



our chemistry
their beauty

Discover Oleon's range
of silicone-like solutions as a green
alternative for low viscosity silicones

SILICONE-LIKE
First choice emollients
for natural formulations

SILICONE-LIKE EMOLLIENTS

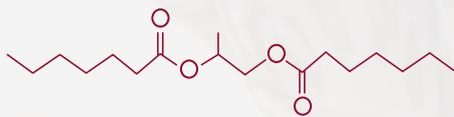
Oleon offers silicone-like solutions as **green alternatives** for the low viscosity silicones on the market. These alternatives originate from **100% natural feedstocks** such as rapeseed, corn, palm, wheat, and castor oil. The use of these silicone-like emollients alone or combined with silicones offers excellent benefits for formulating **light textures**, giving formulations a **great slip** and **unique silky feel**.

Because of their green nature this novel range of Jolee products has a small ecological footprint, is non bio-accumulative, is completely biodegradable, and thus not harmful for the environment.



PRODUCT FEATURES

Jolee
7202



INCI Propylene glycol diheptanoate
CAS 56519-68-7

ECOCERT	USAGE LEVEL	FEATURES	APPLICATION
Certified	1-80%	Good surface diffusion, easy spread, velvety after feel, slight shine	Skin care, hair care, sun care, color cosmetics

Jolee
7750



INCI Isoamyl Laurate
CAS 6309-51-9

ECOCERT	USAGE LEVEL	FEATURES	APPLICATION
Certified	1-80%	High surface diffusion, easy spread, light after feel	Skin care, hair care, color cosmetics

PHYSICOCHEMICAL PROPERTIES

Viscosity, surface tension, refractive index and flash point are important parameters in order to choose the perfect silicone-like emollient for your formulations. An overview of Oleon's solutions compared to benchmark silicones can be found in the table below.

	Cyclopentasiloxane (D5)	Dimethicone (5 cSt)	Jolee 7750	Jolee 7202
Viscosity (25°C) [mm ² /s]	4.22	5.22	5.53	6.49
Density (25°C) [g/cm ³]	0.950	0.920	0.850	0.930
Refractive index (20°C)	1.396	1.398	1.436	1.436
Flash point (°C)	88	140	150	180
Surface tension (25°C) [mN/m]	18.1	19.1	29.0	23.1

Table 1: Comparison of physicochemical properties between cyclopentasiloxane (D5), dimethicone (5 cSt), and Oleon's silicone-like esters: Jolee 7750 and Jolee 7202.

SENSORIAL PROPERTIES

Oleon's 100% natural silicone-like emollients offer an exquisite sensorial profile comparable to that of benchmark silicones. The low viscosity and quick absorption of Oleon's Jolee products result in **high spreading** and **quick penetrating** properties. This makes Oleon's silicone-like range an excellent choice for natural formulations.



Figure 1 & 2: Sensorial analysis conducted by an internal expert panel. Products were rated according to five parameters on a scale from 0 to 5.

PERFORMANCE AND FUNCTIONAL BENEFITS

On top of providing excellent sensorial benefits to formulations, Oleon's emollients show an added value in terms of performance, functionality, and compatibility with solvents and oils.

Spreadability enhancement of oils

A spreading enhancer is an ingredient that improves the spreadability of oils when incorporated in a cosmetic formulation. This property becomes of interest especially when actives are concerned, creating a formulation with great spreadability which enables actives to better deliver their performance.

The graphs below show the spreading enhancement of two common used oils, caprylic/capric triglyceride and sunflower oil, due to the addition of silicones and/or Oleon's silicone-like alternatives. For all tested enhancers a positive increase in spreadability can be seen in function of added concentration.

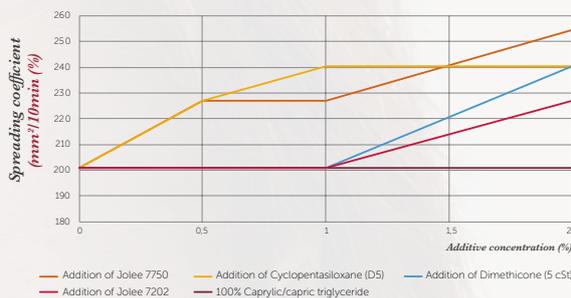


Figure 3: Comparison of the spreadability enhancement of caprylic/capric triglycerides by common used cyclopentasiloxane (D5), dimethicone (5 cSt), Jolee 7750 and Jolee 7202.

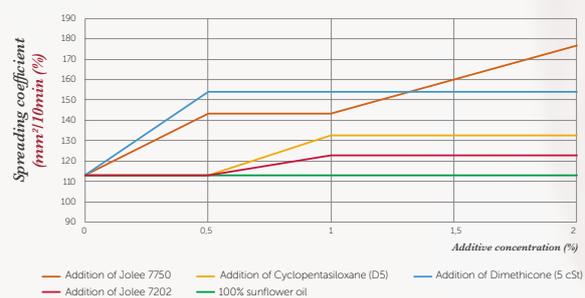


Figure 4: Comparison of the spreadability enhancement of sunflower oil by common used cyclopentasiloxane (D5), dimethicone (5 cSt), Jolee 7750 and Jolee 7202.

