

ERYTHRULOSE

ERYTHRULOSE represents a new solution to the increasing demand for self-tanning. **ERYTHRULOSE** in combination with dihydroxy-acetone (DHA) produces a deep, uniform and natural tan.

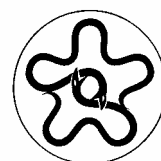
PRODUCT DESCRIPTION

ERYTHRULOSE is a natural keto-sugar which reacts with free primary or secondary amino groups (Maillard's reaction). This reaction with free amino groups of the amino acids of keratin in the skin leads to the DHA-driven formation of brownish polymers, the so-called melanoids. ERYTHRULOSE has been developed to reduce or even eliminate the disadvantages of the presently available self-tanners, namely an irregular and streaky tan as well as an intense drying effect. The impressive properties of ERYTHRULOSE have been documented in complex in vivo studies.

ERYTHRULOSE is a clear, yellowish, preservative-free solution of a biotechnologically produced, chiral carbohydrate. The manufacturing process of pure ERYTHRULOSE includes the aerobic fermentation of the bacterium *Gluconobacter* followed by several purification steps.

BACKGROUND

In today's society, a tanned skin expresses a healthy, dynamic and sporty lifestyle. However, the modern individual is well aware that the natural tan produced by UV rays accelerates the skin ageing process, increasing the number of age spots and hastening the formation of wrinkles. Thus, the impossibility of obtaining a quick tan in many regions in the world, together with the known harmful effects of intensive sun exposure, have led to the development of agents that produce a well tanned skin without UV radiation. The topical application of self-tanning agents makes it possible to attain the beauty ideal of tanned skin without harmful UV rays. The tanning reaction takes place in the upper layers of the epidermis between the primary amino and imino groups of amino acids, peptides and proteins and the aldehyde or keto groups of self-tanning reducing sugar molecules. The resulting brown polymers are bound to proteins of the stratum corneum mainly via lysine side chains. It has been shown that a combination of ERYTHRULOSE and DHA represents the ideal solution for a natural and uniform tan.



EFFICACY

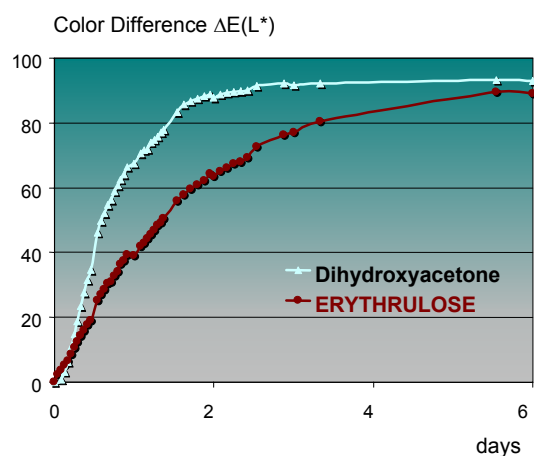
ERYTHRULOSE - THE IDEAL PARTNER OF DHA

An important application concept of the new self-tanning supporting component consists in making use of the complementary advantages of ERYTHRULOSE and DHA. In an in vivo test, an area on the backs of volunteers was treated with a combination of ERYTHRULOSE (1.5%) and DHA (3.5%) incorporated in an O/W-emulsion and another area was treated with an equivalent formulation containing DHA (5%) for 10 days. Skin tanning and hydration were determined daily for the next 20 days. ERYTHRULOSE in combination with DHA produced a more even and longer lasting skin tan without undesired streaks (day 14). The skin areas treated with the combination were up to 30% less dry than those treated with DHA alone.



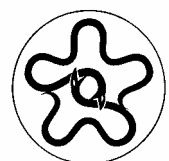
COMPLEMENTARY INFORMATION / ADDITIONAL INFORMATION

In an in vitro test, the reaction kinetics of ERYTHRULOSE and DHA were compared using hydrolyzed keratin as the test model. The maximal tanning intensity was reached with ERYTHRULOSE after 4 to 6 days and with DHA after only two days. This result shows that ERYTHRULOSE reacts with the free amino acids of the horny layer more slowly than DHA. Due to this fact and to its more uniform distribution in the stratum corneum, ERYTHRULOSE is believed to be responsible for a more uniform and even tan.



