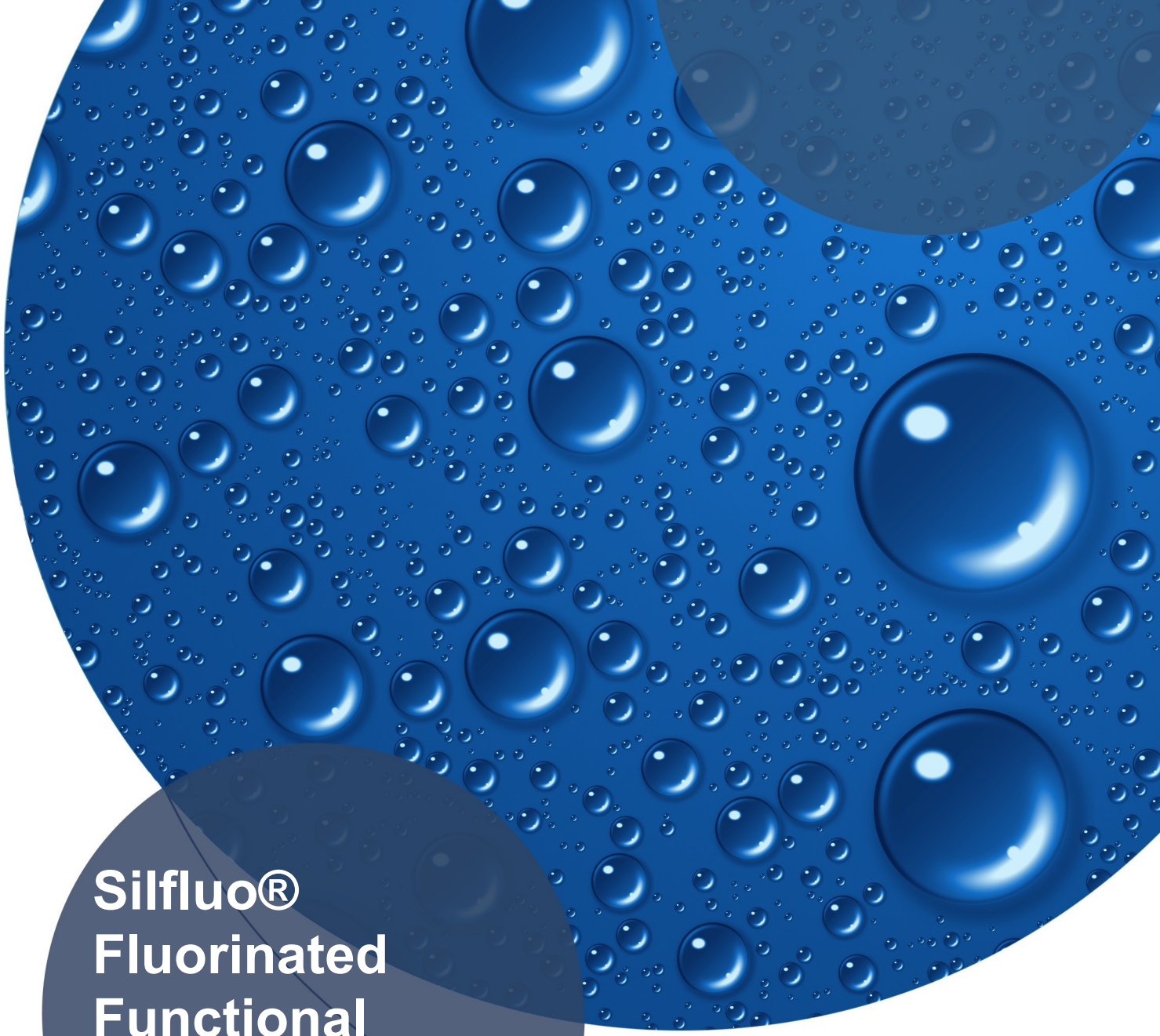


Silfluo® Fluorinated Functional Materials

Product Range

Nanjing Silfluo New Material Co., Ltd.

Silfluo

www.silfluosilicone.com

MANAGEMENT SYSTEM

The Silfluo Quality Management Framework is not a stand-alone platform. It is embedded in the broader Silfluo Operating Discipline Framework, which brings together the policies, standards and workflows for environment, health, safety, manufacturing, human resources and quality. The quality management system is certified to ISO 9001.

With this integrated framework, Silfluo works to one cohesive system based on industry best practice.





SILFLUO QUALITY MANAGEMENT SYSTEM

The Silfluo Quality Management System, established and supported by company leadership, ensures that customers receive dependable products and services and that their needs and expectations are met. It requires strict compliance with technical specifications, regulatory standards and quality benchmarks.

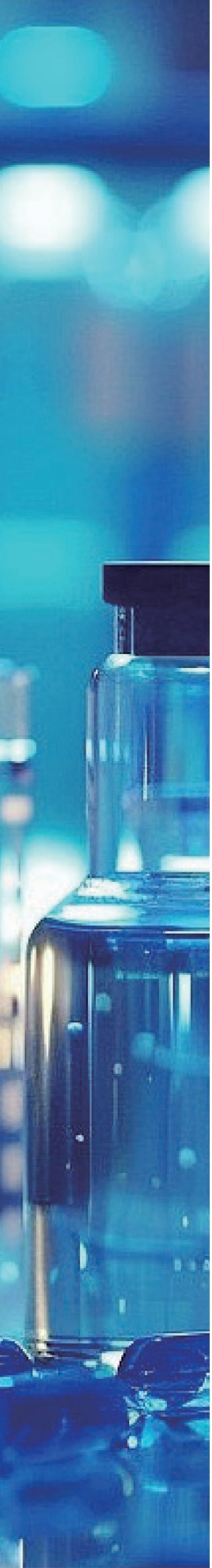
Product quality is upheld through standardization and precise process control. Service quality covers all customer interactions and is overseen by the responsible functional area. The quality attributes of both products and services are defined and agreed upon by Silfluo and its customers.



