

# Elage

## Safe and Stable Skin Lightener

**Elage** is a **100 % nature identical** and **nature-derived skin lightening agent**. It is a **highly pure** grade of Ellagic Acid, a polyphenol naturally occurring in fruits, such as strawberries, raspberries, blackberries, pomegranates, walnuts and chestnuts.

**Elage** is an **“active pigment”**, a fine powder which is practically insoluble in common cosmetic solvents. Hence it can be handled like any ordinary pigment. Thanks to its low solubility, Elage is a **very stable ingredient**.

**Elage** has an **excellent safety profile and is non-cytotoxic**. Its influence on the skin tone is **100 % reversible**. The natural skin tone returns completely, once the application is stopped. <sup>(1)</sup>

**Elage** slows down or **inhibits the skin from over-producing melanin**. It **evens out the skin tone** and **reduces colored spots** caused by melanin-related hyper pigmentation. As a result, the **skin appears brighter and more uniform**.

**Elage**'s skin lightening activity is based on **two different mechanisms**: <sup>(1,6)</sup>

- 1) Inhibition of alpha-Tyrosinase, a key enzyme in the formation of the skin pigment Melanin.
- 2) Prevention of non-enzymatic oxidation reactions within the cascade of Melanin formation.

**Elage** is further known for a multitude of beneficial effects on skin, such as:

- **radical scavenging** and **inhibition of lipid peroxidation** <sup>(2,3)</sup>
- **anti-inflammatory** and **analgesic** activity <sup>(4)</sup>
- **anti-photoaging**, preventing collagen destruction and inflammation caused by UV-B <sup>(5)</sup>

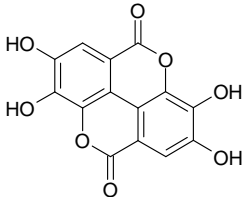

### Main Functions

- Lightening of the skin tone
- Balancing of the skin tone
- Reduction of hyperpigmented spots
- Reduction of red spots

### Applications

- Skin Care / Face Care
- Sun Care
- Make up / Concealers

### Specifications and characteristics

<b>INCI</b>	Ellagic Acid
<b>CAS Reg. No</b>	476-66-4
<b>Appearance</b>	beige or yellow powder
<b>Purity</b>	≥ 98.0 %
<b>Recommended pH of use</b>	3 – 5.5
<b>Recommended use level</b>	0.1 – 1.0 %
<b>Regulatory status</b>	Globally approved; regulatory data available on request
<b>Origin, ISO 16128</b>	Derived-natural Natural origin index: 1
<b>Chemical structure:</b>	 

The given information is accurate to the best of our knowledge. Customers are advised to perform their own studies on the usefulness of any ingredient for a particular application. Any recommended usage information is only provided as indication, and should not be considered as recommendation to violate of any laws, patents, or official regulations dealing with manufacture, composition, local procedures, product design, or end usage.

# Elage

## Safe and Stable Skin Lightener

### In Vivo-Test for Skin Lightening Effects

The performance of **Elage** was evaluated in a clinical in vivo study on 11 female subjects, aged 18-50 years with phototype Fitzpatrick I-V. The tests were carried out at PhD Trials, Lisbon. **Elage** was used at a concentration of 0.5 % in an O/W emulsion (**Table 1**). The product was applied at home **two times per day for 28 days**. During the entire test period the product presented **very good skin acceptability**.

