

Active Beauty
Vegetan[®] Evolve
Long-lasting tan enhancer

Crafted by white technology



Focus on the product

Consumers and self-tanning

Colour plays a significant role in one's self-image, explaining the tremendous success of self-tanning products. The skin's brightness largely depends on the tone and more specifically on the cutaneous colour harmony. By evening the skin tone, imperfections are hidden and contrasts are blurred. Wrinkles are less visible and skin age is less perceptible. As a result, the skin look is entirely more radiant.

In the past few years, consumers' demand for innovation in the self-tanning domain has been tremendous: bringing skin hydration together with the tanning process, combining benefits with skincare, or aiming for long-lasting tanning and a more natural tan colour.

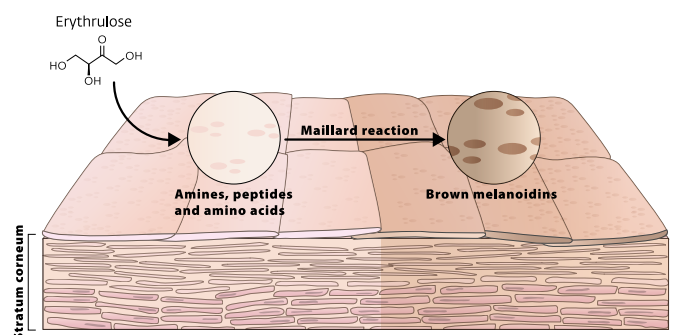
The perfect sidekick to DHA in self-tanning formulations

Vegetan® Evolve is based on erythrulose, a molecule with a chemical structure very close to Dihydroxyacetone (DHA), the reference molecule for self-tanning.

It possesses the same properties as DHA, by reacting with the amines, peptides and amino acids of the *stratum corneum* through the so-called Maillard reaction, leading to the production of brown compounds, the melanoidins. These pigments, linked to the proteins of the skin, provide a long-lasting tanning effect, within hours.

Erythrulose is more stable and has a lower reactivity with the skin proteins than DHA, enabling a more controlled reaction, a more natural tan colour, and a reduced skin peeling after effect¹.

Thanks to these properties, Vegetan® Evolve is ideal in association with DHA (Vegetan® or Vegetan® FL for instance), to obtain the results consumers are looking for: a sun-kissed effect, a long-lasting tan, a natural looking tan and a gentler effect on the skin.

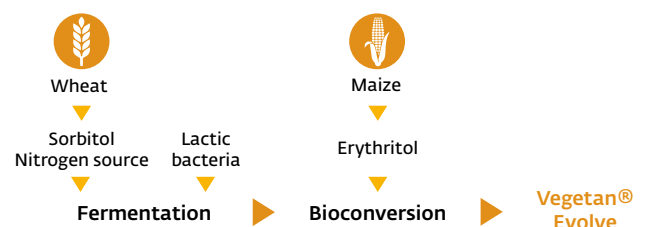


Active Beauty, mastering white biotechnology processes

Givaudan Active Beauty produces Vegetan® Evolve thanks to a biotechnology process already mastered for the production of the Vegetan® range (DHA) in its White Biotechnology and Green Fractionation Centre of Excellence.

Located in a unique biorefinery platform enabling exchanges between the stakeholders (circular economy), it helps to reduce CO₂ emissions, waste water and energy consumption.

By using erythritol instead of glycerol in the bioconversion process, it is possible to obtain erythrulose rather than dihydroxyacetone.



