



Dermolife di Margonari Maria Franca
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Technical Information

TEGO® Care 450

Universal PEG-free emulsifier for the formulation of O/W creams and lotions

Intended use

O/W emulsifier

Benefits at a glance

- Mild emulsifier based on vegetable raw materials.
- Low usage concentration of 2 – 3 %.
- Provides moisturizing properties and support of water resistance.
- Shows high compatibility with actives, significant amounts of electrolyte and critical ingredients.
- Stable emulsions from pH 4.5 up to 8.5.
- Emulsions with high heat and freeze/thaw stability are possible to formulate.

INCI (PCPC name)

Polyglyceryl-3 Methylglucose Distearate

Chemical and physical properties (not part of specifications)

Form	pellets
Colour	ivory
HLB value	approx. 12

Application

TEGO® Care 450 is a non-ionic, PEG-free emulsifier based on natural, renewable raw materials.

- TEGO® Care 450 is suitable for the formulation of O/W creams and lotions.

- The amount used, referred to the emulsion, is 2.0 to 3.0 % for lotions and approx. 3.0 % for creams.
- Creams based on TEGO® Care 450 show good application and stability properties, if they contain 20 – 40 % of oil phase; lotions should contain 15 – 25 % of oil phase.

In addition to the lipoid ingredients, emulsifiers and consistency enhancers are included as part of the oil phase. Even though a considerable amount of them will move to the water phase during emulsification to form viscosity-increasing gel structures there.

- TEGO® Care 450 forms stable emulsions with all common oils and fats used for skin care products, including polar oils. Thus, it gives the possibility to adjust the application properties of the emulsion by the choice of the oils: the better the spreading properties and the lower the viscosities of the oils are, the "lighter" the resulting emulsions are. The application properties may also be adjusted by varying the quantity of the oil phase.
- To increase heat stability for lotions, a rheological additive such as 0.15 to 0.20% of TEGO® Carbomer 141 should be added. Usually, the addition of cetyl or stearyl alcohol is not necessary. The best way to adjust the viscosity is to change the dosage of carbomer. As lotions based on TEGO® Care 450 do not show a "whitening" effect, the addition of dimethicone is not necessary.

I metodi di analisi non indicati sono metodi interni del produttore ottenibili su specifica richiesta

Le informazioni sopra riportate non Vi sollevano dall'obbligo di identificare il prodotto prima dell'impiego. DERMOLIFE non si assume alcuna responsabilità per danni a persone o cose derivanti dall'impiego dei prodotti da noi commercializzati

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- For the preparation of creams, depending on the formulation, additional 2–5 % of consistency providing substances may be needed for the formation of viscosity-enhancing gel structures in the external water phase.

Blends of TEGIN® M Pellets (glycerol stearate) and stearic acid or cetyl/stearyl alcohol have proved most effective. These form liquid–crystalline structures in the water phase, the viscosity of the external phase is increased and the emulsion is stabilized. By addition of max. 0.2% TEGO® Carbomer 134 the amount of consistency providing substances can be reduced. Furthermore, the stability of creams towards freeze will improve significantly.

- Substances with specific properties, such as UV filters, plant extracts, protein derivatives and moisturisers are well tolerated by the emulsion.
- TEGO® Care 450 is used in slightly acidic to neutral emulsions. However, slightly alkaline adjustments are possible (pH 4.5 to 8.5 in creams, pH 5.5 to 8.5 in lotions).
- The creams and lotions are distinguished by high stability towards heat and freezing stress; stability between –25 °C and +50 °C is attainable.

In vivo comparing performance testing

The mildness of TEGO® Care 450 was tested on 20 panelists with the help of a Duhring chamber test.

During this test the parameters erythema and scaling have been evaluated. Beside these mildness criteria the moisturization properties of this emulsifier have been evaluated. The test showed that TEGO® Care 450 as mild emulsifier shows no erythema reaction and provides very low scaling on the skin. The obtained corneometer values during this study have been confirmed by another in vivo corneometer study. Both studies have shown that TEGO® Care 450 provides moisturizing properties while improving the hydration status of the skin.

(Source: Publication: “On the choice of oil–in–water emulsifiers for use in skin care products for sensitive skin”; G. Kutz, P. Biehl, M. Waldmann–Laue, B. Jackwerth, SOEFW Journal, 123, 145 – 150 (1997)).

In vitro testing of water resistance

An emulsion with TEGO® Care 450 was tested versus an emulsion with an ethoxylated emulsifier for their influence on water resistance properties. The tests have shown that TEGO® Care 450 as lipoid emulsifier provides better water resistance properties than an ethoxylated emulsifier.

Preparation

TEGO® Care 450 belongs to the group of the so called lipid emulsifiers. The HLB value of these emulsifiers is lower in comparison to ethoxylated emulsifiers.