QUALITY PERFORMANCE STATEMENT

Excellence in quality is a shared responsibility and a core value for every Silfluo team member. It is achieved through collaboration, dedication and a commitment to continuous improvement.

We are committed to delivering products and services that meet or exceed customer expectations. Quality management ensures that we consistently deliver the products and services our customers trust.



QUALITY MEASUREMENT SYSTEMS

Silfluo uses QDG (Quality Data Gather) systems to track and evaluate progress in quality improvement. The QDG systems handle high-volume testing, so that every production batch is tested with validated methods.

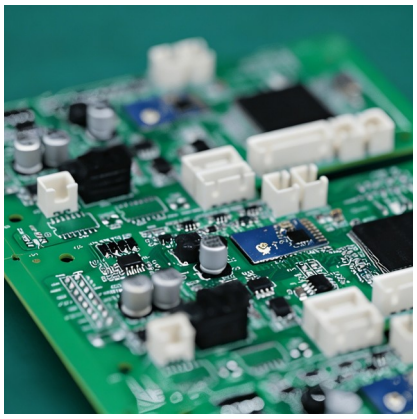
CONVENTIONAL TEST ITEMS	
Test item	**Equipment**
Viscosity	Viscometer
Solid / active content	Drying oven and balance
Contact angle	Contact angle goniometer
Light transmittance	Transmittance meter
Adhesion	Cross-cut tester
Thermal stability	Thermogravimetric analyzer
Release force	Peel tester
Others	

FLUORINATED FUNCTIONAL MATERIALS

Fluoropolymers have a very low surface energy. Thin films and additives based on them make surfaces repel water and oils, keep lubricants where they belong and let adhesives release cleanly, at film thicknesses of a few micrometres.

Silfluo supplies three families of fluorinated functional materials: fluorinated electronic coatings for circuit assemblies and precision parts, fluorinated release agents for release films, and a PFPE-modified acrylic additive for easy-clean and anti-fingerprint coatings.

The Silfluo range



LC-FC series

Fluorinated electronic coatings

- Fluoropolymer in a non-flammable fluorinated carrier
- 2%, 5% and 10% solids grades
- Single-coat dry film 0.5–10 µm
- Water contact angle ≥ 110°



FRA series

Fluorinated release agents

- FRA-500L and FRA-20000: solvent-free, 100% active, platinum cure
- Release force 1–3 g
- FRA-C10: two-component, solvent-borne



LS-53C

PFPE functional additive

- PFPE-modified acrylic, 30% active
- Water and oil repellency, easy-clean surfaces
- Dosage 0.1–10%

Common features

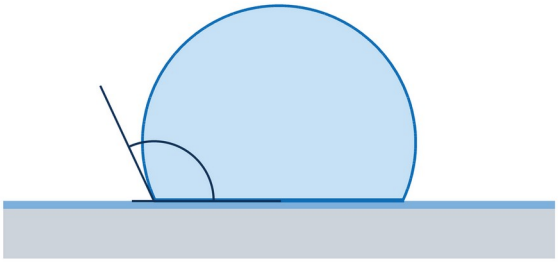
- Four types of fluorinated electronic coating: matte (LC-FC130), high oleophobic (LC-FC181 / 183), yellow indicator (LC-FC260) and standard (LC-FC633).
- The electronic coatings protect PCBAs, FPCAs and sensitive components against water vapour, condensation, dust, grease, solvents and corrosive gases; they are applied by spray, dip, roll or blade coating.
- Fluorinated electronic coatings: the fluorinated carrier has no flash point and a boiling range of 50–68 °C; films are tack-free in 30 s to 2 min at ambient conditions; zero ozone depletion potential (ODP); RoHS compliant.
- Coverage inspection: fluorescent tracer in LC-FC183 and LC-FC633, yellow film in LC-FC260 (colour retained at least 30 days).
- Release agents and LS-53C are transported as non-dangerous goods.
- Packaging from 100 g packs to 200 kg drums.

HOW FLUORINATED SURFACES WORK

Whether a liquid spreads or beads up depends on the surface free energy of the solid. A liquid wets a surface whose surface energy is higher than its own surface tension, and forms droplets on a surface whose surface energy is lower. Fluoropolymer films have a surface free energy of 8–12 mN/m (LC-FC series), below the surface tension of water and of common oils, so both form droplets with a high contact angle instead of spreading.



