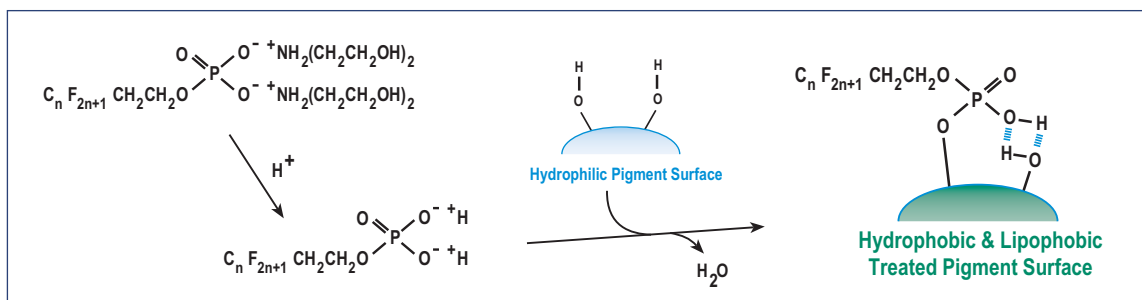


Perfluoroalcohol Phosphate treatment

Perfluoroalcohol Phosphate (PF) treated pigments, patented by Daito Kasei Kogyo (Patents JP5-86984 & JP4-330007), are cosmetic pigments which show both water and oil repellency. Using PF treated pigments, it is possible to achieve long lasting make-up resilient to perspiration and sebum,

promoting a more natural and healthy appearance. During the treatment, the intermediate perfluoroalkyl phosphoric acid bonds to the pigment surface through the formation of metal salts and/or hydrogen bonding depending on the alkalinity of the pigment.



Oil and Water Repellency

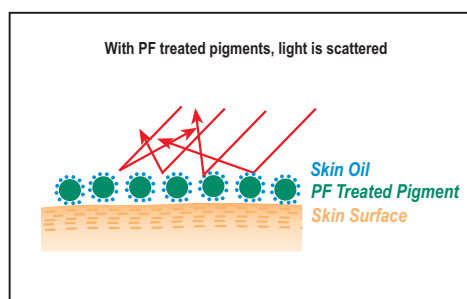
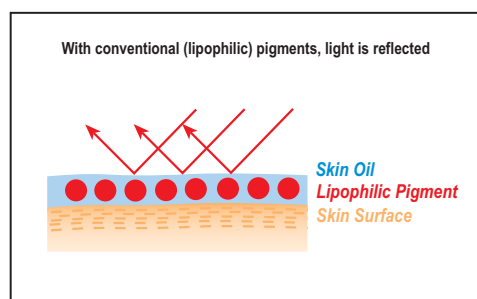
Fluorinated materials generally have extremely low surface tension. As a result, PF treated pigments not only repel water, but also repel oils, which have much lower surface tensions than water. This property is often characterized by the contact angle measurement. As the following table shows, the PF treated pigment has largest contact angle against both water and oil.

Contact Angles of PF Treated TiO₂

	Untreated TiO ₂	Silane treatment	PF treatment
Water	0	127	148
Paraffin Oil	5	13	147

Excessive skin oils may lead to the flotation of pigment particles, collapsing the make-up finish and leading to the breakout of oils on the skin surface. Light will not be uniformly reflected from this surface, and the appearance made is likely to be unnatural and garish.

PF treated pigments do not readily mix with sebum. Light is scattered by pigment particles instead of being reflected by an oil layer. Thus, make-up finished can be maintained for longer periods of time.



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Perfluoroalcohol Phosphate Treatment

