

# AC Biopolymer Soy PF



tired of oily skin?  
 take control! sebum control!  
 film former + antioxidant protection  
 perfect for problem skin

## BACKGROUND

Tired of oily skin? The clogged pores, the over-drying, the constant upkeep? The key to a low maintenance cosmetic regimen is eliminating the root of these time consuming problems. There are three common ways products address sebum<sup>1</sup>: 1) Strip the skin with alcohol, resulting in a rebound effect that causes the skin to go into sebum producing overdrive, 2) Powder absorption, resulting in a less oily aesthetic, but clumped make up and clogged pores, yuck! 3) Biochemically blocking the formation of sebum on the skin, leaving the skin dried and unattractive.

Our skin and scalp naturally produce sebum which is known to clog pores and cause build-up on our face and in our hair. Excess oil causes hair to lack luster and skin to appear greasy. Sebum also causes the color of foundation and other make-up to shift over time. The best way to combat these problems is by controlling the production of oil<sup>2</sup>, not by ridding the skin of sebum. Sebum provides the skin with a protective barrier, functioning as a film former to seal in moisture.

## SCIENCE

**AC Biopolymer Soy PF** is a modified protein with a lipid moiety that disrupts the surface tension of sebum on the skin by naturally binding to excess sebum. The product combines the properties of oil absorbency in a water-dispersible polymer helping reduce the appearance of sebum on the skin and simultaneously preventing dry skin. **AC Biopolymer Soy PF** contains a water soluble backbone that acts as a film former which causes the polymer to plate out on the skin. The alkyl sulfonate moieties change the contact angle of the sebum that is present on the skin. This change forces the sebum to exist as distinct droplets instead of as a film. The inclusion of soy provides conditioning and moisture retention benefits to keep the skin from becoming overly dry.

**Code Number:** 21002PF

**INCI Name:** Sodium C8-16 Isoalkylsuccinyl Soy Sulfonate

**INCI Status:** Conforms

**REACH Status:** Complies

**CAS Number:** 68607-88-5 & 61788-47-4

**EINECS Number:** 271-770-5 & 262-978-7

**Origin:** Botanical & Synthetic

**Processing:**

GMO Free

No Ethoxylation

No Irradiation

**Additives:**

Preservatives: None

Antioxidants: None

Other additives: None

**Solvents Used:** Water

**Appearance:** Opaque Liquid

**Soluble/ Miscible:** Water Soluble

**Ecological Information:**

87.70% Biodegradability

**Microbial Count:** <100 opg,  
No Pathogens

**Suggested Use Levels:** 0.5 - 5.0%

**Suggested Applications:**

Sebum Control, Problem Skin,  
Film Former

## Benefits of AC Biopolymer Soy PF:

- Sebum Control
- Antioxidant
- Alternative Approach for Oily Skin
- Ideal for Problem Skin
- Film Former

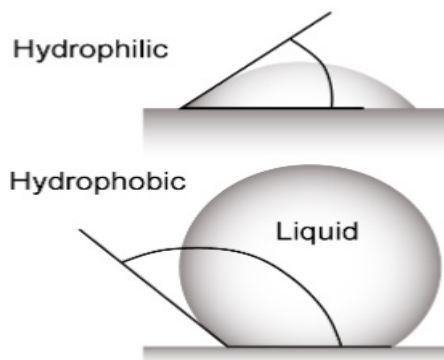
# AC Biopolymer Soy PF

## BENEFITS

**AC Biopolymer Soy PF** is a game changer; this product capitalizes on the health benefits of soy protein while a sebum controlling agent changes the contact angle of the sebum on the skin. **AC Biopolymer Soy PF** is a modified protein with a lipid moiety that disrupts the surface tension of sebum on the skin by naturally binding to excess sebum. **AC Biopolymer Soy PF** can be used as an ingredient in various cosmetic and personal care products for sebum control and enhancing brand differentiation.

