

NMF mimicking blend

Intended use

Active for skin care

Benefits at a glance

- Blend of humectants in aqueous solution as a substitute for the "Natural Moisturizing Factor" (NMF) of human skin
- Especially suitable for use in hydro-regulative cosmetics and anti-aging products

INCI (PCPC name)

Sodium Lactate; Sodium PCA; Glycine; Fructose; Urea; Niacinamide; Inositol; Sodium Benzoate; Lactic Acid

Chemical and physical properties (not part of specifications)

Form	liquid
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Properties

Besides lipids the skin needs an optimal proportion of water to retain its softness and suppleness. The ability of the horny layer of the skin to absorb moisture depends on the moisturizing factors contained in the epidermis – the "Natural Moisturizing Factors" (NMF). The NMF are easily washed out by using soaps or other surfactants. This results in the premature desquamation of the epithelial cells and loss of suppleness. Hydro-regulative cosmetics can help to counteract this effect by substituting the natural substances that have been washed out. In form of emulsions these cosmetics are excellent preparations supplying the

skin with lipids and moisture. The skin's inherent NMF consist mainly of lactate and pyroglutamate components. In LACTIL®, Sodium Lactate and Sodium PCA (2-pyrrolidone-5-carboxylic acid) are the major functional components. In addition, LACTIL® contains glycine, urea and niacinamide, which further enhance moisturization.

Efficacy studies

Moisturizing properties of LACTIL® – General study setup

To evaluate the skin moisturization benefits of LACTIL® studies were performed with 16 volunteers. The moisturization of the skin was determined by means of the Corneometer CM 825 (Courage & Khazaka, Cologne, D). Measurements were carried out under standardized conditions in a climatic room at ambient temperature and 55% relative humidity. The panellists acclimatized for 15 minutes before each measurement. At the beginning of the tests the baseline moisture content ($t = 0$) was determined for every test area. Further measurements followed after application of the test formulations at 2 hours or 2 and 6 hours, respectively. The differences between the initial baseline corneometer units (CU) and the CU after application were calculated for each panellist and are presented as Δ CU (delta CU) for the test formulations. The test formulations were randomized over both inner forearms of the volunteers with 4 test fields of 5 cm² per arm. The studies included a control and a vehicle test field.

• Dose response short term moisturization

An O/W test emulsion was used and 0% (vehicle), 1%, 2%, and 3% of LACTIL® were incorporated. 4 µg/cm² of each O/W emulsion were applied on the test fields on the forearms. The skin moisture was determined before and 2 hours after application.

The results verify that LACTIL® rebalances the hydration status of the skin and provides excellent short term skin hydration efficacy (Fig. 1).

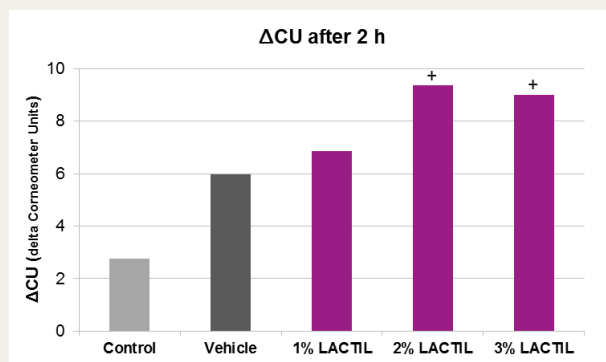


Figure 1: Short term moisturization (⁺p<0.05 compared to vehicle)

• Combination of LACTIL® and Glycerin

In a third study the properties of Glycerin in concentrations of 2.5% and 5% were compared to the combinations of 2.5% LACTIL® and 2.5% Glycerin as well as 5% LACTIL® and 5% Glycerin. (Formulations and procedure as described before.) After 6 hours the moisturization properties of Glycerin are prolonged significantly by LACTIL® due to its NMF mimicking composition (Fig. 2).

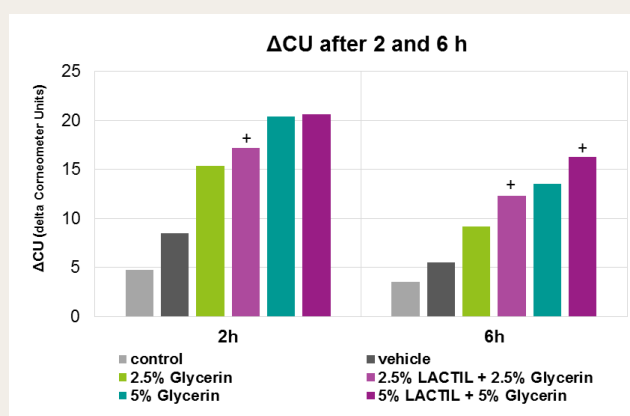


Figure 2: Prolonged moisturization properties of Glycerin in combination with LACTIL® (⁺p<0.05 compared to 2.5% and 5% Glycerin)

Formulation hints

LACTIL® is water soluble and cold processable, if the formulation type itself allows this.

In O/W emulsions it is recommended to add LACTIL® during the cooling process at temperatures below 40 °C. At usage levels of >3% it is recommended to increase the concentration of fatty alcohols, fatty acids or Glyceryl Stearate to ensure sufficient stability of the formulation. Due to its anionic character, LACTIL® cannot be applied in cationic emulsions. The combination with hydrocolloids like carbomer is only recommended for hot processed formulations.

In W/O emulsions LACTIL® is added to the water phase and the emulsion is prepared as usual.

