FPC
Fluorinated Polymer Coating

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.

- 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	**RoHS Compliant (2015/863/EU):**	**Yes**
	REACH Compliant:	**Yes**
	UL746E-QMJU2:	**Approved File Number: E138403**
Liquid Properties	Appearance:	Colourless liquid
	Density @ 20°C:	1.44 g/ml
	Flash Point of Solvent:	None
	Boiling Point of Solvent:	45°C
	Solids content:	2.2% Fluoropolymer
	Touch Dry Time at 20°C:	1-5 minutes
	Recommended Drying Time:	24 Hours @ 20°C 15 minutes @ 100°C*
	UV Trace:	Yes
Dry Film Coating	Colour:	Colourless
	Temperature Range:	-40 to 200ºC**
	Flammability:	UL94 V-0
	Moisture Resistance:	> 1 x 10^{12} Ω
	Surface Energy:	<16 dynes/cm
	Dielectric Strength:	60 kV/mm
	Surface Insulation Resistance:	1 x 10^{15} Ω
	Dielectric Constant:	2.23 @ 1MHz
	Dissipation Factor:	0.015 @ 1MHz
	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

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Description	Packaging	Order Code	Shelf Life
FPC Coating	5 Litre	FPC05L	48 Months
HFS Solvent	5 Litre	HFS05L	48 Months

Directions for Use

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 5-10ml 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 5ml – 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 5ml 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 (60-80ºC 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)	Initial Weight of FPC inc. Dish and Syringe (B)	Final Weight after Evaporation of Solvent (C)	Initial Weight of FPC (D)	Final Weight of FPC (E)	% Solids of FPC
e.g. 22.0236g	e.g. 29.0153g	e.g. 22.1634g	= B-A	= C-A	= (E/D)*100
			= 29.0153-22.0236 = 6.9917g	= 22.1634 – 22.0236 = 0.1398g	= (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.

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