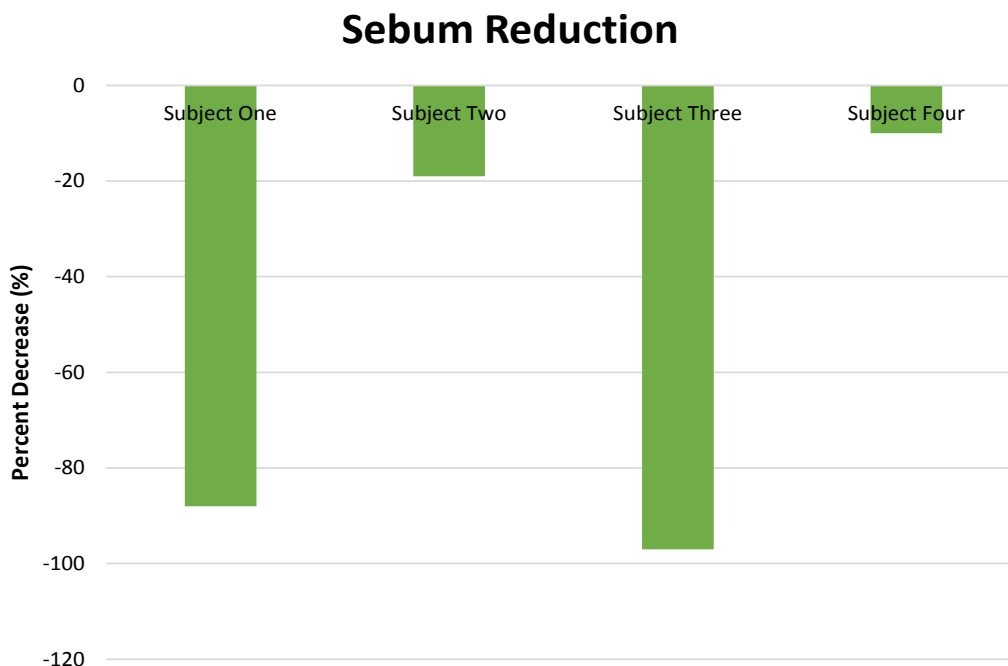
## EFFICACY DATA

This modified protein with a lipid moiety disrupts the surface tension of sebum on the skin by naturally binding to excess sebum. The product combines the properties of oil absorbency in a water-dispersible polymer helping reduce the appearance of sebum on the skin and simultaneously preventing dry skin. Additionally, the product contains a water soluble backbone that acts as a film former which causes the polymer to plate out on the skin. The alkyl sulfonate moieties change the contact angle of the sebum that is present on the skin. This change forces the sebum to exist as distinct droplets instead of as a film. This can be seen in Figure 1.



**Figure 1.** Change in contact angle of the sebum present on the skin.

An *in-vivo* study was conducted to evaluate the ability of **AC Biopolymer Soy PF** to reduce facial sebum when incorporated into a mass market liquid foundation. Results indicate that this material is capable of significantly decreasing sebum, a common problem, over time. As evidenced in the Figure 2 above, **AC Biopolymer Soy PF** was effective at decreasing sebum for all participants. The percent decrease exhibited was relative to both the subject's self-assessment and the base sebum reading. **AC Biopolymer Soy PF** can be used as a means to mattify without dehydrating the skin to offer a smooth, sebum free all day complexion.