Uncoated surface: the liquid spreads



Fluorinated film: water beads up, contact angle ≥ 110°

Reading the data sheet

Property	What it tells you	LC-FC series
Static water contact angle	Angle between the edge of a water droplet and the film; the higher the angle, the stronger the water repellency.	≥ 110° to ≥ 118°
Static n-hexadecane contact angle	The same test with an oil; shows oil repellency, which keeps lubricants from creeping over a part (epilame effect).	≥ 70° to ≥ 80°
Surface free energy (mN/m)	Derived from contact angles; the lower the value, the fewer liquids wet the film.	8–12
Single-coat dry film thickness	Set by the solids grade (2%, 5%, 10%) and by the application method.	0.5–10 µm
Tack-free time	Time until the film is dry to the touch at ambient conditions.	30 s to 2 min
Thermal stability (1% mass loss)	Thermogravimetric result; it does not by itself define a continuous service temperature.	~ 200 °C to ~ 280 °C
Tg / melting point	Temperature at which the film softens (glass transition, Tg) or melts (Mp).	Tg 5–15 °C; Mp 25–30 °C or 70–80 °C
Adhesion (ASTM D3359)	Cross-cut tape test; 5B is the top class, no detachment.	5B

One effect, four uses

- Keeping water and oils off circuit assemblies and precision parts: LC-FC electronic coatings.
- Holding lubricants in place (epilame): LC-FC coatings; the 2% grades give the lowest film build.
- Letting adhesives release cleanly: FRA release agents.
- Keeping touch surfaces clean: LS-53C in clear coats and hardcoats.

SELECTION GUIDE: COATINGS

Fluorinated electronic coatings: series comparison (typical values)

Property	LC-FC130	LC-FC181 / 183	LC-FC260	LC-FC633
Type	Matte	High oleophobic	Yellow indicator	Standard
Liquid	Colorless, transparent	Colorless, transparent	Colorless, transparent	Colorless, transparent
Cured film	Colorless	Colorless	Yellow	Colorless
Film gloss	Matte	Glossy	Glossy	Glossy
Light transmittance	≥ 90%	> 91%	> 90%	> 90%
Water contact angle	≥ 110°	≥ 118°	≥ 110°	≥ 110°
n-Hexadecane contact angle	≥ 70°	≥ 80°	≥ 75°	≥ 75°
Surface free energy (mN/m)	10–12	8–10	10–12	10–11
Thermal stability (1% mass loss)	~ 200 °C	~ 260 °C	~ 280 °C	~ 260 °C
Tg / melting point	Mp 25–30 °C	Mp 70–80 °C	Tg 10–15 °C	Tg 5–10 °C
Max. single-coat thickness	1.5–2.5 µm	3–10 µm	2.0–3.5 µm	1.5–2.5 µm
Coverage indicator	None	Fluorescent (LC-FC183)	Yellow film, ambient light; retained ≥ 30 days	Fluorescent (LC-FC633)
Dynamic viscosity, 25 °C (mPa·s)	10–30	10–30	10–30	10–30
Dielectric constant	3.1	3.1	3.1	3.1
Volume resistivity (Ω·m)	> 10^{14}	> 10^{14}	> 10^{14}	> 10^{14}
Surface resistivity (Ω/sq)	> 10^{14}	> 10^{14}	> 10^{14}	> 10^{14}

Grades: solids, tack-free time and single-coat dry film thickness

Grade suffix	Tack-free	LC-FC130	LC-FC181 / 183	LC-FC260	LC-FC633
-2 (2.0% solids)	30 s	0.5–1.5 µm	0.5–1.5 µm	1.0–1.5 µm	0.5–1.0 µm
-5 (5.0% solids)	1 min	1.0–2.0 µm	1.5–2.5 µm	1.0–2.5 µm	1.0–1.5 µm
-10 (10.0% solids)	2 min	1.5–2.5 µm	3–10 µm	2.0–3.5 µm	1.5–2.5 µm

Other solids contents on request. Tack-free time at ambient conditions; drying depends on film thickness, temperature, ventilation and humidity.

Which coating for which need

- Matte film: LC-FC130 (matte type).
- Clear, glossy film for general protection, with fluorescent tracer for coverage inspection: LC-FC633 (standard type).
- Coverage inspection under UV light: LC-FC183 or LC-FC633 (fluorescent tracer).
- Visual coverage check in ambient light: LC-FC260 (yellow indicator type).
- Highest listed water and oil contact angles, lowest surface free energy and the thickest single coat: LC-FC181 / 183 (high oleophobic type).
- Highest listed thermal stability: LC-FC260.
- Lowest film build for precision parts: the -2 grades, down to 0.5–1.0 µm (LC-FC633).

Thermal stability and Tg / melting point are thermal-analysis results; they do not by themselves establish the continuous service temperature or reflow-soldering compatibility.

SELECTION GUIDE: RELEASE AGENTS

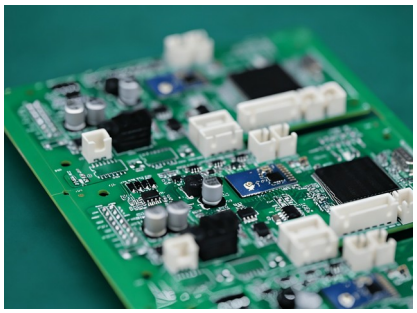
Fluorinated release coatings are used where an adhesive sticks to conventional silicone release coatings, for example silicone pressure-sensitive adhesives. Silfluo FRA release agents form the release layer on films and liners; LS-53C is added to coatings to give an easy-clean, anti-fingerprint surface.

