

INCI: Cetearyl Olivatate, Sorbitan Olivatate

**According to the strong market request, B&T is now launching a new vegetable PEG-FREE emulsifier, selected and produced with its own know-how: OLIVEM 1000, a new O/W emulsifier derived from olive oil.** OLIVE OIL, in fact, is the one of the lipids showing the highest compatibility with our skin, and the innovative idea is combining all the precious virtues of olive oil with interesting cosmetic functions.

From the original olive oil, by esterification of its fatty acids groups with sorbitol and cetearyl alcohol, we obtained **a new, non ethoxylated, mild emulsifier.**

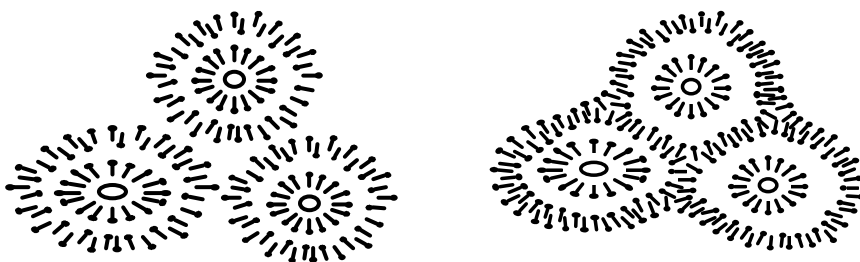
**OLIVEM 1000 is a functional self-emulsifying system of the new generation, forming a liquid crystal network inside the emulsion, and allowing the easy formulation of stable emulsions.** It has got a pleasant silky touch, moisturising properties and nice spreadability, all due to its important origin from olive oil. The gel network stabilizes the emulsion, absorbs on the skin and reduces the Transepidermal Water-loss without solubilizing the skin proteins and lipids.

Olivem 1000 is made by natural raw-materials, it's free from soap and ethoxylated ingredients. While the Cetearyl Ester derivative stabilizes the liquid crystals, Sorbitan Olivatate enhances the emolliency properties and provides easier dispersion for powders ( Uv filters and pigments are easily dispersed at high percentages). Furthermore OLIVEM 1000 combines the liquid crystal structure with the oleic component derived from olive oil, which is responsible for its easy skin penetration, with a soft, silky smooth after-feel.

The substantivity of its composition, being very similar to the human sebum, provides retention of the skin moisture and increases the active ingredient's resistance to water and/or sweat.

## LIQUID CRYSTAL STRUCTURE

OLIVEM 1000 works by forming liquid crystals in emulsions. In fact it places itself at the interface of a two phase system in a preferential direction, placing the polar head into the aqueous phase and the apolar tail into the lipidic phase. The post-micellar organization of OLIVEM 1000 in water is the typical structure of a liquid crystal reticule, where the bilayer micelles create a multilayer lamellar formation. Following the images of the formation first of lamellar liquid crystals ( Picture A ), and of the reticular structure ( Picture B )



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For such reasons, emulsions formulated with OLIVEM 1000 appear very shiny and light and have an original, fresh and silky touch even if they contain high percentages of lipids.

OLIVEM 1000, forming this reticular structure inside the emulsion, allows the formulation to contain quite large amounts of natural and polar lipids without affecting the final stability of the emulsion ( up to 25% ). Despite the final polarity of the lipidic phase OLIVEM 1000 may build up emulsions containing natural oils as the only lipids, giving the emulsion a “natural” origin. Oil-free systems are also available, giving very light and fast-absorbed textures.

**The major advantages of using OLIVEM 1000 liquid crystal system are:**

- **stability of viscosity with different lipidic phase**
- **high hydration and moisturizing effect**
- **extremely high skin absorption**
- **light texture without whitening effect**

## **TOTAL SAFETY AND NO TOXICITY**

OLIVEM 1000, as with all B&T products, **has not been tested on animals**. It has been tested on human skin (for primary potential irritation: **PATCH TEST**), 100% active, and in vitro system (RED CELL BLOOD TEST ) diluted at 10% in demineralized water.

**Results show that the product can be classified as NON IRRITANT on the skin and in vitro**. From the results of the tests performed on OLIVEM 1000, it can be concluded that the use of this ingredient in cosmetic formulations is absolutely safe.

- **PATCH TEST**

The primary irritation test has been made using OLIVEM 1000 applied undiluted. The test requires the application of an occlusive patch on the skin of the back on 20 adult healthy volunteers, and it is left on the skin for 48 hours. At the end of this period, the patch is removed and the conditions of the skin are evaluated after 15 minutes and after 24 hours from patch removal. Irritation Index was 0,05 after 15 minutes, and 0,15 after 24 hours.