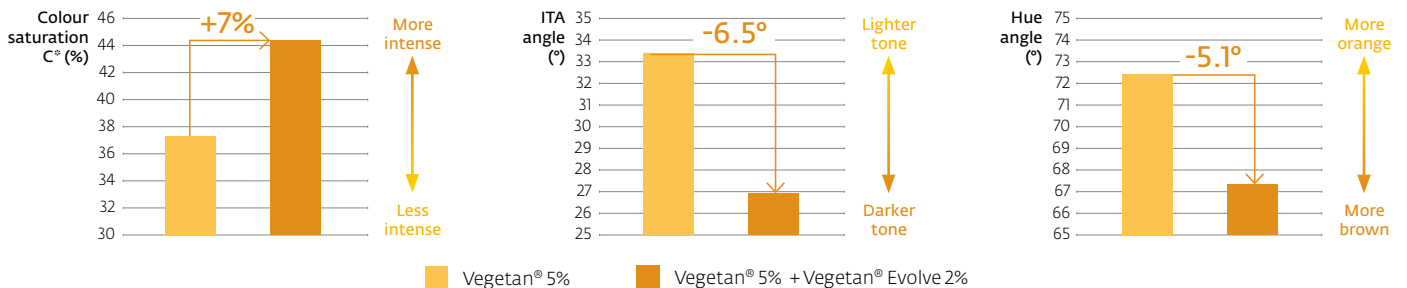
¹ A review of common tanning methods, M. Garone, J. Howard, J. Fabrikant, J Clin Aesthet Dermatol. 2015 Feb; 8(2): 43-47.

Biological activity

More intense and more natural skin tan colour (*in vitro*)

In this study, Whatman paper pieces were soaked with an arginin solution (amino-acid) then dried. Then, paper pieces were treated either with a solution containing 5% of DHA (Vegetan®), or 5% of DHA and 2% of Vegetan® Evolve. The colour parameters (saturation, Hue angle and ITA angle) were then measured with a colorimeter after 4 days.

Colour parameters evolution

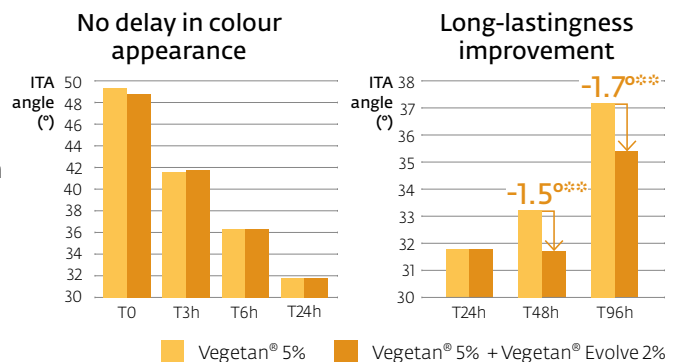


Results: By increasing the colour saturation by 7%, and decreasing the ITA angle by 6.5°, Vegetan® Evolve enables a **more intense and darker colouration of the skin**. By decreasing value of Hue angle by 5.1°, Vegetan® Evolve enables a **more natural colour for the skin tan**.

Long-lasting and more natural skin tan colour (clinical test)

A single blind randomised clinical evaluation was performed on 22 volunteers (aged 20 to 46, average age of 30) showing a phototype I to IV on the Fitzpatrick scale.

Volunteers performed a single application on each of their forearm of either a cream containing Vegetan® at 5%, or the same cream, containing Vegetan® at 5% and Vegetan® Evolve at 2%. ITA angle was then measured with a spectrophotometer at time 0, 3 hours, 6 hours, 24 hours, 48 hours and 96 hours.



**p<0.01 Student's t-test



Results: Vegetan® Evolve results in a **long-lasting and darker tan colour without any delay in colour appearance**, by enabling the ITA angle value to remain lower for a longer period of time (-1.7° after 96 hours). Pictures of the volunteers also highlight this long-lasting effect, together with a more natural tan tone, as previously highlighted by the *in vitro* test.

Summary



Technical information

INCI:	Erythrulose (and) Water
Origin:	Biotechnology
Preservation:	Preservative free
Appearance:	Pale yellow to orange viscous liquid
Solubility:	Water soluble
Dosage:	1-5% (recommended ratio: 70/30 DHA/Erythrulose)
Processing:	Can be added at the end of the formulation process, below 40°C, under gentle stirring.

Claims

Claims:	Self-tanning, UV-free pigmentation, glow tan, long-lasting colouration, UV-free skin self-tanner, natural tan colour.
Applications:	Self-tanning products, glowing products, self-tanning creams, good look foundation, long-lasting self-tanning, UV-free body tanning lotion.

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