Grade	Type	Viscosity / content	Key data
FRA-500L	Fluorinated release agent, main agent; solvent-free	400–600 cSt; 100% active	Platinum cure with LF-HF12-M8; release force 1–3 g, aged increase < 10 g
FRA-20000	Fluorinated release agent, main agent; solvent-free	18,000–22,000 cSt; 100% active	As FRA-500L, higher viscosity
LF-HF12-M8	Crosslinker for FRA-500L and FRA-20000	20–100 cSt	—
FRA-C10	Two-component solvent-borne fluorocarbon release agent	30% solids	Mix ratio A : B = 2 : 1 by weight; use within 2 h after mixing; dense, transparent film
LS-53C	PFPE-modified acrylic compound (additive)	30% active	Dosage 0.1–10%; contact angles typically > 100° (water), > 70° (oils)

Preparing a release coating solution

Step	FRA-500L / FRA-20000	FRA-C10
1 Dissolve	Dissolve the main agent in butyl acetate, MIBK, MEK or a fluorinated solvent; a single solvent or a blend	Dilute the main agent (Part A) with a suitable solvent, such as an ester solvent
2 Add curing component	Add and dissolve the crosslinker LF-HF12-M8	Add the curing agent (Part B) at A : B = 2 : 1 by weight; mix until uniformly dissolved
3 Catalyse	Add inhibitor, platinum catalyst and other additives; stir until uniform	—
4 Use	Use the coating solution as soon as possible; prolonged standing may affect coating performance	Use within 2 h after mixing
5 Optimise	Crosslinker ratio, inhibitor and platinum levels, coating weight and cure schedule by trials	Application conditions by trials

INDUSTRIES AND APPLICATIONS



Circuit assemblies (PCBA, FPCA)



LED modules



Cameras and precision mechanisms



Hard disk drive read heads



Release liners for adhesive tapes



Optical lenses and display films

Products by application

Application	LC-FC130	LC-FC181 / 183	LC-FC260	LC-FC633	FRA series	LS-53C
PCBA and FPCA protection	•	•	•	•		
LED surface treatment	•					
Coverage checked by eye, field-serviceable assemblies			•			
Epilame: watches, micro-motors, cameras	•	•	•	•		
Hard disk drive MR head protection	•	•	•	•		
Precision micro-parts, MEMS, miniaturized sensors	•	•	•	•		
Fluorinated release films and liners					•	
Anti-fingerprint coatings: screen films, displays, lenses						•
Anti-fouling topcoats: appliance and electronics casings						•
Hardcoats for PC, PMMA and PET						•

PROCESS GUIDE

Fluorinated electronic coatings dry by evaporation of the fluorinated carrier; no curing step is needed. Establish process parameters through trials on the intended substrate and assembly.

1

Prepare

Parts should be clean and dry: remove flux residues, dust and oils, which reduce adhesion of the thin film.

2

Mask

Mask or otherwise protect electrical contacts unless the assembly process, solderability and rework method have been validated with the coating.

3

Apply

Spray, dip, roll or blade coating. Stainless-steel or PTFE-lined equipment is generally suitable. For spray application, provide local exhaust ventilation.

4

Control film build

Choose the solids grade (2%, 5%, 10%) for the required thickness. For dip coating, control the withdrawal speed for thickness and uniformity.

5

Dry

Tack-free in about 30 s (-2 grades) to 2 min (-10 grades) at ambient conditions; drying depends on film thickness, temperature, ventilation and humidity.

6

Inspect

LC-FC183 and LC-FC633: fluorescent tracer under UV light. LC-FC260: yellow film in ambient light; check its visibility on the substrate colour.

Validate before production

• Thin films on precision parts (HDD read heads, MEMS, micro-sensors): confirm film thickness, adhesion, electrical performance and cleanliness.

• Epilame use: confirm the effect with the intended lubricant, substrate, surface preparation and film thickness.

• Thermal-analysis values (1% mass loss, Tg, Mp) do not by themselves establish reflow-soldering compatibility; test under the required product protocol, including thermal cycling.

PACKAGING, STORAGE AND TRANSPORT

Shelf life applies to original, unopened containers stored as below. Material stored beyond its shelf life should be re-tested against the required properties before use.

Product	Packaging	Storage	Shelf life	Transport
LC-FC130 LC-FC181 / 183 LC-FC260 LC-FC633	100 g, 500 g, 1 kg and 25 kg packs	5–35 °C in the original tightly closed container; cool, dry, well ventilated; away from sunlight, heat and ignition sources	24 months	See the current SDS
FRA-500L, FRA-20000	5, 20, 25 and 200 kg plastic or steel drums	Tightly closed at ambient temperature, dry and well ventilated; protected from sunlight and rain; away from heat, open flames, strong oxidizers, acids and alkalis	12 months	Non-dangerous goods
FRA-C10	15 kg set: 10 kg Part A + 5 kg Part B, plastic or steel containers	As FRA-500L	12 months	Non-dangerous goods
LS-53C	1 kg fluorinated bottle, 25 kg pail, 200 kg drum	Cool, dry, well ventilated; away from sunlight, heat and ignition sources	12 months	Non-hazardous

Handling

- Keep containers tightly closed after use.
- Spray application of the electronic coatings: provide adequate local exhaust ventilation.
- Release coating solutions: use as soon as possible after preparation; FRA-C10 within 2 h after mixing.
- Refer to the SDS of each product before handling, storage and use.



