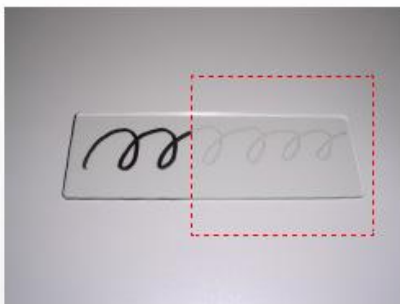


Antifouling Coating Agent

FLUOROSURF®



- By coating surfaces with this agent, fingerprint and other stains attaching to those surfaces decrease and attached stains can be easily wiped away. The high adhesion of the film keeps functions after the stains are wiped away with tissue paper or the like.
- Coefficient of dynamic friction of the surface is low ($\mu = 0.09$ or less) and provides dry lubricating surface.



**Example of FG-5020 coating on glass plate (right half)
Repels oil-based ink.**

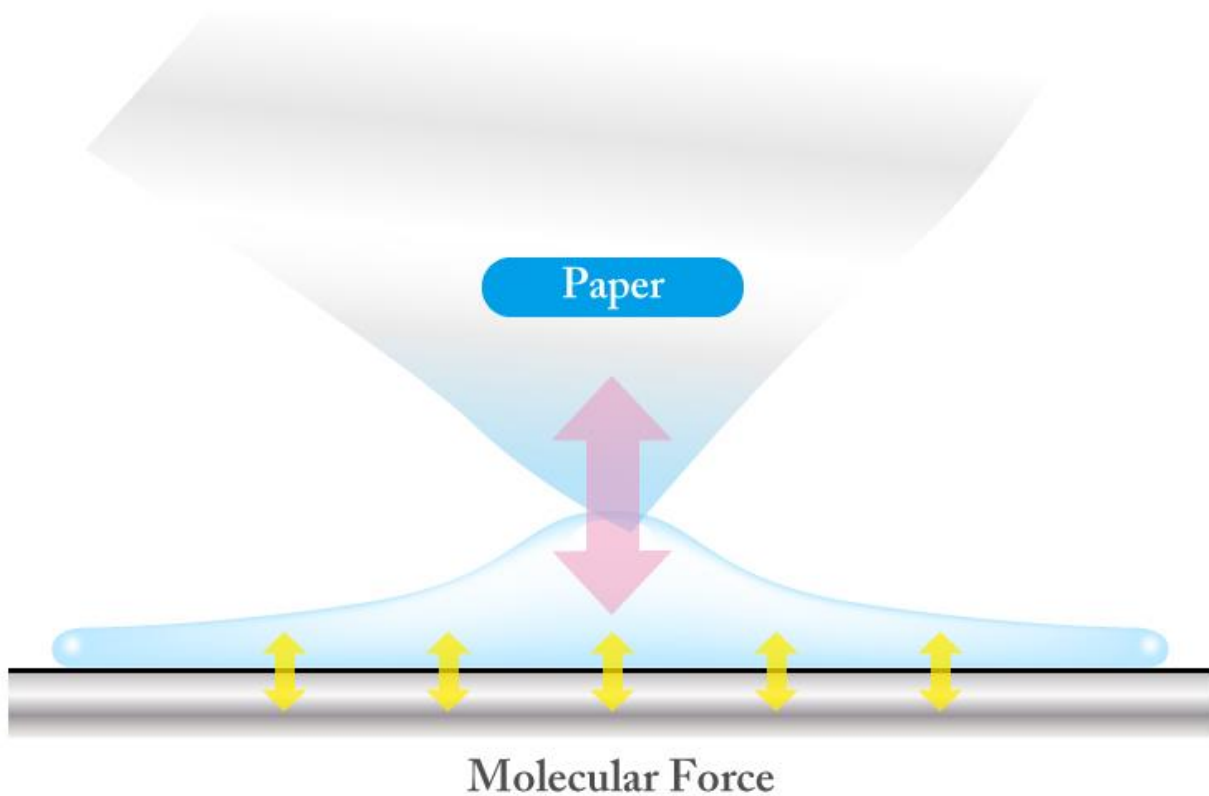


**Ink of coating can be completely removed
by wiping with tissue paper several times.**

For simplicity's sake, oil-based ink is used for this test. Fingerprint attaching decreases by coating as in the case of this ink and attached fingerprint can be easily removed.

