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Discover Oleon's range of protective isostearic esters with varying film-forming properties

PROTECTIVE EMOLLIENTS
Isostearic esters

PROTECTIVE EMOLLIENTS

The growing complexity of the environment we live in has a significant impact on the human well-being. Next to the well-known danger of UV radiation for the skin, the aggressive effect of other external factors is increasingly studied and recognized. Exposure to pollution, extreme climates, and natural and synthetic sources of light can disrupt the health and cause premature aging of the skin.

OLEON'S PROTECTIVE ISOSTEARIC DERIVATIVES

Oleon offers a range of **isostearic esters** with varying film-forming properties, which allow the formation of both **light** and **heavy protective** layers on the skin. These plant-based molecules also have excellent **solubilization properties** and show **water resistant** properties, enhancing the effect and durability of protective formulations.

PRODUCT FEATURES

PHYSICOCHEMICAL PROPERTIES

The saturation of Oleon's isostearic esters ensures **chemical stability** combined with a **stable color** and **odor**. Due to their branched structure, these molecules have a low cloud point, which can be translated into a better **resistance against crystallization** in end formulations. Isostearic esters are liquid below zero degrees and form a perfect match for **cold process methods** and challenging productions.

	INCI	ORIGIN	COLOR (APHA)	VISCOSITY 25°C (mPas)	FEATURES	APPLICATION
Jolee 7739	Isopropyl isostearate		*≤50*	*17.7*	*Excellent solubilization properties, great sensorial profile*	*Skin care, sun care, color cosmetics*
Jolee 7687	Neopentyl glycol diisostearate		*≤150*	*94*	*Soft feel, water resistant*	*Skin care, sun care, color cosmetics*
Jolee 7373	Triisostearin		*≤150*	*167*	*High protective film former, conditioning agent*	*Skin care, sun care, color cosmetics, hair care, toiletries*
Jolee 7380	Trimethylolpropane triisostearate		*≤150*	*207*	*Very easy spread, good film former*	*Skin care, sun care, color cosmetics*
Jolee 7181	Pentaerythritol tetraisostearate		*≤150*	*338*	*High protective film former, conditioning agent*	*Skin care, sun care, color cosmetics*

FILM-FORMING PROPERTIES

Film formers are used to coat the skin to prevent water loss, to maintain a good barrier for ultraviolet radiation, and to prevent chapping of the skin in cold, dry weather. The molecular structure and physicochemical properties of Oleon's isostearic esters make them excellent film formers with both heavy and light protective properties.

The film-forming properties of Oleon's isostearic esters were tested by measuring the transepidermal water loss (TEWL) before and after application of 2 µl of isostearic ester on the skin. TEWL is the loss of water that passes from inside the body through the epidermal layer (skin) to the surrounding atmosphere via diffusion and evaporation processes. The graph indicates the occlusive effect obtained by isostearic esters, reflecting the creation of a film on the skin surface, preventing water loss from the tissue and thus resulting in a reduction of the TEWL.

Oleon's isostearic esters show a clear reduction in TEWL of the skin, which is comparable to the effect of mineral oil. Jolee 7181 induces a remarkable decrease in TEWL, proving to be an exceptionally efficient film former and an ideal ingredient for high protective formulations. Jolee 7739 on the other hand can be recommended for light protective formulations with pleasant spreading properties.