Fluorinated bottles

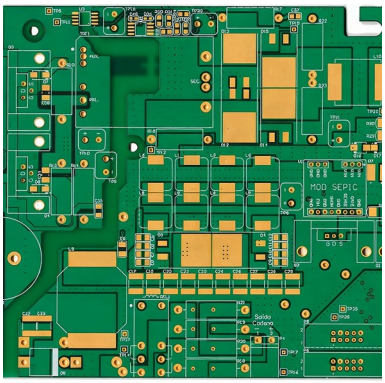


Plastic pails



Steel drums

FLUORINATED ELECTRONIC COATING LC-FC130



Key features

- Fluoropolymer in a non-flammable fluorinated carrier; no flash point
- 2%, 5% and 10% solids grades; other concentrations on request
- Matte type: colorless matte film; light transmittance ≥ 90%
- Water contact angle ≥ 110°, n-hexadecane ≥ 70°
- Surface free energy 10–12 mN/m; adhesion 5B
- Tack-free in 30 s to 2 min at ambient conditions

Description:

Silfluo LC-FC130 is a fluoropolymer electronic coating in a non-flammable fluorinated carrier, available in 2%, 5% and 10% solids grades; other concentrations on request. After solvent evaporation it forms a colorless, transparent, low-surface-energy film that reduces wetting by water and oils. Typical tack-free times are 30 seconds to 2 minutes at ambient conditions, depending on grade, film thickness, temperature, ventilation and humidity.

LC-FC130 can be evaluated as a thin protective coating for electronic assemblies and as an epilame (lubricant anti-migration) treatment for precision parts. Suitability must be confirmed on the intended substrate and assembly.

Typical Properties:

Property	LC-FC130-2	LC-FC130-5	LC-FC130-10
Liquid	Fluoropolymer in fluorinated solvent; colorless, transparent, slight odor		
Dynamic viscosity, 25 °C (mPa·s)	10–30		
Carrier	No flash point; boiling range 50–68 °C		
Solid content	2.0%	5.0%	10.0%
Single-coat dry film thickness	0.5–1.5 µm	1.0–2.0 µm	1.5–2.5 µm
Tack-free time (ambient conditions)	30 s	1 min	2 min
Film color; light transmittance	Colorless; ≥ 90%		
Static contact angle: water / n-hexadecane	≥ 110° / ≥ 70°		
Surface free energy (mN/m)	10–12		
Adhesion (ASTM D3359)	5B		
Melting point	25–30 °C		
Thermal stability (1% mass loss)	~ 200 °C		
Dielectric constant	3.1		
Volume / surface resistivity	> 10^{14} Ω·m / > 10^{14} Ω/sq		

FLUORINATED ELECTRONIC COATING LC-FC130 (CONTINUED)

Applications:

1. PCBA and FPCA protection: may be evaluated as a thin conformal coating for printed circuit board assemblies and flexible circuits to reduce exposure to moisture, condensation, dust and oils. Mask or protect electrical contacts unless the assembly process has been validated with the coating.
2. LED surface treatment: a water- and oil-repellent treatment for LED modules where a thin, colorless film is required. Confirm optical performance, adhesion and appearance on the target module.
3. Precision anti-migration (epilame): applied around lubricated components in watches, micro-motors, cameras and other precision mechanisms to reduce lubricant migration. LC-FC130-2 gives the lowest film build in the series.
4. Hard disk drive (HDD) MR head protection: a thin contamination and lubricant-migration barrier for magnetoresistive read heads; film thickness, adhesion, electrical performance and cleanliness must be validated before use.
5. Precision micro-part sealing: precision parts, MEMS devices and miniaturized sensors where low film build is important. Confirm dimensional and functional compatibility before production use.

Package & Storage:

Available in 100 g, 500 g, 1 kg and 25 kg packs.
Store at 5–35 °C in the original tightly closed container in a cool, dry and well-ventilated area, protected from direct sunlight, heat and ignition sources. Shelf life: 24 months from the date of manufacture in unopened original containers. Material stored beyond the shelf life should be re-tested against the required properties before use. Refer to the current SDS for handling and transport information.

FLUORINATED ELECTRONIC COATING LC-FC181 / LC-FC183 SERIES



Key features

- LC-FC181 clear film; LC-FC183 with fluorescent tracer for coverage inspection
- High oleophobic type: water contact angle ≥ 118°, n-hexadecane ≥ 80°
- Surface free energy 8–10 mN/m
- Single-coat dry film 0.5–10 μm, depending on grade
- Light transmittance > 91%; adhesion 5B
- Non-flammable fluorinated carrier; no flash point

Description:

Silfluo LC-FC181 and LC-FC183 are fluoropolymer electronic coatings in a non-flammable fluorinated carrier, each available in 2%, 5% and 10% solids grades. LC-FC181 forms a standard clear film; LC-FC183 contains a fluorescent tracer for coating-coverage inspection.
After solvent evaporation the coatings form a colorless, low-surface-energy film with a typical single-coat dry film thickness of 0.5–10 μm, depending on grade. The static water contact angle is ≥ 118° and the typical surface free energy 8–10 mN/m. Solderability and solvent-removability must be confirmed under the customer's process conditions before production use.

Typical Properties:

Property	LC-FC181 / 183-2	LC-FC181 / 183-5	LC-FC181 / 183-10
Liquid	Fluoropolymer in fluorinated solvent; colorless, transparent		
Dynamic viscosity, 25 °C (mPa·s)	10–30		
Carrier	No flash point; boiling range 50–68 °C		
Solid content	2.0%	5.0%	10.0%
Single-coat dry film thickness	0.5–1.5 μm	1.5–2.5 μm	3–10 μm
Tack-free time (ambient conditions)	30 s	1 min	2 min
Film color; light transmittance	Colorless; > 91%		
Static contact angle: water / n-hexadecane	≥ 118° / ≥ 80°		
Surface free energy (mN/m)	8–10		
Adhesion (ASTM D3359)	5B		
Melting point	70–80 °C		
Thermal stability (1% mass loss)	~ 260 °C		
Dielectric constant	3.1		
Volume / surface resistivity	> 10^{14} Ω·m / > 10^{14} Ω/sq		

