Boost Up the Stability
of Oil in Water Emulsions by
Pair2Phase

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Potassium Cetyl Phosphate (60%)
Behenyl Alcohol (40%)

Pair2Phase1

Potassium Cetyl Phosphate (60%)
Oryza Sativa Bran Cera (40%)
(Rice Bran Wax)

Pair2Phase2

- **Emulsifier blend of Potassium Cetyl Phosphate and Wax like components**
- **Caring effects similar to skin phospholipids due to lamellar phases**
- **Gives robustness to oil in water emulsions**
- **Forms liquid crystal based emulsions**
- **Outstanding skin feel without stickiness**
- **Humectant abilities**
- **Key component for water resistant suncare applications**
- **Stabilizes UV-absorbers like zinc oxide and titanium dioxide in emulsions**
- **COSMOS and NaTrue certified**
- **No yellowing in sun care formulations**
- **Free from preservatives, fragrances and solvents**
- **Sulphate free, PEG-free, EO-free**

Pair2Phase Series
Green Certification

ECOCERT® COSMOS CERTIFIED

Schill+Seilacher struktol®

ATTESTATION OF CONFORMITY - COSMOS

List of the approved raw materials of: **SCHILL+SEILACHER GMBH**

PPAI: Physically Processed Agro-Ingredients
CPAI: Chemically Processed Agro-Ingredients
NNI: Non Natural Ingredients (Petrochemical origin)
PeMo: Petrochemical Moiety
CSPO: Raw material proceeding from certified sustainable palm/palm kernel oil

The asterisk * is used to identify the commercial name of the raw materials concerned by the appendices II and/or V of the Cosmos-standard.
Unless an exception, the following references are published on the ECOCERT raw materials online database for approved raw materials available at the following link: http://ap.ecocert.com/ecoproduits.

Commercial name / INCI / Function	%PPAI	%CPAI	%NNI	%PeMo	Restriction	Approved since
Pair2Phase1 *Potassium Cetyl Phosphate (and) Behenyl Alcohol* Emulsifier	0	100	0	0	Use only in leave-on products	01/01/2019

Commercial name / INCI / Function	%PPAI	%CPAI	%NNI	%PeMo	Restriction	Approved since
Pair2Phase2 *Potassium Cetyl Phosphate (and) Oryza Sativa Bran Cera* Emulsifier	40	60	0	0	Use only in leave-on products	01/01/2019

Pair2Phase Series
Green Certification

Schill+Seilacher
struktol®

Accredited by
IOAS

this certificate has been issued to confirm
that the listed products of

Schill + Seilacher GmbH

DE – 71032 Böblingen

are in accordance with the standard of

WWW.NATRUE.ORG

NATRUE
European Natural and Organic Cosmetics Interest Grouping A.I.S.B.L.
(see product list on page 2 - 4, dated 1/26/2019)

The certificate entitles to the use of the NATRUE label according to the license contract
with the NATRUE association.

Validity: see single product in the annex

Trade name	INCI name(s)	Begin of label usage	Expiration date	% certified organic natural substances (referred to the share of natural substance)	% natural substances total	% derived natural substances	% nature-identical substances	% portion organic Botano-Chemicals	% organic Botano-Chemicals related to total derived natural substances	% Water
Pair2Phase1	Potassium Cetyl Phosphate, Behenyl Alcohol	23.01.2019	23.01.2021			100,00%				
Pair2Phase2	Potassium Cetyl Phosphate, Oryza Sativa Bran Cera	23.01.2019	23.01.2021		40,00%	60,00%				