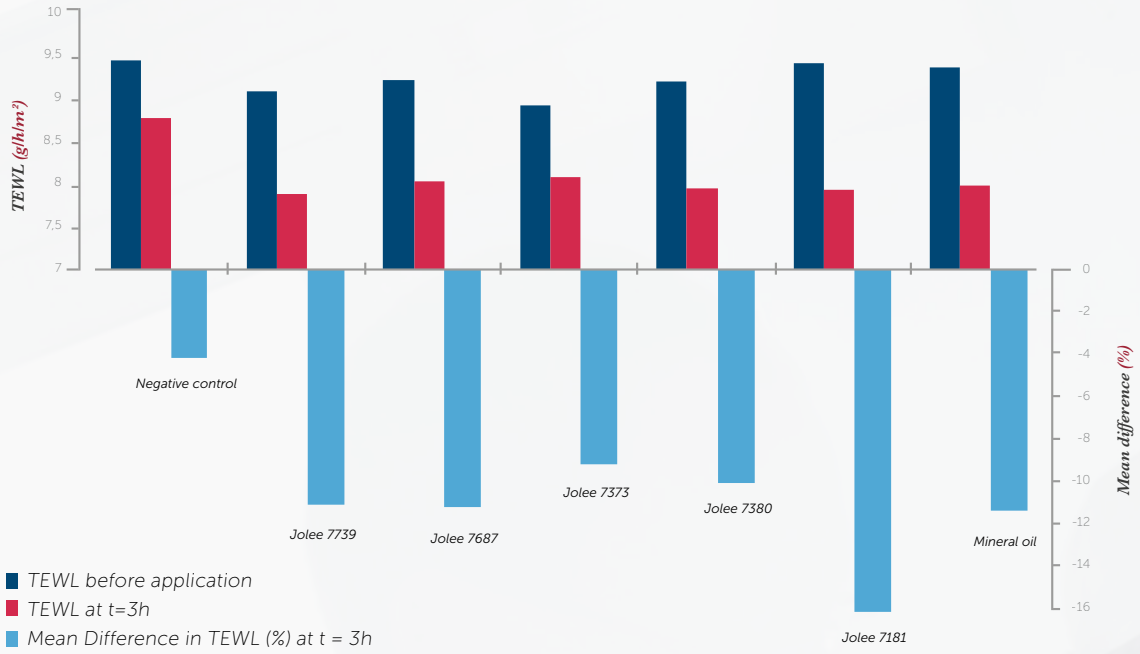


Figure 1: Results were obtained using a Tewameter TM 300: 2µl of product per cm2 skin was applied; TEWL was measured before application and 3 hours after application. Negative control: untreated skin.

WATER RESISTANT PROPERTIES

The films formed by isostearic esters show excellent water resistant properties. The water resistance was determined by applying a film of product on cotton textile and measuring the remaining percentage of product after submersion in water and overnight drying. The high water resistant properties of Jolee 7181 and Jolee 7687 make them suitable for heavy protective applications, while the lower water resistance of Jolee 7739 makes this molecule suitable for a lighter protection.

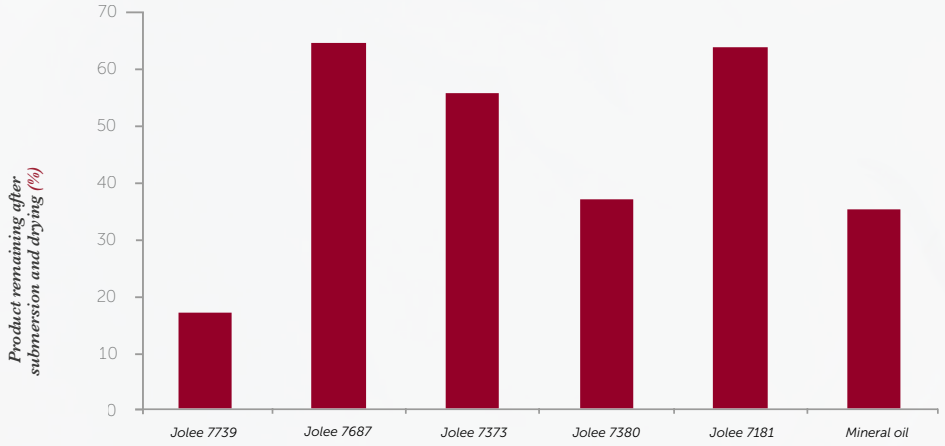


Figure 2: After applying a film of product on cotton textile, the textile was submerged in water for 30 minutes and then dried at 80°C. By comparing the weight of product on the textile before and after treatment, the percentage of remaining product was determined.

The microscopic pictures below show the water resistant properties of Oleon's protective emollients in comparison to mineral oil. Coating cloth with a layer of Jolee 7739 forms a light film, while coating cloth with mineral oil or Jolee 7181 forms a heavy film, reducing the speed with which a water droplet spreads on the surface.