FLUORINATED ELECTRONIC COATING LC-FC181 / LC-FC183 SERIES (CONTINUED)

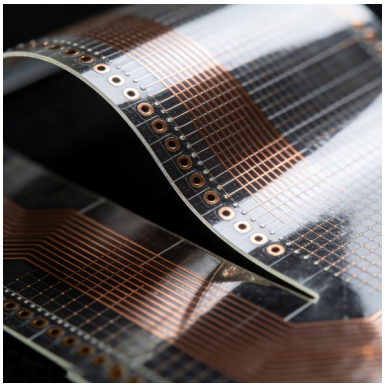
Applications:

1. PCBA and FPCA protection: may be evaluated as a thin conformal coating for PCBAs and flexible circuits to reduce exposure to moisture, condensation, dust and oils. LC-FC183 supports fluorescent coverage inspection. Mask electrical contacts unless the assembly process, solderability and rework method have been validated with the coating.
2. Precision anti-migration (epilame): applied around lubricated components in watches, micro-motors, cameras and other precision mechanisms. The 2% grade gives the lowest film build. Confirm the epilame effect with the intended lubricant, substrate, surface preparation and film thickness.
3. Hard disk drive MR head protection: a thin contamination and lubricant-migration barrier for magnetoresistive read heads; film thickness, adhesion, electrical performance and cleanliness must be validated before use.
4. Precision micro-part sealing: precision parts, MEMS devices and miniaturized sensors where low film build is important. The listed 1% mass-loss temperature does not by itself establish reflow-soldering compatibility.

Package & Storage:

Available in 100 g, 500 g, 1 kg and 25 kg packs.
Store at 5–35 °C in the original tightly closed container in a cool, dry and well-ventilated area, protected from direct sunlight, heat and ignition sources. Shelf life: 24 months from the date of manufacture in unopened original containers. Material stored beyond the shelf life should be re-tested against the required properties before use. Refer to the current SDS for handling and transport information.

FLUORINATED ELECTRONIC COATING LC-FC260 SERIES



Key features

- Yellow indicator type: yellow film for visual inspection of coverage
- Yellow colour retained for at least 30 days
- Water contact angle ≥ 110°, n-hexadecane ≥ 75°
- Thermal stability ~ 280 °C (1% mass loss)
- Single-coat dry film 1.0–3.5 μm, depending on grade
- Non-flammable fluorinated carrier; no flash point

Description:

Silfluo LC-FC260 Series is a fluoropolymer electronic coating in a non-flammable fluorinated carrier, available in 2%, 5% and 10% solids grades. The cured film keeps a yellow visual indicator for at least 30 days, so coating coverage can be inspected directly by eye.
After solvent evaporation LC-FC260 forms a yellow-tinted fluoropolymer film with a typical single-coat dry film thickness of 1.0–3.5 μm, depending on grade. The static water contact angle is ≥ 110°, the typical surface free energy 10–12 mN/m and the light transmittance > 90%. The carrier has no flash point and a boiling range of 50–68 °C.

Typical Properties:

Property	LC-FC260-2	LC-FC260-5	LC-FC260-10
Liquid	Fluoropolymer in fluorinated solvent; colorless, transparent, slight odor		
Dynamic viscosity, 25 °C (mPa·s)	10–30		
Carrier	No flash point; boiling range 50–68 °C		
Solid content	2.0%	5.0%	10.0%
Single-coat dry film thickness	1.0–1.5 μm	1.0–2.5 μm	2.0–3.5 μm
Tack-free time (ambient conditions)	30 s	1 min	2 min
Film color; light transmittance	Yellow; > 90%		
Color retention time	At least 30 days		
Static contact angle: water / n-hexadecane	≥ 110° / ≥ 75°		
Surface free energy (mN/m)	10–12		
Adhesion (ASTM D3359)	5B		
Glass transition temperature (Tg)	10–15 °C		
Thermal stability (1% mass loss)	~ 280 °C		
Dielectric constant	3.1		
Volume / surface resistivity	> 10^{14} Ω·m / > 10^{14} Ω/sq		

FLUORINATED ELECTRONIC COATING LC-FC260 SERIES (CONTINUED)

Applications:

1. Visual inspection zones and field-serviceable assemblies: for applications where coating coverage is checked by eye. Verify the visibility of the yellow indicator on the intended substrate colour and at the selected film thickness.
2. PCBA and FPCA protection: may be evaluated as a thin conformal coating for PCBAs and flexible circuits to reduce exposure to moisture, condensation, dust and oils. Mask electrical contacts unless the assembly process has been validated with the coating; confirm thermal-cycling performance under the required test protocol.
3. Precision anti-migration (epilame): around lubricated components in watches, micro-motors, cameras and other precision mechanisms. The yellow indicator may remain visible on transparent or light-coloured parts; confirm appearance and epilame effect before use.
4. Hard disk drive MR head protection: a thin contamination and lubricant-migration barrier for magnetoresistive read heads; film thickness, adhesion, electrical performance, cleanliness and indicator visibility must be validated before use.
5. Precision micro-part sealing: precision parts and miniaturized sensors where low film build and a visible coverage indicator are important.

Package & Storage:

Available in 100 g, 500 g, 1 kg and 25 kg packs.
Store at 5–35 °C in the original tightly closed container in a cool, dry and well-ventilated area, protected from direct sunlight, heat and ignition sources. Shelf life: 24 months from the date of manufacture in unopened original containers. Material stored beyond the shelf life should be re-tested against the required properties before use. Refer to the current SDS for handling and transport information.

