

EXCEPARL®

LM-

LC

**THICKENING ABILITY
RHEOLOGY MODIFIER
VISCOSITY STABILISER
EO-FREE**

**A NATURAL LIQUID EO-FREE
THICKENER DERIVED FROM
RENEWABLE SOURCES**

THE TECHNOLOGY OF KAO'S SURFACTANTS APPLIED TO PERSONAL CARE



EXCEPARL® LM-LC

100% natural

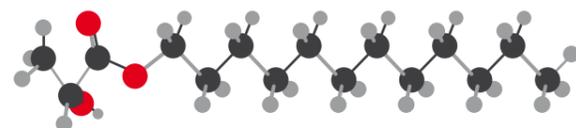
100% effective



Today's personal care market shows an increasing trend towards green and natural-based concepts and formulations.

These cosmetic products feature an interesting "free from" trend, and are preferably free from preservatives, sulfates, PEG-derivatives and silicones, among other additives or ingredients. The consumer tends to associate more skin compatibility, safety and general eco-friendliness with the absence of these ingredients.

Following this trend, Kao Chemicals Europe has developed EXCEPARL® LM-LC (INCI: Lauryl Lactate), a new natural liquid thickener derived from renewable sources, which additionally shows viscosity stabilising properties in surfactant-based formulations. This natural ester, obtained through a reaction of fatty alcohol and lactic acid, has the advantage of being nitrogen-, salt- and PEG-free.



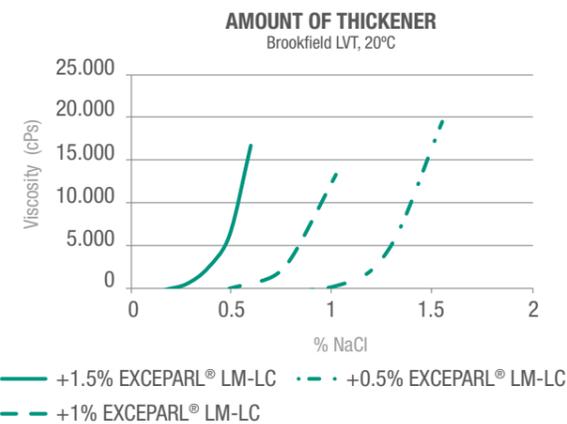
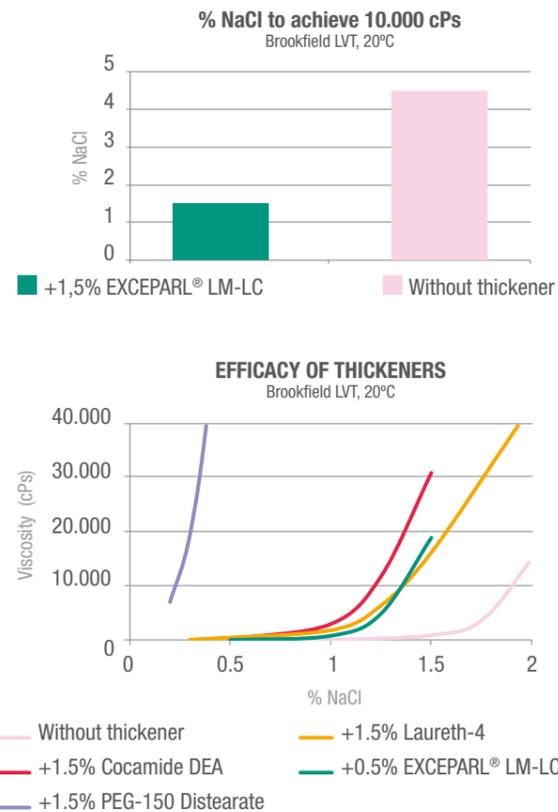
MAIN FEATURES

EXCEPARL® LM-LC is a 100% active, biodegradable, clear, odourless and colourless liquid which is easy to handle and can be processed at room temperature. Additionally, EXCEPARL® LM-LC is a mild product with some emollient and conditioning properties for skin and hair due to its hydrophobic characteristics, and with no detrimental effect on the foaming behaviour of the formulations. Due to its chemical nature, EXCEPARL® LM-LC is a good choice for many PEG- and/or Sulfate-free rinse-off formulations.

The addition of EXCEPARL® LM-LC to a final formulation allows a reduction in the percentage of sodium chloride (NaCl) necessary to achieve a desired viscosity. The balance between EXCEPARL® LM-LC and NaCl can be easily adjusted depending on the composition. EXCEPARL® LM-LC shows excellent thickening properties, outperforming other commonly used thickeners such as Cocamide DEA, the most widely used thickener, or Laureth-4. A smaller amount of it is required.