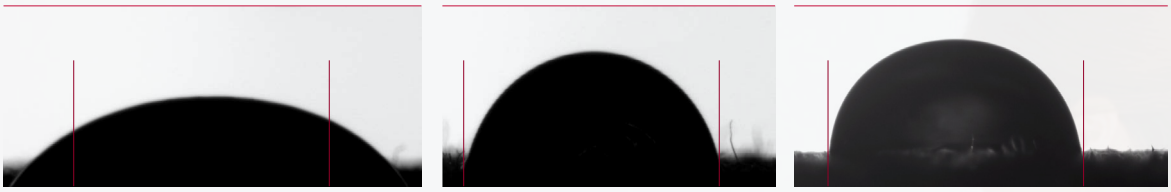


Figure 3: Microscopic photographs show the effect of the film formation of Oleon's protective emollients in comparison with a common used benchmark. Pictures were taken 1 second after a water droplet was placed on a cotton covered with a) Jolee 7739, b) Mineral oil, c) Jolee 7181.

COMPATIBILITY WITH SOLVENTS/OILS

Oleon's isostearic esters act as **superior solubilizers** of lipophilic cosmetic raw materials. At different ratios the compatibility with various solvents was investigated through a visual evaluation. The results show **remarkable stability** with frequently used oils/solvents in diverse applications like sun care, skin care, and hair care.

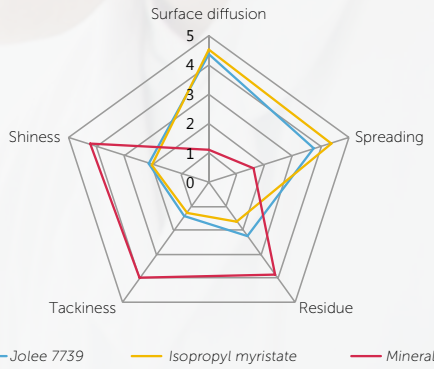
SOLVENT	Jolee 7739	Jolee 7687	Jolee 7373	Jolee 7380	Jolee 7181
Dimethicone 300cs	≤50%	Insoluble	Insoluble	Insoluble	Insoluble
Sunflower oil	≤75%	≤75%	≤75%	≤75%	≤75%
Mineral oil	≤75%	≤75%	≤75%	≤75%	≤75%
Caprylic/capric triglycerides	≤75%	≤75%	≤75%	≤75%	≤75%
Isopropyl myristate	≤75%	≤75%	≤75%	≤75%	≤75%
Propylene glycol	Insoluble	Insoluble	Insoluble	Insoluble	Insoluble
Ethanol	≤75%	Insoluble	Insoluble	Insoluble	Insoluble

Table 1: Compatibility of protective emollients with oils and solvents. Solubility was determined when mixture remained uniform and clear after mixing at 55-60°C and 24hrs at room temperature.

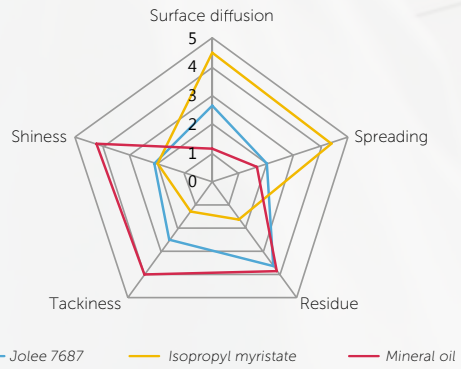
SENSORIAL PROPERTIES

Due to their branched structure the isostearic derivatives have a characteristic emollient feel: a non-greasy after feel, a **highly substantive lipid film**, **soft skin feel,** and leave a **glossy appearance** to the skin.

