Technical Information

dermofeel® easymuls plus

Natural O/W emulsifier for low-viscous products

Intended use

O/W emulsifier

Benefits at a glance

- 100% naturally derived, anionic PEG-free emulsifier
- For low-viscous and sprayable emulsions
- Suitable for several manufacturing procedures (cold, hot-cold, hot-hot)
- Provides a light and non-tacky skin feel with low body

INCI (PCPC name)

Glyceryl Oleate Citrate

dermofeel® easymuls plus is CFDA registered.

Properties

It is a yellowish viscous liquid and has an HLB value of approx. 10 – 15. **dermofeel® easymuls plus** is made from fatty acids from sunflower oil in food ingredient quality.

Application characteristics

- **dermofeel® easymuls plus** is optimized for stabilizing low-viscous emulsions and sprays.
- It can be used for different application forms such as sprayable sun care, body sprays, face serums or natural deodorant roll-ons.
- **dermofeel® easymuls plus** typically does not require a co-emulsifier.
- To stabilize low-viscous emulsions a combination with gelling agents is recommended, e. g. natural gelling agents (e. g. 0.5% Xanthan Gum) or synthetic thickeners (acrylates, carbomer types).
- **dermofeel® easymuls plus** is optimized for stabilizing fluid emulsions. If higher viscosities such as creams should be formulated, increased amounts of consistency enhancers or gelling agents (such as starch polymers, carbomers or xanthan gum) have to be added. Alternatively, **dermofeel® easymuls plus** can be combined with 3 – 5% **dermofeel® viscolid MB** to achieve high-viscous textures.
- It can be used as a co-emulsifier for improving skin feel or stabilizing O/W-emulsions without increasing the viscosity.
- **dermofeel® easymuls plus** is compatible with many kinds of emollients and oils. It can be used for oil phases from 5 – 25%. For oil phases of 5 – 15% additional amounts of stabilizers are recommended.
- Emulsions over a pH range of 5.0 – 7.0 can be formulated.
- **dermofeel® easymuls plus** is prone to pH drift down to ~ pH 3.5. It is recommended to use 0.15% tri-sodium-citrate as a buffer system.
- The emulsifier is compatible with up to 5% of ethanol and typical amounts of electrolytes. If higher amounts of ethanol or electrolytes have to be tolerated, combine **dermofeel® easymuls plus** with TEGO® Care PBS 6.
- It is incompatible with cationic substances, Zinc PCA and Aluminum Chlorohydrate.

Suggested usage concentration

1.0 – 4.0%	as main-emulsifier
0.5 – 1.0%	as co-emulsifier

Preparation

dermofeel® easymuls plus can be used in cold-cold, hot-cold or hot-hot processes for the preparation of low-viscous emulsions and sprays. It can also be used for one-pot processes.

dermofeel® easymuls plus can be dispersed either in the cold or hot oil phase. Emulsify by adding the oil phase to the hot or cold water phase while stirring. Homogenize the pre-emulsion thoroughly to obtain good stability and viscosity.

If the above mentioned processing is not possible, the water phase should be added to the oil phase without stirring (to avoid the building of the water-in-oil form) and start afterwards with the homogenization. During the homogenization process the homogenizer must be placed in the water phase to ensure that the oil phase will be incorporated into the water phase.

During cooling, a constant horizontal and vertical movement of the emulsion has to be ensured if hot-hot processing was applied. The viscosity of the liquid emulsion increases in dependence of the amounts of consistency enhancers, as these components solidify within the first 2 - 3 days after manufacturing.

It is recommended that thickeners, such as electrolyte tolerant, alkyl modified carbomers, are dispersed in oil and then added to the emulsion.

The dispersion of carbomer in oil (e. g. in mineral oil, ethylhexyl stearate; not in triglycerides) is added at maximum at 60 °C and after formation of the pre-emulsion. Then, the emulsion is homogenized again. Alternatively, polyacrylate based thickeners can also be incorporated via dissolving them in the hot water phase.

In order to avoid a negative impact on the lamellar structures formed by the emulsifier and consistency enhancers, it is recommended to add Xanthan Gum after formation of the pre-emulsion and below 40 °C to the emulsion.