- Liquid
- Biodegradable
- Vegetable Origin
- Mild & Safe Product
- High Concentration
- PEG-, Nitrogen- & Salt-Free
- Solvent-Free
- Colourless and Odourless

THICKENING ABILITY



INCI Name: Lauryl Lactate

* THICKENER: viscosity at 20°C (cPs)

| %NaCl | EXCEPARL® LM-LC | Cocamide DEA | PEG-150 Distearate | Laureth-4 |
|------------|-----------------|--------------|--------------------|-----------|
| 0.5 | 351 | liquid | 1240 | liquid |
| 1.0 | 545 | liquid | 1505 | liquid |
| 1.5 | 811 | - | 1655 | - |
| 3.0 | 2190 | liquid | 2404 | liquid |
| 5.0 | 4999 | - | 3409 | - |
| Appearance | clear | clear | turbid | clear |

Ref. C-225

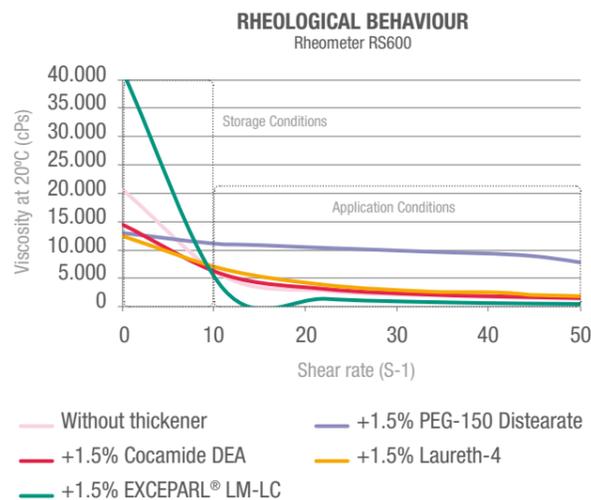
| FORTIFYING SHAMPOO | % |
|--|-----------|
| EMAL® 270D Sodium Laureth Sulfate | 14.3 |
| AKYPO® SOFT 100 BVC Sodium Laureth-11 Carboxylate | 5.7 |
| BETADET® S-20 Lauryl Hydroxysultaine | 5.0 |
| LEVENOL® H&B Glycereth-2 Cocoate | 2.0 |
| EXCEPARL® LM-LC Lauryl Lactate | 1.5 |
| Hair Loss Prevention | 2.0 |
| Hydrolysed Pea Protein | 2.0 |
| Preservative | q.s. |
| NaCl | 0.50 |
| Water | Up to 100 |
| Appearance | Clear |
| pH (100%) | ≈ 5.5 |
| Viscosity at 20°C (cPs) | ≈ 6500 |

| SHOWER GEL | % |
|--|-----------|
| SUCCIDET® S-30 UK Disodium Laureth Sulfosuccinate | 16.6 |
| BETADET® S-20 Lauryl Hydroxysultaine | 14.0 |
| BETADET® HR Cocamidopropyl Betaine | 10.0 |
| THICKENER* | 2.0 |
| Aloe vera gel | 0.5 |
| Preservative | q.s. |
| Water | Up to 100 |
| pH (100%) | ≈ 7.0 |

MAIN PROPERTIES

RHEOLOGY

EXCEPARL® LM-LC, being a hydrophobic thickener, provides a shear thinning flow behaviour, which means that the viscosity decreases with increasing shear rate. Dispersed particles, like pearlising agents or some anti-dandruff additives like Zinc Pyrithione, tend to separate in a surfactants mixture. The use of EXCEPARL® LM-LC improves stabilisation against sedimentation during storage conditions, and has a positive effect on pumping and application, which is well appreciated by consumers.



Ref. C-211

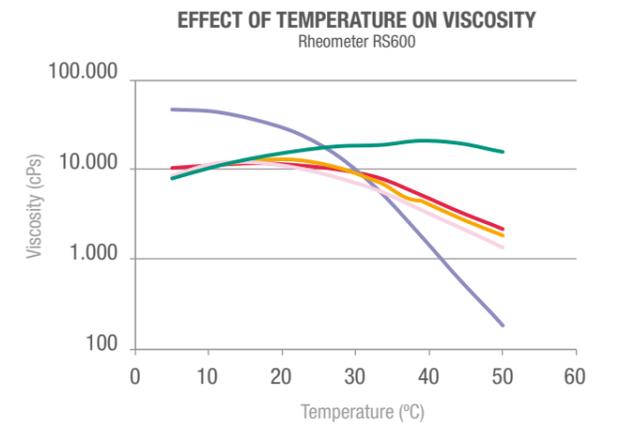
| SHAMPOO ANTI-DANDRUFF | % |
|--|------------------|
| EMAL® 270D Sodium Laureth Sulfate | 14.0 |
| AKYPO® FOAM RL 40 Sodium Laureth-5 Carboxylate | 5.0 |
| DANOX® PL-10 Pearlizing Agent | 4.0 |
| LEVENOL® H&B Glycereth-2 Cocoate | 2.5 |
| EXCEPARL® LM-LC Lauryl Lactate | 1.5 |
| TETRANYL® U | 0.5 |
| Zinc Pyrithione | 2.0 |
| Dimethicone 350cst | 0.5 |
| Jaguar C-162 | 0.1 |
| EDTA NA₄ | 0.2 |
| Ucare LR400 | 0.2 |
| Dye(s) | q.s. |
| Preservative | q.s. |
| NaCl | q.s. |
| Water | Up to 100 |
| Appearance | Blue viscous gel |
| pH (100%) | 6.5 |
| Viscosity at 20°C (cPs) | ≈ 30000 |

