

TEGO® Care PS

Emulsifier for the formulation of O/W creams and lotions

- Low usage concentration of 2 – 4 %
- Emulsifier for O/W emulsions with a bright white appearance and pleasant application properties
- Formulations with all kinds of cosmetic oils
- High compatibility with active ingredients
- Stable creams from pH 3.5 up to 8.5;
lotions from pH 5.5 to 8.5
- Emulsions with high heat and freeze stability
- PEG-free emulsifier
- Vegetable-based raw materials

Goldschmidt Personal Care

INCI Name (CTFA name)

Methyl Glucose Sesquistearate

Chemical and physical properties (not part of specifications)

| | |
|-----------|--------------|
| Form | pellets |
| Colour | light yellow |
| HLB-value | approx. 12 |

Application

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

- TEGO® Care PS is suitable for the formulation of O/W creams and lotions.
- The amount used, referred to the emulsion, is 2.0 – 3.0 % for lotions, approx. 2.0 – 4.0 % for creams.
- Creams based on TEGO® Care PS 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 lipid ingredients, emulsifiers and consistency promoters are included as parts 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 PS 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.

- For the formulation of lotions consistency-providing substances such as 0 – 3 % cetyl and/or stearyl alcohol may be needed.

To increase heat stability a rheological additive such as 0.15 to 0.20 % of TEGO® Carbomer 141 should be added.

- For the preparation of creams, depending on the formulation, additional 2 – 7 % of consistency-providing substances may be needed for the formation of viscosity-enhancing gel structures in the external water phase. Blends of TEGIN® M (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 PS is well suited for emulsions containing higher amounts of electrolytes.
- TEGO® Care PS is used in slightly acidic to neutral emulsions; however, slightly alkaline adjustments are possible (pH 3.5 to pH 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 +45 °C is attainable.

Preparation

TEGO® Care PS 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 for ethoxylates common method (add the hot water phase slowly to the hot oil phase while stirring) it could happen that a water-in-oil emulsion be formed (recognizable by high viscosity and transparent/gel-like appearance). During the cooling process this emulsion converts to an oil-in-water emulsion with great particle size.

We therefore 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.

The dispersion of TEGO® Carbomer 141 or TEGO® Carbomer 134 in oil (e.g. in mineral oil, decyl oleate, octyl 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 – 45 °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 – 4.0 %

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.

Guide Line Formulations

| O/W Cream F 46/96 | |
|------------------------------|--------|
| Phase A | |
| TEGO® Care PS | 3.0 % |
| TEGO® Alkanol 18 | 1.0 % |
| TEGIN® M | 1.0 % |
| TEGOSOFT® liquid | 9.2 % |
| TEGOSOFT®CT | 10.0 % |
| Phase B | |
| Glycerin | 3.0 % |
| Water | 71.2 % |
| Phase C | |
| TEGO® Carbomer 134 | 0.2 % |
| TEGOSOFT® liquid | 0.8 % |
| Phase D | |
| Sodium Hydroxide, 10 % | 0.6 % |
| Preservative, Perfume | q.s. |

| O/W Cream with AHA F 68/96 | |
|---------------------------------------|--------|
| Phase A | |
| TEGO® Care PS | 4.0 % |
| TEGOSOFT® DO | 8.5 % |
| TEGOSOFT® OS | 8.5 % |
| TEGIN® M | 2.0 % |
| TEGO® Alkanol 18 | 2.0 % |
| Phase B | |
| Glycerin | 2.0 % |
| Water | 63.0 % |
| Phase C | |
| Water | 6.4 % |
| Malic Acid | 1.5 % |
| Citric Acid | 1.5 % |
| Sodium Hydroxide, 10 % | 0.6 % |
| Preservative, Perfume | q.s. |
| pH-value approx. 3.5 | |

| O/W Cream with Urea F 57/96 | |
|--|--------|
| Phase A | |
| TEGO® Care PS | 3.0 % |
| TEGIN® M | 2.5 % |
| TEGO® Alkanol 18 | 1.5 % |
| TEGOSOFT® OS | 9.0 % |
| TEGOSOFT® DO | 9.0 % |
| Phase B | |
| Glycerin | 3.0 % |
| Water | 64.0 % |
| Phase C | |
| Water | 5.0 % |
| Urea | 3.0 % |
| Preservative, Perfume | q.s. |

| O/W Body Lotion F 1/99 | |
|-----------------------------------|--------|
| Phase A | |
| TEGO® Care PS | 2.0 % |
| TEGOSOFT® OS | 5.0 % |
| TEGOSOFT® MM | 1.0 % |
| Mineral Oil (30 mPas) | 5.7 % |
| Tocopheryl Acetate | 0.5 % |
| Phase B | |
| Glycerin | 3.0 % |
| Water | 81.0 % |
| Phase C | |
| TEGO® Carbomer 141 | 0.2 % |
| Mineral Oil (30 mPas) | 0.8 % |
| Phase D | |
| Panthenol | 0.5 % |
| Sodium Hydroxide, 10 % | 0.3 % |
| Preservative, Perfume | q.s. |

| O/W After Sun Lotion BK 45/96 | |
|--|--------|
| Phase A | |
| TEGO® Care PS | 2.0 % |
| TEGOSOFT® OS | 6.5 % |
| Mineral Oil (30 mPas) | 6.5 % |
| Tocopheryl Acetate | 0.5 % |
| Phase B | |
| Glycerin | 3.0 % |
| Water | 79.6 % |
| Panthenol | 0.5 % |
| Phase C | |
| Mineral Oil (30 mPas) | 0.8 % |
| TEGO® Carbomer 141 | 0.2 % |
| Phase D | |
| Sodium Hydroxide, 10 % | 0.4 % |
| Preservative, Perfume | q.s. |

| O/W Sun Protection Cream BK 01/96 | |
|--|--------|
| Phase A | |
| TEGO® Care PS | 4.0 % |
| TEGOSOFT® CT | 4.0 % |
| Avocado Oil | 4.5 % |
| ABIL® 350 | 0.5 % |
| Behenyl Alcohol | 3.0 % |
| Phase B | |
| Glycerin | 3.0 % |
| Water | 67.5 % |
| Water (and) Titanium Dioxide ¹⁾ | 12.5 % |
| Phase C | |
| TEGO® Carbomer 141 | 0.2 % |
| TEGOSOFT® DO | 0.8 % |
| Phase D | |
| Sodium Hydroxide, 10 % | q.s. |
| Preservative, Perfume | q.s. |

| O/W Sun Protection Lotion BK 16/97 | |
|--|---------|
| Phase A | |
| TEGO® Care PS | 3.00 % |
| TEGO® Alkanol 18 | 2.00 % |
| TEGOSOFT® DO | 4.00 % |
| TEGOSOFT® P | 3.50 % |
| ABIL® Wax 9840 | 0.50 % |
| Titanium Dioxide (and) Octyl Palmitate ¹⁾ | 5.00 % |
| Octyl Methoxycinnamate | 4.00 % |
| Butyl Methoxydibenzoylmethane | 1.50 % |
| Phase B | |
| Glycerin | 3.00 % |
| EDTA | 0.15 % |
| Water | 72.95 % |
| Phase C | |
| Xanthan Gum ²⁾ | 0.4 % |
| pH-value approx. 7,0. | |

¹⁾e.g. Tioveil OP, Tioxide Chemicals Ltd.

²⁾e.g. Keltrol T, Kelco

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(Status: April, 2008)