Recommended usage concentration

1.0% – 5.0%

Applications

LACTIL® is suitable as an additive for hydro-regulative cosmetics of all kinds:

- Moisturizing creams and lotions
- Body creams and lotions
- Anti-aging creams

Packaging

25 kg can

Hazardous goods classification

Information concerning

- classification and labelling according to regulations for transport and for dangerous substances
- protective measures for storage and handling
- measures in accidents and fires
- toxicity and ecological effects

is given in our material safety data sheets.

Guideline formulations

Firming and Moisturizing Body Lotion MM 282/9	
Phase A	
TEGO® Care PBS 6 (Polyglyceryl-6 Stearate (and) Polyglyceryl-6 Behenate)	3.00%
TEGO® Alkanol 1618 (Cetearyl Alcohol)	0.70%
TEGIN® M Pellets (Glyceryl Stearate)	0.50%
TEGOSOFT® AC (Isoamyl Cocoate)	6.00%
TEGOSOFT® DC (Decyl Cocoate)	8.00%
TEGOSOFT® MM (Myristyl Myristate)	2.00%
CERAMIDE IIIB (Ceramide NP)	0.05%
TEGO® Xymenynic (Caprylic/Capric Triglyceride; Xymenynic Acid)	1.00%
Phase B	
TEGO® Cosmo C 100 (Creatine)	0.80%
Glycerin	0.50%
Water	64.45%
Phase C	
Keltrol CG-SFT (Xanthan Gum)	0.50%
Glycerin	2.50%
Water	7.00%
Phase D	
LACTIL® (Sodium Lactate; Sodium PCA; Fructose; Urea; Niacinamide; Inositol; Sodium Benzoate; Lactic Acid)	2.0%
Phase Z	
Preservative, Perfume	q.s.
Preparation:	
- Heat phase A and B separately to approx. 80 °C. - Add phase A to phase B with stirring. ¹⁾ - Homogenize. - Cool with gentle stirring and add phase C below 40 °C. - Homogenize for a short time - Add phase D ¹⁾ Important: If phase A has to be charged into the vessel first, phase B must be added without stirring .	

Hydra Plus Day Cream (MAC 743/3/1)	
Phase A	
TEGO® Care PSC 3 (Polyglyceryl-3 Dicitrate/Stearate)	3.00%
TEGIN® M Pellets (Glyceryl Stearate)	2.00%
TEGO® Alkanol (Stearyl Alcohol)	1.00%
TEGOSOFT® MM (Myristyl Myristate)	1.00%
TEGOSOFT® AC (Isoamyl Cocoate)	8.00%
TEGOSOFT® CI (Cetearyl Isononanoate)	5.00%
TEGOSOFT® TIS (Triisostearin)	5.00%
Phase B	
SKINMIMICS® (Ceteareth-25; Glycerin; Cetyl Alcohol; Behenic Acid; Cholesterol; Ceramide EOP; Ceramide NP; Ceramide NS; Ceramide AP; Caprooyl Phytosphingosine; Caprooyl Sphingosine)	1.00%
Glycerin	5.00%
Water	59.75%
Phase C	
Xanthan Gum	0.20%
Water	3.80%
Phase D	
LACTIL® (Sodium Lactate; Sodium PCA; Fructose; Urea; Niacinamide; Inositol; Sodium Benzoate; Lactic Acid)	2.0%
Phase E	
TEGO® Arjuna S (Terminalia arjuna extract; Pentyleneglycol)	1.25%
Phase Z	
Preservative, Perfume	q.s.
Preparation:	
- Heat phase A and B separately to approx. 70–75 °C. - Add phase A to phase B with stirring. ¹⁾ - Homogenize. - Cool with gentle stirring and add phase C below 40 °C. - Homogenize for a short time. - Add phases D and Z ¹⁾ Important: If phase A has to be charged into the vessel first, phase B must be added without stirring .	

Winter Skin Cream (MM 284/5)	
Phase A	
TEGO® Care 450 (Polyglyceryl-3 Methylglucose Distearate)	2.0%
ABIL® Care XL 80 (Bis-PEG/PPG-20/5 PEG/PPG-20/5 Dimethicone; Methoxy PEG/PPG-25/4 Dimethicone; Caprylic/Capric Triglyceride)	1.0%
TEGIN® M Pellets (Glyceryl Stearate)	2.0%
TEGO® Alkanol 18 (Stearyl Alcohol)	1.0%
TEGOSOFT® TIS (Triisostearin)	4.0%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	5.0%
TEGOSOFT® DEC (Diethylhexyl Carbonate)	5.0%
Persea Gratissima (Avocado) Oil	5.0%
CERAMIDE III (Ceramide NP)	0.1%
Phase B	
Glycerin	5.0%
Water	64.9%
Phase C	
TEGO® Carbomer 134 (Carbomer)	0.2%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	0.8%
Phase D	
LACTIL® (Sodium Lactate; Sodium PCA; Fructose; Urea; Niacinamide; Inositol; Sodium Benzoate; Lactic Acid)	3.0%
Phase E	
TEGO® Arjuna S (Terminalia arjuna extract; Pentylene Glycol)	0.5%
Phase F	
Sodium Hydroxide (10%)	q.s.
Phase Z	
Preservative, Perfume	q.s.
Preparation: - Heat phase A and B separately to approx. 70–75 °C. - Add phase A to phase B with stirring.¹⁾ - Homogenize. - Cool with gentle stirring and add phase C at 60 °C. - Homogenize for a short time. - Add phases D – Z below 40 °C. ¹⁾ Important: If phase A has to be charged into the vessel first, phase B must be added without stirring .	

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Especially concerning Active Ingredients

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