RESPLANTA®
the natural way to add the properties of oils to your cosmetic formulation

RESPLANTA® SERIES

Resplanta® ALM
Resplanta® BABASSU
Resplanta® COCONUT
Resplanta® COTTON
Resplanta® GRAPE
Resplanta® HEMP
Resplanta® JOJOBA
Resplanta® KARITE®
Resplanta® MAC
Resplanta® MAIS
Resplanta® OLEA
Resplanta® PALM
Resplanta® PEACH
Resplanta® PGA
Resplanta® RICE
Resplanta® SMO
Resplanta® SOJA
Resplanta® SUN
Resplanta® TRITICUM

Almond Oil Glycereth-8 Esters
Babassu Oil Glycereth-8 Esters
Coconut Oil Glycereth-8 Esters
Cotton Seed Oil Glycereth-8 Esters
Grape Seed Oil Glycereth-8 Esters
Cannabis Sativa Seed Oil Glycereth-8 Esters
Jojoba Oil Glycereth-8 Esters
Shea Butter Glycereth-8 Esters
Macadamia Seed Oil Glycereth-8 Esters
Corn Oil Glycereth-8 Esters
Olive Oil Glycereth-8 Esters
Palm Oil Glycereth-8 Esters
Peach Kernel Oil Glycereth-8 Esters
Avocado Oil Glycereth-8 Esters
Rice Oil Glycereth-8 Esters
Sesame Oil Glycereth-8 Esters
Soybean Oil Glycereth-8 Esters
Sunflower Seed Oil Glycereth-8 Esters
Wheat Germ Oil Glycereth-8 Esters

RESPLANTA®
is a complete series of water soluble/dispersible vegetable oils.
The exclusive trans-esterification process, that replaces the glycerin of the triglycerides with the Glycereth-8 from vegetable glycerin, guarantees the absence of dioxan and ethylene oxide residues (< 1 ppm for both).

THE PROCESS

The Res Pharma manufacturing process is not a direct condensation with ethylene oxide, and therefore our products offer the following advantages:

✔️ The fatty acids composition and the unsaponifiable fraction reflect that of the starting vegetable oils. REPLANTA® water soluble/dispersible oils reflect the properties, the appearance and the behavior of the starting oil.

✔️ In RESPLANTA® products, the unsaponifiable fraction of the starting oils (phytosterols, squalene, vitamins, etc...) is not ethoxylated as in the directly ethoxylated oils commonly found in the market.

✔️ Complete elimination of free ethylene oxide and dioxane that are normal residues of the direct ethoxylation process.
HIGHLIGHTS

✓ They are easy to use.
✓ They form a gel in water.
✓ RESPLANTA® have an excellent dermal and ocular compatibility, tested using the Invitro Irritection® method

WATER SOLUBILITY

✓ The level of water solubility depends on the starting oil.
If they are not 100% clear in water, they become clear in surfactant systems.

