OLIVEM® 1000
The first emulsifying active ingredient
OLIVEM® 1000

Olivem® 1000 (Cetearyl Olivate, Sorbitan Olivate) is a PEG-free naturally derived self-emulsifying active ingredient designed for oil-in-water systems. Drawing from Hallstar’s deep expertise in olive oil chemistry, Olivem® 1000 is derived from a complex combination of fatty acids that are chemically similar to the composition of the hydrolipidic film of the skin. Olivem® 1000 has the ability to generate liquid crystal structures, making it an ideal biomimetic ingredient in terms of composition and structure for use in a very wide range of applications.

TECHNICAL DATA

- INCI: Cetearyl Olivate, Sorbitan Olivate
- China approved
- Solvent-free manufacturing and preservative free
- Ivory flakes (non-sticky, easy to handle)
- Recommended concentration: 0.5-5%; pH of stability: 4.5-8.0;
- Melting point: 65-75°C

A BIOMIMETIC INGREDIENT

Olivem® 1000 is a biomimetic ingredient designed to mimic the physiological processes and chemical composition of human skin for complete skin affinity and maximum performance.

<table>
<thead>
<tr>
<th></th>
<th>Coconut oil</th>
<th>Olive oil</th>
<th>Healthy Skin Sebum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short chain ≤C12; saturated</td>
<td>&gt;40%</td>
<td>&lt;5%</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Long chain C14-C18; saturated</td>
<td>25-35%</td>
<td>10-25%</td>
<td>40%</td>
</tr>
<tr>
<td>Long chain C14-C18; unsaturated</td>
<td>6.0-10%</td>
<td>60-85%</td>
<td>50%</td>
</tr>
</tbody>
</table>

EASY-TO-USE FORMULATION BASE

Recommended dosage levels: 0.5-5%

<table>
<thead>
<tr>
<th>Phase</th>
<th>INCI Name</th>
<th>Trade Name</th>
<th>% Wt</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Water (Aqua) (deionized)</td>
<td>-</td>
<td>up to 100</td>
</tr>
<tr>
<td></td>
<td>Trisodium Ethylenediamine Disuccinate</td>
<td>-</td>
<td>0.30</td>
</tr>
<tr>
<td>B</td>
<td>Cetearyl Olivate, Sorbitan Olivate</td>
<td>Olivem® 1000</td>
<td>5.00</td>
</tr>
<tr>
<td></td>
<td>BHT</td>
<td>-</td>
<td>0.10</td>
</tr>
<tr>
<td>C</td>
<td>Preservative</td>
<td>-</td>
<td>a.n.</td>
</tr>
</tbody>
</table>

Glycolic anhydrous gel formation at 5% with:
- Glycerin
- Propylene Glycol

Quasi-drug (Japan)

Hallstar Italia, as a member of RSPO, is interested in supporting the efforts of RSPO to promote the growth and use of sustainable oil palm products. We are now able to provide a certified sustainable version of this product according to the Mass Balance supply chain model.

Viscosity performances

As emulsifier 3-5%

5% Olivem® 1000 emulsifies up to 20% oil concentration of wide range of emollients
**SENSORIAL VERSATILITY**

<table>
<thead>
<tr>
<th>Olivem® 1000 into Water Phase</th>
<th>Olivem® 1000 into Oil Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light sensation</td>
<td>Nutritive</td>
</tr>
<tr>
<td>Moderate soapy effect</td>
<td>Reduced soapy effect</td>
</tr>
<tr>
<td>Less glossy</td>
<td>More glossy</td>
</tr>
<tr>
<td>Fast absorbed</td>
<td>Longer play time</td>
</tr>
</tbody>
</table>

**CLINICALLY-PROVEN DELIVERY OF ACTIVE INGREDIENTS**
Acts as a carrier of caffeine into the epidermis and promotes the delivery of water-soluble active ingredients.

![Evaluation of reconstructed epidermis](image)

**PROTECTIVE EFFECT**
5% Olivem® 1000 in water demonstrates a good soothing, reparatory and regenerating activity on keratinocytes.

Skin equivalent (reconstituted human epidermis)
1. Exposure to Triton x-100 (detergent)
2. Post-stress application of Olivem® 1000 5% gel
3. Measurement of cell viability - MTT assay (mitochondrial activity)
4. Measurement of cellular integrity
   Release of the pro-irritant IL-1α

![Cell damage - IL-1α](image)

**IMPACT OF OLIVEM® 1000 ON SKIN’S CUTANEOUS MICROBIOTA**
To evaluate the impact of Olivem® 1000 on cutaneous microbiota after eight days of repeated applications, Hallstar conducted an in vivo metagenomic study.

- Tested dose: Olivem® 1000 formulated at 5%
- Panel: 22 Caucasian female subjects aged from 20 to 40 years old and presenting with a normal and healthy skin on the inner forearms
- Application protocol:
  - D-1 morning: last cleansing of forearms with usual cleanser and no other product application until D0
  - From D0 morning to D7 evening: application of a standard amount of formula with 5% Olivem® 1000 on forearms in place of usual skincare product, twice a day (after showering, if applicable); volunteers continue to use their usual cleanser during this period (maximum twice a day)
  - D8 morning: last cleansing of forearms with usual cleanser and no other product application until D9
- Skin microbiota is analyzed at D0 (before the first application) and D9 with measurements of:
  - Semi-quantitative bacterial composition (relative abundance) through 16S-rDNA metagenomic approach
  - Shannon index (microbiota diversity)
Semi-quantitative bacterial composition: relative abundance

At both the phylum level and genus-species level, no significant change is observed at D9 compared to D0 in terms of cutaneous bacterial composition. The global picture is very stable.

Note that the species Staphylococcus epidermidis is preserved (6% at both D0 and D9); this commensal bacteria is known to protect the skin against inflammation/pathogens attacks, and contributes to the skin innate immune defense.

Biodiversity of ecological communities
The Shannon index measures biodiversity of ecological communities and assigns a value between 0 and 5. The higher the Shannon index, the greater biodiversity.

Shannon's diversity index is very stable from D0 to D9.

In addition, we see that at D9, the data distribution is tighter and the Shannon value tends to increase. These results suggest that Olivem® 1000 could preserve microbial diversity over time, even in the presence of preservatives.