**Table 1: O/W-cream used for the in vivo evaluation of Elage, pH 5.5**

Phase	Ingredient	INCI-Name	wt.-%
<b>A</b>	Water	Aqua	ad 100
	Xanthan Gum PC <sup>(1)</sup>	Xanthan Gum	0.50
<b>B</b>	Emulgade PL 68/50 <sup>(2)</sup>	Cetearyl Glucoside (and) Cetearyl Alcohol	5.00
	Shea Butter <sup>(3)</sup>	Butyrospermum Parkii Butter	3.00
	Sesame Oil <sup>(3)</sup>	Sesamum Indicum (Sesame) Oil	3.00
	Hazelnut Oil <sup>(3)</sup>	Corylus Avellana (Hazel) Nut Oil	3.00
<b>C</b>	Phenoxyethanol	Phenoxyethanol	1.00
	α-Tocopherol	Tocopherol	0.10
<b>D</b>	<b>Elage</b> <sup>(4)</sup>	<b>Ellagic Acid</b>	<b>0.50</b>
	L-Lysine	Lysine	0.50
	Ascorbic Acid	Ascorbic Acid	0.05
	Water	Aqua	20.00
<b>Premix</b>	Plantacare 1200 UP <sup>(2)</sup>	Lauryl Glucoside	5.00
	Citric acid solution	Aqua (and) Citric acid	qs

Suppliers: (1) Jungbunzlauer, (2) BASF, (3) Caesar & Loretz, (4) Minasolve

**Two instrumental test methods** were applied before and after the treatment (Day 0 and Day 28) in order to assess the changes in general skin tone and reduction of dark spots:

### Skin coloration ...

... of the cheek areas was measured according to the L\*a\*b\* system (7) with a Minolta chromameter CR-400 (Minolta, Japan). The results are shown in **Figure 1** (L\* = luminance; a\* = green-red color; b\* = blue-yellow color).

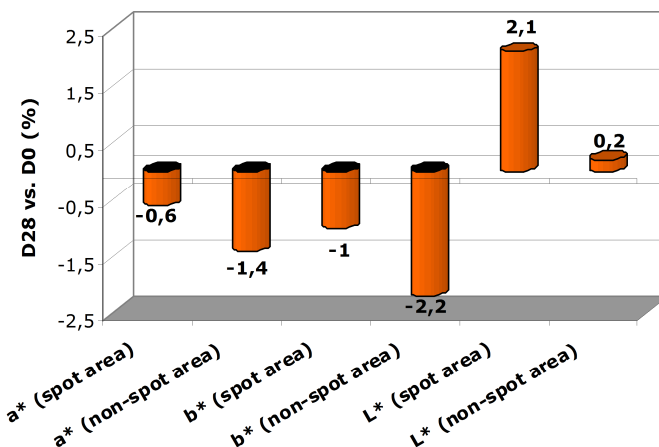
### High resolution photos ...

... of the subjects' faces very taken with a **VISIA-CA system**. The variation in areas (in % of pixels) and counts of pigmented spots was examined by analysis software.

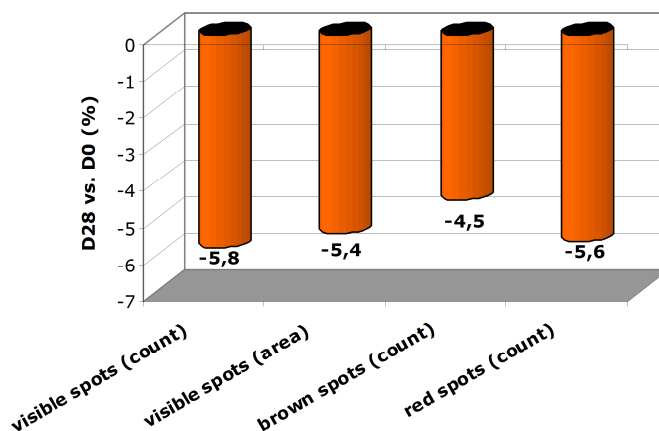
**Brown spots, red spots and total visible spots** were analyzed separately (**Figure 2**).

### Results:

- The **total number of visible spots**, and in particular the **numbers of brown and red spots** were **significantly reduced**.
- The **color of the remaining visible spots** showed **significant lightening** (increased L\* and decreased a\*/b\* of spot areas).
- The overall **brightness of the skin** was **enhanced** (increased luminance L\* and decreased a\*/b\* values of non-spot areas).
- According to the Physician's global assessment, a **depigmentation effect was observed on 81.8 % of all subjects**.



