



Silfluo LC-FC181/183

Fluorinated Electronic Coating

Description:

Silfluo LC-FC181/LC-FC183 is a fluoropolymer-based electronic coating carried in a non-flammable fluorinated solvent, available in two inspection grades and three solid content concentrations (2%, 5%, 10%) with customizable concentrations on request. LC-FC181 deposits a standard clear film; LC-FC183 incorporates a built-in fluorescent indicator for coverage inspection under 365 nm UV blacklight (automated optical inspection or manual).

Upon solvent evaporation, the coating deposits a colorless fluoropolymer film with dry film thickness of 0.5–10 µm (grade-dependent), static water contact angle $\geq 118^\circ$, and surface free energy of 8–10 mN/m. The cured film is directly solderable and solvent-removable, allowing rework without mechanical damage to PCB substrates or component leads.

Compared to LC-FC130, LC-FC181/183 provides a higher water contact angle ($\geq 118^\circ$ vs. $\geq 110^\circ$), lower surface free energy (8–10 vs. 10–12 mN/m), higher thermal stability (1% weight loss at $\sim 260^\circ\text{C}$ vs. $\sim 190^\circ\text{C}$), and higher melting point (70–80°C vs. 25–30°C), indicating a higher-fluorine-content polymer backbone.

Typical Technical Properties:

Active Ingredient:	Fluoropolymer
Appearance:	Colorless clear liquid
Carrier Solvent:	Fluorinated solvent
Solid Content (%):	2%, 5%, 10% (Customizable upon request)
Flash Point:	None
Boiling Point (°C) :	50 - 68

Cured Film Properties (By Grade)

Property	LC-FC18-2	LC-FC18-5	LC-FC18-10
Solid Content:	2.0%	5.0%	10.0%
Cured Film Color:	Colorless	Colorless	Colorless
Light Transmittance:	$\geq 91\%$	$\geq 91\%$	$\geq 91\%$
Single-Coat Dry Film Thickness:	0.5 - 1.5 µm	1.5 - 2.5 µm	3 - 10 µm
Tack-Free Time (Ambient):	30s	1min	2min
Static Water Contact Angle:	$\geq 118^\circ$	$\geq 118^\circ$	$\geq 118^\circ$
Static n-Hexadecane Contact Angle:	$\geq 80^\circ$	$\geq 80^\circ$	$\geq 80^\circ$
Surface Free Energy (mN/m)	8 - 10	8 - 10	8 - 10
Adhesion (ASTM D3359)	5B	5B	5B
Melting Point	70 - 80°C	70 - 80°C	70 - 80°C
Thermal Stability (1% weight loss)	$\sim 260^\circ\text{C}$	$\sim 260^\circ\text{C}$	$\sim 260^\circ\text{C}$

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Dielectric Constant:	3.1	3.1	3.1
Volume Resistivity:	$>10^{14}\Omega\cdot\text{m}$	$>10^{14}\Omega\cdot\text{m}$	$>10^{14}\Omega\cdot\text{m}$
Surface Resistivity:	$>10^{14}\Omega\cdot\text{m}$	$>10^{14}\Omega\cdot\text{m}$	$>10^{14}\Omega\cdot\text{m}$

Coating Process

Suitable for spray coating, dip coating, roll coating, and blade coating. Use fluoropolymer-compatible equipment (stainless steel or PTFE-lined). For dip coating, control withdrawal speed to manage wet film uniformity; faster withdrawal increases film thickness. For spray coating, use local exhaust ventilation to control fluorinated solvent vapor concentration in the work area.

Applications

1. PCBA and FPCA Protection

Applied to PCBs and flexible circuit assemblies as a thin conformal barrier against condensation, dust, industrial oils, solvents, and corrosive gases. Film thickness of 0.5–10 μm does not affect electrical connectivity at contact pads or connector pins. The cured film is directly solderable — components can be soldered through the coating without prior removal, reducing rework time relative to conventional thick-film conformal coatings. For rework requiring full coating removal, apply compatible fluorinated solvent remover and verify complete removal by contact angle measurement (target: untreated PCB substrate contact angle) before recoating.

2. Precision Anti-Migration (Epilame)

Applied to surfaces adjacent to lubricated components in micro-motors, watch movements, and optical camera mechanisms to form a low-surface-energy barrier (8–10 mN/m) that prevents capillary migration of lubricating oils beyond the lubrication zone. LC-FC18X-2 is the recommended grade for this application — 0.5–1.5 μm film build and 30-second tack-free time are compatible with precision assembly throughput requirements. Verify epilame effectiveness by lubricant spreading test on coated vs. uncoated reference surfaces before production qualification.

3. Hard Disk Drive MR Head Protection

Applied to magnetoresistive read heads to prevent lubricant transfer from disk surfaces and particulate contamination. Film thickness control is critical — use LC-FC18X-2 and verify dry film thickness by ellipsometry or profilometry on production samples. Water contact angle $\geq 118^\circ$ and n-hexadecane contact angle $\geq 80^\circ$ confirm both hydrophobic and oleophobic barrier function on the head surface.

4. Precision Micro-Part Sealing

Used for environmental sealing of precision micro-parts, MEMS devices, and miniaturized sensors where conventional conformal coating film thicknesses are incompatible with component dimensional tolerances. Thermal stability to $\sim 260^\circ\text{C}$ (1% weight loss) allows use in assemblies subjected to reflow soldering profiles after coating.

Fluorinated Coating Series - Product Comparison

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Dimension	LC-FC260	LC-FC631/633	LC-FC181/183	LC-FC130
Water contact angle	≥110°	≥110°	≥118°	≥110°
n-Hexadecane contact angle	≥75°	≥75°	≥80°	≥70°
Surface free energy (mN/m)	10–12	10–11	8–10	10–12
Thermal stability (1% wt loss)	~250°C	~260°C	~260°C	~190°C
Tg / melting point	Tg 10–15°C	Tg 5–10°C	Mp 70–80°C	Mp 25–30°C
Max single-coat thickness	2.0–3.5 μm	1.5–2.5 μm	3–10 μm	1.5–2.5 μm
Visual indicator	Yellow tint — ambient light	UV fluorescent (633 only)	UV fluorescent (183 only)	Not specified
Color retention	≥30 days	N/A	N/A	N/A

Packing

In 100g, 500g, 1kg, 25kg.

Safety and Storage

Keep in a cool, dry, and well-ventilated environment, avoiding direct sunlight, heat, and ignition sources. The shelf life is 24 months from the date of manufacture when stored in original unopened containers. Classified as a non-hazardous substance for transport and handling. Storage beyond the shelf life does not necessarily mean the product is unusable; however, the properties required for the intended use must be thoroughly checked for quality assurance reasons prior to application.

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