

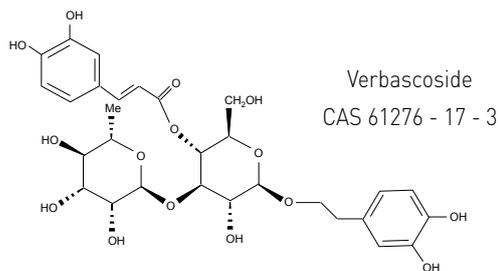


OPEXTAN®

ANTIOXIDANT, UV PROTECTANT

CHARACTERISTICS

OPEXTAN®	AVAILABLE DOCUMENTATION
Total phenols content by spectrophotometry ≥ 10% Verbascoside content by HPLC ≥ 2% Hydroxytyrosol and derivatives content by HPLC ≥ 4.5% Form: light brown powder Odor characteristic Stability: retesting date after 2 years Level of use: 0.5% - 2.5% pH: not applicable (not soluble in water) Solubility*: freely soluble in Polyoxyethylene Sorbitan Monoleate, Polyoxyethylene Sorbitan Monoleate : Water (1:1 v/v), PEG 40 Hydrogenated castor Oil : Water (1:1 v/v); slightly soluble in: Water, Alcohol 50°C, Propylene Glycol : Water (1:1 v/v), Glycerin : Water (1:1 v/v), Ethoxydiglycol : Water (1:1 v/v), PEG 6 Caprylic/Capric Tryglicerides : Water (1:1 v/v).	Botanical Certificate Method of analysis Reference Standard Declaration GMO free Safety Data Sheet Published Literature Confidential documentation



SAFETY DATA*

- Opextan® is devoid of side effects as localized erythema or skin discomfort of any kind, and showed a good tolerability in all the trials performed so far in topical application. Also, Opextan® resulted not mutagenic in the in vitro Ames test.¹

FORMULATION EXAMPLES

MEDITERRANEAN PROTECTION EMULSION				Formulation Advice
Cetyl alcohol / C12-20 Acid PEG-8 Ester	14.00%	Hydrolyzed wheat proein	0.60%	As a general rule, plant derivatives should be added to the phase most suitable for their dissolution or dispersion. In the case of Opextan®, its hydrophilic nature makes it suitable for emulsions and should be added to the hydrophilic phase. Opextan® is rather thermostable, nevertheless we suggest adding it in a cool to slightly warm phase. Opextan® S is a more water soluble version of Opextan®.
PEG 90 Stearate / Glyceryl stearate	4.00%	Opextan®	0.50%	
Simmondisa chinensis (Jojoba) oil	8.10%	Aqua (Water)	10.00%	
Olea europeae (Olive) oil unsaponifiables	2.20%	Sodium Hyaluronate	0.10%	
Dimethicone	0.70%	Aqua / Dehydroacetic acid / Benzyl alcohol	0.80%	
Tocopheryl acetate	0.50%	methylene bisbenzotriazolyl tetramethylbutylphenol	0.30%	
Lecithin / Tocopherol / Ascorbyl palmitate / Citric acid	0.10%	Glucose / Sorbitol / Urea / Sodium PCA / Glycine / lactic acid / Panthenol / Hydrolyzed wheat protein / Sodium Glutamate	2.00%	
Zanthalene®	0.50%	ALSO SUITABLE FOR: Sun care products° After sun products Anti-ageing lotions Anti-wrinkle treatments Hair care		
Helicrysum italicum	0.10%			
Aqua (Water)	50.40%			
Glycerin	4.00%			
Allantoin	0.50%			
Disodium EDTA	0.30%			
Phenoxyethanol	0.30%			

* All safety trials are compliant to EU regulation 1223/2009.
 ° Compliance to be verified with US regulations by customer.

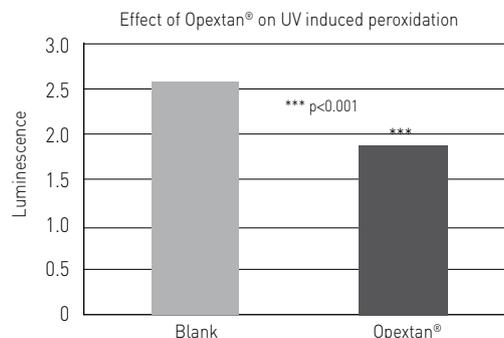
The ingredients described herein are offered for consideration for use in personal care products. The information provided describes historical use, ingredient activity and other information that may be relevant to their use in such products. How each ingredient would contribute to a particular product would be formulation specific. Furthermore please note that this documentation is available for various countries all over the world and hence it may contain statements not applicable to your country.



