

SK-INFLUX®

A skin-identical lipid concentrate for enhanced skin moisturization and protection

Intended use

Active for hair and skin care

Benefits at a glance

- Restores the protective barrier function of the skin
- Ideal for ageing skin, dry skin and sensitive skin
- Enhanced delivery and exchange of skin lipids

INCI (PCPC name)

Ceramide NP; Ceramide AP; Ceramide EOP;
Phytosphingosine; Cholesterol; Sodium Lauroyl
Lactylate; Carbomer; Xanthan Gum

For Chinese SFDA listed as:

Ceramide 3; Ceramide 6II; Ceramide 1;
Phytosphingosine; Cholesterol; Sodium Lauroyl
Lactylate; Carbomer; Xanthan Gum

Chemical and physical properties (not part of specifications)

Form	viscous liquid
Active matter	about 2.5%

Properties

- SK-INFLUX® is a skin-identical lipid concentrate, which restores the protective barrier function of the skin.
- SK-INFLUX® is a concentrated formulation, consisting of a multi-lamellar (membrane) system

resembling the structure of the lipid barrier in the Stratum Corneum.

- A concentrated mix of different types of ceramides, cholesterol, free fatty acids and phytosphingosine makes it an ideal ingredient for personal care products with unique restoring capabilities.
- Application of SK-INFLUX® will result in an enhanced moisturization and protection, ultimately leading to a less sensitive and less dry skin.
- Depending on the type of skin and desired effect, SK-INFLUX® is used with concentrations varying from 1 – 15%.
However, for typical applications such as ageing and dry skin a dosage level of 3 – 5% is recommended.

Efficacy studies

Uptake of Ceramide into Stratum Corneum (*Ex vivo incorporation study*)

Introduction: This study investigated the extent to which Ceramides can be incorporated into the natural lipid barrier of the stratum corneum when topically applied in different types of formulations.

Study: The study was performed by Prof. P.W. Wertz at the Dows Institute (University of Iowa, USA).

Methods: ¹⁴C-radiolabeled Ceramide VI was formulated in three different systems at a concentration of 0.5% (specific activity of

59 000 dpm/nmol):

System 1: Oil/water with ethoxylated sorbitan ester

System 2: Oil/water with polyglyceryl ester

System 3: SK-INFLUX® system

Ceramide VI was chosen as a representative Ceramide for this study.

50 µl of each formulation was topically applied to isolated Stratum Corneum (1.5 cm x 1.5 cm). After 1 hour, excess formulation was removed and new formulation (50 µl) was applied. This was repeated after the second hour. After 3 hours, excess formulation was removed from the surface. Ten layers of Stratum Corneum were removed by successive stripping with tape. Radioactivity in each strip was determined by liquid scintillation counting. The residual Stratum Corneum was excised to calculate the total amount of Ceramide incorporated (strips plus residue radioactivity).

Results: The graph shows the amount of Ceramide VI incorporated in the layers of the Stratum Corneum. S1–S10 refer to ten sequential tape strips (fig. 1).

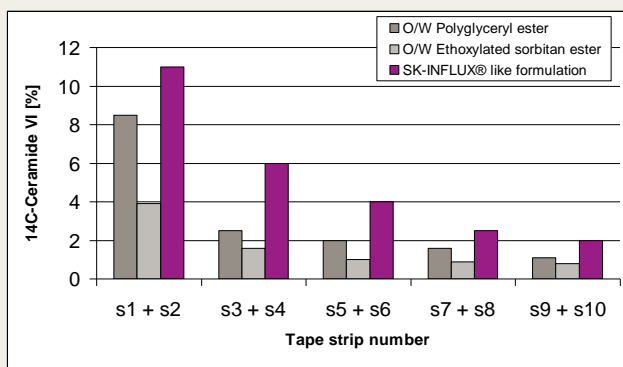


Fig. 1: Ex-vivo incorporation study with ¹⁴C-radio-labeled Ceramide VI

The largest amount of Ceramide VI, thus the best incorporation, can be found with the SK-INFLUX® system. The lower layers of the Stratum Corneum showed decreasing amounts of incorporated Ceramide VI.

Total amounts of incorporated Ceramide VI (strips plus residue) were 20, 31 and 44 µg/cm² for systems 1 to 3 respectively.