Antifoaming properties

An antifoaming agent or defoamer is an ingredient that helps reducing and/or hindering the formation of foam during the production of a cosmetic formulation. They are commonly used as foam can cause defects on surface coatings and prevent the efficiency of filling.

A simple formulation containing 90.5% water, 9% SLES (foaming agent) and 0.5% of test product has been put in a test tube under air sparging for 5 minutes. The foam decrease was measured in comparison to the control (without test product) at 24°C and 80°C. The graph below indicates the antifoaming property for the tested products. Jolee 7750 significantly stands out in performance at 24 and 80°C in comparison to cyclopentasiloxane; it will not only help to decrease the initial formation but also to break a foam already formed. Jolee 7202's performance, on the other hand, increases at higher temperature.

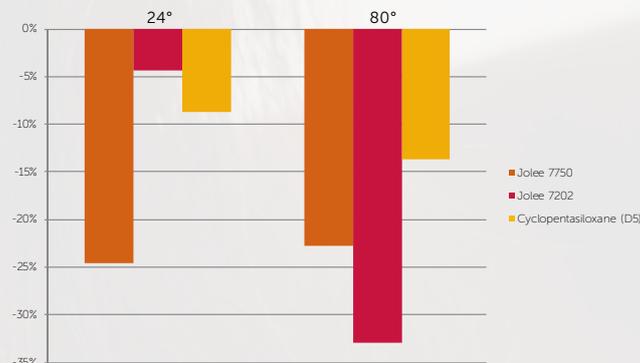


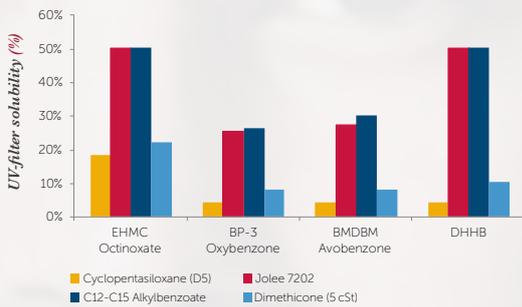
Figure 5: Foam decrease due to addition of cyclopentasiloxane (D5), Jolee 7750 and 7202 measured in comparison to control (without test product) at 24°C and 80°C.

UV-filter solubilization

The solubility of organic UV-filters in Jolee 7202 has been evaluated in order to prove its beneficial use in sun care formulations. In comparison to a common used benchmark and silicones, it is clear that Jolee 7202 brings an added value to any formulation containing organic UV-filters, even at high UV-filter concentrations. While formulating this means that, next to its benefit of being a natural silicone alternative, there is also no more need of adding additional UV-filter solubilizers.

The below graph shows the results of the various test solvents. Filters were added to the solvent, heated at 80°C for one hour and stored at room temperature and in parallel overnight at -10°C as an additional stability check.

After overnight storage at 25°C



After overnight storage at -10°C

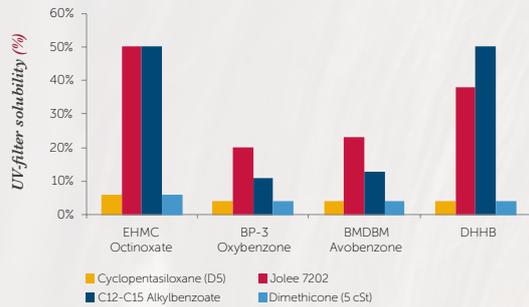


Figure 6 & 7: Solubility of UV-filters in Jolee 7202 compared to C12-C15 alkylbenzoate, cyclopentasiloxane and dimethicone (5 cSt). (EHMC = Ethylhexyl methoxycinnamate (US: Octinoxate); BP-3 = Benzophenone-3 (US: Oxybenzone); BMDBM= Butyl methoxydibenzoylmethane (US: Avobenzonone); DHHB = Diethylamino hydroxybenzoyl hexyl benzoate).

Sand repellency

Say no to an itchy sand feel! Jolee 7202 complements all sun care formulation with a unique sand repelling action. Furthermore, it improves the skin feel with its non-sticky, silky soft and powdery touch.

The sand repellent power of Jolee 7202 in comparison with two volatile silicones, cyclopentasiloxane (D5) and dimethicone (5 cSt) is shown below. For the test, 60 µL of sun oil was applied on a second skin patch. Afterwards, 5.35 gram dried, fine sand was pored on the patch and evenly spread with a finger. The excess of sand was removed. The graph shows the percentage of sand repelled in function of emollients used in the emulsion.

