which must not be used for safety reasons:**  
high volume water jet  
**Specific hazards:** Burning produces irritant fumes : Carbon monoxide, carbon dioxide (CO<sub>2</sub>).  
**Special protective equipment for firefighters:**  
Wear self contained breathing apparatus for fire fighting if necessary.  
**Specific methods:** Water mist may be used to cool closed containers.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Avoid contact with skin, eyes and clothing.

**Environmental precautions:** Do not flush into surface water or sanitary sewer system.  
**Methods for cleaning up:** Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Shovel into suitable container for disposal.

### 7. HANDLING AND STORAGE

**Handling:** Avoid contact with the skin and the eyes. When using, do not eat, drink or smoke. Do not breath vapours or spray mist.  
**Storage:** Store in original container.

### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Chemical Name:** METHYL ETHYL KETONE  
**National occupational exposure limits:**  
Long term (8 hrs) = 200ppm / 600mgm<sup>-3</sup>  
Short term (15 min) = 300ppm / 899mgm<sup>-3</sup>  
TOLUENE  
Long term (8 hrs) = 50ppm / 191mgm<sup>-3</sup>  
Short term (15 min) = 150ppm / 574mgm<sup>-3</sup>

#### NON HAZARDOUS CONSTITUENTS

##### Engineering measures

Ensure adequate ventilation, especially in confined areas.

##### Personal protection equipment:

- **Respiratory protection:** not required under normal use.
- **Hand protection:** solvent-resistant gloves (butylrubber)
- **Eye protection:** safety glasses with side-shields / goggles
- **Skin and body protection:** Lab coat / lightweight protective clothing.

##### Hygiene measures:

Wash hands before breaks and immediately after handling the product.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Form:</b>	liquid	* MEK
<b>Colour:</b>	off-white	
<b>Odour:</b>	solvent	
<b>Melting point/range:</b>		< - 89 °C
<b>Flash point:</b>		< 0 °C
<b>Autoignition temperature:</b>		>404 °C
<b>Explosion limits:</b>	- lower	1.9 * vol. %
	- upper	10 * vol. %
<b>Vapour pressure:</b>	( 20 °C)	> 29 hPa
<b>Relative density:</b>	( 20 °C)	>= 0.91
<b>Solubility:</b>		
<b>Water solubility</b>		immiscible (g/l)
<b>Viscosity:</b>		2.0 mPa.s

### 10. STABILITY AND REACTIVITY

**Stability:** Stable.  
**Conditions to avoid:** Keep away from heat and sources of ignition.  
**Materials to avoid:** oxidizing agents.  
**Hazardous decomposition products:** No decomposition if stored and applied as directed.

Product name: **ACRYLIC CONFOMAL COATING**

PAGE: 3 of 4  
PRINT DATE: 12/05/1997  
REF: APL - BULK

### 11. TOXICOLOGICAL INFORMATION

**Acute toxicity:** MEK: LD50/oral/rat = 3.98mg/kg,  
Methoxy propoxy propanol: LD50/oral/rat = 500mg/kg

**Local effects:**

**Sensitization:** No data is available on the product itself

**Long term toxicity:** No data is available on the product itself

**Chronic toxicity:**

### 12. ECOLOGICAL INFORMATION

**Mobility:** Immiscible with water,

**Persistence and degradability:** Not readily biodegradable.

**Bioaccumulation:** not significant

**Ecotoxicity effects:** not significant

### 13. DISPOSAL CONSIDERATIONS

**Waste from residues / unused products:** Contact waste disposal services.

**Contaminated packaging:** In accordance with local and national regulations.

### 14. TRANSPORT INFORMATION

<b>UN-No:</b>	1263	<b>Marine pollutant:</b>	NO
<b>ADR/RID</b>			
<b>Class:</b>	3	<b>Item:</b>	31° (C)
<b>Proper shipping name:</b>	Paint		
<b>IMO</b>			
<b>Class:</b>	3.2	<b>IMDG Page:</b>	3268
<b>EmS:</b>	3-05	<b>MFAG:</b>	310, 313
<b>Proper shipping name:</b>	Paint		
<b>ICAO</b>			
<b>Class:</b>	3		
<b>Proper shipping name:</b>	Paint		

### 15. REGULATORY INFORMATION

Classification according to European directive on classification of hazardous preparations 90/492/EEC

- Contains: Toluene

- Symbol(s):



F - Highly flammable



Xn - Harmful

**R-phrases(s):** R11 - Highly flammable. R20 - Harmful by inhalation. R36/37/38 - Irritating to eyes, respiratory system and skin..

**S-phrases(s):** S16 - Keep away from sources of ignition - No smoking. S25 - Avoid contact with eyes.. S33 - Take precautionary measures against static discharges..

### 16. OTHER INFORMATION

**Recommended use:**

**Recommended restrictions:**

**Revision number:** 3

Product name: **ACRYLIC CONFOMAL COATING**

PRINT DATE: 12/05/1997

REF: APL - BULK

---

**Further information:** CN no: 32082010  
Contact Name: Carolyn Booth  
Department: Technical

---

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in the text.