

# Technical Data Sheet



<b>PRODUCT DESCRIPTION:</b>	<b>Acrylic Protective Lacquer</b>	<b>DATE:</b>	<b>03/97</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 (APL)** 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.

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### **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.

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## **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**

400 ml Aerosol	APL400H
500 ml Bulk	APL500ML
5 Litre Bulk	APL05L

### **Universal Acrylic Thinners**

5 Litre Bulk	UAT05L
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### **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

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# ARBEJDSHYGIEJNISK DATABLAD

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TRYKT DATO: 19/12/1997  
REF: APL400H/S

## 1. IDENTIFIKATION AF STOF/PRÆPARAT OG AF SELSKABET/VIRKSOMHEDEN

**Produkt navn:** ACRYLIC CONFORMAL COATING  
**Produkt kode:** APL400H/S  
**Leverandør:** ELECTROLUBE  
H.K. Wentworth Ltd.,  
Wentworth House, Blakes Road,  
Wargrave, Berkshire, RG10 8AW, United Kingdom.  
**Nødtelefon nr:** 0118 9404031 Fax No: 0118 9403084

## 2. SAMMENSÆTNING/OPLYSNING OM INDHOLDSSTOFFER

### Identifikation af præparatet

Kemisk betegnelse	CAS-Nr	EC-Nr	Klasse	Vægt %
BUTANE	106-97-8	203-448-7	F+; R12	< 35
TOLUENE	108-88-3	203-625-9	F; R11 Xn; R20	< 35
METHYL ETHYL KETONE	78-93-3	201-159-0	F; R11 Xi; R36/37	< 25
NON HAZARDOUS CONSTITUENTS				< 10

## 3. FAREIDENTIFIKATION

**Væsentligste risici:** Yderst brandfarlig. Sundhedsskadelig.  
**Specifikke risici:** Farlig ved indånding. Irriterer øjnene, åndedrætsorganerne og huden. Kraftige påvirkninger kan påvirke helbredet på følgende måde: Lever- og nyreskader kan opstå; Blodforstyrrelse kan forekomme efter indtagelse

## 4. FØRSTEHJÆLPSFORANSTALTNINGER

**Generelt råd:** Gå bort fra påvirkningskilden og lig ned.  
**Indånding:** Søg ud i frisk luft efter tilfældig indånding af dampe. Søg læge ved betydelig påvirkning.  
**Hudkontakt:** Vask af med sæbe og vand. .  
**Øjenkontakt:** Skyl straks grundigt med vand i mindst 15 min. og søg læge.  
**Indtagelse:** Store mængder vand skal øjeblikkeligt drikkes. Tilkald omgående læge.

## 5. BRANDBEKÆMPELSE

**Passende slukningsmidler:** Sluk med kuldioxid, pulver, skum eller vandsprøjte.  
**Slukningsmidler, som af sikkerhedsgrunde ikke må anvendes:** kraftig vandstråle  
**Specifikke risici:** Forbrænding fremkalder irriterende dampe : Kulilte, kulsyre (CO2).  
**Specielt beskyttelsesudstyr for brandslukningsfolk:** Benyt om nødvendigt selvforsynet åndedrætsværn ved brandbekæmpelse.  
**Specifikke fremgangsmåder:** Vandtåge kan anvendes til afkøling af lukkede beholdere.

## 6. FORHOLDSREGLER FOR UDSLIP VED UDHELD

**Personlige beskyttelsesmidler:** Undgå kontakt med huden, øjnene og tøjet.

<b>Sikkerhedsforanstaltninger til beskyttelse af miljøet:</b>	Skyl ikke ud til overfladevand eller til det sanitære kloaksystem.
<b>Metoder til oprydning:</b>	Oprenses med inaktivt absorberende materiale (d.v.s. sand, kiselgel, syrebindemiddel, universal bindemiddel, savsmuld). Opsamles i egnede beholdere til bortskaffelse.

## 7. HÅNDTERING OG OPBEVARING

<b>Håndtering:</b>	Undgå kontakt med huden og øjnene. Ved anvendelse må man ikke spise, drikke eller ryge. Undgå at indånde dampe eller sprøjtetåge.
<b>Opbevaring:</b>	Skal opbevares i den originale beholder.

## 8. EKSPONERINGSKONTROL/PERSONLIGE BESKYTTELSESMIDLER

<b>Kemisk betegnelse:</b>	<b>Dansk erhvervsmæssig påvirkningsgrænse:</b>
BUTANE	Lang tid (8 Timer) = 400ppm / 750mgm <sup>-3</sup> Kort tid (15 min.) = 500ppm / 600mgm <sup>-3</sup>
TOLUENE	Lang tid (8 Timer) = 50ppm / 191mgm <sup>-3</sup> Kort tid (15 min.) = 150ppm / 574mgm <sup>-3</sup>
METHYL ETHYL KETONE	Lang tid (8 Timer) = 200ppm / 600mgm <sup>-3</sup> Kort tid (15 min.) = 300ppm / 899mgm <sup>-3</sup>

NON HAZARDOUS CONSTITUENTS

<b>Bearbejdningsforholdsregler:</b>	Tilstrækkelig ventilation skal sikres, specielt i tillukkede områder.
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### Sikkerhedsudstyr til personlig beskyttelse:

- **Åndedrætsværn:** ikke påkrævet ved normalt brug.
- **Håndværn:** handsker modstandsdygtige overfor opløsningsmidler (butylgummi)
- **Øjenværn:** sikkerhedsbriller med sideskærme / beskyttelsesbriller
- **Hud- og kropsbeskyttelse:** Laboratoriekittel / letvægtsbeskyttelsesdragt.

