Emulium® Illustro
Pigment empowered
Despite growing consumer interest in silicone-free, natural cosmetics, water-in-silicone formulations remain undisputed leaders in make-up and suncare applications.

There is indeed a lack of high performance natural water-in-oil (W/O) emulsifiers able to make low viscosity formulations with long-lasting properties and enhanced water-resistance. Among the few options that are currently available, stability and compatibility issues are frequent.

Gattefossé has applied its strong knowledge in lipid chemistry to the development of Emulium® Illustro. Using a patented technology based upon polyglycerol esters, this W/O emulsifier perfectly meets consumer expectations in terms of naturality and formulators’ requirements for performance and flexibility.

Pigments at the heart of creation

Six years of research and development have been necessary to conceive this ingredient. Guided by color formulation experts, pigments were placed at the heart of the research from day one. The emulsions were constructed around pigments, taking into consideration different types of coating and uncoated materials.

Three carefully selected raw materials were reacted together by esterification.

<table>
<thead>
<tr>
<th>POLYGLYCEROL-6 (PG-6)</th>
<th>12-HYDROXystearic ACID (12-HSA)</th>
<th>RICINOLEIC ACID (RA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A low free-glycerol grade which brings stability thanks to a large polar headgroup</td>
<td>Homopolymer of a C18 fatty acid with a hydroxyl group on carbon 12, which has well known dispersing properties</td>
<td>Possesses an unsaturation which brings fluidity to final textures</td>
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The association of solid 12-HSA and liquid RA has allowed the creation of a structure that is liquid at room temperature and can be used in a cold process.

When formulated, the emulsifier forms a water-in-oil emulsion. The PG-6 polar head can be found in the water phase and the 12-HSA and RA long carbon chains extend into the oil phase, bringing stability to the emulsion by steric repulsion. In a formulation containing pigments, the long carbon chains entrap the pigments, holding them in a homogeneous stable but non-rigid dispersion.
Add Emulium® Illustro to the oil phase and heat if necessary to homogenize or melt the other ingredients.

Once homogeneous, add the aqueous phase to the oil phase under moderate to high shear (using rotor stator or dispersing mixers).

Maintain moderate to high shear mixing until the emulsion is homogeneous (approx. 10 minutes).

If necessary, cool under mixing.

The use of salts is recommended to help the stabilization of the emulsion (NaCl and/or MgSO₄ at 1-2% depending on the water phase level).

**Seamless formulation**

**Use level: 3-5%**

![Diagram](image)

**Cold process**

1. Add Emulium® Illustro to the oil phase and heat if necessary to homogenize or melt the other ingredients.
2. Once homogeneous, add the aqueous phase to the oil phase under moderate to high shear (using rotor stator or dispersing mixers).
3. Maintain moderate to high shear mixing until the emulsion is homogeneous (approx. 10 minutes).
4. If necessary, cool under mixing.

**Wide compatibility**

- **Water phase**: 30 to 70%
  - Perfectly adapted to medium to high polarity oils
    - Silicone oils: up to 10%
    - Apolar oils: up to 10%
    - Vegetable oils: up to 50% of the total oil phase (except castor oil: fully compatible)
- **Oils**
  - Vegetable oils: up to 50% of the total oil phase (except castor oil: fully compatible)
- **Pigments**: All types of pigments and coatings
- **UV filters**: Organic and inorganic
- **Polyols**: Glycerin, propylene glycol, propanediol: up to 10% (without stabilizer)
  - Butylene glycol: up to 10% (up to 5% without stabilizer)
- **Ethanol**: Up to 5% (without stabilizer)
- **Stabilizing agents**: Natural and synthetic, required for stability
- **Others**: Most film formers, fillers, feeling agents, pearls and preservative systems

**Sensoriality**

The sensory imprint of Emulium® Illustro is unique. It is characterized by a light and soft afterfeel, providing foundations and mineral sunscreens with a “skincare” touch. The skin appears naturally dewy and glowing – but not shiny – and both looks and feels hydrated.
Emulium® Illustro has been evaluated at 5% in a natural foundation and validated non-comedogenic through a dedicated clinical trial. Dermatological and self-assessment scoring were performed immediately after the first application to evaluate the foundation performance and after 28 days of application to assess the quality of the bare skin.

**Foundation performance**

- Complexion uniformity*: +47%
- Imperfections visibility**: -23%
- Healthy glow**: +33%
- Skin fineness**: +27%

**Skin quality**

- Smooth aspect of the skin*: +16%
- Healthy glow**: +26%
- Moisturized appearance of the skin**: +26%
- Overall quality**: +19%

* Self-assessment  ** Dermatological scoring

Emulium® Illustro brings a uniform, flawless skin appearance and enhances the skin quality, even without any make-up.

**Answer to consumer expectations**

- Easy to spread (a)
- Easy to apply (a)
- No mask effect (a)
- The skin recovers a smooth aspect (a)
- Leaves the skin comfortable (a)
- Leaves the skin non sticky (a) (b)
- Leaves the skin non greasy (a) (b)
- No tight-feeling skin (b)
- Fine lines and wrinkles are not accentuated (b)
- Leaves the skin soft (b)
- Complexion is more uniform (b)
- Gives a healthy glow (b)

(a) Immediately after the first application  (b) At the end of the study

Emulium® Illustro meets consumer requirements in terms of foundation appearance and feel.

Three in four panelists expressed a desire to continue use of the foundation beyond the study. Unaware of the composition of the formulation, the performance was acclaimed. When informed of the natural, PEG and silicone-free composition, an astounding 91% of panelists stated that they were willing to abandon their usual silicone formulation for the product tested.

Emulium® Illustro clearly answers the growing consumer expectation for more natural make-up.
Emulium® Illustro is an innovative W/O emulsifier of natural origin, designed principally for use in pigmented formulations.

Emulium® Illustro demonstrates superior performance and stability compared to other emulsifiers on the market.

Compatibility with cosmetic ingredients – emollients, film formers, polymers, pearlescent agents, powders, stabilizers – is excellent. Flexible, easy to use, cold processable, it enables the creation of ultra-fluid to thick textures without any co-emulsifier.

Of particular interest in pigmented color and sunscreen formulations, it can also be used to formulate innovative textures for skincare.

**Characteristics**
- W/O emulsifier (liquid)
- HLB = 4.5
- PEG-free

**Applications**
- From ultra fluid to thick textures
- Color cosmetics: foundations, concealers, BB and CC creams, highlighters, eye and lip products
- Sun care: organic and inorganic sunscreens
- Skin care
- Natural, organic and vegan formulations

**Use level**
3-5%

INCI name: Polyglyceryl-6 Polyhydroxystearate (and) Polyglyceryl-6 Polyrincincoleate

Worldwide approval for cosmetic applications
Listed on IECIC (Inventory of Existing Cosmetic Ingredients in China) 2015
COSMOS approved
Patent pending

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