FPC

Fluorinated Polymer Coating

DESCRIPTION

FPC is a specialist fluorinated polymer coating formulated to provide high levels of liquid repellence to printed circuit boards and other electronic devices. Once dried, **FPC** has a low film strength and is therefore easily removed by minimal friction, allowing assemblies to be coated without masking.

READ ENTIRE TECHNICAL BULLETIN BEFORE USING THIS PRODUCT

FEATURES AND BENEFITS

- Very low surface energy; repels hydrocarbon and silicone oils, synthetic fluids and aqueous solutions
- Low solids content and low film strength once cured; connectors do not require masking
- Promotes cost effective and efficient application, quick touch dry time and simple coating procedure
- Non-flammable coating which contains a UV trace; ensures quality of coating by visual inspection

APPROVALS

Standard	Status
RoHS Compliant (2015/863/EU)	Yes
REACH Compliant	Yes
UL Approval	UL746E-QMJU2 (File: E138403)

PRODUCT INFORMATION

For available packaging sizes please visit:

electrolube.com

PHYSICAL PROPERTIES

Category	Results
Liquid Properties	
Appearance	Colorless Liquid
Density @ 20 °C (g/mL)	1.44
Flash Point Solvent (°C)	None
Boiling Point Solvent (°C)	45
Solid Content	2.2% Fluoropolymer
Touch Dry @ 20 °C	1 to 5 minutes
Recommended Drying Time 20 °C 100 °C	 24 hours 15 minutes*
UV Trace	Yes
Dry Film Coating	
Color	Colorless
Temperature Range (°C)	-40 to 200**
Flammability	UL94 V-0
Dielectric Constant (1MHz)	2.23
Dielectric Strength (kV/mm)	60
Surface Insulation Resistance	1 x 10^{15} Ω
Moisture Resistance	>1 x 10^{12} Ω
Surface Energy (Dynex/cm)	<16
Dissipation Factor (1MHz)	0.015
Comparative Tracking Index	600V

* An increase in repellency occurs with heat curing; curing times and temperatures can be evaluated according to the application requirements.

** Application and geometry dependent.

APPLICATION GUIDELINES

FPC is designed for use in dipping applications. Due to its low film strength, it is possible to coat connectors without the need for masking; upon first connection, the film will be broken, allowing current to pass through the connector. NB: It is recommended to check on different connector types before full scale use. If FPC needs to be removed from any PCBs, use the dilution solvent HFS.

It is recommended to use specialist dip coating equipment fitted with cooling rings, to manage solvent loss by evaporation. Such equipment will condense evaporated solvent and filter, separating any moisture present in the condensate and thus maximizing product use. FPC should be maintained at a solids content in the bath of ~2%, using HFS to dilute the product as required.

Solids content can be checked using the following method:

1. Use a dish that is assigned for solids content measurements for the tank and a disposable 5 to 10 mL syringe.
2. Weigh the dish and the syringe (ideally on a 4 figure balance) and record the weight.
3. Using the syringe, take a set volume of FPC from the tank; for example: 5 mL – this should be the same volume for every measurement taken.
4. Tare the scales and then place the dish onto the scales. Immediately dispense the 5 mL into the dish and place the syringe on the scales also. Note the weight – the solvent evaporates rapidly so this must be done very quickly.
5. Leave the dish and syringe for a minimum of 60 minutes at room temperature or place everything into the oven to speed up the process (60 to 80 °C should be fine but check the upper temperature limit of the syringe is OK). All solvent must be evaporated and the rate of this evaporation will also be affected by the surface area of the dish used. To ensure a repeatable method, the initial tests should be repeated 3 times on the same tank to ensure drying times are sufficient and the internal test method can be confirmed.
6. Once all solvent has evaporated, weigh the dish and syringe again on the same balance and record the weight.
7. Weights should be recorded as shown in the following table and solids content can be calculated:

Weight of Dish and Syringe (A)	e.g., 22.0236g	
Initial Weight of FPC inc. Dish and Syringe (B)	e.g., 29.0153g	
Final Weight after Evaporation of Solvent (C)	e.g., 22.1634g	
Initial Weight of FPC (D)	= B – A	= 29.0153 – 22.0236 = 6.9917g
Final Weight of FPC (E)	= C – A	= 22.1634 – 22.0236 = 0.1398g
% Solids of FPC	= (E/D)*100	= (0.1398/6.9917)*100 = 1.9995%

The withdrawal speed of the PCB from the bath can affect the quality of the coating coverage due to the fast evaporation rate of the solvent. If streaking/lines are seen on the coated boards, slow down the rate of withdrawal from the bath, this will allow an even coverage across the PCB.

INSPECTION

FPC 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.

ADDITIONAL INFORMATION

Shelf Life

Description	Shelf Life
FPC Coating	48 Months
HFS Solvent	48 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

To confirm this document is the most recent version, please contact
TechnicalSupportTeam@hkw.co.uk
www.electrolube.com

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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