Import and distribution for Serbia: Farmadria DOO
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TECHNICAL DATA SHEET

Product Name: Arginine

INCI Name: Arginine

CAS: 74-79-3

Chemical Classification: Amino acid (basic, polar)

Functional Category: pH adjuster; Skin conditioning agent; Humectant; Raw material for highlighting (accent) (buffering agent)

IUPAC Name: (S)-2-amino-5-guanidinopentanoic acid

Description: Arginine is a natural, basic amino acid used in cosmetic formulations primarily for its ability to stabilize system pH while also improving product hydration and tolerability. As a polar molecule with a pronounced alkaline character, it effectively neutralizes excess acidity in formulations containing organic acids or acids derived from fermented and botanical raw materials, enabling precise pH adjustment without compromising product stability. Upon skin contact, arginine demonstrates good biocompatibility because it is physiologically present in the human body and participates in natural metabolic processes. In cosmetics, it helps maintain optimal skin moisture by supporting water binding in the superficial layers of the epidermis and reinforcing barrier function. For this reason, it is commonly used in hydrating serums, creams, and gels, especially in formulations intended for dry, dehydrated, or sensitive skin. Arginine also plays an important role in improving the sensory profile of products. Its presence can reduce the potential irritancy of acidic actives such as AHA, BHA, or PHA acids, making formulations more balanced and more comfortable for daily use. This is why it is often included in chemical peel products, toners, and exfoliants, where it supports better tolerability without reducing the efficacy of active components. Due to its water solubility, arginine is easily incorporated into aqueous and hydrogel systems without the need for heating or complex processing. It is stable across a broad pH range typical of cosmetic products and does not react adversely with commonly used emulsifiers, thickeners, and active ingredients. These properties make arginine a reliable, multifunctional raw material suitable for both classic skincare formulations and modern gentle formulations intended for sensitive regions, such as the area around the eyes.

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Physicochemical Properties: Arginine is a white to slightly off-white crystalline substance or fine powder with no pronounced odor and a characteristic slightly bitter taste typical of basic amino acids. It is very soluble in water and practically insoluble in oils and organic solvents, which is why it is used exclusively in aqueous and hydrophilic cosmetic systems. In aqueous solution, it exhibits an alkaline reaction with naturally high pH values, making it suitable for precise pH adjustment of formulations containing acidic components. It is chemically stable across the broad pH range typical for cosmetic products and does not undergo hydrolysis or oxidation under standard storage conditions. At elevated temperatures, it does not melt in the classic sense but decomposes at temperatures above approximately 220 °C, which is not relevant for cosmetic use since it is incorporated at room temperature or with mild warming. Due to its polarity and strong affinity for water, arginine can be mildly hygroscopic; therefore, storage in well-sealed packaging protected from moisture is recommended. In formulations, it remains chemically compatible with most emulsifiers, thickeners, preservatives, and actives, without affecting the color, odor, or texture of the finished product. It does not recrystallize from stable aqueous systems and does not cause solution cloudiness when properly dosed.

Benefits:

- Helps achieve precise pH adjustment without compromising formulation stability.
- Improves skin hydration by binding water in the superficial layers of the epidermis.
- Supports skin barrier strengthening and reduces the sensation of tightness.
- Helps reduce potential irritation from acidic actives in the formulation.
- Increases tolerability of products intended for sensitive regions, such as the area around the eyes.
- Does not clog pores and is suitable for different skin types.
- Easily incorporates into aqueous and gel formulations without the need for heating.
- Does not negatively affect the fragrance, color, or texture of the finished product.

Directions for Use: Arginine is used in cosmetic formulations exclusively in the water phase, where it dissolves quickly with gentle mixing and without the need for heating. It

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is most often added in the final stage of formulation, after incorporating active ingredients, to precisely adjust the system pH. It can be used alone or in combination with acids, enabling stable and controlled neutralization without sudden pH fluctuations. In moisturizing creams, lotions, and skincare gels, arginine is commonly used at 0.1–0.5%, where it supports formulation stability and improves hydration. In serums and light emulsions, the concentration is most often 0.05–0.3%, especially when the goal is mild pH adjustment with good tolerability. In products containing AHA, BHA, or PHA acids, arginine is used in the amount needed to reach the desired pH, most commonly within 0.2–1%, depending on overall formulation acidity. In products intended for sensitive regions, such as the area around the eyes, lower concentrations are used typically 0.05–0.2% to ensure maximum tolerance. In cleansers, toners, and facial cleansing gels, arginine is used in similar ranges, helping balance the formulation without affecting foaming or texture. In all cases, gradual addition with continuous pH monitoring is recommended to avoid over-alkalizing the product.

Natural or Synthetic Ingredient: Arginine is a natural ingredient because it is a physiological amino acid naturally present in the human body and in plant and animal proteins. In the cosmetic industry, however, arginine is typically produced industrially most often via fermentation of plant-derived substrates or by controlled chemical synthesis to ensure high purity, stable quality, and consistent composition.

Animal Testing: In accordance with current European regulation (Regulation (EC) No. 1223/2009 on cosmetic products), the substance has not been tested on animals. The safety assessment is based on available toxicological data, scientific literature, and validated alternative methods (in vitro and in silico). The term in silico refers to testing and assessment methods performed using computer models and simulations rather than laboratory testing on living organisms (in vivo) or on cell cultures (in vitro). This statement confirms compliance with the animal testing ban and is provided solely for informational purposes regarding further use of the raw material in cosmetic formulations.

GMO: Non-GMO

Vegan: Does not contain components of animal origin