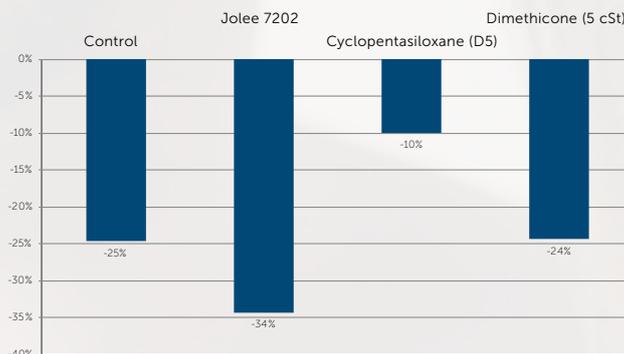


Figure 8: Sand repellent power of Jolee 7202 in comparison to a control and two volatile silicones, cyclopentasiloxane (D5) and dimethicone (5 cSt).

Compatibility with solvents/oils

Oleon's silicone-like Jolee products are short chained esters that 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 7750	Jolee 7202
Ethanol	≤ 75%	≤ 75%
Mineral oil	≤ 75%	≤ 75%
Sunflower oil	≤ 75%	≤ 75%
Dimethicone (5 cSt)	≤ 75%	≤ 75%
Dimethicone (300 cSt)	≤ 75%	≤ 75%
Cyclopentasiloxane (D5)	≤ 75%	≤ 75%
Propylene glycol (Radia 4710)	Insoluble	Insoluble
Isopropyl myristate (Radia 7730)	≤ 75%	≤ 75%
C8/C10 triglycerides (Radia 7104)	≤ 75%	≤ 75%

Table 2: Compatibility of Jolee 7750 and Jolee 7202 with various oils and solvents. Solubility was determined when mixture remained uniform and clear after mixing at 55-60°C and 24hrs at room temperature.

Pigment dispersion

Jolee 7750 is recommended to be used as a pigment disperser due to its high wetting power. Its pigment dispersion capacity can be shown on the graph below, where Jolee 7750 is compared with different benchmarks.



Figure 9: Amount of emollient (gram) needed to solubilize 1 gram of pigment (iron oxides C177491 Jojoba esters).

Hair detangling

In vitro tests have been performed on four leave-in hair oil formulations containing either Oleon's silicone-like emollients or cyclopentasiloxane (D5) to study the detangling efficacy. This efficacy was determined by measuring the combing force needed to comb tresses treated with hair oil compared to hair tresses treated with water. Hair oil formulations contained 70% of the test product as shown below:

LEAVE-IN HAIR OIL - OL0317					
PHASE		INGREDIENT	INCI	% W/W	% W/W
A		Radia 7363	<i>Triolein</i>	5	5
		Radia 7104	<i>Caprylic/capric triglycerides</i>	15	15
		Jojoba oil	<i>Simmondsia Shinensis (Jojoba) seed oil</i>	5	5
		Jolee 7380	<i>Trimethylolpropane triisostearate</i>	5	5
		Silicone-like emollients		70	0
		High volatile silicones		0	70

Oleon's silicone-like emollients showed a significant decrease in combing force needed to detangle the tresses compared to untreated hair. Based on conducted in vitro test it can be concluded that Oleon's silicone-like emollients have a similar efficacy as cyclopentasiloxane (D5).

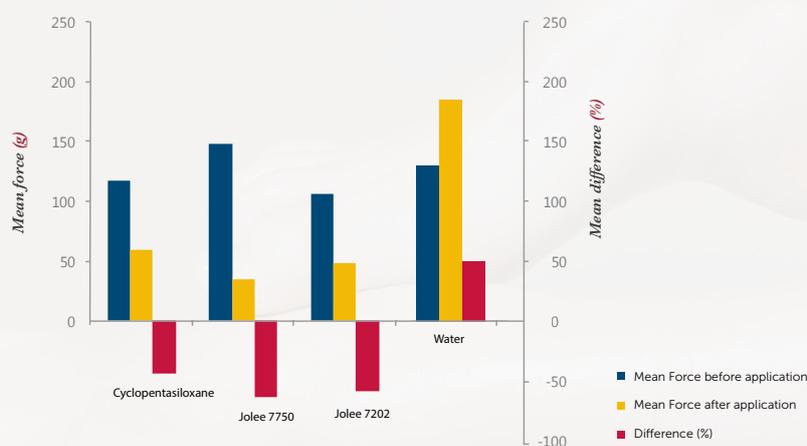


Figure 10: Combing force needed to detangle hair tresses at T0* (before application of hair oil) and T1 (after application of hair oil). Measurements were performed on dark brown, straight Caucasian hair with a TA.XT plus Texturometer from Stable Micro Systems. In red the decrease/increase of combing force is shown as a percentage of the initial combing force. *The values obtained at T0 differ due to the fact that no hair tress is equal to another and combing differences might be observed in each tress.



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