Conclusion:

It was demonstrated that Ceramides are effectively incorporated into the lipid barrier of the Stratum Corneum when topically applied. Furthermore, the SK-INFLUX® formulation increased the bioavailability of Ceramide VI by more than 38% compared to the other oil/water emulsions.

Other efficacy studies are available on request.

Preparation of emulsions

SK-INFLUX® should be added to the water phase before the homogenisation step.

Adding SK-INFLUX® to an existing recipe of an **O/W emulsion** drops the viscosity significantly. The reason for this is a rearrangement of the liquid crystalline structures. But the emulsion is not necessarily less stable in spite of the lower viscosity. To increase the viscosity it is suggested to increase the amount of consistency enhancer, e. g. the amount of TEGO® Alkanol 18 (Stearyl Alcohol).

When using SK-INFLUX® in **W/O emulsions** it has to be checked whether its addition to an existing W/O formula leads to phase inversion. A phase inversion can normally be prevented by using a sufficient amount of suitable W/O emulsifiers like ABIL® EM 90 (Cetyl PEG/PPG-10/1 Dimethicone), ISOLAN® GPS (Polyglyceryl-4 Diisostearate/Polyhydroxy-stearate/Sebacate) or ISOLAN® PDI (Diisostearoyl Polyglyceryl-3 Dimer Dilinoleate). For W/O emulsions the maximal usage concentration of SK-INFLUX® should not exceed 3%.

Application

Consequently SK-INFLUX® has a wide range of applications, such as creams and lotions of the segments:

- Moisturizing products
- Ageing and anti-wrinkle products
- Skin repair
- Skin protection

Recommended usage concentration

Normal skin: 1.5 – 5% SK-INFLUX®
Dry skin: 3 – 5% SK-INFLUX®
Ageing skin: 3 – 5% SK-INFLUX®

Skin repair: 3 – 15% SK-INLUX®
 Protection: 3 – 15% SK-INLUX®
 W/O Emulsions 1.5 – 3% SK-INLUX®

Packaging

25 kg package

Storage

- The product is stable for 1 year when stored at 10 – 15°C.
- Kept at room temperature the product is stable for half a year.
- The product should not be stored at temperatures lower than 10°C.

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 case of accidents and fires
- toxicity and ecological effects

is given in our material safety data sheets.

Guideline formulations

O/W Anti-Ageing Cream with SK-INLUX® WR 2 / 00-4	
Phase A	
TEGIN® 4100 Pellets (Glyceryl Stearate)	1.00%
TEGO® Alkanol 1618 (Cetearyl Alcohol)	3.00%
Stearic Acid	1.00%
TEGOSOFT® liquid (Cetearyl Ethylhexanoate)	5.00%
TEGOSOFT® CI (Cetearyl Isononanoate)	5.00%
TEGOSOFT® DC (Decyl Cocoate)	4.00%
Tocopheryl Acetate	2.00%
Phase B	
TEGO® Care CG 90(Cetearyl Glucoside)	1.00%
Glycerin	3.00%
Allantoin	0.10%
SK-INLUX®	5.00%
Water	69.4%
Phase C	
TEGO® Carbomer 134 (Carbomer)	0.10%
Mineral Oil	0.40%
Phase D	
Sodium Hydroxide (10% in water)	q.s.
Preservative, Perfume	q.s.
Preparation:	
1. Heat phase A and B separately to approx. 80°C.	
2. Add phase A to phase 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 below 40°C.	
¹⁾ Important: If phase A has to be charged into the vessel first, phase B must be added without stirring .	

Skin Repair Cream with SK-INFLUX®	
WR 1/00-11	
Phase A	
TEGO® Alkanol S 2 (Steareth-2)	2.40%
TEGO® Alkanol S 20 P (Steareth-20)	0.60%
TEGO® Alkanol 1618 (Cetearyl Alcohol)	3.00%
Stearic Acid	1.00%
Isohexadecane	6.00%
TEGOSOFT® APS (PPG-11 Stearyl Ether)	3.00%
Cyclomethicone	1.00%
Phase B	
Glycerin	3.00%
SK-INFLUX®	5.00%
Water	74.0%
Phase C	
TEGO® Carbomer 134 (Carbomer)	0.20%
Mineral Oil	0.80%
Phase D	
Sodium Hydroxide (10% in water)	q.s.
Preservative, Perfume	q.s.
Preparation:	
1. Heat phase A and B separately to approx. 80 °C. 2. Add phase A to phase 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 below 40 °C.	
¹⁾ Important: If phase A has to be charged into the vessel first, phase B must be added without stirring .	

