

PEG-free solubilizer for natural oils and lipophilic emollients

BENEFITS AT A GLANCE

- Effective solubilization of natural and fatty oils
- Crystal clear formulations possible
- Low foaming during processing
- Easy to handle, cold processable
- 100% based on renewable raw materials

INCI NAME (PCPC NAME)

Polyglyceryl-6 Caprylate; Polyglyceryl-3 Cocoate;
Polyglyceryl-4 Caprate; Polyglyceryl-6 Ricinoleate

CHEMICAL AND PHYSICAL PROPERTIES (NOT PART OF SPECIFICATIONS)

Appearance (20 °C)	clear to slightly turbid, yellowish, viscous liquid
HLB	~11
Surface tension (0.5% in water, r.t.)	~30 mN/m

PROPERTIES

TEGO® Solve 61 shows very good solubilizing properties for natural and fatty oils, e.g. almond, avocado, olive, jojoba, sunflower and argan oil. Also hydrophobic emollients like Caprylic/Capric Triglyceride or hydrophobic perfume oils, actives or preservatives can effectively be solubilized in water or water-based formulations.

Figure 1 illustrates the solubilizing efficacy of TEGO® Solve 61 in water and surfactant systems, compared to two benchmarks. It is comparable with the market standard PEG-40 Hydrogenated Castor Oil and clearly outperforms the PEG-free standard.

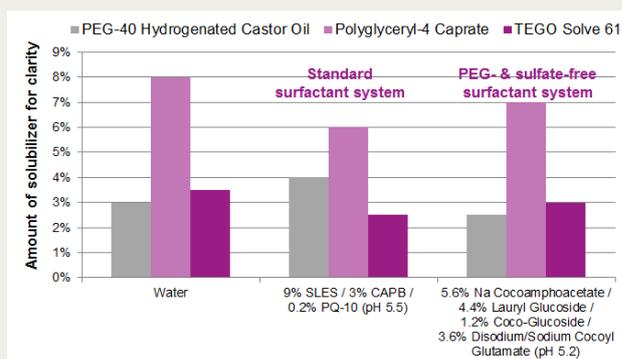


Figure 1: Solubilization of 0.5% Caprylic/Capric Triglyceride in water and surfactant systems (0.5% oil; x% solubilizer; ad 100% water resp. surfactant solution).

Figure 2 shows the solubilizing benefits of TEGO® Solve 61 for different natural oils. TEGO® Solve 61 clearly outperforms the PEG-free benchmark and is even more effective than the market standard PEG-40 Hydrogenated Castor Oil.

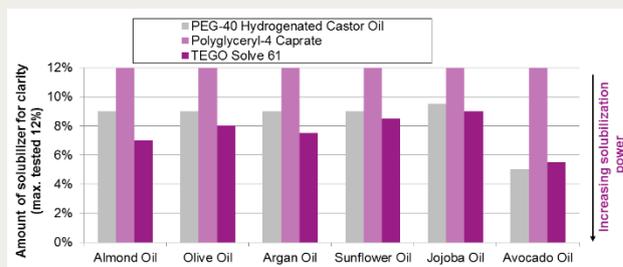


Figure 2: Solubilization of 0.5% oil in water (0.5% oil + x% solubilizer + slowly add water ad 100%. x = necessary amount of solubilizer for crystal clear solution).

Crystal clear formulations are accessible.

Note: TEGO® Solve 61 itself is usually not clearly soluble in water, especially in concentrations of approx. 1–5%, only the addition of an oil will give clarity.

In addition to the solubilizing properties, TEGO® Solve 61 exhibits ultra-mild cleansing attributes as well as improved moisturizing and skin feel benefits. Results of *in vitro* red blood cell tests showed mitigating effects, which means the addition of TEGO® Solve 61 to a surfactant base can improve the mildness of the final formulation.

TEGO® Solve 61 is low foaming in water, so mixtures with oils and water can easily be prepared. In surfactant mixtures, no negative effect on the foaming properties has been observed.