<table>
<thead>
<tr>
<th>% IN WATER</th>
<th>1.0 – 5.0 %</th>
<th>6.0 – 10.0 %</th>
<th>11.0 – 15.0 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESPLANTA® ALM</td>
<td>clear liquid</td>
<td>from clear to slightly hazy viscous liquid</td>
<td>slightly hazy gel</td>
</tr>
<tr>
<td>RESPLANTA® BABASSU</td>
<td>clear liquid</td>
<td>clear liquid</td>
<td>clear liquid</td>
</tr>
<tr>
<td>RESPLANTA® COCONUT</td>
<td>clear liquid</td>
<td>clear liquid</td>
<td>clear liquid</td>
</tr>
<tr>
<td>RESPLANTA® COTTON</td>
<td>clear liquid</td>
<td>clear liquid</td>
<td>clear liquid</td>
</tr>
<tr>
<td>RESPLANTA® GRAPE</td>
<td>clear liquid</td>
<td>from clear to slightly hazy viscous liquid</td>
<td>slightly hazy gel</td>
</tr>
<tr>
<td>RESPLANTA® HEMPH</td>
<td>clear liquid</td>
<td>clear viscous liquid</td>
<td>slightly hazy gel</td>
</tr>
<tr>
<td>RESPLANTA® JOJOBA</td>
<td>hazy liquid (1%)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>RESPLANTA® KARITE</td>
<td>hazy liquid</td>
<td>hazy viscous liquid</td>
<td>hazy viscous liquid</td>
</tr>
<tr>
<td>RESPLANTA® MAC</td>
<td>clear liquid</td>
<td>clear viscous liquid (6-7%)</td>
<td>hazy gel</td>
</tr>
<tr>
<td>RESPLANTA® MAIS</td>
<td>clear liquid</td>
<td>clear viscous liquid</td>
<td>slightly hazy gel</td>
</tr>
<tr>
<td>RESPLANTA® OLEA</td>
<td>clear liquid</td>
<td>clear viscous liquid</td>
<td>slightly hazy gel</td>
</tr>
<tr>
<td>RESPLANTA® PALM</td>
<td>hazy liquid</td>
<td>from clear to slightly hazy viscous liquid</td>
<td>hazy viscous liquid</td>
</tr>
<tr>
<td>RESPLANTA® PEACH</td>
<td>clear liquid</td>
<td>from clear to slightly hazy viscous liquid</td>
<td>hazy gel</td>
</tr>
<tr>
<td>RESPLANTA® PGA</td>
<td>clear liquid</td>
<td>clear liquid</td>
<td>clear viscous liquid</td>
</tr>
<tr>
<td>RESPLANTA® RICE</td>
<td>clear liquid</td>
<td>clear viscous liquid</td>
<td>hazy gel</td>
</tr>
<tr>
<td>RESPLANTA® SMO</td>
<td>clear liquid</td>
<td>clear viscous liquid</td>
<td>slightly hazy gel</td>
</tr>
<tr>
<td>RESPLANTA® SOJA</td>
<td>clear liquid</td>
<td>clear viscous liquid</td>
<td>hazy gel</td>
</tr>
<tr>
<td>RESPLANTA® SUN</td>
<td>clear liquid</td>
<td>clear viscous liquid</td>
<td>slightly hazy gel</td>
</tr>
<tr>
<td>RESPLANTA® TRITICUM</td>
<td>clear liquid</td>
<td>clear viscous liquid</td>
<td>hazy gel</td>
</tr>
</tbody>
</table>

RESPLANTA®:
Fatty acid composition and functionality

One key to better understand and predict the efficacy of the Resplanta’s is to look at the fatty acid composition. Generally speaking, the short fatty acid chains promote cleansing and foaming properties, while longer chains improve the refatting effects. Saturated chains give a protective film that results in a smoothing and lubricating effect, while the unsaturated chains with one double bond are more refatting and become more softening with the increasing numbers of double bonds.

In this way it is possible to group most Resplanta’s into subclasses that have similar efficacy.

✓ Short chain fatty acids: BABASSU and COCONUT
Rich in Lauric Acid.
Very good foaming soluble in water up to 15%.
Can help to solubilize Resplanta’s that are less soluble.
Best choice as cleansing agents.

✓ Medium chain saturated fatty acids: PALM
Rich in Palmitic Acid.
Lubricating.
Conditioning effects.

✓ Long chain saturated fatty acids: KARITE
Low solubility in water.
Rich in Stearic Acid.
Has a smooth touch.

✓ Medium chain unsaturated fatty acids: MAC
Rich in Palmitoleic Acid.
Still good foaming properties.
Excellent hair conditioning effects.

✓ Long chain unsaturated fatty acids and Palmitic Acid: COTTON, PGA and RICE
Good quantities of Oleic Acid and Linoleic Acid and also Palmitic Acid.
Medium degree of softness.
Conditioning effects.

✓ Long chain monounsaturated fatty acids: OLEA, PEACH and ALM
Rich in Oleic Acid.
Good refatting properties.
Give body to hair.

✓ Long chain mono and di-unsaturated fatty acids: MAIS and SMO
Good quantities of Oleic Acid and Linoleic Acid.
Medium degree of softness.
Conditioning effects.

✓ Long chain di-unsaturated fatty acids: GRAPE, SUN and SOJA
Rich in Omega-6 essential fatty acids.
Good softening effects.
Makes hair glow.

✓ HEMP and TRITICUM rich in Linoleic and Linolenic Acid (Omega-3 and Omega-6)
High degree of softness.
Conditioning effects: soft and glowing hair.