If the production takes place with the method commonly used for ethoxylates (add the hot water phase slowly to the hot oil phase while stirring) it could happen that a water–in–oil emulsion is formed (recognizable by high viscosity and transparent/gellike appearance). During the cooling process this emulsion converts to an oil–in–water emulsion with big particle size.

Therefore, we recommend for the preparation of creams to heat oil phase and water phase separately to approx. 65 °C; for lotions oil phase and water phase are heated separately to 80 °C.

Furthermore, we recommend adding the hot oil phase to the hot water phase while stirring. The coarsely dispersed pre-emulsion is then homogenized.

If the above mentioned processing is not possible, we recommend to combine the hot water and oil phase without stirring (to avoid the building of the water–in–oil form) and start afterwards with the homogenisation.

During cooling, a constant horizontal and vertical movement of the emulsion has to be ensured. The viscosity of the liquid emulsion increases to a creamy consistency, as the hydrated consistency promoters solidify.

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The dispersion of TEGO® Carbomer 141 or TEGO® Carbomer 134 in oil (e. g. in mineral oil, decyl oleate, ethylhexyl stearate; not in triglycerides) is added at 60 °C. Then the emulsion is homogenized again. Perfume, temperature-sensitive substances or electrolyte containing ingredients are added at 35 to 40 °C. Neutralization of the emulsion is done at approx. 35 °C.

The particle size of the dispersed oil droplets of long-term stable emulsions is approx. 1 – 5 µm. More coarsely dispersed emulsions tend to separate.

Recommended usage concentration

2.0 – 3.0 % TEGO® Care 450

Packaging

600 kg pallet (24 x 25 kg)

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

Power Serum for aged Skin (MM 216/2)	
Phase A	
TEGO® Care 450 (Polyglyceryl-3 Methylglucose Distearate)	2.00%
TEGOSOFT® DEC (Diethylhexyl Carbonate)	5.00%
TEGOSOFT® OP (Ethylhexyl Palmitate)	5.00%
TEGOSOFT® OER (Oleyl Erucate)	1.50%
Persea Gratissima (Avocado) Oil	1.50%
Phase B	
Water	75.90%
TEGO® Pep 4-17 (Tetrapeptide-21; Glycerine; Butylene Glycol; Aqua)	2.00%
HyaCare® 50 (Hydrolyzed Hyaluronic Acid)	0.10%
Glycerine	3.00%
Phase C	
TEGO® Carbomer 134 (Carbomer)	0.20%
TEGOSOFT® OP (Ethylhexyl Palmitate)	0.80%
Phase D	
TEGO® Stemlastin (Cyanadium Caldarium Extract; Water)	3.00%
Phase E	
Sodium Hydroxide (10% in water)	q. s.
Phase Z	
Preservative, Perfume	q. s.
Processing: 1. Heat phases A and B separately to approx. 80 °C. 2. Add phase A to B with stirring.¹⁾ 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 phase D and phase E 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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O/W Lotion BR 6/14-14	
Phase A	
TEGO® Care 450 (Polyglyceryl-3 Methylglucose Distearate)	2.50%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	6.50%
TEGOSOFT® OS (Ethylhexyl Stearate)	5.70%
Phase B	
Water	79.60%
Glycerin	3.00%
Phase C	
TEGOSOFT® OS (Ethylhexyl Stearate)	0.80%
TEGO® Carbomer 141 (Carbomer)	0.20%
Phase D	
Sodium Hydroxide (10% in water)	q. s.
Phase E	
LACTIL® (Sodium Lactate; Sodium PCA; Glycine; Fructose; Urea; Niacinamide; Inositol; Sodium Benzoate; Lactic Acid)	1.00%
Phase F	
Phenoxyethanol; Ethylhexylglycerin (Euxyl PE 9010, Schülke&Mayr GmbH)	0.70%
Phase Z	
Perfume	q. s.
Processing: - Heat phase A and phase B separately to 80 °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. - Cool with gentle stirring. - Add phase D and phase E at 40 °C and stir well. - Add phase F and stir well. ¹⁾Important: If phase A has to be charged into the vessel first phase B must be added without stirring.	