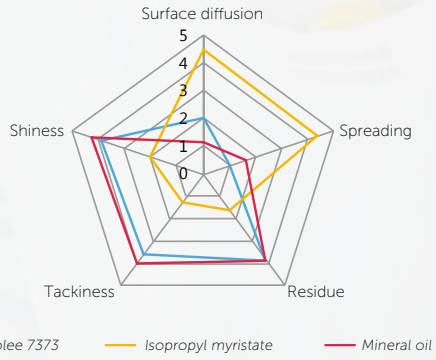
Jolee 7739



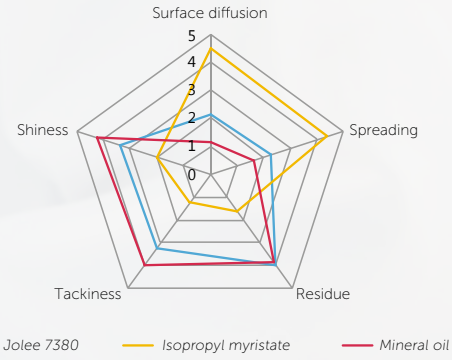
Jolee 7687



Jolee 7373



Jolee 7380



Jolee 7181

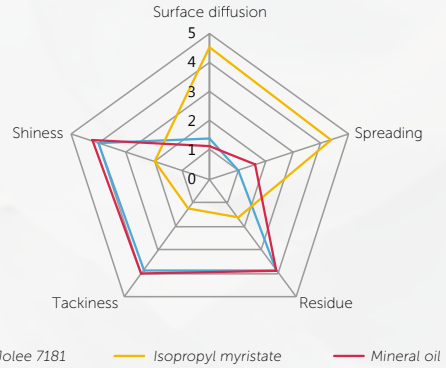


Figure 4: Sensorial analysis conducted by an internal expert panel. Products were rated according to five parameters on a scale from 0 to 5.

GUIDE FORMULATION

HIGH PROTECTIVE SUNSCREEN SPF 50 – OL0418

PHASE	INGREDIENT	INCI	% W/W
A	Aqua	*Water*	Up to 100
	Glycerine 4811	***Glycerin***	**3**
B	Eusolex® OCR	*Octocrylene*	9
	Tinosorb® S	*Bis-ethylhexyloxyphenol methoxyphenyl triazine*	5
	Eusolex® 2292	*Ethylhexyl Methoxycinnamate (and) BHT*	9
	Uvinul® A+	*Diethylamino hydroxybenzoyl hexyl benzoate*	5
	Jolee 7710	***Isononyl isononanoate***	**8**
	Jolee 7637	***Propylene glycol diheptanoate blend***	**4**
	Jolee 7181	***Pentaerythrityl tetraisostearate***	**4**
	Radia 7490	***PEG-100 stearate (and) Glyceryl stearate***	**5**
	Lanette® OOR	*Cetearyl alcohol*	3
C	Preservative		
	Perfume		

MANUFACTURING PROCEDURE

1 Weigh water in the main vessel. - 2 Mix glycerin and gelling agent until a homogeneous paste is obtained. - 3 Add paste to water under slow stirring (400 rpm) and heat at 80°C. - 4 Weigh all the ingredients of phase B one by one and heat at 80°C until a clear solution is obtained. - 5 Add phase B to A under high stirring (1000 rpm). - 6 Stir 1 minute with Ultra Turrax (9000 rpm). - 7 Let the mixture cool down to room temperature and add additives below 30°C.

COMMENTS

Assessment: *High protective sunscreen, homogeneous film, nice after feel.*

GUIDE FORMULATION

PROTECTIVE FACE FOAM - OL0116

PHASE	INGREDIENT	INCI	% W/W
A	Aqua	*Water*	Up to 100
	Glycerine 4811	*Glycerin*	4
	Makimousse 25	*Sodium polyacrylate starch*	0.5
B	Radia 7490	*PEG-100 stearate (and) Glyceryl stearate*	4
	Jolee 7739	*Isopropyl isostearate*	4
	Radia 7104	*Caprylic/capric triglycerides*	4
	Jolee 7202	*Propylene glycol diheptanoate*	7
C	Preservative		
	Perfume		

MANUFACTURING PROCEDURE

1 Weigh water in the main vessel. - 2 Mix glycerin and gelling agent until a homogeneous paste is obtained. - 3 Add paste to water under slow stirring (400 rpm) and heat at 80°C. - 4 Weigh all ingredients of phase A one by one and heat at 80°C until a clear solution is obtained. - 5 Add phase B to A under high stirring (1000 rpm). - 6 Stir 1 minute with Ultra Turrax (9000 rpm). - 7 Let the mixture cool down to room temperature and add additives below 30°C.

COMMENTS

Assessment: *Foam-like texture, easy spread, cocooning feeling.*