The results of this test allow us to define the **product as “NON IRRITANT”**.

- **RED BLOOD CELL TEST (ocular irritation alternative test)**

The Red Blood Cell Test can quantify the effects of surfactant detergents products on the cytoplasmic membranes (Hemolysis) in combination with the damage of liberated cellular protein (Denaturation). Various concentrations of test sample are incubated with a defined quantity of RBC suspension for 10 minutes. At the end of the incubation period, the resulting supernatant is monitored to evaluate the ability of test samples to induce hemolysis or denaturation.

The relation between hemolysis and protein Denaturation, known as Lysis/Denaturation ratio, is then calculated and may be compared with acute eye irritancy data.

## LEGENDA

In Vivo eye irritation	in vitro L/D	In Vivo eye irritation	in vitro L/D
Not irritant	>100	Irritant	> 0.1
Slightly irritant	>10	Very irritant	< 0.1
Moderately irritant	>1		

Olivem 1000 has been tested 10% diluted in demineralized water following the a.m. procedure. The irritation index is > 100

## SKIN HYDRATION

**Many studies show liquid crystal based emulsions increase the hydration capacity on our skin, both short term and long term.** In such a structure the amount of intralamellar water can reach 70% percent, and all this water is immediately available for the skin as soon as the cream is spread and the network is broken. This structure is also responsible for the cooling effect one feels while spreading.

## COSMETIC APPLICATIONS

OLIVEM 1000 can be easily used as the primary O/W emulsifier, also alone and without consistency factors.

The recommended use level is: 2-8%, depending on the formulation.

The product is very easy to employ as the only emulsifier:

- **melt lipidic phase to 70-75 °C**
- **mix watery phase and heat it up to 70°C**
- **under homogeneization, slowly add lipidic phase to water for direct process**
- **homogenize for a couple of minutes**
- **cool down slowly while mixing**
- **final viscosity is generally reach in 24 hours ( about 20% higher than the viscosity at time 0 ) and remains stable thereafter.**
- **agitation process can influence the final viscosity: low stirring provide lower viscosity and the structure is organized as a lamellar structure.**
- **faster agitation produces a less consistent structure, although still stable, with a smaller particles size**
- **At 2-3 % the inverse method is possible too, adding the watery phase to the lipidic one**  
( for example when a pre-mixing of the oil phase and powders is recommended ).  
The final viscosity and the stability are not affected.

## EMULSIFYING ABILITY

**Olivem 1000 has been tested in a percentage range from 2 to 8 % with a lipid phase from 5% to 25% at different polarity value .** The analysis on the numerous laboratory trials allowed us to conclude:

- **OLIVEM 1000** allows to emulsify various oils with different polarity ( mineral oil, liquid esthers and waxes, triglycerides and vegetal oils )
- From 6 to 8% **OLIVEM 1000** works as a self-emulsifying system, without consistency factors or rheological modifiers required.
- From 4 to 5 % **OLIVEM 1000** is able to emulsify a lipid phase from 5 to 25%, obtaining from light emulsions to consistent creams.

A very low amount of gelling agent ( ex. 0,1 % carbomer or 0,3% xanthan gum ) is enough to grant the stability.

- From 2 to 3% **OLIVEM 1000** provides light fluid lotions .
- The manufacturing procedure grants a stable liquid crystal emulsion with slow agitation required.

## COMPATIBILITY WITH THICKENING AGENTS

We have checked in laboratory the compatibility of OLIVEM 1000 with some of the most employed gelling agents, in order to be able to modify the rheological characteristics of the emulsion. The final viscosity, stability, texture and absorption have been evaluated .

Based on a general formulation, we checked different gelling agents, obtaining the following results:

The general formula we used was:-A-

<b>OLIVEM 1000</b>	3.0%
Fluid ester ( Cetearyl Ethylexanoate )	7 %
Gelling agents	as needed
Preserved Water	up to 100

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GELLING AGENTS	%	Stability centrifuge ( 5000rpm60' )	COA*	Viscosity	pH	Texture*	Absorption*
1. Xantan gum	0.3	stable	3	<b>(S4;v30)</b> 2070 cPs	5.3	5	5
2. Hydroxyethylcellulose	0.5	unstable	3	<b>(S4;v30)</b> 1723 cPs	5.4	3	4
3. Carbomer	0.25	stable	4	<b>(S4;v30)</b> 4900 cPs	6.4	4	5
4. Sodium Polyacrylate	0.40	stable	5	<b>(S4;v30)</b> 3950cPs	5.8	5	5
5. Polyacrylamide, C13-14 Isoparaffin,	0.50	stable	4	<b>(S4;v30)</b> 4467cPs	5.9	4	4

