

# TEGO® Solve 61

## 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 (CTFA name, proposed)

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

### Chemical and physical properties (not part of specifications)

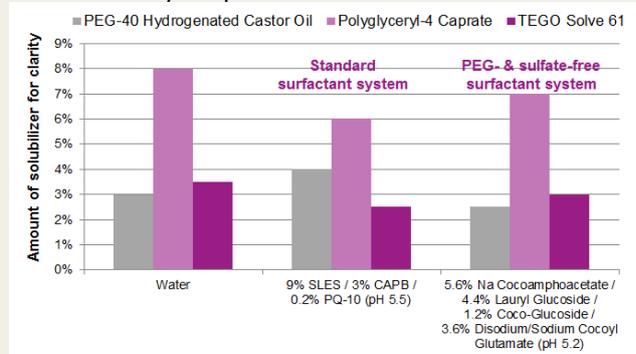
Appearance (20 °C)	clear to slightly turbid, yellowish, viscous liquid
HLB	~11
Surface tension (0.5% in water, r.t.)	~30 mN/m

### 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.

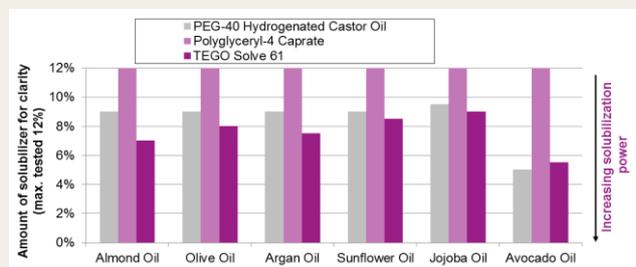
Figure 1 illustrates the solubilizing efficacy of TEGO® Solve 61 in water and surfactant systems,

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

### Packaging

600 kg (24 x 25 kg drum) on a CP3 pallet

### 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 formulation

<b>Clear conditioning shampoo with Argan Oil BK 357/4</b>	
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.
<b>Preparation:</b> 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.	

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