CONCLUSION

ERYTHRULOSE in combination with DHA produces a deep, uniform and natural skin tan without undesired streaks. Thanks to its retardation effect, ERYTHRULOSE prolongs the tan and leaves the skin less dry and scaly. Due to the slow and even tanning it produces ERYTHRULOSE alone represents the ideal solution for a tinting day cream.



TECHNICAL INFORMATION

PRODUCT SPECIFICATIONS

Appearance	:	clear, yellow, highly viscous liquid
Content	:	75 - 82% m/m
pH	:	2.0 – 3.5
Water content	:	≤ 20% m/m
Total nitrogen	:	≤ 0.1% m/m
Sulfated ash	:	≤ 1.5% m/m
Preservative	:	none
Microbial count	:	< 100 CFU/ml
Specified pathogens	:	absent

PRESERVATION AND MICROBIOLOGY

ERYTHRULOSE does not contain any preservative. ERYTHRULOSE is free of specified pathogens. The amount of non-pathogenic microorganisms with less than 100 CFU per ml of ERYTHRULOSE meets the CTFA microbiology guidelines. ERYTHRULOSE fulfills the criteria of the repetitive germ loading test described by Shyam B. Singh-Verma (Parfümerie und Kosmetik 68(7), 414-421, 1987).

SAFETY AND ECOLOGY

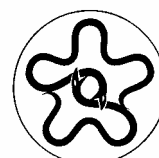
Standard and well-defined safety testing has been performed on ERYTHRULOSE which has proved the product to be safe for cosmetic use. The data available do not indicate any environmental risks. The manufacturing process is designed to meet the criteria for the assessment of safety, health and protection of people and of the environment set out in the *Responsible Care Program*.

PROCESSING AND DOSAGE

ERYTHRULOSE can be processed either warm (<40°C) or cold, and is incorporated into the aqueous phase of a cosmetic formulation. To guarantee a constant product quality, pure ERYTHRULOSE should never exceed a temperature of 40°C. Note: ERYTHRULOSE should never be heated above 115°C as an exothermic reaction would take place. ERYTHRULOSE is stable in the pH-range of 2.0 to 5.0. In formulations, ERYTHRULOSE is compatible at concentrations of up to 20%. For usual, self-tanning formulations, we recommend the addition of 1 to 3% of ERYTHRULOSE in combination with 2 to 4% of DHA. For day creams we recommend an addition of 3 to 5% of ERYTHRULOSE. Basic Guide Formulations are available upon request.

STORAGE AND SHELF LIFE

ERYTHRULOSE should be stored in the original sealed containers protected from light in a clean place at a temperature between 4 and 8°C. In order to avoid secondary microbial contamination, following opening, containers should be handled with special care. If stored under the recommended conditions, ERYTHRULOSE remains stable for at least three years.



GENERAL PRODUCT INFORMATION

Trade Name : ERYTHRULOSE
Product Code : 307-01
INCI Name (CTFA) : Erythrulose
EU-Labeling Name : not listed
Chemical Name : S-1,3,4-Trihydroxy-2-butanone
CAS No : 533-50-6
EINECS No : 208-567-8
JCID Approval No : Not approved
NICNAS : Not listed
Customs Tariff No : 2920.90 (Harmonized System Number)
Shelf life : 3 years

COMPOSITION

A) Ingredient	INCI Name #	Amount*
As listed in the CTFA Dictionary	Erythrulose	A

B) Additives	INCI Name #	Amount*
Solvent	Water	C
Preservative	None	---
Others (buffers, antioxidants, colorants)	None	---

CTFA Dictionary

* FDA-Code (A = > 50%, B = 25-50%, C = 10-25%, D = 5-10%, E = 1-5%, F = 0.1-1%, G = < 0.1%)

REMARK

Although these data and information have been prepared with the utmost possible care, we reserve the right to make changes due to product improvement and other considerations.

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