Nouryon

Dry-Flo® PC / Dry-Flo® Pure starches

For improved aesthetics

INCI: Aluminum Starch Octenylsuccinate

Dry-Flo PC/Pure starches are unique, hydrophobically modified natural polymers. Supplied as free flowing white powders, Dry-Flo PC/Pure starches display a unique combination of properties that makes them well suited for use in a wide variety of personal care products. Dry-Flo Pure starch is the irradiated version of Dry-Flo PC starch and possess a cleaner microbiological profile. Dry-Flo PC/Pure starches are globally approved and available.

Because of their smooth, velvety feel properties, Dry-Flo PC/Pure starches can be used in various powder applications. The starch-based product can be utilized as a talc replacement in body powders, adsorbing moisture without caking. In anti-perspirants, Dry-Flo PC/Pure starches enhance the visual whiteness of a stick, for example, without contributing to whitening upon application to the skin. In color cosmetics, Dry-Flo PC/Pure starches can be incorporated into liquid or powdered make-up products to improve the aesthetics of the formulation and to adsorb excess oil from skin.

Perhaps the most distinctive property of these remarkable products is their unique ability to mitigate the greasiness produced by occlusive agents used in lotions, creams and ointments. In both aqueous and anhydrous products for skin care, Dry-Flo PC/Pure starches reduce the perceived oiliness of formulations, leaving a soft, dry and matte finish on the skin. Because the starches have a broad incorporation range, the amount of Dry-Flo PC/Pure starches can be adjusted for very specific formulation aesthetics. Sunscreens can also benefit from the addition of Dry-Flo PC/Pure starches to the formula. The starches can improve aesthetics and mitigate greasiness in the formulations without whitening on the skin.

Recommended applications

- Powders
- Color cosmetics
- Lotions
- Ointments
- Creams
- Antiperspirants
- Sunscreens
- Deodorants
- Dry schampoo
- Pomades

Features and benefits

- Soft, velvety feel
- Hydrophobic
- Oil adsorbent
- Natural polymer
- Free flowing/anti-caking
- Fine, uniform particle size
- Easy to use
- Environmentally friendly
- Improves aesthetics and mitigates greasiness of lotions, creams and ointments
- Improves aesthetics and flow properties of powders
- Does not whiten on skin

Suggested use levels, as supplied

Application	% active
Aqueous emulsion systems	1-10
Ointments	up to 30
Dry powder applications	5-50

Formulation guidelines

Dry-Flo PC/Pure starches are commonly used as an aesthetics modifier in aqueous emulsions as well as in anhydrous ointment formulations. The method of incorporation, which is especially important when adding the starch to an aqueous emulsion, is detailed below.

Aqueous emulsions

Dry-Flo PC/Pure starches are hydrophobic and thus not wetted by water alone. The preferred method of incorporation into an emulsion is to wet out the starch in water soluble humectants or in oils. Post add the slurry to the emulsion below 45°C, on cool down. The Dry-Flo PC/Pure starches can be added as a powder directly to the emulsion with proper mixing. Again, care must be taken to incorporate the starch at 45°C or below when used in aqueous systems. If temperatures above 50°C are encountered, the starch granule begins to partially solubilize, reducing its effectiveness as an aesthetics control agent and potentially increasing the formulation viscosity.

Anhydrous ointments

Combine all ingredients, except for Dry-Flo PC/Pure starches and heat to melting. Mix until homogeneous. Slowly sift in the Dry-Flo PC/Pure starches and mix until uniform. Maintain temperature above the melting point of the combined oleaginous materials; the starch will remain in the system as a particulate. Note that the temperature constraint outlined for aqueous emulsions does not apply in anhydrous systems. The Dry-Flo PC/Pure starches will be unaffected up to 80°C in non-aqueous formulations.

Once added to either an aqueous emulsion or an anhydrous product, the Dry-Flo PC/Pure starches can be homogenized or milled without affecting its properties.

Because Dry-Flo PC/Pure starches are organic materials, it is susceptible to bacteriological attack. Suitable preservation is recommended for systems containing the Dry-Flo starches.

Tests and methods

Greasiness mitigation

In a blind panel test involving 20 participants, the anhydrous ointment described below was overwhelmingly selected as being far less greasy than the same formula control without Dry-Flo PC/Pure starches.

Petrolatum	35
Cocoa Butter	5
Dry-Flo PC/Pure	60

Non-whitening

Using the same formula above, panelists found that it produced a clear, translucent coating on the skin. Whitening was not perceived in spite of the relatively high loading of the Dry-Flo PC/Pure starches in the ointment.

In addition, actual reflectance measurements were performed on swatches of natural worsted wool which had been uniformly coated with lotions containing Dry-Flo PC/Pure starches or micronized titanium dioxide. Higher reflectance values relate to greater perceived whiteness on skin. Reflectance was measured directly using a model Micro S-5 Brightmeter manufactured by Technidyne Corp., New Albany, IN.

Formula	% active "pigment"	% reflectance	- vs control
Control (fabric only)	0	45.7	-
Lotion only	0	54.6	+ 8.9
Lotion +Dry-Flo PC/Pure	10	51.7	+ 6.0
Lotion + micronized TiO_2	5	66.5	+ 20.8
Lotion + micronized TiO_2	10	73.2	+ 27.5

Substantially less reflectance was measured with 10% Dry-Flo PC/Pure starches than with formulas tested which contained micronized titanium dioxide.

Storage and handling

Dry-Flo PC/Pure starches are finely divided organic particulates. When handling, avoid generation of dust. Use in well ventilated area. Use of a dust mask is suggested. Exercise good housekeeping practices. Avoid contact of the Dry-Flo PC/Pure starches powders or dust with heat, sparks or open flame.

Health and safety

Health safety data summarizing the results of the testing performed on Dry-Flo PC/Pure starches are available upon request. Information on Dry-Flo PC/Pure starches relating to EU Cosmetic Directive 76/768/EEC is also available upon request.

FDA status

Dry-Flo PC/Pure starches are acceptable for use in food and are covered by regulation 121.1031 for food starch-modified.

Contact us directly for detailed product information and sample request
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Nouryon

Nouryon is a global, specialty chemicals leader. Markets and consumers worldwide rely on our essential solutions to manufacture everyday products, such as personal care, cleaning goods, paints and coatings, agriculture and food, pharmaceuticals, and building products. Furthermore, the dedication of more than 7,900 employees with a shared commitment to our customers, business growth, safety, sustainability and innovation has resulted in a consistently strong financial performance. We operate in over 80 countries around the world with a portfolio of industry-leading brands. Visit our website and follow us @Nouryon and on LinkedIn.

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