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TECHNICAL DATA SHEET

Product name: Beta-Carotene Oil Suspension 30%

INCI Name:
Beta-Carotene (and) Helianthus Annuus (Sunflower) Seed Oil (and) Tocopherol

CAS:
7235-40-7, 8001-21-6, 10191-41-0

Synonyms:
Betacarotene, beta carotenum, E 160a, Food Orange 5, Gelbfarbstoff, Natural Brown 5, Natural Yellow 26, L-Orange 3, ß-ß-Carotene, Provitamin A, Carotene

IUPAC Name:
1,1'-(3,7,12,16-Tetramethyl-1,3,5,7,9,11,13,15,17-octadecaheptaen-1,18-diyl)bis[2,6,6-trimethylcyclohexene]

Description:
The 30% beta-carotene oil suspension is a micronized beta-carotene uniformly dispersed in sunflower oil with the addition of dl-alpha-tocopherol as an antioxidant. It is a stable dispersion of beta-carotene in a vegetable oil matrix, enabling easy incorporation into both oil-based and emulsion systems. This processing form provides improved stability compared to pure beta-carotene powder, which is sensitive to light, oxygen, and elevated temperatures.

Beta-carotene is known for its ability to neutralize free radicals, thereby helping protect the skin from oxidative stress induced by UV radiation and environmental pollution. In cosmetic applications, it contributes to an improved visual skin tone, creating a subtle golden-orange glow, particularly in formulations intended for dry and devitalized skin. Its presence in formulations may support the preservation of lipids in the skin barrier, helping maintain the integrity of the hydrolipidic film.

The beta-carotene oil suspension is suitable for use in various cosmetic products, including creams, serums, body care oils, lip balms, and sun care formulations. The raw material has a characteristic intense orange color, which may influence the final product shade and should be considered during formulation development. Thanks to its specific stabilization process, the suspension maintains color stability and

antioxidant efficacy throughout its shelf life when properly stored away from heat and light sources.

Beta-carotene in this form shows good compatibility with vegetable oils, emollients, and most standard ingredients used in natural and conventional cosmetic formulations.

Mechanism of Action:
The mechanism of action of beta-carotene in cosmetics is primarily based on its antioxidant properties and its ability to protect cellular structures from damage caused by free radicals. As a provitamin A, beta-carotene can be metabolically converted in the skin into retinoids, which participate in the regulation of keratinocyte differentiation and maintenance of the epidermal barrier; however, this conversion is slow and limited in topical cosmetic use.

Beta-carotene acts by scavenging reactive oxygen species generated by UV radiation and other external factors, thereby preventing lipid oxidation in the outer skin layers. In this way, it protects phospholipids of cell membranes and lipids of the hydrolipid film, contributing to the maintenance of skin elasticity, softness, and smoothness. Due to its pronounced lipophilicity, beta-carotene integrates easily into the lipid regions of the skin, where it provides localized antioxidant protection.

At the same time, its ability to absorb visible light, particularly in the blue-green spectrum, helps neutralize light energy that can trigger photoxidative reactions. In formulations intended for dry, tired, and damaged skin, beta-carotene contributes to restoring skin radiance, providing a subtle natural tint thanks to its intense color, without causing unwanted staining when properly dosed.

In summary, the mechanism of action of beta-carotene in cosmetics includes antioxidant protection, stabilization of skin lipid structures, support of the epidermal barrier, and visual improvement of skin tone, making it a valued ingredient in skin protection, care, and regeneration products.

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Benefits:

- Protects the skin from oxidative stress by neutralizing free radicals
- Helps preserve skin lipids and strengthen the barrier function
- Reduces visible signs of fatigue and improves skin radiance
- Supports protection against UV-induced skin damage
- Promotes skin regeneration and reduces the negative effects of external stressors
- Provides antioxidant activity that helps slow premature skin aging
- Softens the skin and improves elasticity
- Contributes to a more even skin tone and reduces dull, grayish appearance
- Stable in oil phase and compatible with vegetable oils and emollients

Usage Instructions:
The 30% beta-carotene oil suspension is used in cosmetic formulations at low concentrations due to its strong color intensity and potent antioxidant properties. In emulsion systems such as creams and lotions, it is typically added during the cooling phase at temperatures below 40°C to preserve the stability of active components.

Typical usage levels in moisturizing creams and serums range from 0.05% to 0.2%, allowing a visible but natural skin glow without discoloration. In botanical oils, skincare serums, and lip balms, it may be used at higher concentrations up to 0.5%, depending on the desired shade and antioxidant effect.

In sun care formulations, it is often combined with other lipid-soluble antioxidants such as tocopherol and coenzyme Q10, with recommended dosages up to 0.3% to enhance protection against UV-induced oxidative stress. Due to its lipophilic nature, it is easily incorporated into anhydrous products such as facial oils and body butters, where careful dispersion is required to prevent pigment settling.

In decorative cosmetics such as tinted creams and lip balms, it can be used up to 1%, but requires careful blending with other colorants to achieve the desired shade.

Safety of Use:
Beta-carotene is a natural pigment found in fruits and vegetables and is known for its antioxidant properties and provitamin A activity. The Cosmetic Ingredient Review (CIR)

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Expert Panel published a safety assessment of beta-carotene in 1980, concluding that it is safe for use in cosmetic products. However, the report did not specify recommended usage concentrations.

In practice, beta-carotene concentrations in cosmetic products typically range from 0.01% to 0.1%. Manufacturers are advised to conduct appropriate testing to ensure the safety and efficacy of finished formulations containing beta-carotene.

Animal Testing:
The substance has not been tested on animals.

GMO Status:
Non-GMO.

Vegan Status:
Does not contain animal-derived components.

Storage and Shelf Life:
The extract is stable when stored in a dry, cool place protected from light. Shelf life: 2 years.

Origin of raw material:
China