

The immediate Hydro-Regulator

Intended use

Active for skin care.

Benefits at a glance

- TEGO® Natural Betaine is a natural amino acid derivative from sugar beet
- Shows strong water binding capacity
- Retains skin moisture

INCI (PCPC name)

Betaine

Chemical and physical properties (not part of specifications)

Appearance (20 °C)	White crystals
Active content (Betaine Monohydrat)	> = 99 %
Solubility in water	160 g/100 g
Solubility in ethanol	8.7 g/100 g

Properties

TEGO® Natural Betaine is a naturally occurring substance. It can be found in various species, like plants, animals as well as in the human organism. It functions as an osmo-protectant as its amphoteric structure counteracts against osmotic pressure. In this way especially halophile organisms living in high salinity environment protected themselves from osmotic stress.

TEGO® Natural Betaine is a natural amino acid derivative (trimethylglycin). Due to its structure it is hygroscopic and has moisturizing properties. Its strong water binding capacity ensures a retention of skin moisture.

TEGO® Natural Betaine is obtained from sugar beet molasses by an extraction process.

Efficacy studies

Water binding capacity

In a comparative in vitro trial the water binding capacity of TEGO® Natural Betaine and glycerin were tested. First both products were dried in a desiccator and the weight was determined. The relative humidity was then stepwise increased in 10% intervals from 20% up to 80%. At every humidity step the substances were equilibrated for 24 h and the weight was determined. Afterwards the relative humidity was decreased back from 80% to 20% and the weight was again determined stepwise.

Result: TEGO® Natural Betaine shows a higher water binding capacity compared to glycerin and it supports a high water retention (Fig.: 1).

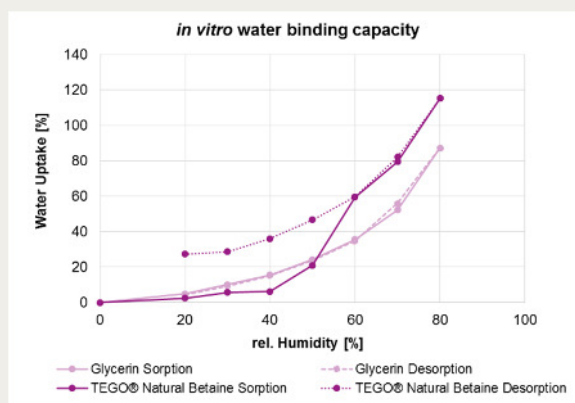


Fig. 1: Water binding capacity with sorption and desorption graphs.

Immediate skin moisturization

To evaluate the skin moisturization benefits of TEGO® Natural Betaine, in vivo studies were performed with 16 volunteers. The moisturization was determined using a 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 were acclimatized for 15 minutes before each measurement.

At the beginning of each test the baseline water content (t=0) was determined for every test area. Further measurements followed after application of the test formulations at different time points. The differences between the initial baseline corneometer units (CU) and the CU after application were calculated for each panellists and presented as ΔCU (delta CU) for every test product.

The test products were randomized over both inner forearms of the volunteers with 4 test fields per arm. The studies included always a control and a vehicle test field.

A standard O/W test emulsion was prepared and 0% (vehicle), 1%, 2.5%, and 5% of TEGO® Natural Betaine were incorporated. Subsequently, 4 μg/cm² of each O/W emulsion were applied to the marked, randomized 5 cm² test fields of the forearms. Two hours and six hours later, the skin moisture was measured again.

Result: TEGO® Natural Betaine shows a significant improvement of skin moisturization (Fig.: 2).

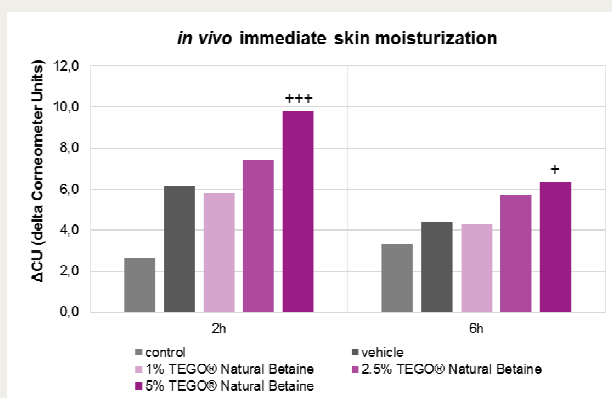


Fig.2: Immediate moisturization at 2 and 6 hours
(+p < 0.05, +++p < 0.001).

Application

TEGO® Natural Betaine is recommended for use in Skin Care products:

- All kinds of moisturizing body and face care products
- Suitable for mass market formulations

Formulation hints

TEGO® Natural Betaine has excellent water solubility and is also soluble in ethanol, 1,2-propylene glycol and glycerin between 20 – 30 °C while stirring.

In O/W emulsions, it is recommended to add TEGO® Natural Betaine as aqueous solution after the cooling process at temperatures below 40°C.

In W/O emulsions TEGO® Natural Betaine is added to the water phase of the emulsion and the emulsion is prepared as usual.

Recommended usage concentration

2.5–5.0% TEGO® Natural Betaine

Hazardous goods classification

Information concerning

- classification and labelling according to regulations for transport of chemicals
- protective measures for storage and handling
- measures in case of accidents and fire
- toxicological and ecotoxicological effects

is given in our safety data sheets.

