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TECHNICAL DATA SHEET

Product Name: Lecithin powder

INCI name: Lecithin

CAS: 8002-43-5

Chemical class: Mixture of phospholipids (predominantly phosphatidylcholine), glycolipids, and triglycerides; natural amphiphilic lipids

Functional category: Emulsifier; Co-emulsifier; Dispersing agent; Solubilizer; Conditioning component; Ingredient for enhancement (texture and system stability)

IUPAC name: Lecithin is not a single chemical compound but a complex mixture of phospholipids; the dominant component, phosphatidylcholine, has the IUPAC name: 1,2-diacyl-sn-glycero-3-phosphocholine.

Description: Lecithin powder is a natural mixture of phospholipids, predominantly phosphatidylcholine, most commonly obtained from soybeans or sunflower seeds. Through the removal of the oil fraction, the phospholipid content becomes concentrated and converted into a stable dry form. As an amphiphilic substance, it contains both hydrophilic and lipophilic portions within its molecular structure, enabling it to position itself at the interface between the aqueous and oil phases and thereby stabilize emulsion systems. This property makes lecithin particularly valuable in formulations where fine dispersion and long-term stability must be achieved without compromising the sensory profile of the product. In cosmetic formulations, lecithin powder functions as a mild natural emulsifier and co-emulsifier, but also as a structural component that improves texture, spreadability, and skin feel. Due to its structural similarity to phospholipids naturally present in cell membranes, it exhibits a high degree of biocompatibility and contributes to strengthening the skin barrier. On the surface of the skin it forms a light protective film that reduces transepidermal water loss, contributing to improved hydration and elasticity without leaving a heavy or greasy residue. Its mechanism of action is based on the ability to organize lipid structures into lamellar layers, thereby mimicking the natural architecture of intercellular lipids in the stratum corneum of the epidermis. Such organization helps stabilize active substances, improves their dispersion, and may contribute to more uniform release within the formulation. At the same time, lecithin can act as a carrier for lipophilic active ingredients, improving their

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compatibility with the aqueous phase of the system. In powder form it allows easier dosing, offers better microbiological stability compared with the liquid form, and provides greater flexibility in formulations without heating, provided that it is properly hydrated or dispersed in the appropriate phase beforehand. In emulsions it contributes to a richer and creamier sensory impression, while in serums and lighter systems it can improve skin tolerance, particularly for dry and sensitive skin. Due to its natural origin and high skin compatibility, lecithin powder is used in a wide range of products from moisturizing creams and balms to masks, regenerative treatments, and formulations intended for sensitive areas, such as the areas around the eyes. Its role is not purely technological but also functional, as it directly contributes to improving the quality of the lipid barrier and the overall comfort of the skin.

Physicochemical properties: Lecithin powder is a powdered substance of light yellow to yellow-brown color with a characteristic mild odor. The odor is not sharp or irritating but is recognizable and typical of phospholipid mixtures. The texture may vary from fine powder to slightly agglomerated particles due to natural hygroscopicity, which is why storage in tightly closed packaging protected from moisture and direct light is recommended. From a physicochemical perspective, lecithin powder represents a complex mixture of phospholipids, predominantly phosphatidylcholine, together with other phosphatidic compounds, glycolipids, and small amounts of triglycerides. It is not a single chemical compound but a natural lipid complex with pronounced amphiphilic properties. Density and melting point are not defined as for pure substances because they depend on composition and degree of purification. Softening and melting of the lipid fraction usually occur within a temperature range of approximately 50–70 °C. Lecithin powder is not soluble in water but swells upon contact with water and forms colloidal dispersions or lamellar structures. In oils and other lipid media it shows good dispersibility, while in polar organic solvents such as ethanol it is partially soluble depending on the concentration and composition of the phospholipid fraction. The pH value is not directly determined because lecithin is a lipid substance; however, in aqueous dispersions it may contribute to a slightly neutral to slightly acidic system reaction depending on composition. Due to its hygroscopic nature it may absorb moisture from the air, which can lead to clumping without affecting the functional properties of the raw material. From a stability standpoint, lecithin is sensitive to oxidation, especially at elevated temperatures and in the presence of light and air. Storage in cool and dry conditions is therefore recommended. When stored in properly sealed packaging, lecithin remains stable throughout the usual shelf life, and minor color changes do not

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necessarily indicate degradation of functional characteristics.

Benefits:

- Improves emulsion stability by linking the aqueous and oil phases into a homogeneous system.
- Contributes to better skin hydration by reducing transepidermal water loss.
- Strengthens the skin's lipid barrier due to its structural similarity to natural phospholipids.
- Improves product texture and provides a creamier, more pleasant skin feel.
- Enhances compatibility of lipophilic active ingredients with the aqueous phase of the formulation.
- Contributes to more uniform distribution of active components within the system.
- Improves product tolerance for dry and sensitive skin.
- Facilitates dispersion of pigments and solid particles in formulations.

Method of use: Lecithin powder is used in formulations as an emulsifier, co-emulsifier, or functional lipid component. The method of application depends on the type of system and the desired effect. It is most commonly pre-dispersed in the oil phase with mild heating in order to achieve uniform distribution and complete hydration of the phospholipid fraction, after which it is combined with the aqueous phase under homogenization. In formulations without heating, it can be pre-wetted with a small amount of glycerin or oil and then gradually incorporated into the system with intensive mixing. In classical O/W emulsions it is used at concentrations of approximately 0.5–3%, most often as a co-emulsifier in combination with a primary emulsifier, where it contributes to stability and improves the sensory characteristics of the product. In W/O systems it is usually applied in the range of 1–5%, depending on the total lipid composition and the desired structure of the emulsion. In lipid serums, balms, and anhydrous formulations, concentrations typically range from 0.5–2%, where lecithin acts as a structural and conditioning component. For liposomal or phospholipid dispersions, the concentration may be higher, typically in the range of 2–10%, depending on the technological objective and the ratio to the active substance. In products intended for dry and sensitive skin, including sensitive areas such as the areas around the eyes, it is most often used at concentrations up to 2% to provide gentle system stabilization and support of the lipid barrier without overloading the formulation.

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The optimal concentration depends on the overall composition, the type of emulsion system, the oil phase content, and the desired sensory effect, therefore laboratory stability testing is recommended in order to determine the final dosage precisely.

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

GMO: Non-GMO

Vegan: Does not contain components of animal origin.