**Hygiejniske foranstaltninger:** Vask hænder før pauser og umiddelbart efter at have været i forbindelse med stoffet.

## 9. FYSISKE OG KEMISKE EGENSKABER

<b>Form:</b>	væske	* Butane	
<b>Farve:</b>	klar grålig hvid		
<b>Kogepunkt/område:</b>		< 0 *	°C
<b>Smeltepunkt/område:</b>		< -86.7 *	°C
<b>Flammepunkt:</b>		< 0 *	°C
<b>Selvantændelsestemperatur:</b>		410 / 550	°C
<b>Ekspløsningsgrænser:</b>	-	1.8 *	vol. %
	<b>laveste</b>		
	-	10 *	vol. %
	<b>højeste</b>		
<b>Damptryk:</b>	( 25 °C)	8.7 *	hPa
<b>Relativ vægtfylde:</b>	( 20 °C)	>= 0.78	
		<= 0.90	
<b>Opløselighed:</b>			
- vandopløselighed		ikke blandbar	g/l)
- fedtopløselighed		ingen data	
		tilgængelige	

**10. STABILITET OG REAKTIVITET**

<b>Stabilitet:</b>	Stabil.
<b>Forhold, der skal undgås:</b>	Holdes væk fra antændelseskilder. Undgå kontakt med åben ild, varme overflader og antændelseskilder.
<b>Materialer, der skal undgås:</b>	Acetylene, Cl <sub>2</sub> , HCl, O <sub>2</sub> , N <sub>2</sub> O <sub>4</sub> .
<b>Farlige dekomponeringsprodukter:</b>	Ingen nedbrydning ved lagring og brug efter forskriften.

**11. TOKSIKOLOGISKE OPLYSNINGER**

<b>Akut toksicitet:</b>	Toluene LD50/oral/rotte = 500mg/kg MEK LD50/oral/rotte = 3.98mg/kg
<b>Lokal virkning:</b>	Opløsningsmidler kan affedte huden
<b>Sensibilisering:</b>	
<b>Giftige langtidsvirkninger:</b>	Længerevarende hudkontakt kan affedte huden og kan give betændelse i huden
<b>Kronisk toksicitet:</b>	

**12. MILJØOPLYSNINGER**

<b>Mobilitet:</b>	Ikke blandbar med vand,
<b>Persistens og nedbrydelighed:</b>	Ikke let bionedbrydelig.
<b>Bioakkumulation:</b>	ubetydelig
<b>Økotoksiske virkninger:</b>	ubetydelig

**13. BORTSKAFFELSE**

<b>Restaffald/restprodukter:</b>	Kontakt renovationsvæsenet.
<b>Forurenede emballage:</b>	I henhold til lokale og nationale regulativer.

**14. TRANSPORTOPLYSNINGER**

UN-Nr: 1950

**ADR/RID**

<b>Klasse:</b>	2	<b>Punkt:</b>	5° F
<b>Teknisk betegnelse:</b>	Aerosol dispensers		

**IMO**

<b>Klasse:</b>	2.1	<b>IMDG-Kode:</b>	2102
<b>EMS:</b>	2-13	<b>MFAG:</b>	620
<b>Teknisk betegnelse:</b>	Aerosol dispensers		

**ICAO**

<b>Klasse:</b>	2.1	<b>UN/ID Nr:</b>	1950
<b>Teknisk betegnelse:</b>	Aerosols, flammable, n.o.s		

**15. OPLYSNINGER OM FORESKRIFTER**

Klassificering i henhold til Miljøministeriets bekendtgørelse nr. 586 af 8. august 1991 om klassificering af farlige præparater

- Indeholder: TOLUENE
- Symbol(er):



F+ - Yderst  
brandfarlig



Xn -  
Sundhedsskadelig

Produktnavn:

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**R-Sætning(er):** R12 - Yderst brandfarlig. R20 - Farlig ved indånding. R36/37/38 - Irriterer øjnene, åndedrætsorganerne og huden..

**S-Sætning(er):** S16 - Holdes væk fra antændelseskilder - Rygning forbudt. S25 - Undgå kontakt med øjnene.. S33 - Træf foranstaltninger mod statisk elektricitet..

## 16. ANDRE OPLYSNINGER

**Anbefalet brug:**

**Anbefalede restriktioner:**

**Revisions nummer** 5

**Yderligere information:** CN no. 38140090  
Contact Name: Carolyn Booth  
Department: Technical

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