

TECHNICAL DATA SHEET

Product Name: Erythrulose

INCI name: Erythrulose

CAS: 40031-31-0

Chemical class: Monosaccharides – ketoses (ketotetrose)

Functional category: Self-tanning agent

Description: Erythrulose is a low-molecular carbohydrate from the group of ketone sugars, more precisely a ketotetrose, used in cosmetics as an active substance for gradual self-tanning of the skin. In terms of physicochemical properties, it appears as a whitish to slightly yellowish crystalline powder, highly soluble in water and stable in aqueous and hydroalcoholic systems. It has no pronounced odor and does not significantly affect the organoleptic profile of the finished formulation, which makes it suitable for products intended for daily use. The mechanism of action of erythrulose is based on a non-enzymatic Maillard reaction with free amino groups of keratin in the superficial layers of the epidermis. During this reaction, colored melanoidins are formed, giving the skin a mild to moderate bronze tone. Compared with dihydroxyacetone, the reaction is slower and more controlled, resulting in a more gradual and even color development with a lower risk of spotting or orange undertones. For this reason, erythrulose is often used alone in formulations intended to provide a subtle tanning effect or in combination with DHA to correct tone and prolong color durability. In self-tanning formulations, erythrulose contributes to a more natural-looking complexion, producing a tone described as warmer and softer compared with DHA. The color develops more slowly, usually within 24 to 48 hours, but remains more stable and uniform over time. An additional advantage is better tolerability for sensitive skin, as erythrulose shows a lower potential for dryness and irritation compared with conventional self-tanning agents. From a formulation standpoint, erythrulose is compatible with most commonly used cosmetic raw materials, including humectants, polymers, mild emulsifiers and botanical extracts. It shows optimal stability in a slightly acidic to neutral pH range, which corresponds to the physiological pH of the skin. It does not clog pores and is suitable for formulations intended for sensitive areas, such as the area around the eyes, when used in appropriately adjusted concentrations. Due to its predictable reactivity and favorable safety profile, erythrulose is considered one of the key ingredients in modern formula-

Disclaimer: The details provided here are specific to the identified material and may not remain accurate if that material is combined with other substances or used in different processes. The information presented is, to the best of the company's knowledge, considered precise and trustworthy as of the date mentioned. However, the company does not make any explicit or implied assurance, guarantee, or claim regarding the information's precision, trustworthiness, or comprehensiveness, and will not be held accountable for any losses, damages, or costs, whether direct or indirect, that arise from its use. Users are encouraged to independently verify the appropriateness and thoroughness of this information for their specific purposes.

TECHNICAL DATA SHEET

tions designed for gradual and natural-looking self-tanning.

Physicochemical properties: Erythrulose in powder form demonstrates good chemical and physical stability when stored under dry and controlled conditions. As a hygroscopic substance, it is sensitive to moisture, and exposure to elevated relative humidity may lead to particle agglomeration and localized degradation. For this reason, the powder should be stored in tightly closed packaging, protected from moisture and direct light, at stable room temperature. In its dry state, erythrulose is significantly more stable than in aqueous solutions and does not exhibit notable chemical degradation over extended storage periods, provided it is not exposed to heat or oxidative conditions. Improper storage, especially in the presence of moisture, may initiate undesirable browning reactions and reduce its reactive efficiency in formulations. For this reason, erythrulose powder is considered a stable raw material with a long shelf life, with moisture control being the key factor in maintaining its quality.

Benefits:

- Enables gradual and controlled self-tanning without sudden color development.
- Produces a more natural and warmer skin tone compared with conventional self-tanning agents.
- Reduces the risk of spots, streaking and uneven skin tone.
- Demonstrates better tolerability on sensitive skin and lower irritation potential.
- Does not clog pores and does not contribute to the comedogenicity of the formulation.
- Stable in aqueous and hydroalcoholic systems typical for skin pH.
- Combines well with DHA and prolongs the duration of the achieved color.
- Does not significantly affect the odor or texture of the finished cosmetic product.

Method of use: Erythrulose is used in formulations as a water-soluble active substance. It is introduced into the aqueous phase, usually at room temperature or with mild heating, ensuring complete dissolution before further processing. After solubilization, the aqueous phase can be combined with other formulation components without specific technological requirements, allowing easy incorporation into gels, emulsions and serums. It is stable within a slightly acidic to neutral pH range corresponding to physiological skin conditions, therefore formulations are typically adjusted to pH 4.5–6.5. In

Disclaimer: The details provided here are specific to the identified material and may not remain accurate if that material is combined with other substances or used in different processes. The information presented is, to the best of the company's knowledge, considered precise and trustworthy as of the date mentioned. However, the company does not make any explicit or implied assurance, guarantee, or claim regarding the information's precision, trustworthiness, or comprehensiveness, and will not be held accountable for any losses, damages, or costs, whether direct or indirect, that arise from its use. Users are encouraged to independently verify the appropriateness and thoroughness of this information for their specific purposes.

TECHNICAL DATA SHEET

body lotions and creams, erythrose is most commonly used at concentrations of 1–3% when gradual and natural self-tanning with even color development is desired. In facial formulations, concentrations are lower, usually within the range of 0.5–2%, to ensure a more subtle effect and good tolerability, particularly for sensitive skin. In light gels, serums and emulgel systems, erythrose is used in similar or slightly lower concentrations depending on the desired tone intensity and frequency of product application. When combined with dihydroxyacetone, erythrose is usually incorporated at concentrations of 0.5–1.5%, while DHA is used at lower levels to achieve a balanced, more natural tone and extended color durability. In formulations intended for sensitive areas, such as the area around the eyes, minimal concentrations are used, typically up to 0.3–0.5%, with careful adjustment of pH and overall formulation composition.

Comparative advantages: Compared with conventional self-tanning agents, erythrose is distinguished by a gradual and controlled development of color, enabling a more even result without abrupt tonal changes. The shade produced on the skin is more natural and warmer, with significantly less tendency toward orange undertones, which are a common drawback of formulations based exclusively on DHA. Due to the milder course of the Maillard reaction, erythrose shows better tolerability, particularly on sensitive skin, with a reduced risk of irritation and dryness. Another advantage is a more stable and long-lasting tanning effect, especially when used in combination with DHA, as it contributes to a more uniform and gradual fading of the color. It also allows more precise control of effect intensity through adjustment of concentration and application frequency, providing formulators with greater flexibility in product development. Due to good tolerability and the fact that it does not clog pores, erythrose is suitable for products intended for facial care and sensitive areas, such as the area around the eyes.

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 evaluation 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 assessment methods performed using computer models and simulations rather than laboratory testing on living organisms (in vivo) or cell cultures (in vitro). This statement 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.