

TECHNICAL DATA SHEET

Product name: Beta Sitosterol

INCI name: Beta-Sitosterol

CAS: 83-46-5

Chemical classification: Sterol, belongs to the class of lipids and is characterized by the presence of a polycyclic steroid skeleton with one or more hydroxyl groups.

Functional category: Skin care conditioner

Description: Beta-sitosterol is a compound of plant origin (phytosterol). It has a structure similar to cholesterol, with a hydroxyl group (-OH) at position 3 on the A-ring, contributing to its polarity and ability to interact with other molecules. It is stable under normal conditions but sensitive to light and air, which can lead to oxidation over time. Beta-sitosterol is relatively unreactive under normal conditions but can undergo chemical reactions typical of sterols, such as esterification and oxidation. At room temperature, Beta-sitosterol is a white powder. It is practically insoluble in water and slightly soluble in oil. The highest solubility of beta-sitosterol is in ethyl acetate, followed by acetone, ethanol, and n-hexane. The melting point of beta-sitosterol is relatively high, usually around 136-140°C.

Benefits:

- **Moisturizing properties:** The moisturizing effect of beta-sitosterol stems from its ability to act as an emollient. Beta-sitosterol helps preserve the skin's natural moisture by strengthening the skin barrier, preventing excessive water loss through the epidermis. Its emollient properties are particularly beneficial for dry and dehydrated skin.

- **Anti-inflammatory action:** The anti-inflammatory action of beta-sitosterol is based on its ability to reduce the production of pro-inflammatory cytokines in the body, such as interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF- α). This action helps reduce inflammation and redness of the skin, making it effective in treating conditions such as eczema, psoriasis, and acne. Beta-sitosterol can also modulate the immune response. These characteristics make beta-sitosterol a useful ingredient in cosmetics for sensitive and inflamed skin.

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• **Antioxidant activity:** The antioxidant action of beta-sitosterol is based on its ability to neutralize free radicals and protect cells from oxidative stress. Free radicals are unstable molecules that can damage DNA, proteins, and lipids in cells, and antioxidants like beta-sitosterol can prevent or slow down this damage. Through this protective role, beta-sitosterol helps maintain the health and vitality of the skin, reducing visible signs of aging such as fine lines, wrinkles, and loss of firmness. This makes it a valued ingredient in anti-aging cosmetics and skin care products.

• **Wound healing:** Beta-sitosterol promotes wound healing by reducing inflammation at the wound site. It stimulates collagen production by fibroblasts, promotes angiogenesis (formation of new blood vessels) necessary for nourishing regenerating tissue. These effects make beta-sitosterol a useful ingredient in skin care products and tissue regeneration.

• **Reduces inflammatory processes on the scalp:** Beta-sitosterol can effectively reduce inflammatory processes on the scalp by reducing the production of pro-inflammatory cytokines. Beta-sitosterol protects the scalp from external irritants and microorganisms that can exacerbate the inflammatory response. Additionally, its role in maintaining hydration helps prevent dryness and flaking. By using hair care products containing beta-sitosterol, overall scalp condition can be improved. It is believed to contribute to healthier hair by strengthening hair follicles and promoting hair growth, making it a desirable ingredient in hair care formulations.

Safe application: Beta-sitosterol is a safe lipid that does not cause toxic or mutagenic effects. It is a completely safe ingredient that does not pose specific risks to any type of skin.

Usage: In cosmetic formulations, the concentration of beta-sitosterol may vary depending on the type of product and the desired effect. Generally, beta-sitosterol is used in relatively low doses, usually ranging from 0.1% to 1% in finished products. For products intended for intensive skin care, such as serums or treatments for specific skin problems, the concentration may be slightly higher. These doses are sufficient to deliver the therapeutic benefits of beta-sitosterol, such as improving skin hydration, reducing inflammation, and protecting against oxidative stress, without causing irritation or unwanted reactions.

Application: Beta-sitosterol can be used in a wide range of cosmetic products, including: face creams - for hydration, improving skin elasticity, and reducing inflammation,

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serums - concentrated treatments for specific skin problems such as wrinkles or hyperpigmentation, body lotions - for moisturizing and soothing dry and irritated skin, lip balms - to provide hydration and protection from external factors, shampoos and conditioners - to improve scalp health and hair shine, aftershave products - to soothe and hydrate the skin and reduce irritation, sunscreens - as an additive to improve skin protection from UV radiation and oxidative stress, acne treatments - to soothe the skin and reduce inflammation without drying it out, hand care products - for the care of dry and cracked skin on the hands, face masks - for deep hydration and anti-aging treatments.

Animal testing: Substance has not been tested on animals

GMO: Not GMO

Vegan: Does not contain components of animal origin

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