**-B-**

OLIVEM 1000	3.0%
Fluid ester ( Cetearyl Ethylexanoate )	17 %
Gelling agents	as needed
Preserved Water	up to 100

GELLING AGENTS	%	Stability centrifuge (5000rpm60')	COA*	Viscosity	pH	Texture*	Absorption*
1. Xantan gum	0.3	stable	3	<b>(S3;v30)</b> 2260 cPs	5.2	5	5
2. Hydroxyethylcellulose	0.5	unstable	4	<b>(S3;v30)</b> 2383 cPs	5.6	3	4
3. Carbomer	0.25	stable	5	<b>(S4;v30)</b> 3920 cPs	6.1	4	5
4. Sodium Polyacrylate	0.40	unstable	3	<b>(S5;v30)</b> 6520cPs	5.9	3	4
5. Polyacrylamide, C13-14 Isoparaffin, Laureth-7	0.50	stable	4	<b>(S6;v30)</b> 14000cPs	6.0	3	4

\* expressed by a numeric scale from 1 to 5

**All these thickeners increase the emulsions' viscosity in many different ways.**

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The amount of the rheological modifiers has been chosen on the base of our best technical knowledge. The amount of OLIVEM 1000 and the different gelling agents didn't change in both the trials, while the total lipid phase has been tested at 10 and 20 % .

**Xantan gum**, for instance, increases the stability while the viscosity is only lightly affected, so it is recommended for fluid formulations only.

The texture and the skin absorption properties are quite interesting.

**Hydroxyethylcellulose** increases viscosity but a higher percentage is required: 0,8% at least or in combination with a different rheological modifier.

**Carbomer** ( Carbopol 2050), can be used at low quantities: from 0,1 to 0.25% , depending on the final viscosity required: 0,1 % is already enough to give excellent stability. The amount of lipid phase doesn't significantly affect the final viscosity.

**Polyacrylamide** , **C13-14 Isoparaffin**, **Laureth-7** (Sepigel 305), at the chosen percentage of 0,5%, gives a light fluid emulsion with the lower amount of lipid phase (7% ), while it provides a quite consistent cream with the higher amount ( 17%).

**Sodium polyacrylate** gives a very white and shine emulsion, the most interesting in terms of bulk appearance, but the higher amount of lipid phase causes instability using the centrifuge test.

#### • OLIVEM 1000 AS AUTOEMULSIFYING SYSTEM

**OLIVEM 1000 performs also as self-emulsifying system. This means that if OLIVEM 1000 is added with water, it may act both as emulsifier and as the only source of fats.**

The result is a very light gel-emulsion, containing a high amount of water, suitable for a wide range of application. Olivem 1000 is melted alone and added under fast agitation (stirring is not necessary) to water pre-heated at 60-70 °C.

**In these cases the percentages of Olivem 1000 are between 5 to 10%**, depending on the kind of viscosity and texture desired. Higher amount will provide a more consistent and nourishing creamy product, while at 5% you will get a "gel-cream" emulsion with a cool and light texture.

These formulations can be used for different functional properties.

By the simple addition of surfactants: a cleansing cream is obtained;

by the addition of a conditioning agent: an hair-conditioning cream is obtained;

by the addition of anti-wrinkle active principle: a very light anti-ageing product is obtained.

OLIVEM 1000, as an auto-emulsifying system, can be particularly interesting for hair-care cream masques. Besides it allows to create various formulations based on the same natural based systems, matching a very nice silky touch with nature.

It is also very interesting to observe the strong synergy between OLIVEM 1000 and OLIVEM 700 ( 2- 3% ). The last one used as a functional lipid and sensorial modifier



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can provide a richer and original texture to the final products ( see formulative example at the end of the bulletin )

## CONCLUSIONS

**OLIVEM 1000 is a naturally derived emulsifier of the new generation, creating a liquid crystal network inside the emulsion that allows the employment of natural polar lipids, light esthers and silicon based products.** The emulsions containing OLIVEM 1000 match all the important characteristics of liquid crystals with the natural origin from olive oil: the oleic composition of the emulsifier is responsible for the extremely high compatibility and fast skin penetration of the product into skin.

The formation of reticular structures organised in liquid crystals gives the emulsion a high hydrating power thanks to the water that is kept inside the network.