PERSONAL CARE

LIPID PEROXIDATION

- Lipid peroxidation is a well known model of oxidative stress and lipid peroxides are prominent non-radical intermediates of lipid peroxidation. The protective effect of Opextan® in a formulation at 0.5% applied topically was evaluated² on a group of 6 healthy volunteers, who were asked to wash their face and apply the Opextan® and the blank formulation on each half face. After three hours they were irradiated with the sunlight for about 20 minutes. Skin sebum was then sampled by sebutape, extracted and measured by dosing chemiluminescence in 0.1 mg recovered sebum. Luminescence indicating the level of lipid peroxidation in the Opextan® treated area was lower by 27.1%, which means that the Opextan® containing formulation protected skin lipids from UV induced peroxidation.

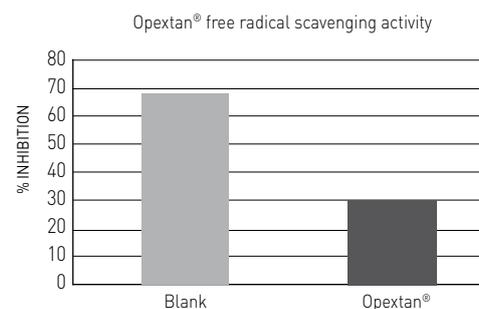


SKIN ELASTICITY AND WRINKLES

- An additional clinical assessment has been led on 23 male healthy volunteers who applied on each half face an Opextan® containing formulation (2.5%) and a blank formulation, twice daily for three months.³ The measurements of moisture of the skin horny layer and the viscoelasticity of the skin, as well as the skin replicas, were performed before the beginning of the study, at week 8 and week 12. The product containing Opextan® showed significant amelioration compared to the placebo group in terms of the roughness parameters of the replica analysis. An ameliorating tendency was seen as to the moisture of the horny layer as well. Additional assessments on the skin protecting properties of Opextan® have also been carried out for oral application. Orally administered Opextan® was shown to decrease skin sensitivity to UV irradiation and the oxidative status in healthy volunteers.⁴ Still as a dietary supplement in healthy subjects, Opextan® was shown to ameliorate skin hydration, microcirculation and oxygenation over a 4 weeks treatment.⁵

FREE RADICAL SCAVENGING ACTIVITY

- The Oxygen Radical Absorbance Capacity (ORAC) of Opextan® is 2200-2300 mmol TE/g. On the other side, the superoxide radical model mimics the *in vivo* situation as its formation is physiological (i.e. in case of UV skin exposure, when the harmful effects are associated to the formation of at least 50 reactive oxygen species). Verbascoside and other characteristic constituents of olive pulp and leaves have been tested for their ability to scavenge the superoxide anion in vitro at a 0.016mM concentration.² Their radical scavenging effect was expressed as percentage of inhibition of the superoxide radical formation. Verbascoside was shown to inhibit 68% of superoxide anion formation, whereas oleuropein, a characteristic polyphenol found in the olive leaves, inhibited by 30% the radical formation.



MECHANISM OF ACTION

- Opextan® is an olive fruit extract whose most active component is verbascoside, a polyphenol typical of olive fruit pulp, the only edible part of the plant. Verbascoside is a strong free radical scavenger, and has been tested in vitro on DPPH free radical as well as superoxide anion O²⁻. Verbascoside, as well as other polyphenols present in the extract (hydroxytyrosol, caffeic acid), exerts a remarkable antioxidant and free radical scavenging activity.

DID YOU KNOW...

- Symbol of the Mediterranean culture, the olive tree is extremely long living due to its content of potent antioxidant compounds. Since the most ancient times, both Pliny and Hippocrates used to prescribe medications from olive as a cure for a number of disorders, and many of these old remedies have passed into folk medicine and are as relevant today as they were hundreds of years ago.

TRADE NAME	INCI (PCPC)	INCI (EU)	EINECS N.	CAS N.	INDENA CODE
Opextan®	Olea Europaea (Olive) Fruit Extract	Olea europaea Fruit Extract	-	84012 - 27 - 1	36POF0090
Opextan® S	Olea Europaea (Olive) Fruit Extract	Olea europaea Fruit Extract	-	84012 - 27 - 1	36POF0190

1. Data on file, Indena 2005. - 2. Maramaldi G., Artaria C., Ikemoto T., Haratake A., "Estratto standardizzato di frutti di Olea europaea", Cosmetic Technology 9 (5), 9-13, 2006. - 3. Matsuoka Y., et al., "Curative properties of a topical product containing olive fruit polyphenol shown by a placebo controlled, double blind study using half face", 107th Annual Meeting of Japanese Dermatological Association, (April 10-20, 2008) - 4. Maramaldi G., Artaria C., Ikemoto T., Haratake A., "Estratto standardizzato di frutti di Olea europaea", L'Integratore Nutrizionale 9 (3), 23-29, 2006. 5. Data on file, Indena, Irvine Clinic, 2017.