FLUORINATED ELECTRONIC COATING LC-FC633 SERIES



Key features

- Standard type: clear film with fluorescent tracer for coverage inspection
- Single-coat dry film from 0.5–1.0 μm (2% grade)
- Water contact angle ≥ 110°, n-hexadecane ≥ 75°
- Surface free energy 10–11 mN/m; adhesion 5B
- Thermal stability ~ 260 °C (1% mass loss)
- Non-flammable fluorinated carrier; no flash point

Description:

Silfluo LC-FC633 is a fluoropolymer electronic coating in a non-flammable fluorinated carrier, available in 2%, 5% and 10% solids grades. LC-FC633 forms a clear film and contains a fluorescent tracer for coating-coverage inspection.

After solvent evaporation the coatings form a colorless, low-surface-energy film with a typical single-coat dry film thickness of 0.5–2.5 μm, depending on grade. The static water contact angle is ≥ 110° and the typical surface free energy 10–11 mN/m. The carrier has no flash point and a boiling range of 50–68 °C.

Typical Properties:

Property	LC-FC633-2	LC-FC633-5	LC-FC633-10
Liquid	Fluoropolymer in fluorinated solvent; colorless, transparent, slight odor		
Dynamic viscosity, 25 °C (mPa·s)	10–30		
Carrier	No flash point; boiling range 50–68 °C		
Solid content	2.0%	5.0%	10.0%
Single-coat dry film thickness	0.5–1.0 μm	1.0–1.5 μm	1.5–2.5 μm
Tack-free time (ambient conditions)	30 s	1 min	2 min
Film color; light transmittance	Colorless; > 90%		
Static contact angle: water / n-hexadecane	≥ 110° / ≥ 75°		
Surface free energy (mN/m)	10–11		
Adhesion (ASTM D3359)	5B		
Glass transition temperature (Tg)	5–10 °C		
Thermal stability (1% mass loss)	~ 260 °C		
Dielectric constant	3.1		
Volume / surface resistivity	> 10^{14} Ω·m / > 10^{14} Ω/sq		

FLUORINATED ELECTRONIC COATING LC-FC633 SERIES (CONTINUED)

Applications:

1. PCBA and FPCA protection: may be evaluated as a thin conformal coating for PCBAs and flexible circuits to reduce exposure to moisture, condensation, dust and oils. LC-FC633 supports fluorescent coverage inspection. Mask electrical contacts unless the assembly process has been validated with the coating; confirm thermal-cycling performance under the required test protocol.
2. Precision anti-migration (epilame): around lubricated components in watches, micro-motors, cameras and other precision mechanisms. The 2% grade gives the lowest film build. Confirm the epilame effect with the intended lubricant, substrate, surface preparation and film thickness.
3. Hard disk drive MR head protection: a thin contamination and lubricant-migration barrier for magnetoresistive read heads; film thickness, adhesion, electrical performance, cleanliness and fluorescent-tracer compatibility must be validated before use.
4. Precision micro-part sealing: precision parts, MEMS devices and miniaturized sensors where low film build is important.

Package & Storage:

Available in 100 g, 500 g, 1 kg and 25 kg packs.
Store at 5–35 °C in the original tightly closed container in a cool, dry and well-ventilated area, protected from direct sunlight, heat and ignition sources. Shelf life: 24 months from the date of manufacture in unopened original containers. Material stored beyond the shelf life should be re-tested against the required properties before use. Refer to the current SDS for handling and transport information.

FLUORINATED RELEASE AGENT FRA-500L / FRA-20000



Key features

- Solvent-free main agents, 100% active content
- Platinum-catalysed cure with the crosslinker LF-HF12-M8
- Release force 1–3 g; aged increase below 10 g
- Viscosity: FRA-500L 400–600 cSt, FRA-20000 18,000–22,000 cSt
- Dissolves in butyl acetate, MIBK, MEK or fluorinated solvent
- Transported as non-dangerous goods

Description:

Silfluo FRA-500L and FRA-20000 are solvent-free fluorinated release agents supplied at 100% active content. Each main agent is used with the crosslinker LF-HF12-M8.
The products form platinum-catalysed curing systems with high reaction activity and stable performance. The coated fluorinated release film gives a release force of 1–3 g, with an aged increase below 10 g.

FLUORINATED RELEASE AGENT FRA-500L / FRA-20000 (CONTINUED)

Typical Technical Properties:

Property	Combination 1		Combination 2	
Product	FRA-500L	LF-HF12-M8	FRA-20000	LF-HF12-M8
Component	Main agent	Crosslinker	Main agent	Crosslinker
Appearance	Colorless transparent or pale yellow oily liquid			
Viscosity (25 °C, mm^2/s [cSt])	400–600	20–100	18,000–22,000	20–100
Active content (%)	100			

Application Method:

Dissolve the main agent in a suitable solvent, such as butyl acetate, methyl isobutyl ketone (MIBK), methyl ethyl ketone (MEK) or a fluorinated solvent; a single solvent or a blend may be used. Then add and dissolve the crosslinker LF-HF12-M8, add inhibitor, platinum catalyst and other additives, and stir until uniform. Use the coating solution as soon as possible. Crosslinker ratio, inhibitor level, platinum level, coating weight and cure schedule must be established by trials.

Package & Storage:

Available in 5 kg, 20 kg, 25 kg and 200 kg plastic or steel drums. Store tightly closed at ambient temperature in a dry, well-ventilated place, protected from direct sunlight and rain, away from heat, open flames, strong oxidizing agents, corrosive materials, acids and alkalis. Recommended shelf life: 12 months from the date of manufacture. Transported as non-dangerous goods, subject to the current SDS and applicable transport regulations.