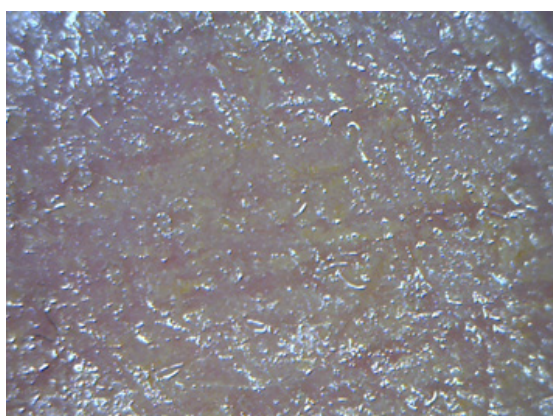


**Figure 2.** Reduction in Sebum over an 8 hour period.

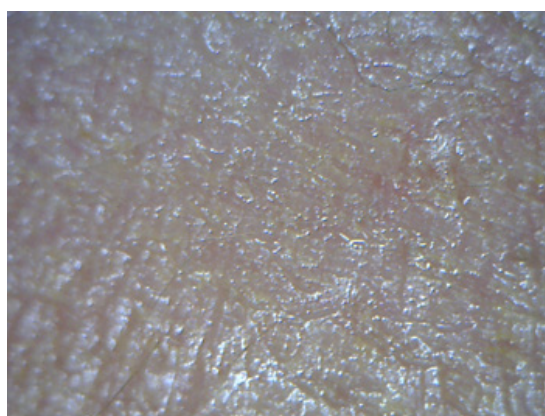
# AC Biopolymer Soy PF

An *in-vivo* study was conducted to evaluate the ability of **AC Biopolymer Soy PF** to reduce color shift in a mass market liquid foundation. Results indicate that this material is capable of significantly decreasing foundation color shift over time. Color shift is a common issue which occurs when foundation oxidizes on the skin and alters the color of the foundation throughout the day. This is caused by the interaction of facial sebum and foundation.

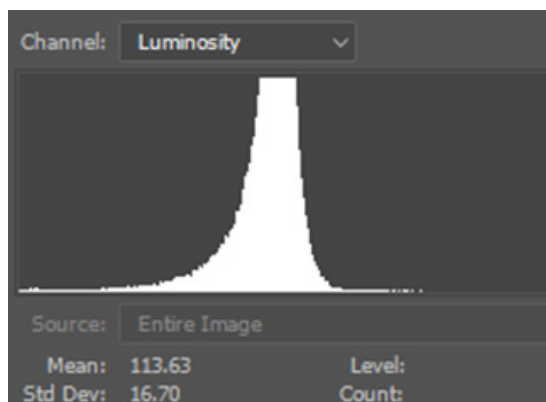
Figures 3 and 4 depict the comparison of the control forehead at eight hour wear time to the experimental forehead at 8 hour wear time. In the control photo, it is clear that the color has settled into fine lines, gathered, and oxidized to a slightly darker shade. The experimental side elicits a non-settled foundation, reduced visible sebum, and even color on the surface. The histograms, in turn, quantify the photos based on color change. Over an eight hour wear period, the color is more evenly distributed and present compared to the control. **AC Biopolymer Soy PF** controls facial sebum, the factor in color shift, ensuring the foundation stays true to color throughout the wear time.



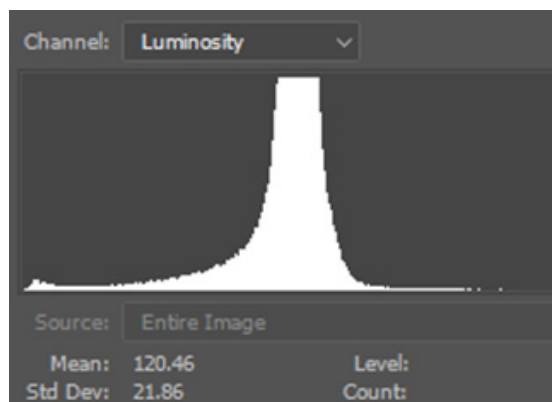
**Figure 3.** Control forehead at 8 hours wear time (Subject 2).



**Figure 4.** Experimental forehead at 8 hours wear time (Subject 2).



**Figure 5.** Histogram Control forehead at 8 hours wear time (Subject 2).



**Figure 6.** Histogram Experimental forehead at 8 hours wear time (Subject 2).

The oxygen radical absorbance capacity (ORAC) assay is a standard method used to assess antioxidant capacity of physiological fluids, foods, beverages, and natural products. The assay quantitatively measures a sample's ability to quench free radicals that have the potential to react with and damage cellular components. As seen in Figure 7, the antioxidant capacity of **AC Biopolymer Soy PF** increased as the concentration increased, as a result we can assure that its ability to minimize oxidative stress is dose dependent.

