ESTERLAC™ Emulsifiers

GENTLE, VERSATILE EMULSIFIERS FOR PERSONAL CARE APPLICATIONS

corbion.com/PersonalCare
ESTERLAC™

Gentle, versatile emulsifiers for personal care applications

ESTERLAC™ is a range of multi-functional and safe emulsifiers for personal care applications. Its ingredients were invented and patented by the CJ Patterson Company (part of Corbion). ESTERLAC™ emulsifiers bring many unique features to o/w and w/o emulsions. These natural based emulsifiers form excellent lamellar based gel network emulsions. They create both extremely good emulsions' stability and the right rheology profile for a wide range of personal care products.

Based on Acyl Lactylates (high HLB surfactants) and Glycerol Mono Stearates (low HLB surfactants), ESTERLAC™ emulsifiers are truly multi-functional, as alongside emulsifier functionality, they can act as:

• Skin feel enhancer
• Skin penetration enhancer
• Moisturizer
• Hair conditioning effects
• Foam booster
• Viscosity builder
• Secondary surfactant

Skin Care

ESTERLAC™ emulsifiers are very substantive to proteins and starches. They improve the moisturization and skin conditioning properties of formulations. Moisturizing ingredients can penetrate into the skin more easily in the presence of ESTERLAC™ emulsifiers. On the skin, these ingredients provide a light, silky, soft feel, both in leave-on and rinse-off formulations. Furthermore, the ESTERLAC™ emulsifiers have a very low skin irritation: they are dermatologically innocuous and non-irritating to eyes.

Rinse-off

In bar soaps, shampoos and body washes, ESTERLAC™ SLL acts like a foam booster and mild surfactant, delivering significantly improved foam volume and richness vs. formulations without ESTERLAC™.

Hair care

Substantive to proteins, ESTERLAC™ provides excellent hair conditioning effects. This is especially observed for ESTERLAC™ CARE+. This ingredient adsorbs to damaged hair and helps to retain moisture in skin and hair. When applied in hair care products like shampoos and conditioners, the user will experience smooth and soft hair. ESTERLAC™ emulsifiers can also be used to thicken shampoos as a Cocamide MEA replacement.

Solutions for personal care

• Multi-functional
• Mild ingredients
• Natural

Oral care

Lactylate emulsifiers can act as mild surfactant for tooth pastes. Alongside their surfactancy, they can give excellent foaming properties to oral care formulations. ESTERLAC™ SLL is a particularly suitable ingredient for these benefits. The very low irritation of lactylates means it is extremely mild to gums.

Formulation benefits

ESTERLAC™ emulsifiers have low levels of free fatty acids and lactate giving them very good hydrolytic stability, which is essential for personal care applications. ESTERLAC™ Perform delivers superior electrolyte and heat stability vs standard emulsifiers.

Applications

Applications of the Corbion ESTERLAC™ range include skin care, facial cleansers, baby care products, hair conditioning formulations, shampoos & body washes, bar soaps and sunscreens. For more information or questions about other applications, please contact us.

<table>
<thead>
<tr>
<th>Name</th>
<th>INCI</th>
<th>CAS no</th>
<th>Appearance</th>
<th>HLB value</th>
<th>emulsification</th>
<th>co-surfactant</th>
<th>mildness</th>
<th>lathering</th>
<th>soft skin feel</th>
<th>skin permeation</th>
<th>moisture retention</th>
<th>antimicrobial properties</th>
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<tbody>
<tr>
<td>ESTERLAC™ SLL</td>
<td>sodium lauroyl lactylate</td>
<td>13557-75-0</td>
<td>White to off-white plastic solid</td>
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<td>solid, off white free flowing powder</td>
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<td>ESTERLAC™ CARE+</td>
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<td>clear viscous liquid</td>
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<td>ESTERLAC™ PERFORM</td>
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<td>Beige, waxy flakes</td>
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<td>ESTERLAC™ SMOOTH</td>
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For personal care industry, Corbion offers Lactic Acid, Lactates and emulsifiers that are some of the most natural, safe and cost-effective ingredients that formulators can use. These products are widely known for their moisturizing, anti-aging, sebum control, pH adjustment and antimicrobial functions.

Corbion is the global market leader in lactic acid, lactic acid derivatives, and a leading company in emulsifiers, functional enzyme blends, minerals, vitamins and algae ingredients. We develop sustainable ingredient solutions to improve the quality of life for people today and for future generations. For over 100 years, we have been uncompromising in our commitment to safety, quality, innovation and performance. Drawing on our deep application and product knowledge, we work side-by-side with customers to make our cutting edge technologies work for them. Our solutions help differentiate products in markets such as food, home & personal care, animal nutrition, pharmaceuticals, medical devices, and bioplastics. In 2016, Corbion generated annual sales of € 911.3 million and had a workforce of 1,684 FTE. Corbion is listed on Euronext Amsterdam.