Natural O/W Body Butter H 18/07-50	
Phase A	
TEGO® Care 450 (Polyglyceryl-3 Methylglucose Distearate)	3.00%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	4.00%
Triisostearin	4.00%
TEGO® Alkanol 1618 (Cetearyl Alcohol)	5.00%
TEGIN® M Pellets (Glyceryl Stearate)	3.00%
TEGOSOFT® CR (Cetyl Ricinoleate)	3.00%
TEGOSOFT® MM (Myristyl Myristate)	1.00%
Butyrospermum Parkii (Shea) Butter	3.00%
Persea Gratissima (Avocado) Oil	1.50%
Prunus Amygdalus Dulcis (Sweet Almond) Oil	1.50%
Tocopheryl Acetate	1.00%
Phase B	
Water	64.00%
Glycerin	5.00%
Phase C	
Sodium Hydroxide (10% in water)	0.20%
Phase D	
Benzyl Alcohol; Glycerin; Benzoic Acid; Sorbic Acid (Rokonsal BSB-N, Ashland)	0.80%
Phase Z	
Perfume	q. s.
Processing: - Heat phase A and phase B separately to approx. 75 °C. - Add phase A to phase B with stirring.¹⁾ - Homogenize. - Cool with gentle stirring below 40 °C. - Add phase C and stir well. - Add phase D and adjust the pH to 5.0 – 5.5. ¹⁾Important: If phase A has to be charged into the vessel first phase B must be added without stirring.	

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Carin Allrounder JS 5/15-3	
Phase A	
TEGO® Care 450 (Polyglyceryl-3 Methylglucose Distearate)	3.00 %
TEGIN® M Pellets (Glyceryl Stearate)	2.00 %
Stearyl Alcohol	1.00 %
TEGOSOFT® OP (Ethylhexyl Palmitate)	10.00 %
TEGOSOFT® TN (C12-15 Alkyl Benzoate)	8.00 %
ABIL® 350 (Dimethicone)	2.00 %
Phase B	
Water	70.30 %
Glycerin	3.00 %
Phase C	
Phenoxyethanol; Ethylhexylglycerin (Euxyl PE 9010, Schülke&Mayr GmbH)	0.70 %
Phase D	
Citric Acid	q. s.
Phase Z	
Perfume	q. s.
Processing: 1. Heat phase A and phase B separately to approx. 70 – 75 °C. 2. Add phase A to phase B with stirring.¹⁾ 3. Homogenize. 4. Cool with gentle stirring and add phase C below 30 °C. 5. Adjust the pH value to 6.0 – 6.5 with phase D. ¹⁾Important: If phase A has to be charged into the vessel first phase B must be added without stirring.	

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Product specification

Material TEGO CARE 450
Spec.Code K00 STANDARD

Inspection Characteristics	Method	Limits	Units	Z
Iodine value	GM_0050_01	< 5.0	g I/100g	C
Acid Value	GM_0010_01	<=12.0	mg KOH/g	X
Melting Point	GM_0150_01	52.0-58.0	°C	X
Saponification Value	GM_0030_01	120.0-140.0	mg KOH/g	X
Water Content	GM_0080_01	<=2.0	%	X
Colour to Gardner	GM_0140_02	<= 6.0		X

Report on inspection certificate: X = specific/actual value, C = unspecific value/conformity, T = not reported

This product only starting with an E in the batch number is produced in a RSPO certified site.

The raw materials for this product are sourced according to rules set by the RSPO, Supply Chain Mass Balance, Evonik AG RSPO Certification Number : RSPO-V-14-13553. Certificates can only be used from RSPO certified Supply Chain Partners.

This document is computer printed and therefore valid without signature.

All warranty claims in respect of the conformity of our product are subject to our General Terms and Conditions of Sale and Delivery. The data listed above reflects the criteria for our internal quality tests. We do not hereby make any express or implied warranty, whether for specific properties or for fitness for any particular application or purpose. All values are valid for the product when despatched from the works.

The Standard Test Methods can be obtained from specialized publishers. Evonik's test methods are available on request.

Material: TEGO CARE 450		Spec-Code: K00 STANDARD	Page 1 from 1
Print date: 06.07.2015	Valid from: 30.09.2014	Version: 10	

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TEGO® Care 450

Product data record

1. General information

1.1 Manufacturer/Supplier

Evonik Nutrition & Care GmbH
Personal Care Business Line
Goldschmidtstrasse 100
D-45127 Essen / Germany
Phone: +49 (201) 173-2524
Fax: +49 (201) 173-1828
personal-care@evonik.com
<http://www.evonik.com/personal-care>

1.2 Product Description

1.2.1 Raw material category O/W Emulsifier

1.2.2 Ingredients according to INCI

Polyglyceryl-3 Methylglucose Distearate

1.2.3 Composition

Components	Source	Ratio
Polyglyceryl-3 Methylglucose Distearate	vegetable / synthetic	100 %

This composition information serves for information of our customers only.

It is neither relevant for the composition listing according to Regulation (EC) No 1223/2009, nor does it reflect the chemical composition according to the different chemical regulations in the world which is disclosed in the table "information on ingredients/hazardous components" in the relevant parts of the respective (Material) Safety Data Sheets.