Essential performance of antifouling coating is to prevent stains from attaching and abrasion resistance. FLUOROSURF FG-5000 series has cleared abrasion tests of more than 10000 times.

Mechanism of Anti Finger Print

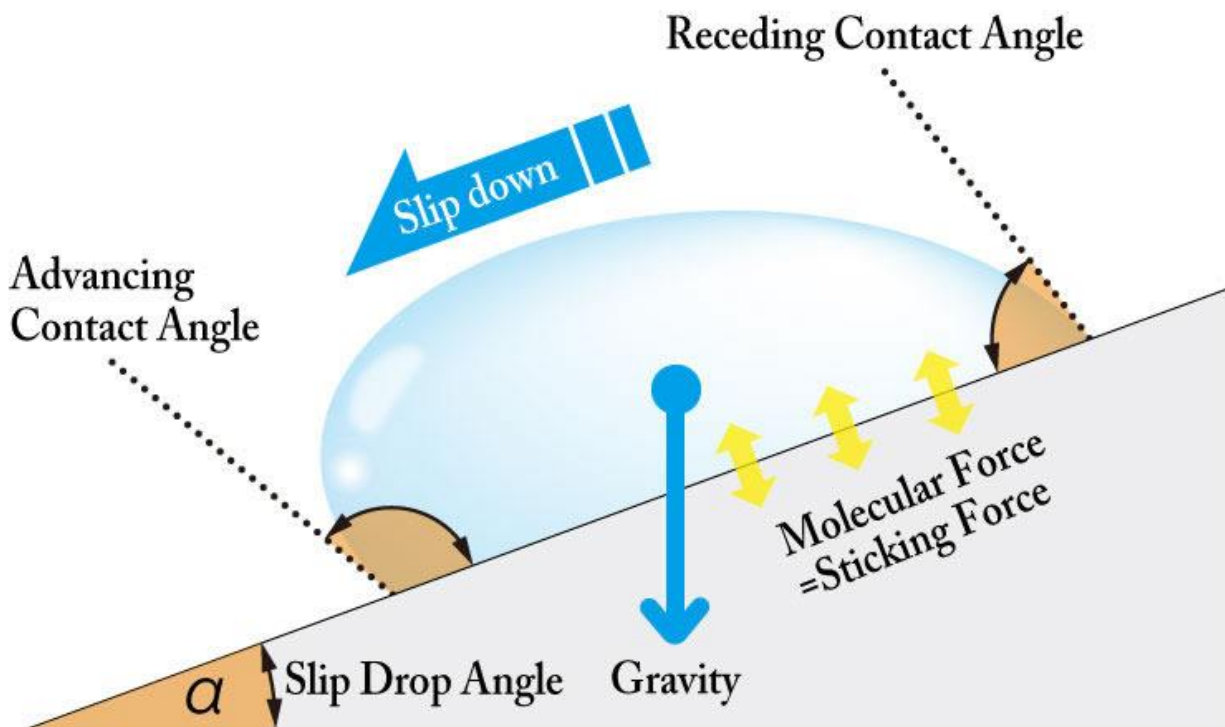


- Fingerprint and stain components stick by the molecular force that act with the surface. (Yellow arrow in the above diagram)
- When a FLUOROSURF is applied, the sticking force of stain is reduced and it is difficult for the stain component to stick and easy to remove it.
- Because the molecular force is strong in the natural fibers of paper or cotton, the force works to suck up stain component. (Pink arrow in the above diagram)
- The difference in the size of the pink and yellow arrows indicates “the level of ease in removing stain.”