✓ Long chain fatty acids free (with fatty alcohols): JOJOBA
Is the least soluble.
Fatty acids made up mostly of Gadoleic Acid (C20 unsaturated).
<table>
<thead>
<tr>
<th>OIL or FAT</th>
<th>SATURATED ACID</th>
<th>UNSATURATED ACID</th>
<th>RESPLANTA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ACID CAPRIC C10.0</td>
<td>ACID CAPRIC C12.0</td>
<td>ACID MYRISTIC C14:0</td>
</tr>
<tr>
<td>ALMOND</td>
<td>-</td>
<td>-</td>
<td>&lt;1.5</td>
</tr>
<tr>
<td>AVOCADO</td>
<td>-</td>
<td>-</td>
<td>0.1-2.1</td>
</tr>
<tr>
<td>BABASSU</td>
<td>4-7</td>
<td>3-8</td>
<td>44-48</td>
</tr>
<tr>
<td>COCONUT</td>
<td>8-9</td>
<td>4-10</td>
<td>44-52</td>
</tr>
<tr>
<td>CORN</td>
<td>-</td>
<td>-</td>
<td>&lt;1</td>
</tr>
<tr>
<td>COTTON</td>
<td>-</td>
<td>-</td>
<td>0.5-2.0</td>
</tr>
<tr>
<td>GRAPE</td>
<td>-</td>
<td>-</td>
<td>0.1-1.5</td>
</tr>
<tr>
<td>HEMP</td>
<td>-</td>
<td>-</td>
<td>4-8</td>
</tr>
<tr>
<td>JOJOBA</td>
<td>-</td>
<td>-</td>
<td>&lt;3</td>
</tr>
<tr>
<td>MACADAMIA</td>
<td>-</td>
<td>-</td>
<td>8-18</td>
</tr>
<tr>
<td>OLIVE</td>
<td>-</td>
<td>-</td>
<td>0.1-1.2</td>
</tr>
<tr>
<td>PALM</td>
<td>-</td>
<td>-</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>PEACH</td>
<td>-</td>
<td>-</td>
<td>4-8</td>
</tr>
<tr>
<td>RICE</td>
<td>-</td>
<td>-</td>
<td>&lt;1</td>
</tr>
<tr>
<td>SESAME</td>
<td>-</td>
<td>-</td>
<td>&lt;0.5</td>
</tr>
<tr>
<td>SHEA BUTTER</td>
<td>-</td>
<td>-</td>
<td>4-7</td>
</tr>
<tr>
<td>SOYBEAN</td>
<td>-</td>
<td>-</td>
<td>&lt;0.5</td>
</tr>
<tr>
<td>SUNFLOWER</td>
<td>-</td>
<td>-</td>
<td>&lt;1.0</td>
</tr>
<tr>
<td>WHEAT GERM</td>
<td>-</td>
<td>-</td>
<td>13-20</td>
</tr>
</tbody>
</table>

**CONDITIONING AND REPAIR ACTIVITY OF RESPLANTA® MAC**

![Brown Hair with Perm Not Treated](image1)

Brown hair with perm treated with base shampoo

![Brown Hair with Perm Treated With Base Shampoo](image2)

Brown hair with perm treated with shampoo with 3% Resplanta Mac

**FOAM PROPERTIES**

The addition of Resplantas to surfactant systems may affect the foam behaviour of the finished formulations. This depends on the chain length of the fatty acids of the starting oil as well as on the hardness of the water. In the figure below we show the effects of Resplantas on the foaming action of a basic shampoo formulation.

**BASIC SHAMPOO FORMULATION**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Laureth Sulfate</td>
<td>30%</td>
</tr>
<tr>
<td>Lauril Amido Propyl Betaine</td>
<td>7%</td>
</tr>
<tr>
<td>Methyl Chloro Isotiazolinone, Methyl Isozaxolinone</td>
<td>0.1%</td>
</tr>
<tr>
<td>Methyl Paraben</td>
<td>0.2%</td>
</tr>
<tr>
<td>EDTA</td>
<td>0.2%</td>
</tr>
<tr>
<td>Water</td>
<td>62.5%</td>
</tr>
</tbody>
</table>

Resplanta products have been added at 3%

The quantity of shampoo tested is 2g/l
The data show that in soft water all Resplanta’s increase the foam of the shampoo, whereas in hard water (saturated with calcium carbonate) the results depend on the type of oil:

**Resplanta® BABASSU** (babassu oil), **Resplanta® MAC** (macadamia oil) and **Resplanta® TRITICUM** (wheat germ oil) offer the best performance.

### APPLICATIONS

RESPLANTA® can be included in any kind of cosmetic formulation in which a vegetable oil may be of interest. They are particularly interesting for use as a refatting agent in detergent formulations that need to be less aggressive in cleansing.

The RESPLANTA family of water soluble oils make the use of oils in cosmetic formulations easy. They may be used in:

- Toiletries and personal care products
- Shampoos
- Make up removers
- Dry alcoholic lotions for face, body and hair
- Bath and massage preparations
- As co-emulsifiers in O/W systems
- Wet wipes

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