Import and distribution for Serbia: Farmadria DOO
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TECHNICAL DATA SHEET

Product Name: Dimethicone 500

INCI: Dimethicone 500

CAS: 63148-62-9

Chemical classification: Siloxane

Functional category: Emollient, Skin conditioning agent ~ Occlusive, Solvent

IUPAC name: Polydimethylsiloxane (PDMS)

Description: Dimethicone 500 is a synthetic silicone from the polydimethylsiloxane group, widely used in cosmetic products due to its distinctive physico-chemical properties. With a viscosity of 500 cSt (centistokes), it is denser than Dimethicone 350, forming a durable protective layer that retains moisture and provides a silky feel upon application. Its breathable barrier does not interfere with natural skin processes, making it suitable for daily use. It reduces the greasiness of formulations, is chemically inert, non-irritating, and ideal for sensitive skin. It exhibits stability across varying temperatures and pH levels, and resistance to oxidation. Commonly found in moisturizers, serums, makeup primers, and hair care products, it facilitates easier combing and adds shine. It can boost SPF (Sun Protection Factor) in sunscreen formulations and improves wet and dry combability, providing softness and shine to hair. Acting as a solvent, it disperses pigments efficiently. It is water-insoluble and thus used with emulsifiers in formulations containing aqueous phases. Compatible with oils and lipid phases, Dimethicone 500 is highly versatile.

Differences between Dimethicone 350 and 500: Dimethicone 350 is lighter and has lower viscosity (350 cSt), providing a smooth, silky feel suitable for formulations requiring lightweight texture, rapid absorption, and non-greasy finish. It is commonly used in skincare, haircare, and makeup products like foundations, primers, and serums. Due to its fluidity, it enhances product spreadability and lubrication. In contrast, Dimethicone 500, with higher viscosity (500 cSt), is richer and denser, offering intense protection ideal for formulations aimed at dry and damaged skin, and hair conditioners requiring long-lasting protective effects. Due to its density, Dimethicone 500 is preferable when additional emollient benefits are desired.

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Physico-chemical properties: Dimethicone 500 is a polydimethylsiloxane, a synthetic polymer composed of repeating dimethylsiloxane units. Its structure includes silicon (Si) bonded to oxygen (O) and methyl groups (CH_3). Its chemical stability relies on strong Si-O bonds, providing resistance to oxidation and degradation. It has high molecular weight and viscosity similar to vegetable oils (500 cps, mPa.s). Dimethicone 500 maintains thermal stability across a broad temperature range, is chemically inert, and oxidation-resistant, thus stable in various formulations. Its boiling point exceeds 200°C, and flash point is around 310°C, indicating low flammability. The refractive index is 1.402 at 25°C. Dimethicone 500 is a clear, viscous, odorless liquid, insoluble in water, soluble in alcohol, and dispersible in oils and fats.

Benefits:

- Forms a protective barrier on the skin surface, retaining moisture and preventing dehydration while protecting from external irritants.
- Improves texture and application ease in cosmetics, offering a silky skin feel.
- Reduces stickiness sensation.
- Known for its soothing properties, often included in skincare to alleviate irritation and redness.
- Enhances makeup longevity.
- Non-comedogenic, suitable for all skin types, including acne-prone skin.
- Reduces static electricity in hair products, smoothens hair, increases shine, eases combing, and reduces split ends.
- Chemical inertness stabilizes cosmetic formulations, increasing their resistance to degradation.

Usage instructions: Dimethicone 500 is used in haircare products such as shampoos and conditioners, skincare products, sunscreens, and makeup. It is employed to dissolve and suspend UV filters and pigments. Recommended concentrations in moisturizing creams and lotions range from 1% to 5%, depending on desired effects and formula specifics. In shampoos and conditioners, suggested concentrations typically range between 0.5% and 2%. "Leave-in" conditioners may contain slightly higher levels, from 1% to 4%. Body oils and balms usually include Dimethicone 500 in concentrations between 1% and 10%, according to the formula and skin-feel objectives. It can be incorporated into the oil phase or added at the end of the production process. Intended exclusively for external use.

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Raw material origin: Dimethyldichlorosilane and water

Manufacturing method: Dimethicone is synthesized from dimethyldichlorosilane, produced by reacting powdered silicon (silicon dioxide) with methyl chloride. The resulting dimethyldichlorosilane undergoes hydrolysis to yield a polysiloxane hydrolysate mixture. Further polymerization with water results in linear silicone polymer (dimethicone).

Animal testing: Not tested on animals

GMO status: Non-GMO

Vegan: Contains no animal-derived components