Import and distribution for Serbia: Farmadria DOO
info@avenalab.com
+381 (0) 69 / 55 65 029
www.avenalab.com

TECHNICAL DATA SHEET

Product Name: Vitamin C (Ascorbyl Tetraisopalmitate)

INCI Name: Ascorbyl Tetraisopalmitate

CAS: 183476-82-6

Synonyms: Tetrahexyldecyl Ascorbate, Ascorbyl Tetra-2-hexyldecanoate

Chemical Classification: Ester

Functional Category: Antioxidant, Skin Conditioning Agent

Description: Ascorbyl Tetraisopalmitate is obtained through the esterification process of ascorbic acid with isopalmitic acid. During this process, the hydroxyl group (-OH) of ascorbic acid reacts with the carboxyl group (-COOH) of isopalmitic acid, forming an ester bond (-COO-). This reaction typically involves the removal of water molecules (H_2O), resulting in a more stable, lipophilic derivative of vitamin C. The formation of the ester bond alters the basic physicochemical characteristics of ascorbic acid. While pure vitamin C is quite unstable and water-soluble, Ascorbyl Tetraisopalmitate is much more stable in formulations containing oils and fats due to its lipophilic (fat-soluble) nature. This modification allows Ascorbyl Tetraisopalmitate to penetrate deeper into the lipid layers of the skin, providing the antioxidant benefits of vitamin C in a much more stable and effective form. Ascorbyl Tetraisopalmitate has a low melting point, which contributes to its ease of use in various cosmetic formulations. As a derivative that is more soluble in fats, its formulation does not depend heavily on pH adjustment, unlike water-soluble forms of vitamin C that require a low pH to remain effective. It is more stable than pure ascorbic acid, which is susceptible to degradation in the presence of light, air, and water. This stability makes it a preferred form of vitamin C in cosmetic formulations requiring a longer shelf life. It appears as a clear, yellowish liquid with no odor.

Benefits:

• ***Antioxidant Activity:*** Ascorbyl Tetraisopalmitate is a powerful antioxidant. It neutralizes free radicals that arise from UV exposure, pollution, and other environmental stressors. As an antioxidant, it helps protect skin cell structures such as DNA, pro-

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teins, and lipids.

• ***Stimulation of Collagen Production:*** Vitamin C is essential in the synthesis of collagen, the main structural protein in the skin. By boosting collagen synthesis, Ascorbyl Tetraisopalmitate aids in improving skin elasticity and firmness, thereby reducing the visibility of fine lines and wrinkles. Enhanced collagen synthesis also helps maintain the integrity of the dermal matrix, which is crucial for a healthy skin appearance.

• ***Skin Brightening and Reduction of Hyperpigmentation:*** Ascorbyl Tetraisopalmitate inhibits the activity of tyrosinase, an enzyme responsible for melanin synthesis. Reducing tyrosinase activity and melanin production leads to gradual brightening of pigmentation spots and a more even skin tone.

• ***Improvement of Skin Barrier Function:*** Ascorbyl Tetraisopalmitate can help maintain and strengthen the skin barrier. It reduces transepidermal water loss and maintains skin hydration, which is key for healthy, elastic, and smooth skin.

• ***Increased Penetration into Deeper Skin Layers:*** The skin consists of multiple layers, with the outer layer (epidermis) acting as a barrier. The epidermis contains the stratum corneum, which is the top layer of dead skin cells and lipids that prevent the passage of water and harmful substances. Thanks to its lipophilicity, Ascorbyl Tetraisopalmitate can more effectively integrate into this lipid layer, allowing better penetration into deeper skin layers.

• ***Compatibility with Other Antioxidants:*** The antioxidant effect can be enhanced by combining with L-ascorbyl palmitate and/or vitamin E. Encapsulation in various carriers allows better stability of this vitamin and controlled delivery to skin cells. Added as an active ingredient, it does not color the final product yellow, unlike L-ascorbic acid.

Use in Cosmetic Products: Considered a highly safe cosmetic active ingredient (KAS). Can be used daily, over an extended period of time. Rarely, application may cause tingling, erythema, and skin dryness. Such changes quickly subside after using moisturizing products. Not recommended for use on the skin around the eyes. Added to the oil phase of solutions. Typical concentrations range between 0.1-3%. For external use only. Not to be applied directly to the skin.

Source Raw Material: L-ascorbic acid, trihexyl hexadecane

Method of Production: Tetrahexyldecyl Ascorbate is obtained by adding hydrocarbon

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chains, such as trihexyl-hexadecane, to ascorbic acid, whereby ascorbic acid becomes stabilized and soluble in oil.

Animal Testing: The substance has not been tested on animals

GMO: Non-GMO

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