**Figure 1: Skin color analysis by chromameter.**



**Figure 2: HR-photo analysis of colored spots.**

The given information is accurate to the best of our knowledge. Customers are advised to perform their own studies on the usefulness of any ingredient for a particular application. Any recommended usage information is only provided as indication, and should not be considered as recommendation to violate of any laws, patents, or official regulations dealing with manufacture, composition, local procedures, product design, or end usage.

# Elage

## Safe and Stable Skin Lightener

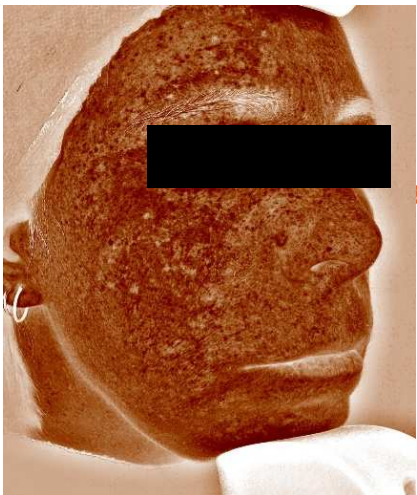
D0:



Visible spot reduction at D28:



D0:



Brown spot reduction at D28:



D0:



Red spot reduction at D28:



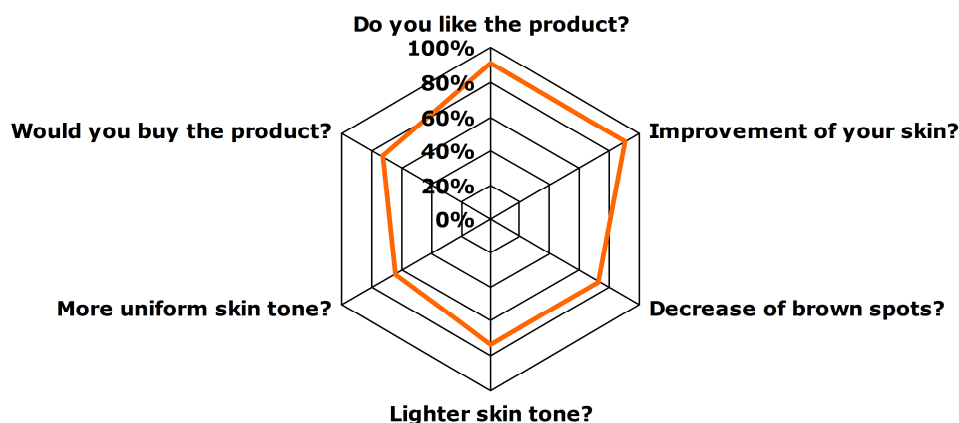
The given information is accurate to the best of our knowledge. Customers are advised to perform their own studies on the usefulness of any ingredient for a particular application. Any recommended usage information is only provided as indication, and should not be considered as recommendation to violate of any laws, patents, or official regulations dealing with manufacture, composition, local procedures, product design, or end usage.

# Elage

## Safe and Stable Skin Lightener

### Self-assessment by the panellists

The panellists of the lightening in-vivo study also evaluated the cosmetic product containing 0.5 % of **Elage**. The ratings were given on a scale of 1 (very good) to 4 (unsatisfactory). The results are shown in Figure 2 as percentage of satisfaction (rating of  $\leq 2$ ). In conclusion, **90.9 %** of the subjects “liked” or “liked very much” the product, and **72.7 %** would buy it.



**Figure 3: Consumer assessment of Elage after 28 days of application at 0.5 % use-level.**

### Application in cosmetic formulations

**Elage** is generally compatible with all common cosmetic ingredients. At pH > 6 it can lead to a yellow coloration, due to the formation of a coloured salt. **Elage** will not dissolve under neutral conditions, which has no negative impact on its activity. Like any common pigment, **Elage** is formulated in cosmetics under a **dispersed state**.