VISCOSITY STABILISER

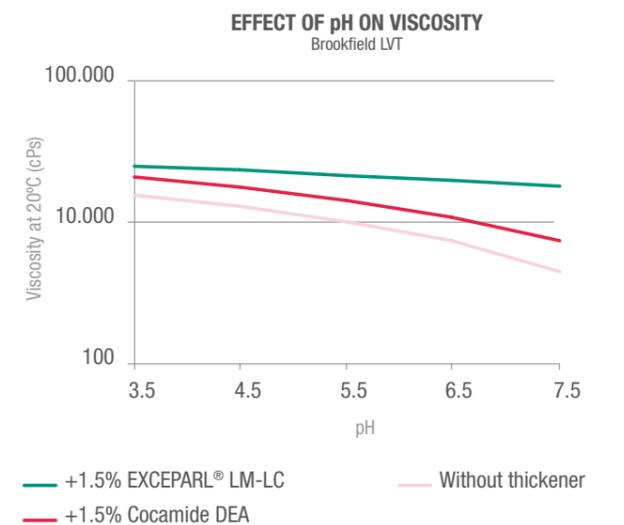
In addition to the rheological behaviour, formulations thickened with EXCEPARL® LM-LC show better viscosity stability in a wide range of pH and temperatures than when other thickeners are used. The viscosity remains almost the same over a wide range of pH and temperatures, which is an advantage when dispersed particles are present in the formulation.

Ref. C-245

| CONDITIONING SHAMPOO | % |
|---|-----------|
| EMAL® 270D Sodium Laureth Sulfate | 16.2 |
| BETADET® S-20 Lauryl Hydroxysultaine | 3.4 |
| AKYPO® RLM 45CA Laureth-6 Carboxylic Acid | 1.7 |
| EXCEPARL® LM-LC Lauryl Lactate | 1.5 |
| Hydroxypropyl Guar Hydroxypropyltrimonium Chloride | 0.3 |
| Tocopheryl Acetate | 0.2 |
| Preservative | q.s. |
| Water | Up to 100 |
| Appearance | Clear |
| pH (100%) | ≈ 5.5 |
| Viscosity at 20°C (cPs) | ≈ 3000 |



— +1.5% Cocamide DEA
— +1.5% PEG-150 Distearate
— +1.5% Laureth-4
— Without thickener
— +1.5% EXCEPARL® LM-LC



— +1.5% EXCEPARL® LM-LC
— +1.5% Cocamide DEA
— Without thickener

Formulations

EXCEPARL® LM-LC is a natural, “green” thickener, suitable as a raw material for personal cleansing products. Some formulation guidelines are provided to show the benefits of using EXCEPARL® LM-LC in different mixtures of surfactants. These formulations have been developed with different final applications

and end users in mind. In all cases, EXCEPARL® LM-LC performs as a thickening agent with viscosity stabilising properties. The use percentage depends on the composition and on the viscosity level desired for the final consumer product. It can vary from 0.3% up to 3% approximately.

SLES-FREE FORMULATIONS

Ref. C-246

| SHOWER GEL | % |
|--|-----------|
| ALFANOX® 46 Sodium C14-16 Olefin Sulfonate | 27.0 |
| BETADET® S-20 Lauryl Hydroxysultaine | 10.5 |
| EXCEPARL® LM-LC Lauryl Lactate | 0.95 |
| Preservative | q.s. |
| Water | Up to 100 |
| Appearance | Clear |
| pH (100%) | ≈ 5.0 |
| Viscosity at 20°C (cPs) | ≈ 8000 |