Key Point of Anti Finger Print

- Fingerprints consist of oil composition and the water contact angle cannot be used to express the performance of anti fingerprint!
- The slip drop angle of oil in effect indicates the performance of anti fingerprint .
- The slip drop angle refers to the angle at which a liquid droplet placed on a surface starts to slide when the surface is tilted.

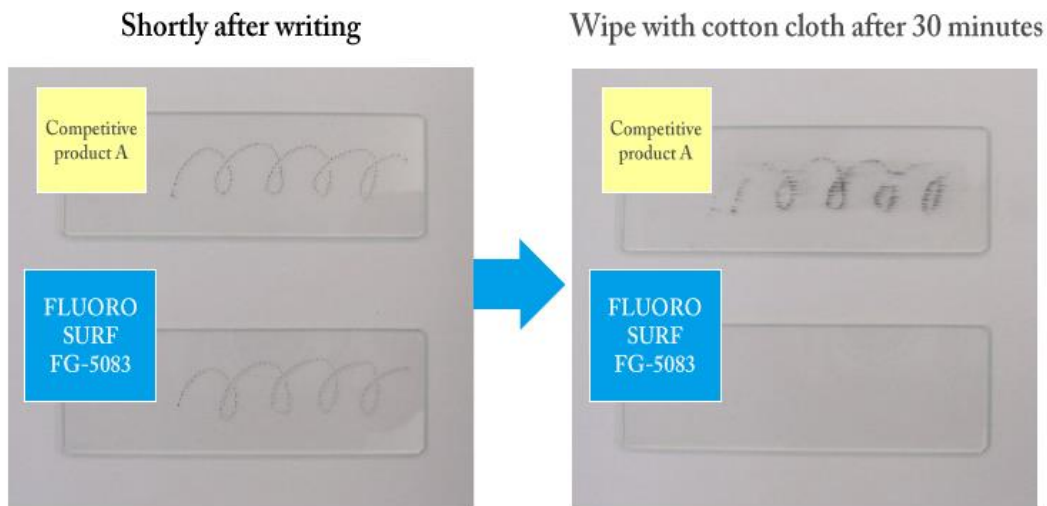
- The slip drop angle is determined by the sticking force of the stain and the gravitational force on the oil droplet, and the droplet begins to slide when the adhesive force < gravitational force.
- The weaker the sticking force of a fingerprint, the smaller is the slip drop angle.



Contact Angle and performance of Antifouling

(The data comparison of contact angle with antifouling performance)

	Water			Oil (n-hexadecane)		
	Contact Angle	Receding Contact Angle	Slip Drop Angle	Contact Angle	Receding Contact Angle	Slip Drop Angle
Competitive product A	117	101	42	70	66	25
FLUROSURF FG-5083	110	109	9	66	64	8



- Competitive product A:
 - ➔ The water contact angle is high, but the ink cannot be wiped off.
 - ➔ Slip drop angle is high in both of water and oil . This means finger print stick strong.
- Fluoro Surf FG-5083:
 - ➔ The water contact angle is not so high .
But the slip drop angles of oil and water are both small . It is easy to wipe off oily ink.
- **FLUOROSURF is designed to have small slip drop angle of oil .
And it is excel in substantial fingerprint prevention performance.**

Applications

- | |
|--|
| * Prevention of Darkening of PC Key Board |
| * Switch of touch sensor |
| * Property modification of metal surface by surface treatment |
| * Antifouling of jewelry |
| * Water/oil repellent coat for vehicle body |
| * Antifouling coating for vehicle aluminum wheel |
| * Chrome or brass water faucet hardware |
| * Fingerprint prevention on mirror and glass door |
| * Fingerprint prevention and antifouling surface treatment of any other products |

FLUROSURF Coated

No Coating



Anti finger print coating
for touch panel



It makes mirror, marbel , faucet,,,, cleaning easy.