SOLVENT-BORNE FLUOROCARBON RELEASE AGENT FRA-C10



Key features

- Two-component, solvent-borne fluorocarbon release agent
- 30% solids
- Mix ratio Part A : Part B = 2 : 1 by weight
- Use within 2 hours after mixing
- Dense, highly transparent film
- 15 kg set; transported as non-dangerous goods

Description:

Silfluo FRA-C10 is a solvent-borne, two-component curing system based on a fluorocarbon-modified material, with high reaction activity and stable performance. Coating and curing give a dense, highly transparent film intended to resist acids, alkalis, water vapor, solvents and dust in demanding service environments.

SOLVENT-BORNE FLUOROCARBON RELEASE AGENT FRA-C10 (CONTINUED)

Typical Technical Properties:

Type	Two-component solvent-borne fluorocarbon release agent
Appearance	Colorless transparent or pale yellow oily liquid
Solids content (%)	30
Mix ratio, Part A : Part B (wt.)	2 : 1
Recommended use window after mixing	Within 2 hours
Packaging	15 kg/set: Part A 10 kg; Part B 5 kg

Typical values; for test methods and specifications, please contact us.

Application Method:

Dilute the main agent (Part A) with a suitable solvent, such as an ester solvent, add the curing agent (Part B) at A : B = 2 : 1 by weight and mix until uniformly dissolved. Use the mixed solution within 2 hours; otherwise the coating result may be affected. Determine the optimum application conditions by trials.

Package & Storage:

15 kg per set: 10 kg Part A main agent and 5 kg Part B curing agent, in plastic or steel containers. Storage as FRA-500L: tightly closed at ambient temperature, dry and well ventilated, protected from sunlight, rain, heat, open flames, strong oxidizing agents, corrosive materials, acids and alkalis. Recommended shelf life: 12 months from the date of manufacture. Transported as non-dangerous goods, subject to the current SDS and applicable transport regulations.

PFPE MODIFIED ACRYLIC COMPOUND LS-53C



Key features

- Perfluoropolyether (PFPE) modified acrylic, 30% active
- Contact angles typically > 100° for water and > 70° for oils
- Anti-smudge, anti-fingerprint and easy-clean surfaces
- Acrylic backbone co-cures with the coating resin
- For UV-curable acrylate, PMMA, PC and PET coating systems
- Dosage 0.1–10%

Description:

Silfluo LS-53C is a perfluoropolyether (PFPE) modified acrylic compound with 30% active content. It combines the low surface energy and slip of PFPE segments with the film-forming properties and resin compatibility of acrylic chemistry.

PFPE MODIFIED ACRYLIC COMPOUND LS-53C (CONTINUED)

During cure the PFPE segments migrate to the coating surface and form a fluorine-enriched surface layer with very low surface energy, which gives water and oil repellency, anti-smudge and easy-clean properties. The acrylic backbone is bound covalently into the coating matrix, so the additive does not migrate or bleed out over time like a plasticizer.
Typical uses are optical coatings, anti-fingerprint films, surface protection of consumer electronics and hardcoats for engineering plastics, where surfaces must stay clean and clear in long-term use.

Typical Technical Properties:

Chemical name	Perfluoropolyether modified acrylic compound
Appearance	Translucent liquid
Active content (%)	30
Dosage (%)	0.1–10

Features:

• Water and oil repellency: PFPE segments at the coating surface give contact angles typically above 100° for water and above 70° for oils and fingerprint sebum. Silicone or hydrocarbon slip additives give water repellency, but not oil repellency.
• Lasting effect: the acrylic backbone co-cures or co-polymerizes with the coating resin and anchors the PFPE segments, so the anti-smudge and easy-clean effect remains through repeated cleaning and UV exposure.
• Smooth surface feel: the PFPE-enriched surface has a low coefficient of friction (COF), for high-touch surfaces such as screen protectors, optical lenses and device casings.
• Resin compatibility: compatible with UV-curable acrylate, PMMA, PC and PET coating systems at recommended dosage levels. Verify optical clarity (haze) in the specific formulation and substrate.
• Chemical stability: the fully fluorinated polyether segment resists UV, cleaning agents and solvents.

Applications:

1. Anti-smudge and anti-fingerprint coatings for displays and optical films: UV-curable clear AF coatings for screen protective films, LCD / OLED display surfaces, optical lenses and optical discs.
2. Consumer electronics and appliance surfaces: anti-graffiti and anti-fouling topcoat additive for the casings of white goods and consumer electronics, against permanent ink, stains and wear in daily use.
3. Engineering plastic hardcoats: in surface hardcoats for polycarbonate, PMMA and PET to improve surface slip (lower COF), chemical resistance and weathering durability while keeping optical transmission and haze.

Package & Storage:

In 1 kg fluorinated bottles, 25 kg pails and 200 kg drums.
Keep in a cool, dry and well-ventilated place, away from direct sunlight, heat and ignition sources. Shelf life: 12 months from the date of manufacture in original unopened containers. Classified as non-hazardous for transport and handling. After the shelf life the product is not necessarily unusable; check the properties required for the intended use before application.



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The data in this brochure are typical values, not specifications. Please conduct a trial before using a product to confirm that it is suitable for the intended use. The uses described do not guarantee freedom from conflict with any patent. Trademarks are the property of their respective owners.