Ref. C-229

| INTIMATE HYGIENE | % |
|---|-----------|
| BETADET® HR Cocamidopropyl Betaine | 18.3 |
| AMIDET® N PEG-4 Rapeseedamide | 5.3 |
| AKYPO® SOFT 100 BVC Sodium Laureth-11 Carboxylate | 4.3 |
| EXCEPARL® LM-LC Lauryl Lactate | 0.6 |
| Chamomile Extract | 0.25 |
| Preservative | 0.05 |
| Water | Up to 100 |
| Appearance | Clear |
| pH (100%) | ≈ 5.0 |
| Viscosity at 20°C (cPs) | ≈ 4000 |

Ref. C-228

| BABY SHAMPOO | % |
|---|-----------|
| OXIDET® L-75C Cocamidopropylamine Oxide | 25.0 |
| AKYPO® RLM 45CA Laureth-6 Carboxylic Acid | 7.9 |
| AMIDET® N PEG-4 Rapeseedamide | 5.0 |
| EXCEPARL® LM-LC Lauryl Lactate | 0.3 |
| Tocopheryl Acetate | 0.2 |
| Preservative | q.s. |
| Water | Up to 100 |
| Appearance | Clear |
| pH (100%) | ≈ 6.0 |
| Viscosity at 20°C (cPs) | ≈ 3000 |

Ref. C-247

| STRENGTHENING SHAMPOO | % |
|--|-----------------|
| BETADET® HR Cocamido propyl Betaine | 16.3 |
| AKYPO® FOAM RL 40 Sodium Laureth-5 Carboxylate | 13.3 |
| BETADET® THC-2 Disodium Cocoamphodiacetate | 12 |
| EXCEPARL® LM-LC Lauryl Lactate | 2 |
| Triton® CG-50 Decyl Glucoside | 7.5 |
| NaCl | 0.5 |
| Panthenol 50% | 0.4 |
| Keratin | 0.2 |
| Preservative | q.s. |
| Water | Up to 100 |
| Appearance | Clear yellowish |
| pH (100%) | ≈ 5.5 |
| Viscosity at 20°C (cPs) | ≈ 1800 |

EO-FREE FORMULATIONS

Ref. C-248

| ULTRA MILD SKIN CLEANSER | % |
|--|-----------------|
| BETADET HR® Cocamidopropyl Betaine | 16.3 |
| BETADET® THC-2 Disodium Cocoamphodiacetate | 12 |
| EXCEPARL® LM-LC Lauryl Lactate | 1.9 |
| Triton® CG-50 Decyl Glucoside | 7.5 |
| NaCl | 0.5 |
| Exfolactive | 0.2 |
| Preservative | q.s. |
| Water | Up to 100 |
| Appearance | Clear yellowish |
| pH (100%) | ≈ 6.0 |
| Viscosity at 20°C (cPs) | ≈ 2500 |

Ref. C-232

| SHOWER GEL | % |
|--|-----------|
| BETADET® S20 Lauryl Hydroxysultaine | 14.0 |
| BETADET HR® Cocamidopropyl Betaine | 10.0 |
| GLC® 99% Glycerin | 2.0 |
| EXCEPARL® LM-LC Lauryl Lactate | 1.0 |
| Hostapon® SG Sodium N-Cocoyl Glycine | 16.6 |
| Merquat® 550 Polyquaternium-7 | 0.3 |
| Preservative | q.s. |
| Water | Up to 100 |
| Appearance | Hazy gel |
| pH (100%) | ≈ 6.5 |
| Viscosity at 20°C (cPs) | ≈ 6300 |

Ref. C-249

| FRESH FACE CLEANSER | % |
|---|------------------|
| OXIDET® L-75c Cocamidopropylamine Oxide | 10.5 |
| BETADET® HR Cocamidopropyl Betaine | 8.3 |
| EXCEPARL® LM-LC Lauryl Lactate | 1.5 |
| GLC® 99% Glycerin | 2.0 |
| Aloe Vera | 0.5 |
| NaCl | 0.05 |
| Preservative | q.s. |
| Water | Up to 100 |
| Appearance | Clear colourless |
| pH (100%) | ≈ 5.6 |
| Viscosity at 20°C (cPs) | ≈ 2800 |



KAO CHEMICALS EUROPE

www.kaochemicals-eu.com



Enriching lives,
in harmony with nature.

Kao Corporation, S.A.

Puig dels Tudons, 10
E-08210 Barberà del Vallès
(Barcelona) Spain
Tel.: +34 93 7399-300
Fax: +34 93 7399-377
e-mail: sales@kao.es

Kao Chemicals GmbH

Kupferstrasse 1
D-46446 Emmerich, Germany
Tel.: +49 (0) 2822 711-0
Fax: +49 (0) 2822 711-201
e-mail: sales@kaochemicals.de

(Edited March 2018. EU version)

OUR CHEMICALS, YOUR BUSINESS

kao