



Silfluo LC-FC631/633

Fluorinated Electronic Coating

Description:

Silfluo LC-FC631/LC-FC633 is a fluoropolymer-based electronic coating carried in a non-flammable, odorless fluorinated solvent, available in two inspection grades and three solid content concentrations (2%, 5%, 10%) with customizable concentrations on request. LC-FC631 deposits a standard clear film; LC-FC633 incorporates a built-in fluorescent indicator for coverage inspection under 365 nm UV blacklight.

Upon solvent evaporation, the coating deposits a colorless fluoropolymer film with dry film thickness of 0.5-2.5 μm (grade-dependent), static water contact angle $\geq 110^\circ$, and surface free energy of 10-11 mN/m. Glass transition temperature (Tg) of 5-10 $^\circ\text{C}$ and thermal stability to $\sim 260^\circ\text{C}$ (1% weight loss) allow use across a wide service temperature range.

The fluorinated carrier solvent has no flash point, a boiling point of 50-68 $^\circ\text{C}$, zero ozone depletion potential (ODP), and is RoHS compliant.

Typical Technical Properties:

Active Ingredient:	Fluoropolymer
Appearance:	Colorless clear liquid
Carrier Solvent:	Fluorinated solvent
Solid Content (%):	2%, 5%, 10% (Customizable upon request)
Odor:	Odorless
Flash Point:	None
Boiling Point ($^\circ\text{C}$):	50 - 68

Cured Film Properties (By Grade)

Property	LC-FC63-2	LC-FC63-5	LC-FC63-10
Solid Content:	2.0%	5.0%	10.0%
Cured Film Color:	Colorless	Colorless	Colorless
Light Transmittance:	$\geq 90\%$	$\geq 90\%$	$\geq 90\%$
Single-Coat Dry Film Thickness:	0.5 - 1.0 μm	1.0 - 1.5 μm	1.5 - 2.5 μm
Tack-Free Time (Ambient)	30s	1min	2min
Static Water Contact Angle	$\geq 110^\circ$	$\geq 110^\circ$	$\geq 110^\circ$
Static n-Hexadecane Contact Angle	$\geq 75^\circ$	$\geq 75^\circ$	$\geq 75^\circ$
Surface Free Energy (mN/m)	10 - 11	10 - 11	10 - 11
Adhesion (ASTM D3359)	5B	5B	5B
Glass Transition Temperature (Tg)	5 - 10 $^\circ\text{C}$	5 - 10 $^\circ\text{C}$	5 - 10 $^\circ\text{C}$
Thermal Stability (1% weight loss)	$\sim 260^\circ\text{C}$	$\sim 260^\circ\text{C}$	$\sim 260^\circ\text{C}$
Dielectric Constant:	3.1	3.1	3.1

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Volume Resistivity:	>10 ¹⁴ Ω·m	>10 ¹⁴ Ω·m	>10 ¹⁴ Ω·m
Surface Resistivity:	>10 ¹⁴ Ω·m	>10 ¹⁴ Ω·m	>10 ¹⁴ Ω·m

Fluorinated Coating Series - Product Comparison

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

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 0.5–2.5 μm does not affect electrical connectivity at contact pads, test points, or connector pins. Tg of 5–10°C means the cured film remains above glass transition

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temperature at typical operating conditions ($>10^{\circ}\text{C}$), maintaining elastomeric behavior and resistance to microcracking during thermal cycling. Verify coating integrity after thermal cycling per IEC 60068-2-14 or equivalent before production qualification.

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 (10–11 mN/m) preventing capillary migration of lubricating oils beyond the lubrication zone. LC-FC63X-2 is the recommended grade — 0.5–1.0 μm film build and 30-second tack-free time are compatible with precision assembly throughput. 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-FC63X-2 and verify dry film thickness by ellipsometry or profilometry on production samples. Water contact angle $\geq 110^{\circ}$ and n-hexadecane contact angle $\geq 75^{\circ}$ confirm 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 $\sim 260^{\circ}\text{C}$ allows use in assemblies passing through reflow soldering profiles after coating.

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.