K 11/18

Guideline formulations

Body Lotion for Men (MAC 804/2/5)

Phase A

AXOL® C 62 Pellets (Glyceryl Stearate Citrate)	2.00%
TEGO® Alkanol 1618 (Cetearyl Alcohol)	1.00%
TEGOSOFT® MM (Myristyl Myristate)	3.00%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	5.00%
Octyldodecanol	2.00%
ABIL® 350 (Dimethicone)	3.00%
CERAMIDE III B (Ceramide NP)	0.10%
Tocopheryl Acetate	0.50%

Phase B

Glycerin	5.00%
Water	66.40%

Phase C

TEGO® Carbomer 141 (Carbomer)	0.20%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	0.80%

Phase D

Ethanol	5.00%
---------	-------

Phase E

TEGO® Natural Betaine (Betaine)	3.00%
Water	3.00%

Phase F

Sodium Hydroxide (10%)	q. s.
------------------------	-------

Phase Z

Preservative, Perfume	q. s.
-----------------------	-------

Preparation

1. Heat phase A and B separately to 80 °C. Adjust the pH value of this solution to approx. 5 for a better solubility.
2. Add phase A to phase B with stirring¹⁾.
3. Homogenize.
4. Cool with gentle stirring to approx. 60 °C and add phase C.
5. Homogenize for a short time.
6. Cool with gentle stirring and add phases D, E, F and Z below 40 °C.

¹⁾ Important:

If phase A has to be charged into the vessel first, phase B must be added **without stirring**.

Age Correcting Hydro Lotion (MAC 831/9)

Phase A

ABIL® Care XL 80 (Bis-PEG/PPG-20/5 Dimethicone; Methoxy PEG/PPG-25/4 Dimethicone; Caprylic/Capric Triglyceride)	2.00%
TEGOSOFT® CI (Cetearyl Isononanoate)	8.00%
TEGOSOFT® DEC (Diethylhexyl Carbonate)	5.50%
Persea Gratissima (Avocado) Oil	2.00%
TEGO® Carbomer 341 ER (Acrylates/C10-30 Alkyl Acrylate Crosspolymer)	0.45%

Phase B

TEGO® Natural Betaine (Betaine)	5.00%
TEGO® Stemlastin (Cyanidium Caldarium Extract)	2.50%
TEGO® SMO 80V (Polysorbate 80)	1.00%
Glycerin	3.00%
Water	70.55%

Phase C

Sodium Hydroxide (10% in water)	q. s.
---------------------------------	-------

Phase Z

Preservative, Perfume	q. s.
-----------------------	-------

Preparation

1. Prepare phases A and B separately at room temperature.
2. Combine phases A and B without stirring.
3. Homogenize.
4. Add phase C and stir well.

Skin Vitalizing Moisturizer (MAC 829/2)

Phase A

AXOL® C 62 Pellets (Glyceryl Stearate Citrate)	1.50%
TEGO® Alkanol 1618 (Cetearyl Alcohol)	1.00%
TEGOSOFT® OS (Ethylhexyl Stearate)	6.50%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	5.00%
Butyrospermum parkii (Shea) Butter	1.00%

Phase B

TEGO® Cosmo C100 (Creatine)	1.00%
Glycerin	3.00%
Water	70.00%

Phase C

TEGO® Carbomer 141 (Carbomer)	0.20%
TEGOSOFT® OS (Ethylhexyl Stearate)	0.80%

Phase D

TEGO® Natural Betaine (Betaine)	5.00%
Water	5.00%

Phase E

Sodium Hydroxide (10% in water)	q. s.
---------------------------------	-------

Phase Z

Preservative, Perfume	q. s.
-----------------------	-------

Preparation

1. Heat phases A and B separately to approx. 80 °C.
2. Add phase A to phase B with stirring¹⁾.
3. Homogenize.
4. Cool with gentle stirring to approx. 60 °C and add phase C.
5. Homogenize for a short time.
6. Cool with gentle stirring and add phases D and E below 40 °C.

¹⁾ **Important:** If phase A has to be charged into the vessel first, phase B must be added **without stirring**.

Moisturizing Foot Cream (MM 281/9)

Phase A

TEGO® Care 450 (Polyglyceryl-3 Methyl-glucose Distearate)	3.00%
TEGIN® M Pellets (Glyceryl Stearate)	2.00%
TEGO® Alkanol 18 (Stearyl Alcohol)	2.00%
TEGOSOFT® OER (Oleyl Erucate)	6.00%
TEGOSOFT® P (Isopropyl Palmitate)	5.00%
TEGOSOFT® APM (PPG-3 Myristyl Ether)	4.00%
Octyldodecanol	4.00%
CERAMIDE III (Ceramide NP)	0.10%

Phase B

Glycerin	5.00%
Water	58.90%

Phase C

TEGO® Natural Betaine (Betaine)	3.00%
Urea	3.00%
Waer	5.00%

Phase Z

Preservative, Perfume	q. s.
-----------------------	-------

Preparation

1. Heat phases A and B separately to 90 °C.
2. Add phase A to phase B with stirring¹⁾.
3. Homogenize.
4. Cool with gentle stirring and add phases C and Z below 40°C.

¹⁾ **Important:** If phase A has to be charged into the vessel first, phase B must be added **without stirring**.

This information and all further technical advice are based on our present knowledge and experience. However, it implies no liability or other legal responsibility on our part, including with regard to existing third party intellectual property rights, especially patent rights. In particular, no warranty, whether express or implied, or guarantee of product properties in the legal sense is intended or implied. We reserve the right to make any changes according to technological progress or further developments. The customer is not released from the obligation to conduct careful inspection and testing of incoming goods. Performance of the product described herein should be verified by testing, which should be carried out only by qualified experts in the sole responsibility of a customer. Reference to trade names used by other companies is neither a recommendation, nor does it imply that similar products could not be used.

Evonik Nutrition & Care GmbH
Goldschmidtstraße 100
45127 Essen, Germany
Phone +49 201 173 2546
Fax +49 201 173 712546
personal-care@evonik.com
www.evonik.com/personal-care