The ingredient is preferably added to aqueous phases. Pre-mixing with wetting agents may help to ensure a uniform dispersion. High shear mixing is recommended. The addition of **PEG-8 (4-6%)** helps to disperse Elage in the water phase.

The addition of TiO<sub>2</sub> helps to obtain a white cream (4% recommended).

Since **Elage** is lowering the levels of protective melanin inside the skin, it is recommended to formulate it in combination with broad spectrum UV-filtering sunscreen.

The given information is accurate to the best of our knowledge. Customers are advised to perform their own studies on the usefulness of any ingredient for a particular application. Any recommended usage information is only provided as indication, and should not be considered as recommendation to violate of any laws, patents, or official regulations dealing with manufacture, composition, local procedures, product design, or end usage.

# Elage

## Safe and Stable Skin Lightener

### Example 1 : Brightening Cream

Phase	Raw material	INCI name	%
<b>A</b>	Emulgade 165 <sup>(2)</sup>	<i>Glyceryl Stearate (and) PEG-100 Stearate</i>	6.00
	Lanette O <sup>(2)</sup>	<i>Cetearyl Alcohol</i>	3.00
	Cetiol C5 <sup>(2)</sup>	<i>Coco-Caprylate</i>	5.00
	Myritol 318 <sup>(2)</sup>	<i>Caprylic/Capric Triglycerides</i>	3.00
	Massocare Sil DM 350 <sup>(3)</sup>	<i>Dimethicone</i>	1.20
	Uvinul A + B <sup>(2)</sup>	<i>Ethylhexyl Methoxycinnamate (and) Diethylamino Hydroxybenzoyl Hexyl Benzoate</i>	10.0
	Bioxan SFT50 <sup>(3)</sup>	<i>Helianthus Annuus Seed Oil (and) Tocopherol</i>	0.30
<b>B</b>	Glycerin 99,5% <sup>(2)</sup>	<i>Glycerin</i>	2.00
	Xanthan Gum <sup>(3)</sup>	<i>Xanthan Gum</i>	0.30
<b>C</b>	Demineralized water	<i>Aqua (Water)</i>	ad 100
	<b>Elage</b> <sup>(1)</sup>	<b>Ellagic Acid</b>	<b>0.50</b>
	Polyglycol 400 <sup>(3)</sup>	<i>PEG-8</i>	4.00
	Citric Acid	<i>Citric Acid</i>	0.05
<b>D</b>	<b>E-Leen Green B</b> <sup>(1)</sup>	<b>Pentylene Glycol (and) Aqua (Water) (and) Sodium Benzoate (and) Benzoic Acid</b>	<b>3.00</b>

(1) Minasolve (2) BASF (3) Quimica Masso

### Manufacturing process:

- 1 – Mix all ingredients from Phase A and heat at 75°C.
- 2 – Prepare Phase B and Phase C separately.
- 3 – Mix Phase B and Phase C and heat at 75°C.
- 4 – Mix Phase B and Phase C at Rotor Stator for 2 minutes, then add Phase A.
- 5 – Emulsify and cool down under mixing.
- 6 – Add Phase D under mixing.

### Properties, stability and microbiology:

Aspect : Off white viscous emulsion  
pH : 5.0 - 5.5

Stable, 4 weeks at room temperature, 4°C, 45°C.  
Meets Criteria A / ISO 11930

The given information is accurate to the best of our knowledge. Customers are advised to perform their own studies on the usefulness of any ingredient for a particular application. Any recommended usage information is only provided as indication, and should not be considered as recommendation to violate of any laws, patents, or official regulations dealing with manufacture, composition, local procedures, product design, or end usage.