# AC Biopolymer Soy PF

## ORAC Assay

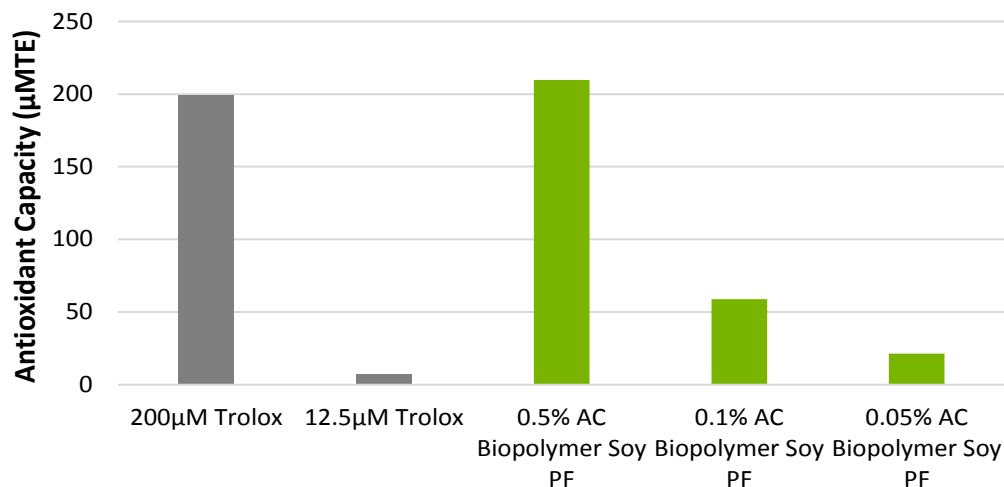


Figure 7. Antioxidant Capabilities.

As shown in Figure 8, **AC Biopolymer Soy PF** did not exhibit significant effects on cellular metabolism. For this reason, we can assume **AC Biopolymer Soy PF** does not have negative effects on cellular metabolism and can safely be used in cosmetic materials.

## Viability Assay

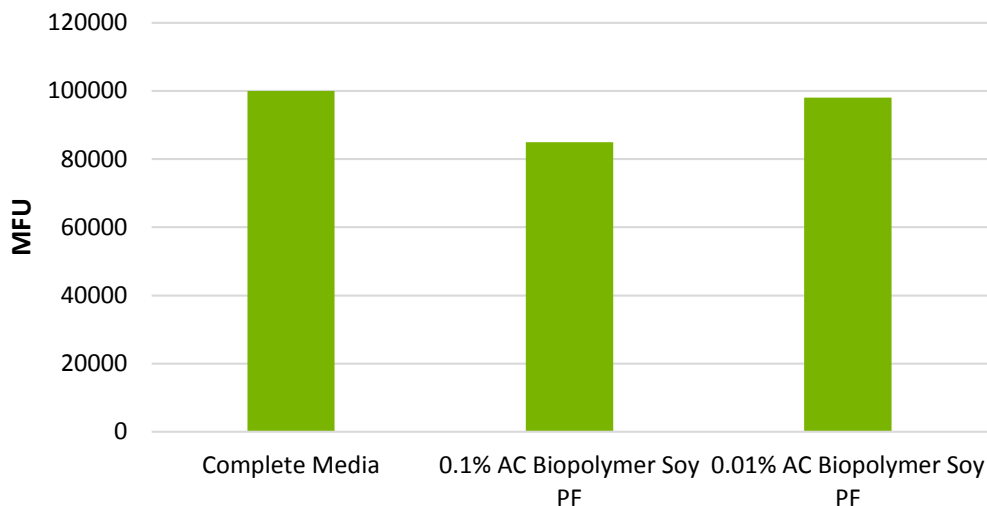


Figure 8. Cellular metabolism.

References:

- 1) Abramovits, W., Gonzalez-Serva, A. 2000. Dermatologic Clinics. *Sebum, Cosmetics, and Skin Care*. 18(4):617-20
- 2) Cheng et al. 2009. Journal of Cosmetic Science. *Moisturizing and anti-sebum secretion effects of cosmetic application on human facial skin*. 60:7-14



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