Perfume, temperature-sensitive substances or electrolyte-containing ingredients are preferably added after formation of the pre-emulsion and below 40 °C to the emulsion. Phenoxyethanol-containing preservatives should be incorporated at this temperature, as well. Since phenoxyethanol is an amphiphilic molecule it can interfere with the emulsification process when added directly to the oil or water phase.

It is also suggested to add natural preservatives, such as benzoic acid or sorbic acid, to the emulsion at temperatures below 40 °C. In order to prevent partial crystallization of the organic acids, it is recommended that the necessary amount of Sodium Hydroxide to neutralize those acids is incorporated in the emulsion prior to adding such natural preservatives. After addition of the acids, it is recommended to adjust to a final pH of 5.0 to 5.5. Neutralization of the emulsion is done at approx. 35 °C. The droplet size of the dispersed oil droplets for emulsions with long-term stability is approx. 1 to 8 µm. More coarsely dispersed emulsions tend to separate.

After processing and cooling down, the viscosity of the system can be still low and can increase particularly during the next 2 days. This is due to a reorganisation process of the stabilizing lamellar structures. Thus, it is recommended to determine the final viscosity of a formula not directly after preparation.

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.

Guideline formulations

Natural Caring Deo Roll-On (L094-4.4-0118)

Phase A	
Water	72.83%
Glycerin	4.00%
dermosoft® anisate eco (Sodium Anisate)	0.12%
Phase A1	
Xanthan Gum (Keltrol CG-SFT, CP Kelco)*	0.25%
Magnesium Aluminum Silicate (Veegum Ultra Granulates, R.T. Vanderbilt)*	1.00%
Sodium Citrate*	0.30%
Phase B	
dermofeel® easymuls plus	2.50%
dermofeel® sensolv MB (Isoamyl Laurate)	2.00%
dermosoft® decalact deo MB (Sodium Caproyl/Lauroyl Lactylate; Triethyl Citrate; Salvia Officinalis Oil)	0.50%
TEGODEO® PY 88 G (Zinc Ricinoleate; Tocopherol; Glycine Soja Oil)	1.00%
TEGO® Cosmo P 813 MB (Polyglycery-3 Caprylate)	0.50%
dermofeel® TEC eco (Triethyl Citrate)	5.00%
Phase C	
Alcohol denat.	10.00%

Preparation

1. Premix phase A and phase B separately and heat up to 78 °C.
2. Add phase A1 to phase A under stirring until everything is dissolved.
3. Add phase B to phase A/A1 under medium stirring. Homogenize for 1 – 2 min. using an Ultra-Turrax.
4. Cool down under medium stirring and add phase C below 40 °C. Adjust ph value if necessary.

Remarks

Viscosity: 4 000 – 6 000 mPa*s (Brookfield RV5, speed 100)
pH value: 5.0 – 5.5
Microbiological stability proven
Natural content c_n (incl. water, ISO 16128): 84.2%
Natural origin content c_{no} (incl. water, ISO 16128): 100%

*Not considered for calculation of c_n and c_{no}.

SOS Pimple Tincture (L072-6-6A-0115)

Phase A	
Water	79.55%
Glycerin	4.00%
dermosoft® anisate eco (Sodium Anisate)	0.30%
Sodium Citrate*	0.15%
dermofeel® PA-3 (Sodium Phytate; Aqua; Alcohol)	0.30%
Phase A1	
Xanthan Gum (Keltrol CG-RD, CP Kelco)*	0.50%
Magnesium Aluminum Silicate (Veegum Ultra Granulates, R.T. Vanderbilt)*	1.00%
Phase B	
dermofeel® easymuls plus	2.00%
dermofeel® sensolv MB (Isoamyl Laurate)	5.00%
dermosoft® decalact liquid MB (Sodium Caproyl/Lauroyl Lactylate; Triethyl Citrate)	1.00%
Prunus Armeniaca (Apricot) Kernel Oil	5.00%
dermosoft® GMCY MB (Glyceryl Caprylate)	0.30%
dermofeel® Toco 70 non GMO (Tocopherol; Helianthus Annuus Seed Oil)	0.10%
Phase C	
dermosoft® 700 B (Levulinic Acid; Sodium Levulinate; Aqua; Glycerin)	0.80%

Preparation

1. Premix phase A and phase B separately.
2. Add phase A1 to phase A under stirring. Wait until everything is dissolved.
3. Add phase B to phase A/A1 under stirring. Homogenize for 1 – 2 min. using an Ultra-Turrax.
4. Add phase C under stirring.
5. Adjust pH value to 5.0 – 5.3 if necessary.