Dust from the brake pad can be easily removed.



Water stain is rejected by the water/oil repellent.

Antifouling Coating Agent

Series Introduction FLUROSURF®

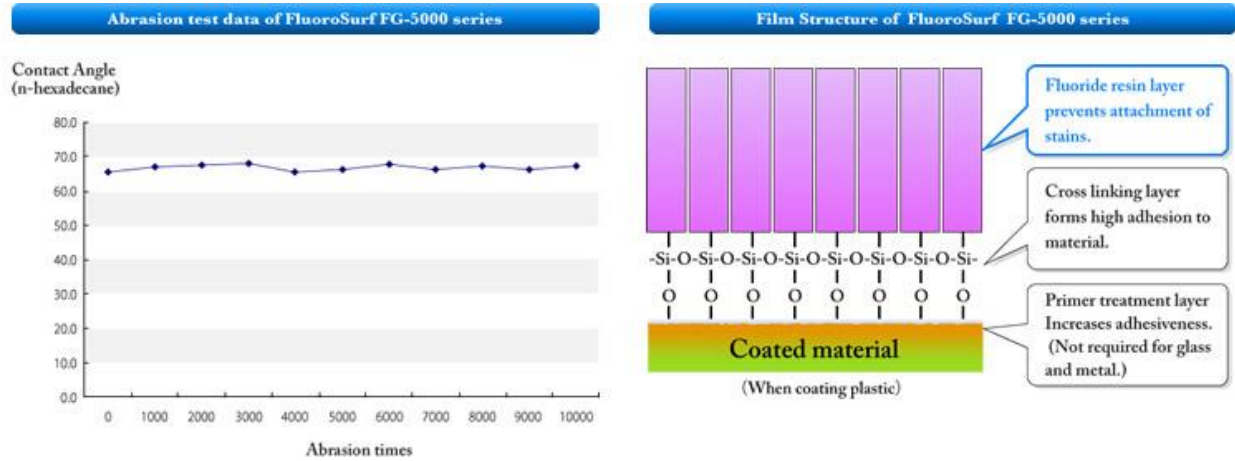
FLUROSURF Coupling type series Line-Up

(type to be combined with material)

Common features: High strength (pencil hardness of 6-9H), and high adhesion, low friction, clear thin film

- The agent is chemically combined with glass, metal and various other materials at ambient temperature and forms clear antifouling film of high adhesion and hardness (pencil hardness of 6 to 9H).

- When coating plastic or materials other than glass and metal, pretreatment of coating the attached special-purpose primer coat helps formation of similar high adhesion and hardness antifouling film.
- Silane coupling type film thickness is as thin as 10 to 30nm and causes no visual disfigurement of materials. Coating film is not peeled and the external view is not