Trade Name	INCI Name	Product Type
PF-5 RED R-516L	Iron Oxides (C.I. 77491) (And) C9-15 Fluoroalcohol Phosphate	Red Iron Oxide
PF-5 YELLOW 601	Iron Oxides (C.I. 77492) (And) C9-15 Fluoroalcohol Phosphate	Yellow Iron Oxide
PF-5 YELLOW LLXLO	Iron Oxides (C.I. 77492) (And) C9-15 Fluoroalcohol Phosphate	Yellow Iron Oxide
PF-5 BLACK BL-100	Iron Oxides (C.I. 77499) (And) C9-15 Fluoroalcohol Phosphate	Black Iron Oxide
PF-5 ULTRAMARINE BLUE NO.801	Ultramarines (And) C9-15 Fluoroalcohol Phosphate	Ultramarine Blue
PF-5 TiO2 A-100	Titanium Dioxide (And) C9-15 Fluoroalcohol Phosphate	Pigmentary Titanium Dioxide
PF-5 TiO2 CR-50	Titanium Dioxide (And) C9-15 Fluoroalcohol Phosphate (And) Alumina	Pigmentary Titanium Dioxide
PF-5 LYS-70	Titanium Dioxide (And) Bismuth Oxychloride (And) Iron Oxides (And) C9-15 Fluoroalcohol Phosphate	Photochromic Titanium Dioxide
PF-5 MICA 5500	Mica (And) C9-15 Fluoroalcohol Phosphate	Mica
PF-5 SERICITE FSE	Mica (And) C9-15 Fluoroalcohol Phosphate	Sericite
PF-5 SERICITE SL	Mica (And) C9-15 Fluoroalcohol Phosphate	Sericite
PF-5 SERICITE GMS-4C	Mica (And) C9-15 Fluoroalcohol Phosphate	Sericite
PF-5 TALC JA-46R	Talc (And) C9-15 Fluoroalcohol Phosphate	Talc
PF-5 BPD-500	HDI/Trimethylol Hexyllactone Crosspolymer (And) C9-15 Fluoroalcohol Phosphate (And) Silica	Polyurethane Microsphere
PF-5 MSS-500/3N	Silica (And) C9-15 Fluoroalcohol Phosphate	Silica Microsphere
PF-5 NYLON SP-10	Nylon 12 (And) C9-15 Fluoroalcohol Phosphate	Nylon Microsphere
PF-5 NYLON SP-500	Nylon 12 (And) C9-15 Fluoroalcohol Phosphate	Nylon Microsphere
PF-5 TOSPEARL 145A	Polymethylsilsequioxane (And) C9-15 Fluoroalcohol Phosphate	Silicone Resin Microsphere
PF-10 STT-65C-S	Titanium Dioxide (And) C9-15 Fluoroalcohol Phosphate (And) Triethanolamine	Attenuation Grade Titanium Dioxide
PF-7 TiO2 MT-600B	Titanium Dioxide (And) C9-15 Fluoroalcohol Phosphate	Attenuation Grade Titanium Dioxide
PF-7 ZnO-350	Zinc Oxide (And) C9-15 Fluoroalcohol Phosphate	Attenuation Grade Zinc Oxide

Long Wearing Liquid Foundation

Formula KLF-008B

Part 1

- **PF-5 TiO2 CR-50** - Kobo Products : Titanium Dioxide (And) C9-15 Fluoroalkyl Phosphate (And) Alumina 8.96%
- **PF-5 YELLOW LLXLO** - Kobo Products : Iron Oxides (C.I. 77492) (And) C9-15 Fluoroalkyl Phosphate 1.20%
- **PF-5 RED R-516L** - Kobo Products : Iron Oxides (C.I. 77491) (And) C9-15 Fluoroalkyl Phosphate 0.48%
- **PF-5 BLACK BL-100** - Kobo Products : Iron Oxides(C.I. 77499) (And) C9-15 Fluoroalkyl Phosphate 0.08%
- **PF-5 TALC JA-46R** - Kobo Products : Talc (And) C9-15 Fluoroalkyl Phosphate 5.98%

Part 2

- Dow Corning 345 Fluid - Dow Corning : Cyclomethicone 11.00%
- Dow Corning 3225C - Dow Corning : Cyclomethicone (And) Dimethicone Copolyol 3.00%

Part 3

- Procol LA-7 - Protameen : Laureth 7 0.50%
- Propylparaben 0.20%

Part 4

- Dow Corning 3225C - Dow Corning : Cyclomethicone (And) Dimethicone Copolyol 18.00%
- Dow Corning 200 Fluid, 50cs - Dow Corning : Dimethicone 3.00%

Part 5

- Propylene Glycol 8.00%
- Methylparaben 0.20%
- Sodium Chloride 2.00%
- Germall® 115 - ISP : Imidazolidinyl Urea 0.20%
- Deionized Water 37.20%

Manufacturing Procedure

1. Mix Part 1 and pulverize.
2. Add Part 2 to Part 1 and pulverize.
3. Mix Part 3.
4. Add premixed Part 4 to Part 3.
5. Add Parts 3 and 4 to Parts 1 and 2, and mix until uniform.
6. Heat Part 5 to 50 °C and mix.
7. Add Part 5 to the rest of the formula while homogenizing.
8. Cool with sweeping.

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