Engstingen, 2019-01-26 Dr. Joachim Banzhaf
place, date, issued by, signature

PROUD to be PART
Eco Control

EcoControl GmbH
Dr. Joachim Banzhaf
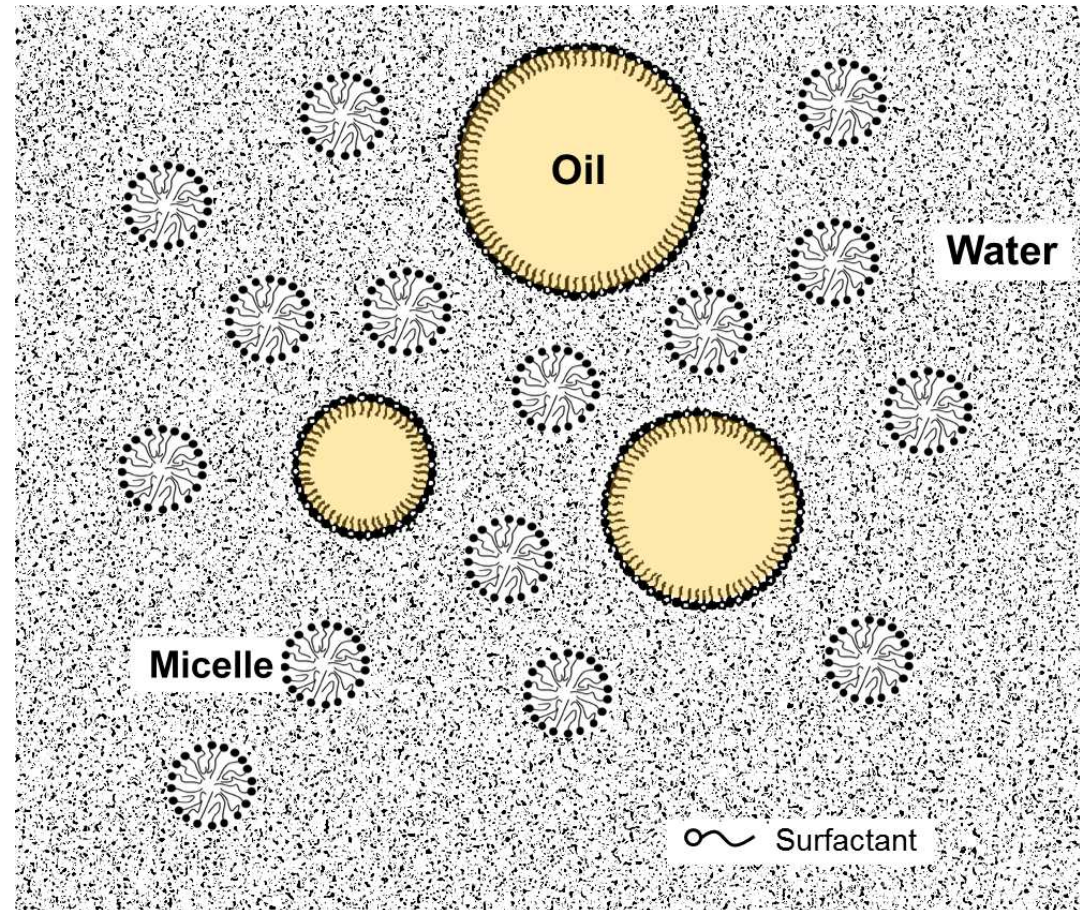Hermann-Hesse Str. 18 • D – 72829 Engstingen
www.eco-control.com

Certification of
natural products

Traditional way of understanding stability of macro emulsions

does not reflect reality of Pair2Phase emulsification

- surfactants surrounding emulsion droplet and build mono-layers
- excess of micelles would shield droplets and contribute to stability

**Liquid Crystals and Emulsions
A Wonderful Marriage**

KEN KLEIN, Cosmet. Toiletries, vol 117, pp. 30-34, 2002

„Who among us hasn't made an oil-in-water emulsion and added a small amount of fatty alcohol

(cetyl or stearyl is most used, but **behenyl** will also work)

to modify skin feel and watched the viscosity increase from a thin lotion to a robust cream?"