As remarked, OLIVEM 1000 may also be employed in oil free systems as the only source of fats, to get a very pleasant, skin friendly and economic base suitable for a broad range of applications.

**OLIVEM 1000 has shown very satisfactory results in the formulation of O/W emulsions that perform perfect tolerance, total safety, natural profile and skin treating properties.**

**The product is non irritant and very safe for cosmetic and pharmaceutical applications.**

## BIODEGRADABILITY

The determination of biodegradability has been made according to the CEE regulation N. 82/242. OLIVEM 1000 is biodegradable over 90 % (OECD method).

## FORMULATIONS

The following formulations indicated here give general directions for the employment of OLIVEM 1000.

Although they have been realised according to best information we know, this does not exonerate the user from verifying their validity. B&T Technical Assistance is at the user's disposal in order to contribute to the development of new formulations, and to give the needful information for correct use of our products

## Nourishing Cream

Phase A	%
1. OLIVEM 1000	6
2. C12-15 Alkyl Benzoate	5
3. Sweet Almond Oil	5
4. Sesame Oil	10
5. Mineral Oil	5
Phase B	
1. Dem.water	up to 100
2. Carbopol 2050	0,1
Phase C	
Sodium Hydroxide	as
Perfume	
Preservatives	as
	as

## Hydrating Lotion

Phase A	%
1. OLIVEM 1000	2
2. Isononyl Isononanoate	5
3. Wheat Germ Oil	10
4. Dimethicone	0,5
5. Hydrogenated Lecithin	0,5
Phase B	
1. Dem.water	up to 100
2. Xanthan Gum	0,4
Phase C	
<b>Eurol BT ( Olive Leaf Extract )</b>	0,1
Preservatives	as needed

## Oil-Free Sun Care cream SPF 8 (theoretical)

Phase A	%
1. OLIVEM 1000	3
2. OLIVEM 700	2
3. Caprylic/capric Triglyceride	10
4. Isononyl Isononanoate	5
5. Benzophenone 3	0.5
6. Ethylhexyl Methoxycinnamate	5
7. Titanium Dioxide	2
8. Hydrogenated Lecithin	0,5
Phase B	
1. Dem.water	up to 100
2. Xanthan Gum/Bentonite	1.2
3. Polyether-1	0.2
Phase C	
Preservatives	as needed
Perfume	as needed
<b>Eurol BT ( Olive Leaf Extract )</b>	0,2

## Hair-care masque

Phase A	%
1. OLIVEM 1000	8
Phase B	
1. Dem.water	up to 100
Phase C	
Cetrimonium Chloride	2.5
Perfume	as needed
Preservatives	as needed



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## TECHNICAL DATA SHEET

### 01 PRODUCT AND COMPANY IDENTIFICATION

<b>Trade Name</b> .....	:	<b>OLIVEM 1000</b>
<b>Applications</b> .....	:	non ionic, not ethoxylated self-emulsifying system derived from olive oil for O/W creams and lotions
<b>INCI Name</b> .....	:	CETEARYL OLIVATE, SORBITAN OLIVATE
<b>CAS Number</b> .....	:	85116 -80-9 ; 92202-01-2
<b>EINECS</b> .....	:	2855323 ; 2960335
<b>Legislative Approval</b> .....	:	world-wide
<b>Company</b> .....	:	B & T Srl - Via O. da Tresseno, 9 - 20127 MILAN - Italy Tel. 0039.02 26142044 - Fax 0039.02.26142060

### 02 SPECIFICATIONS

<b>Form @ 20°C</b> .....	:	waxy solid in flakes
<b>Color</b> .....	:	white-ivory
<b>Odor</b> .....	:	slightly characteristic
<b>Active Substance, %</b> ..	:	99.0 min.
<b>Water Content</b> %.....	:	1.0 max
<b>Acid Value</b> .....	:	5 - 15

### 03 SOLUBILITY

<b>Soluble</b> .....	in ethanol and vegetal oil
<b>Dispersible</b> .....	in water and propylene glycol

### 04 TYPICAL VALUES

<b>pH ( sol 5%)</b> .....	5 - 7
<b>Colour ( Gardner on the melted product)</b> ..	3 - 4.5
<b>Saponification Value</b> .....	90 - 120
<b>Melting Point</b> .....	65 -75°C
<b>Additives and preservatives</b> ...	none



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## **0!** **SHELF-LIFE**

5 years stored unopened into original containers at a temperature between 5 and 35°C following GMP guidelines

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