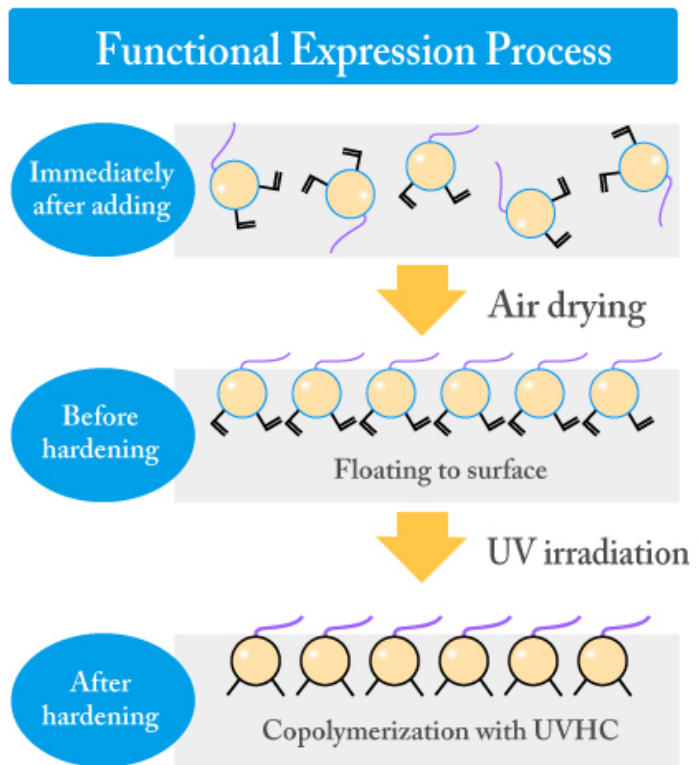
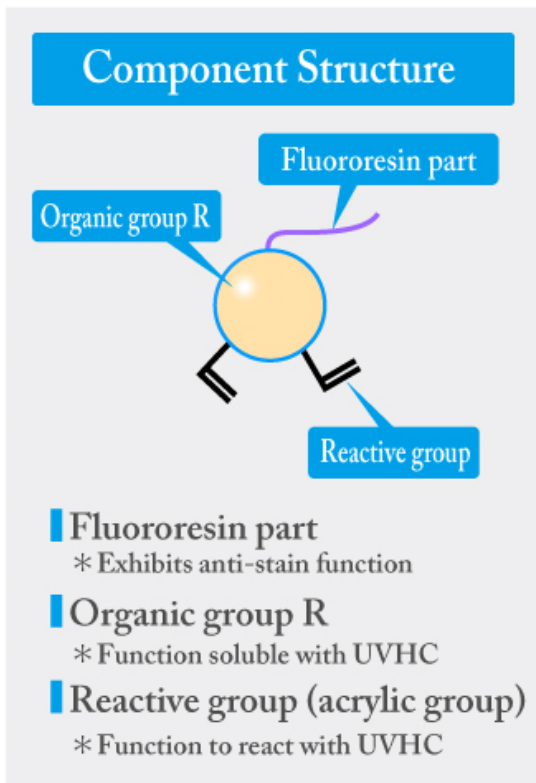
Essential key point to produce the abrasion resistance of FLUOROSURF is the structure of the coating film. As shown in the above diagram, the coating compositions are combined with the material by tight binding reaction and the fluorine film is integrated with the material.

Product Model No.	Solvent	Feature
FG-5080	Non flammable	Anti fouling, Low friction , High Adhesion, High abrasion resistance It's possible to apply by wet coating or vapor deposition
FG-5083	Non flammable	Anti fouling, Low friction , High Adhesion, High abrasion resistance for wet coating
FG-5093	Non flammable	Anti fouling for metal. High repellency Also it works as release agent for mold
FS-2050	I.P.A	Reasonable, PFPE type Replacement from C8 Silane coupling

FLUOROSURF UV additives Line-Up

(For UV Hard Coat)

- Adds anti-stain, low friction and low refractivity properties when used as an additive to UV hard coat agent.
- The oil slip drop angle is low and the product excels in substantial fingerprint adhesion prevention performance.
- When included as an additive, the fluoride component moves to the surface and exhibits its properties.
- Compared to other competitive products, a smaller amount of additive displays its effect and provides superior cost performance.



Model No.	Features
FS-7024	Low Refractive index . Low friction
FS-7025	Low Slip drop angle (oil 7°) Low friction
FS-7026	Low Slip drop angle (oil 7°) Better Solubility Low friction

FLUOROSURF: Polymer type series

(The data comparison of contact angle with antifouling performance.)

- * Drying : Room temperature 1-2 minutes.
- * Selectable film thickness 0.1-10 micron meter.
- * Good for Anti fouling , Acid resistance ,Anti stain, Anti rust,

Product Model No.	Solvent	Feature
FG-5040	Non flammable	Film Hardness = 3H