

TECHNICAL DATA SHEET

Product Name: Sizofiran

INCI name: Water, Schizophyllan, Hydroxyacetophenone, 1,2-Hexanediol

CAS: 7732-18-5, 9050-67-3, 6920-22-5, 99-93-4

Chemical classification: Carbohydrates (polysaccharides)

Functional category: Skin conditioning agent, humectant

IUPAC name: β -(1-3,1-6)-glucan

Product description: Sizofiran (Schizophyllan) is a naturally derived polysaccharide obtained from the mycelium of the fungus Schizophyllum commune, cultivated under controlled conditions in liquid culture to ensure purity and compositional uniformity. Its distinctive molecular architecture, characterized by a high degree of branching, provides exceptional biological activity and stability in aqueous systems. In cosmetics, it is valued for its moisturizing, protective, and soothing properties. Sizofiran forms a thin, transparent film on the skin surface that retains moisture and strengthens the skin barrier while helping reduce dryness and irritation. Furthermore, it exhibits immunomodulatory effects on skin cells, stimulating natural defense mechanisms and enhancing the skin's resilience against external stressors and aging processes. Its ability to stabilize formulations and increase viscosity without compromising sensory comfort makes it suitable for serums, creams, and products intended for sensitive regions such as the area around the eyes. Sizofiran appears as a colorless to pale-yellow liquid with a mild, characteristic odor. It remains stable over a broad pH range (6.0–8.0) and exhibits viscosity between 340 and 410 cps, placing it among easily processable biopolymers. It shows excellent stability under elevated temperatures and varying pH conditions, making it suitable for a wide range of formulations. Fully water-soluble, it can be easily incorporated into aqueous or emulsion systems without special dissolution procedures. The recommended usage level ranges from 1% to 30%, depending on the product type and desired effect, offering formulators broad flexibility in creams, serums, emulgels, lotions, and specialized skincare preparations.

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Mechanism of action: Sizofiran (Schizophyllan) belongs to the class of bioactive polysaccharides known as β -glucans. Its primary structure is a β -1,3-glucan backbone with β -1,6 side branches, giving it a unique molecular configuration. This structure allows Sizofiran to bind to immune cell receptors such as Dectin-1 and TLRs, activating immunomodulatory pathways and enhancing macrophage, NK cell, and T-lymphocyte activity. Its main polysaccharide chain, along with minor oligosaccharide fractions and protein residues, contributes to membrane interaction and stability. The bioactivity of Schizophyllan stems from its ability to form stable triple-helix structures in aqueous solutions, enhancing bioavailability and resistance to degradation. Unlike plant extracts containing low-molecular-weight phytochemicals, its efficacy arises from macromolecular structure and β -glucan unit arrangement. On the skin, Schizophyllan acts multi-dimensionally: as a humectant, it binds and retains water in the epidermis, ensuring long-lasting hydration and reducing transepidermal water loss. Its helix-forming capacity creates a thin, elastic, breathable film that reinforces the barrier function and protects against environmental aggressors such as pollution and climate stressors. Due to its immunomodulatory action, it interacts with keratinocytes and immune cells, enhancing natural defense mechanisms and reducing skin sensitivity. It is particularly beneficial for sensitive and reactive skin, as it alleviates redness and discomfort. Its anti-inflammatory properties help counteract UV-induced and oxidative inflammation, making it suitable for anti-aging and protective formulations. When combined with actives such as hyaluronic acid or vitamins C and E, it exhibits synergistic effects that improve hydration, elasticity, and resilience ideal for serums, creams, and products targeting delicate areas such as the skin around the eyes.

Benefits:

- Deeply hydrates the skin by binding and retaining water in the epidermis.
- Forms a protective film that reinforces the skin barrier.
- Soothes irritation and reduces redness.
- Exhibits anti-inflammatory and antioxidant effects, mitigating UV and oxidative damage.
- Stimulates the skin's natural defense mechanisms.
- Enhances skin elasticity and resilience.
- Shows synergistic action with hyaluronic acid and vitamins C and E.

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Usage and recommended concentrations: Sizofiran is used in various concentrations depending on product type and intended effect.

- Face creams (day/night): 3–10% for hydration and improved elasticity, especially in synergy with hyaluronic acid and niacinamide.
- Serums (hydrating/anti-aging): 5–15% – stimulates fibroblasts and collagen synthesis, providing a strong anti-wrinkle effect.
- Emulgel serums: 5–12%.
- Eye-area products: 1–5% – effective even at low levels for reducing irritation and fine lines.
- Body lotions: 2–8% – supports daily hydration and skin renewal.
- Face masks (sheet or gel): 5–20% – intensive hydration and regeneration.
- After-sun products: 10–20% – soothing, anti-inflammatory recovery action.
- For irritated/problem skin: 2–8% – reduces redness, calms inflammation, strengthens resilience. It is typically added in the final formulation phase at lower temperatures to preserve its triple-helix structure and bioactivity.

Synergistic effects: Sizofiran demonstrates high compatibility with a wide range of actives, making it a valuable addition to modern dermocosmetic formulations combining hydration, protection, and anti-aging benefits. Its synergy with peptides and antioxidants in emulgel serums is based on complementary biological effects. Sizofiran modulates immunity and inflammation, promoting optimal epidermal and dermal conditions for cell renewal. It stimulates fibroblasts and collagen synthesis, reinforcing dermal structure and reducing wrinkles. Signal peptides further enhance collagen, elastin, and GAG production, while antioxidants (vitamin C, E, polyphenols) neutralize free radicals and prevent oxidative damage. By stabilizing the microenvironment, Sizofiran enhances the longevity and efficacy of antioxidants, amplifying their impact. This combined mechanism results in improved elasticity, tone, reduced irritation, balanced complexion, and sustained protection. In brightening formulations, Sizofiran is used at 5–10% for optimal synergy with vitamin C, niacinamide, or arbutin.

Natural or synthetic origin: Sizofiran (Schizophyllan) is a natural ingredient. It is classified in cosmetics as a natural biopolymer obtained through fermentation—originating from nature but produced under controlled technological conditions to ensure purity, stability, and reproducibility.

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Animal testing: In accordance with EU Regulation (EC) No 1223/2009 on cosmetic products, this substance has not been tested on animals. Safety assessment is based on toxicological data, published literature, and validated alternative methods (in vitro and in silico). The term in silico refers to computer-based testing and modeling techniques that replace in vivo (on living organisms) and in vitro (on cell cultures) studies. This confirms compliance with the EU animal-testing ban.

GMO status: Non-GMO

Vegan status: Vegan-friendly. Sizofiran does not contain any animal-derived components. It is produced biotechnologically through microbial fermentation under controlled laboratory conditions using plant-based or synthetic nutrient media.

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