# Elage

## Safe and Stable Skin Lightener

### Example 2 : Radiance Serum

Phase	Raw material	INCI name	%
<b>A</b>	Emulgade 165 <sup>(2)</sup>	<i>Glyceryl Stearate (and) PEG-100 Stearate</i>	3.00
	Lanette O <sup>(2)</sup>	<i>Cetearyl Alcohol</i>	1.50
	Cetiol C5 <sup>(2)</sup>	<i>Coco-Caprylate</i>	2.00
	Myritol 318 <sup>(2)</sup>	<i>Caprylic/Capric Triglycerides</i>	4.00
	Massocare Sil DM 350 <sup>(3)</sup>	<i>Dimethicone</i>	1.20
	Bioxan SFT50 <sup>(3)</sup>	<i>Helianthus Annuus Seed Oil (and) Tocopherol</i>	0.30
<b>B</b>	Glycerin 99,5% <sup>(2)</sup>	<i>Glycerin</i>	3.00
	Xanthan Gum Mesh 80 <sup>(3)</sup>	<i>Xanthan Gum</i>	0.20
<b>C</b>	Demineralized water	<i>Aqua (Water)</i>	ad 100
	<b>Elage</b> <sup>(1)</sup>	<b>Ellagic Acid</b>	<b>0.50</b>
	Polyglycol 400 <sup>(3)</sup>	<i>PEG-8</i>	4.00
	Salicylic Acid	<i>Salicylic Acid</i>	0.50
<b>D</b>	<b>Fresh'in Green+</b> <sup>(1)</sup>	<b>Pentylene Glycol (and) Methyl Diisopropyl Propionamide</b>	<b>0.30</b>
<b>E</b>	<b>E-Leen Green B</b> <sup>(1)</sup>	<b>Pentylene Glycol (and) Aqua (Water) (and) Sodium Benzoate (and) Benzoic Acid</b>	<b>3.00</b>

(1) Minasolve (2) BASF (3) Quimica Masso

### Manufacturing process:

- 1 – Mix all ingredients from Phase A and heat at 75°C.
- 2 – Prepare Phase B and Phase C separately.
- 3 – Mix Phase B and Phase C and Heat at 75°C.
- 4 – Mix Phase B and Phase C at Rotor Stator for 2 minutes, then add Phase A.
- 5 – Emulsify and cool down under mixing.
- 6 – Add Phase D then Phase E under mixing.

### Properties, stability and microbiology:

Aspect : Off white fluid emulsion

pH : 4.5 – 5.0

Stable, 4 weeks at room temperature, 4°C, 45°C.

Meets Criteria A / ISO 11930

### Bibliography

- (1) Shimogaki Y et al., *In vitro and in vivo evaluation of ellagic acid on melanogenesis inhibition*, INTERNATIONAL JOURNAL OF COSMETIC SCIENCE **2000**, vol. 22, pp. 291-303.
- (2) Han DH, *Antioxidant and Apoptosis-inducing Activities of Ellagic Acid*, ANTICANCER RESEARCH **2006**, vol 26, pp. 3601-3606.
- (3) Osawa T et al, *Inhibition of in vitro lipid peroxidation by ellagic acid*, J. AGRIC. FOOD CHEM. **1987**, vol. 35, pp. 808-812.
- (4) Rogerio AP et al., *Anti-inflammatory, analgesic and anti-oedematous effects of Lafoensia pacari extract and ellagic acid*, J. PHARM. PHARMACOL. **2006**, vol. 58, pp. 1265-1263.
- (5) Bae J-Y et al., *Dietary compound ellagic acid alleviates skin wrinkle and inflammation induced by UV-B irradiation*, EXPERIMENTAL DERMATOLOGY **2010**, vol. 19, pp. e182-e190.
- (6) Ando H et al., *Quasi-Drugs Developed in Japan for the Prevention or Treatment of Hyperpigmentary Disorder*, INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES **2010**, vol. 11, pp. 2566-2575.
- (7) Weatherall IL, Coombs BD, *Color measurements in terms of CIELAB color space values*, J. INVEST. DERMATOL. **1992**, vol. 99, pp. 468-473.

The given information is accurate to the best of our knowledge. Customers are advised to perform their own studies on the usefulness of any ingredient for a particular application. Any recommended usage information is only provided as indication, and should not be considered as recommendation to violate of any laws, patents, or official regulations dealing with manufacture, composition, local procedures, product design, or end usage.