1.2.4 Solvents, preservatives and other additives

	CAS No.	EINECS / EC No.	content	Function
no additives				

No components which are listed in Annex II of the Regulation (EC) No 1223/2009 and its modifications and updates are added to and are not to be expected in the above mentioned product due to the raw materials used and the production process.

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2. Information on production process

General description of production process:

Conversion of methylglucose, polyglycerol with fatty acids

The product is not irradiated.

TEGO® Care 450 is produced in the strictest absence of any animal derived material of any type.

Residual plant based source (dominant origin of main constituents): palm oil, rapeseed oil, corn

GMO-Status:

The item contains ingredients derived from corn and rapeseed (including oils and other refined ingredients), but these ingredients are sourced from an "Identity Preserved" programme and can be certified NON-GM.

However max 0.9 % cross-contamination is possible. Any protein or DNA is not present.

Consequently the product will be PCR negative when tested.

2.1 By products

		method
Residual solvents	not applicable	
Free amines	not applicable	
Nitrosamines	not applicable	
Monochloroacetic acid	not applicable	Chromatography
Dichloroacetic acid	not applicable	Chromatography
1,4-Dioxane	not applicable	
Pesticides	meets the valid regulatory requirements for limits on agricultural pesticides	
Total heavy metals	max. 20 ppm	AAS-ICP
As, Cd, Co, Cr, Hg, Ni, Pb, Sb	Each < 1 ppm	AAS-ICP
Latex	not to be expected in the product due to the raw materials used and the production process	
VOC	< 3 % according to SR (Swiss Right) 814.018	

2.2 CMR (Carcinogenic, Mutagenic or Reprotoxic)

The use in cosmetic products of substances classified as CMR substances, of category 1A or 1B or 2 under Part 3 of Annex VI to Regulation (EC) No 1272/2008 shall be prohibited.

Further Information:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:342:0059:0209:en:PDF>

Some of the CMR substances mentioned below and listed in Annex VI to Regulation (EC) No 1272/2008 are used as starting materials or solvents for the production of our cosmetic raw materials and may require reporting under California Proposition 65 or the Safe Cosmetics Act, SB 484.

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The presence of these prohibited substances has to be seen as non-intended. It is stemming from impurities of the starting materials or the manufacturing process which is technically unavoidable in good manufacturing practice.

CMR substance	Starting material	max. concentration	method
Ethylene Oxide	no		
Propylene Oxide	no		
Octamethylcyclotetrasiloxane (D4)	no		
2-Ethylhexanoic Acid	no		
n-Hexane	no		
Methyl Chloride	no		
Dimethyl Sulphate	no		

2.3 "Allergens" according to the Regulation (EC) No 1223/2009

The presence of substances, the mentioning of which is required under the column 'Other' in Annex III, shall be indicated in the list of ingredients in addition to the terms parfum or aroma.

The cosmetic raw materials and the cosmetic actives supplied by Evonik Personal Care are manufactured without the use of perfumes and fragrances. An analytical proof for the absence in traces of the substances to be mentioned in addition to the terms parfum or aroma is not performed in cosmetic raw materials, which are chemically produced.

None of these substances have been intentionally added to our cosmetic raw materials or are formed during the manufacturing process according to our knowledge of the chemistry.

2.4 Food Ingredients listed in Annex IIIa of Commission Directive 2007/68/EC.

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3. Microbiological status

Total Viable Count	max. 100 cfu/g
Pathogens*	absent/g

*Pathogens are: Enterobacteria, Pseudomonas, Enterococci, Candida albicans, Staphylococci

4. Shelf life / storage conditions

24 months after production (unopened original packaging)

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5. Regulatory Status

5.1 Customs tariff number 34029010

5.2 Regulatory status (chemical regulations)

Europe

Components	REACH status	CAS No.	EINECS / EC No.
Polyglyceryl-3 Methylglucose Distearate*	Reg.-No. 01-2119969646-19 for stearic acid, esters with methyl α -D-glucoside	not assigned	939-238-3
	For 1,2,3-propanetriol, homopolymer, octadecanoate	9009-32-9	Polymer

Other countries

Country		yes / no	Remark*
Australia	AICS:	yes	CAS No. 68936-95-8 for D-Glucopyranoside, methyl, octadecanoate (2:3)
China	IECSC:	yes	
Canada	DSL: NDSL:	no	CAS 9009-32-9 is on the Canadian In-Commerce list
Taiwan	TCSI:	yes	

* INCI name covers a mixture of two chemical substances

In the following countries the relevant authorities currently do not require pre-market approval for cosmetic raw materials:

Brazil, Japan, South Korea, Philippines, USA

5.2.1 Regulatory status (cosmetic regulation)

Country		yes / no	Remark
China	CFDA:	yes	
Japan	JSQI:	yes	

6. Toxicology and Ecotoxicology

Refer to summary of ecotoxicological and toxicological data

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