Remarks

Viscosity: 4 000 – 6 000 mPa*s (Brookfield TF, speed 10 rpm)
pH value: 5.0 – 5.3
Microbiological stability proven
Natural content c_n (incl. water, ISO 16128): 86.4%
Natural origin content c_{no} (incl. water, ISO 16128): 100%

*Not considered for calculation of c_n and c_{no}.

Natural Mild Cleansing Face Milk (L072-25.2-0216)	
Phase A	
Water	63.45%
Glycerin	5.00%
dermofeel® PA-3 (Sodium Phytate; Aqua; Alcohol)	0.10%
dermosoft® 1388 eco (Glycerin; Aqua; Sodium Levulinate; Sodium Anisate)	3.50%
Sodium Citrate*	0.15%
Phase A1	
Xanthan Gum (Keltrol CG-RD, CP Kelco)*	0.50%
Phase B	
dermofeel® easymuls plus	3.50%
Prunus Amygdalus (Almond) Dulcis Oil	3.00%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	8.00%
Helianthus Annuus (Sunflower) Seed Oil	5.00%
Oenothera Biennis (Evening Primrose) Oil	3.00%
dermosoft® GMCY MB (Glyceryl Caprylate)	0.30%
dermofeel® Toco 70 non GMO (Tocopherol; Helianthus Annuus Seed Oil)	0.20%
Phase C	
Aqua; Disodium Cocoyl Glutamate; Sodium Cococyl Glutamate (Amisoft CS-22, Ajinomoto OmniChem)*	4.00%
Perfume*	0.30%

Preparation

1. Premix phase A and phase B separately.
2. Add phase A1 to phase A under stirring until everything is dissolved.
3. Add phase B to phase A/A1 under stirring. Homogenize for 1 – 2 min. using an Ultra-Turrax.
4. Add phase C under stirring.
5. Adjust pH value if necessary.

Remarks

Viscosity: 3 000 – 6 000 mPa*s (Brookfield TF, speed 10 rpm)
pH value: 5.2 – 5.4
Microbiological stability proven
Natural content c_n (incl. water, ISO 16128): 79.7%
Natural origin content c_{no} (incl. water, ISO 16128): 100%

*Not considered for calculation of c_n and c_{no}.

Natural In Shower Wash-Cream (L014-115.35-0416)	
Phase A	
Water	67.35%
Glycerin	3.00%
Verstatil® TBG (Triethyl Citrate; Glyceryl Caprylate; Benzoic Acid)	1.00%
Sodium Citrate*	0.15%
dermofeel® PA-3 (Sodium Phytate; Aqua; Alcohol)	0.10%
Phase A1	
Xanthan Gum (Keltrol CG-RD, CP Kelco)*	0.50%
Phase B	
dermofeel® easymuls plus	2.60%
dermofeel® viscolid MB (Hydrogendated Vegetable Oil)	3.00%
Simmondsia Chinensis (Jojoba) Seed Oil	5.00%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	5.00%
dermofeel®sensolv MB (Isoamyl Laurate)	5.00%
Theobroma Cacao Seed Butter	2.00%
Phase C	
Aqua; Disodium Cocoyl Glutamate; Sodium Cococyl Glutamate (Amisoft CS-22, Ajinomoto OmniChem)*	3.00%
Glycerin; Aqua; Avena Strigosa Seed Extract; Lecithin; Potassium Sorbate; Citric Acid (Aquarich, Rahn)*	2.00%
Perfume*	0.30%

Preparation

1. Premix phase A. Add phase A1 under stirring and heat up to 75 °C.
2. Heat phase B up to 75 °C. Add phase B to phase A/A1 under stirring. Homogenize for 1 to 2 min. using an Ultra-Turrax.
3. Cool down to room temperature under stirring.
4. Add phase C and adjust pH value if necessary.

Remarks

Viscosity: 100 000 – 300 000 mPa*s (Brookfield TF, sp. 10 rpm)
pH value: 5.0 – 5.5
Microbiological stability proven
Natural content c_n (incl. water, ISO 16128): 84.4%
Natural origin content c_{no} (incl. water, ISO 16128): 99.9%

*Not considered for calculation of c_n and c_{no}.

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