O/W Lotion with SK-INFLUX®	
SP 14/03-4	
Phase A	
TEGO® Care 450 (Polyglyceryl-3 Methylglucose Distearate)	2.00%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	5.00%
TEGOSOFT® DO (Decyl Oleate)	5.00%
TEGOSOFT® DC (Decyl Cocoate)	4.00%
TEGOSOFT® OS (Ethylhexyl Stearate)	4.00%
Tocopheryl Acetate	0.50%
Phase B	
Propylene Glycol	3.00%
Allantoin	0.10%
SK-INFLUX®	5.00%
Water	68.6%
Phase C	
TEGO® Carbomer 141 (Carbomer)	0.40%
TEGOSOFT® OS (Ethylhexyl Stearate)	1.60%
Phase D	
Sodium Hydroxide (10% in water)	0.80%
Preservative, Perfume	q.s.
Preparation:	
1. Heat phase A and B separately to approx. 80°C. 2. Add phase A to phase 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 below 40°C.	
¹⁾ Important: If phase A has to be charged into the vessel first, phase B must be added without stirring .	

Low Viscous O/W Lotion with SK-INFLUX® WR 4/00-3	
Phase A	
TEGO® Care 215 (Cetearth-15; Glyceryl Stearate)	2.50%
TEGO® Alkanol 18 (Stearyl Alcohol)	1.00%
TEGOSOFT® OS (Ethylhexyl Stearate)	5.20%
TEGOSOFT® CR (Cetyl Ricinoleate)	3.00%
TEGOSOFT® HP (Isocetyl Palmitate)	2.00%
ABIL® 350 (Dimethicone)	0.50%
Phase B	
Glycerin	3.00%
SK-INFLUX®	5.00%
Water	76.8%
Phase C	
TEGO® Carbomer 141 (Carbomer)	0.20%
TEGOSOFT® OS (Ethylhexyl Stearate)	0.80%
Phase D	
Sodium Hydroxide (10% in water)	q.s.
Preservative, Perfume	q.s.
Preparation:	
<ol style="list-style-type: none"> 1. Heat phase A and B separately to approx. 80°C. 2. Add phase A to phase 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 below 40°C. 	
¹⁾ Important: If phase A has to be charged into the vessel first, phase B must be added without stirring .	

W/O Lotion with SK-influx WR 6/06-7	
Phase A	
ISOLAN® GPS (Polyglyceryl-4 Diisostearate/ Polyhydroxystearate/ Sebacate)	2.00%
Microcrystalline Wax (Paracera M; Paramelt B.V.)	0.10%
Hydrogenated Castor Oil	0.10%
TEGOSOFT® DEC (Diethylhexyl Carbonate)	6.80%
TEGOSOFT® TN (C12-15 Alkyl Benzoate)	6.00%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	6.00%
Phase B	
Glycerin	3.00%
Magnesium Sulfate Heptahydrate	1.50%
SK-INFLUX®	2.00%
Water	72.5%
Phase Z	
Preservative, Perfume	q.s.
Preparation:	
<ol style="list-style-type: none"> 1. Heat phase A to approx. 80°C. 2. Add phase B (80°C or room temperature) slowly while stirring. 3. Homogenize for a short time. 4. Cool with gentle stirring below 30°C and homogenize again. 	

W/O Cream with SK-influx	
WR 6/06-11	
Phase A	
ABIL® EM 90 (Cetyl PEG/PPG-10/1 Dimethicone)	2.00%
Hydrogenated Castor Oil	0.80%
Microcrystalline Wax (Paracera M; Paramelt B.V.)	1.20%
TEGOSOFT® DEC (Diethylhexyl Carbonate)	10.00%
Cyclomethicone	10.00%
Phase B	
Glycerin	3.00%
NaCl	0.50%
SK-INFLUX®	2.00%
Water	70.5%
Phase Z	
Preservative, Perfume	q.s.
Preparation:	
<ol style="list-style-type: none"> 1. Heat phase A to approx. 80°C. 2. Add phase B (80°C or room temperature) slowly while stirring. 3. Homogenize for a short time. 4. Cool with gentle stirring below 30°C and homogenize again. 	

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Especially concerning Active Ingredients

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