Natural based solubilizers

HIGH PERFORMANCE SOLUBILIZERS
FOR ALL SOLUBILIZATION NEEDS
Evonik offers a complete range of natural based solubilization solutions for the incorporation of different types of oils into clear water-based formulations.

- Naturality & Sustainability
- Versatility
- Multifunctionality

High performance solubilizers with proven sustainability features

**ESSENTIAL OILS, PERFUME OILS AND FLAVORS**
- **TEGO® Solve 55 MB** Cost-efficient
- **TEGO® Solve 90 MB** Certified

**LIGHT/POLAR EMOLLIENTS**
- **symbio®solve plus MB** Highly efficient
- **RHEANCE® One** Next generation
- **TEGOSOFT® PC 41 MB**

**FATTY NATURAL OILS**
- **TEGO® Solve 61 MB**

**INCREASING HYDROPHOBICITY**
## EVONIK PORTFOLIO OF NATURAL BASED SOLUBILIZERS AT A GLANCE

<table>
<thead>
<tr>
<th>SOLVENT</th>
<th>HLB</th>
<th>RSPO (MB)</th>
<th>COSMOS</th>
<th>ECOCERT</th>
<th>HALAL</th>
<th>VEGAN</th>
<th>CFDA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>symbio*solv clear plus MB</strong>&lt;br&gt;Caprylyl/Capryl Glucoside; Aqua; Sodium Cocoyl Glutamate; Glycerlyl Caprylate; Citric Acid; Polyglyceryl-6 Oleate; Sodium Surfactin</td>
<td>-25% water</td>
<td>-16</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>TEGO® Solve 55 MB</strong>&lt;br&gt;Polyglyceryl-3 Caprate/ Caprylate/Succinate; Propylene Glycol</td>
<td>-25% Propylene Glycol</td>
<td>-15</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>TEGO® Solve 90 MB</strong>&lt;br&gt;Polyglyceryl-6 Caprylate; Polyglyceryl-4 Caprate</td>
<td>-10% water</td>
<td>-15</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>RHEANCE® One</strong>&lt;br&gt;Glycolipids</td>
<td>-50% water</td>
<td>pH dependent: 4 (pH 4.5) – 13 (pH 6.1)</td>
<td>N/A</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>TEGOSOFT® PC 41 MB</strong>&lt;br&gt;Polyglyceryl-4 Caprate</td>
<td>-10% water</td>
<td>-14</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>TEGO® Solve 61 MB</strong>&lt;br&gt;Polyglyceryl-6 Caprylate; Polyglyceryl-3 Cocoate; Polyglyceryl-4 Caprate; Polyglyceryl-6 Ricinoleate</td>
<td>-10% water</td>
<td>-11</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

1 MB = mass balance  
2 N/A = not applicable  
3 vegan according to the definition of the European Vegetarian Union
Solubilization tests to afford crystal-clear solutions of 1.0% essential oils in water

At room temperature

TEGO® Solve 55 MB, TEGO® Solve 90 MB and symbio® solv clear plus MB show high solubilizing power for the incorporation of many essential oils into water.

With natural based solubilizers consumer brands can significantly improve their sustainability profile without compromising performance.
**Solubilization tests to afford crystal-clear solutions of 0.5% emollient oil in water**

*At room temperature*

**TEGOSOFT® PC 41 MB** is highly effective for the solubilization of light and relatively polar emollients.  

**TEGO® Solve 61 MB** outperforms the standard PEG-containing solubilizers for highly lipophilic emollients.

![Graph showing amount of solubilizer needed for clear solution for various emollients.](image)

- PEG-40 Hydrogenated Castor Oil
- TEGOSOFT® PC 41 MB
- Polysorbate 20
- TEGO® Solve 61 MB

**Solubilization tests to afford crystal-clear solutions of 0.5% natural oil in water**

*At room temperature; max. 12% solubilizer tested*

**TEGO® Solve 61 MB** outperforms the standard solubilizer PEG-40 Hydrogenated Castor Oil for natural oils.

![Graph showing amount of solubilizer needed for clear solution for various natural oils.](image)

- PEG-40 Hydrogenated Castor Oil
- TEGOSOFT® PC 41 MB
- Polysorbate 20
- TEGO® Solve 61 MB

1. Not crystal-clear with PEG-40 Hydrogenated Castor Oil
2. Contains approx. 90% soybean oil
**Moisturizing benefits**  
*In vivo* Corneometer test results

TEGO® Solve 61 MB acts as a humectant and provides moisturization as shown in an *in vivo* short-term moisturization test (Corneometer) out of a body lotion.

**Viscosity effects**  
*In surfactant-based formulations*

The polyglycerol ester-based solubilizers show significantly lower viscosity reduction in surfactant-based formulations than PEG-40 Hydrogenated Castor Oil, enabling reduced thickener levels.

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**SKIN HYDRATION IMPROVEMENT (∆CU VALUES) AFTER 2 H REL. TO CONTROL [%]**

<table>
<thead>
<tr>
<th></th>
<th>CONTROL UNTREATED SKIN</th>
<th>VEHICLE</th>
<th>3% TEGO® Solve 61 MB</th>
<th>5% TEGO® Solve 61 MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>∆CU [%]</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>20</td>
</tr>
</tbody>
</table>

**BROOKFIELD VISCOSITY [mPa s]**

![Viscosity Graph]

9% Sodium Laureth Sulfate, 3% Cocamidopropyl Betaine, 0.2% Polyquaternium-10, 0.5% NaCl, 2.5% PEG-18 Glyceryl Oleate/Cocoate; pH 5.5

**SITA foam measurement**

0.5% a.m. in water (10°dH) at 30 °C, pH 6, 1500 rpm

symbio®solv clear plus MB contributes to the foaming performance of the final product. Hence, the total surfactant amount may be reduced, improving the mildness of the formula.

TEGO® Solve 55 MB, TEGO® Solve 90 MB and TEGO® Solve 61 MB are low foaming in water, thus enabling fast and easy processing.
EFFICIENT AND GENTLE MAKEUP REMOVAL

GET INSPIRED
Micellar water for makeup removal
BK 484/2

Makeup removal test results on PMMA plates – 3% a.m. surfactant or solubilizer in water

The PEG-free solubilizers efficiently remove makeup in a very gentle way. They effectively reduce the surface tension of water and show superior pigment-wetting properties.

Red Blood Cell (RBC) tests showed that all five products are basically non-irritant.

## Processing
Blend ingredients in the given order.

## Remarks
pH = 5.0
In vitro mildness test result (RBC): basically non-irritant

## Texture and Sensory
- Clear, water-thin solution.
- 3-in-1: Cleanses, removes makeup, soothes.
- Removes even waterproof eye makeup. Use with a cotton pad. No rinsing required.
BENEFITS

- Proven sustainability features combined with high performance – suitable even for natural concepts
- Broad application profile supportive of current market trends
- Easy to handle and cold processable (no gel phase)
- Low influence on viscosity of surfactant formulations compared to PEG-containing benchmarks reduces thickener levels
- Very low impact on odor and color of formulations
- Gentle cleansing and makeup-removing properties

PROPERTIES

- Based 100% on renewable raw materials
- PEG-free
- Low-viscosity liquids
- Colorless to slightly yellow
- Effectively reduces the surface tension of water
- Recommended use level: 1 – 25%

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