TEGO® Solve 61 shows almost no influence on odor or color of the final formulations.

TEGO® Solve 61 is 100% based on renewable raw materials. It is Ecocert approved.

PROCESSING

- In general, the necessary amount of solubilizers is highly dependent on the oil quality, solubilizer quality, water hardness, pH-value; the formulation in total, temperature and especially the processing method (e.g. speed of water phase addition).
- Recommended process: blend the oil with TEGO® Solve 61, heat to ~50 °C, and add water or a surfactant mixture very slowly, especially at the beginning. Later on it can be added faster.
- Processing at room temperature is easily possible with TEGO® Solve 61. No gel phase is formed (in marked contrast to PEG-40 Hydrogenated Castor Oil).
- Combination of two solubilizers (e.g. with TEGOSOFT® PC 41) recommended for the effective solubilization of lipophilic natural oils and essential/perfume oils together (mix the oils separately with the respective suitable solubilizer first)
- Recommended pH range for use of TEGO® Solve 61: approx. pH 4-8

APPLICATION

TEGO® Solve 61 can be used in:

- shampoos
- body/hand/ facial washes & gels
- make-up remover
- wet wipes
- emulsions

SUGGESTED USAGE CONCENTRATION

0.5 - 10.0 % TEGO® Solve 61

STORAGE

Store at temperatures below 30°C.

HAZARDOUS GOODS CLASSIFICATION

Information concerning

- classification and labelling according to regulations for transport and for dangerous substances
- protective measures for storage and handling
- measures in accidents and fires
- toxicity and ecological effects

is given in our material safety data sheet.

GUIDELINE FORMULATIONS

Clear conditioning shampoo with Argan Oil BK 357/4

TEGO® Solve 61	8.0%
Argan Oil	0.5%
Water	ad 100.0%
Polyquaternium-10	0.2%
Sodium Laureth Sulfate, 28%	32.0%
TEGO® Betain F 50 (Cocamidopropyl Betaine)	8.0%
ANTIL® 120 Plus (PEG-120 Methyl Glucose Dioleate)	1.0%
NaCl	0.7%
Preservative, Perfume	q.s.

Preparation:

Blend TEGO® Solve 61 with Argan Oil and heat to ~45 °C.
Dissolve PQ-10 in water and allow to swell. Add surfactants.
Slowly add the water phase to the oil phase.
Add ANTIL® 120 Plus. Adjust final viscosity with NaCl.

Remarks: pH=5.5; viscosity (Brookfield, 25 °C): 5000 mPas.

Micellar Water for Facial Cleansing, PEG-free UL 5803/9.1

TEGOSOFT® PC 41	1.00%
TEGO® Betain 810 (Capryl/Capramidopropyl Betaine)	1.30%
TEGO® Solve 61 (Polyglyceryl-6 Caprylate; Polyglyceryl-3 Cocoate; Polyglyceryl-4 Caprate; Polyglyceryl-6 Ricinoleate)	1.00%
Perfume	0.05%
Water	ad 100.00%
TEGO® Natural Betain (Betaine)	2.00%
Hexylene Glycol	1.40%
Glycerin	1.00%
Preservative	q.s.

Preparation:

Blend ingredients in the given order.

Remarks:

Clear, water-thin solution. pH = 5.0.
3in1: cleanses, removes make-up, soothes. Removes even
water-proof eye make-up.
In vitro-mildness test result (RBC): basically non irritant.
Micelles have a droplet size of $d = 14$ nm, detected by Dynamic
Laser Light Scattering.
Usage with a cotton-pad. No rinsing required.

Disclaimer

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Evonik Nutrition & Care GmbH
Goldschmidtstraße 100
45127 Essen, Germany
P.O.BOX 45116 Essen
PHONE + 49 201 173-2546
FAX +49 201 173 712546
personal-care@evonik.com
www.evonik.com/personal-care