Oil

Water

W

Liquid crystal

◦〜 Surfactant
●〜 Fatty Alcohol
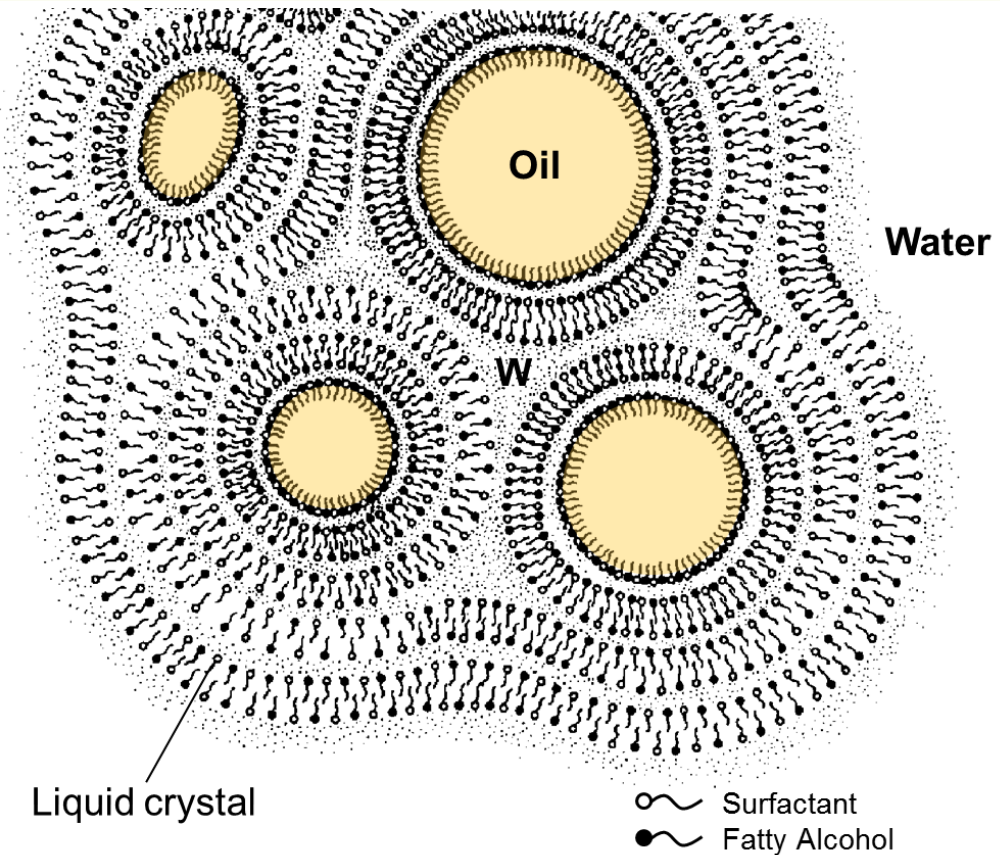
lammelar gel networks surrounding emulsion droplets
explains phenomenona on Pair2Phase emulsification

Pair2Phase Series
Preparation of an Emulsion

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Lipophilic Phase:
- Mix Oil, Fat, Wax, Fatty Alcohols, UV Absorber + Pair2Phase
- Heat up to 85°C to melt all components

Hydrophilic Phase:
- Mix all water soluble components
- Heat up to 85°C

Emulsion:
- Mix lipophilic and hydrophilic phases together at 85°C
- Agitate and cool down to 50°C. Intensity of agitation will influence stability of macro-emuslion.
- Cool down to 30°C and add oil by low intensity agitation to improve cream texture (optional)

Pair2Phase Series
Rheology of Emulsions:

Schill+Seilacher
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Lipophilic Phase:

85% Sunflower Oil

Triglyceride with fatty acid distribution:
5% C16; 2% C18; 25% C16'; 66% C18'

15% Pair2Phase1 Emulsifier

Hydrophilic Phase:

Water

Emulsion:

5-30% Lipophilic Phase
95-70% Hydrophilic Phase

pH 7.0

Rheology of Emulsions:

Schill+Seilacher
struktol®

Lipophilic Phase:

92.5-0% Sunflower Oil

Triglyceride with fatty acid distribution:
5% C16; 2% C18; 25% C16'; 66% C18'

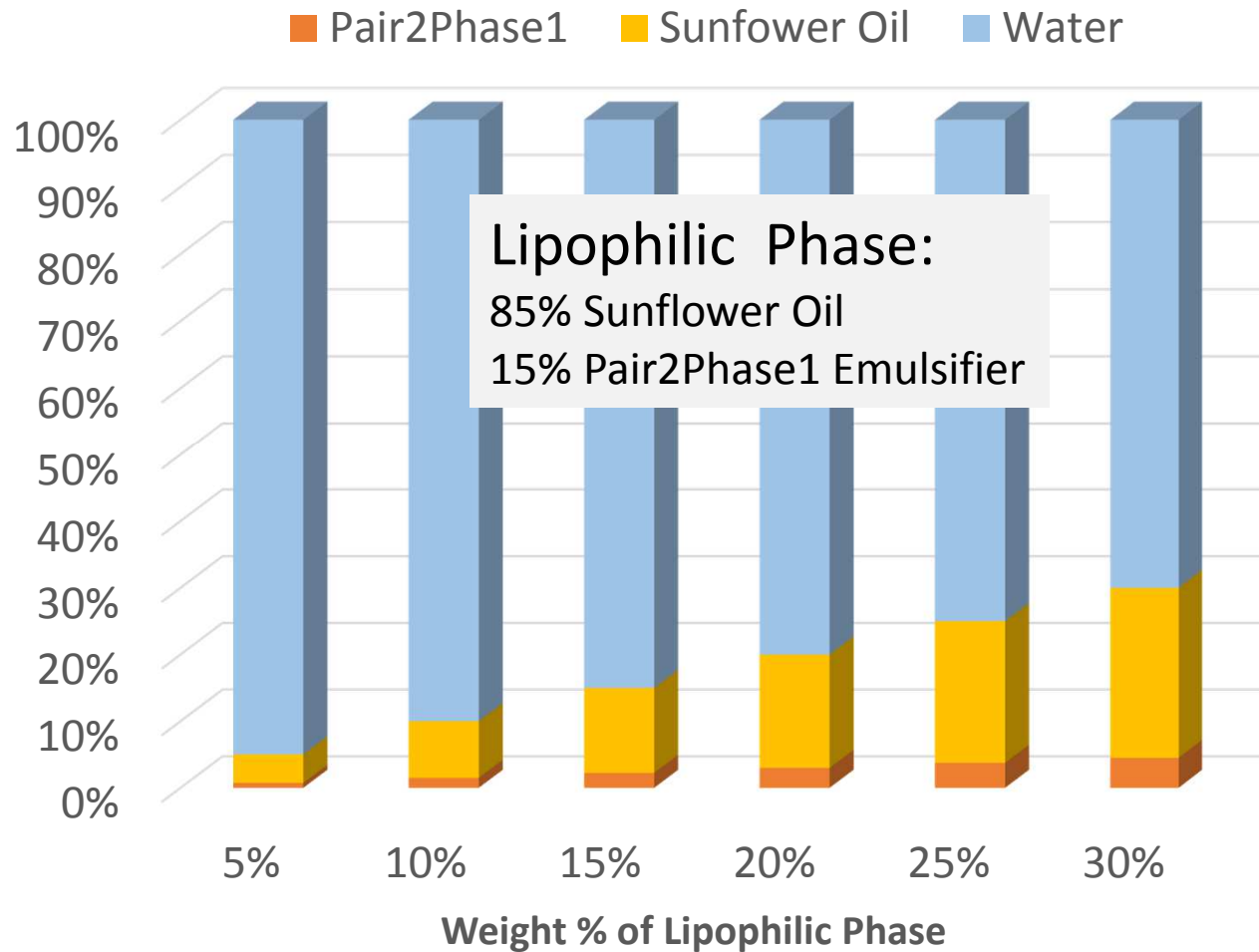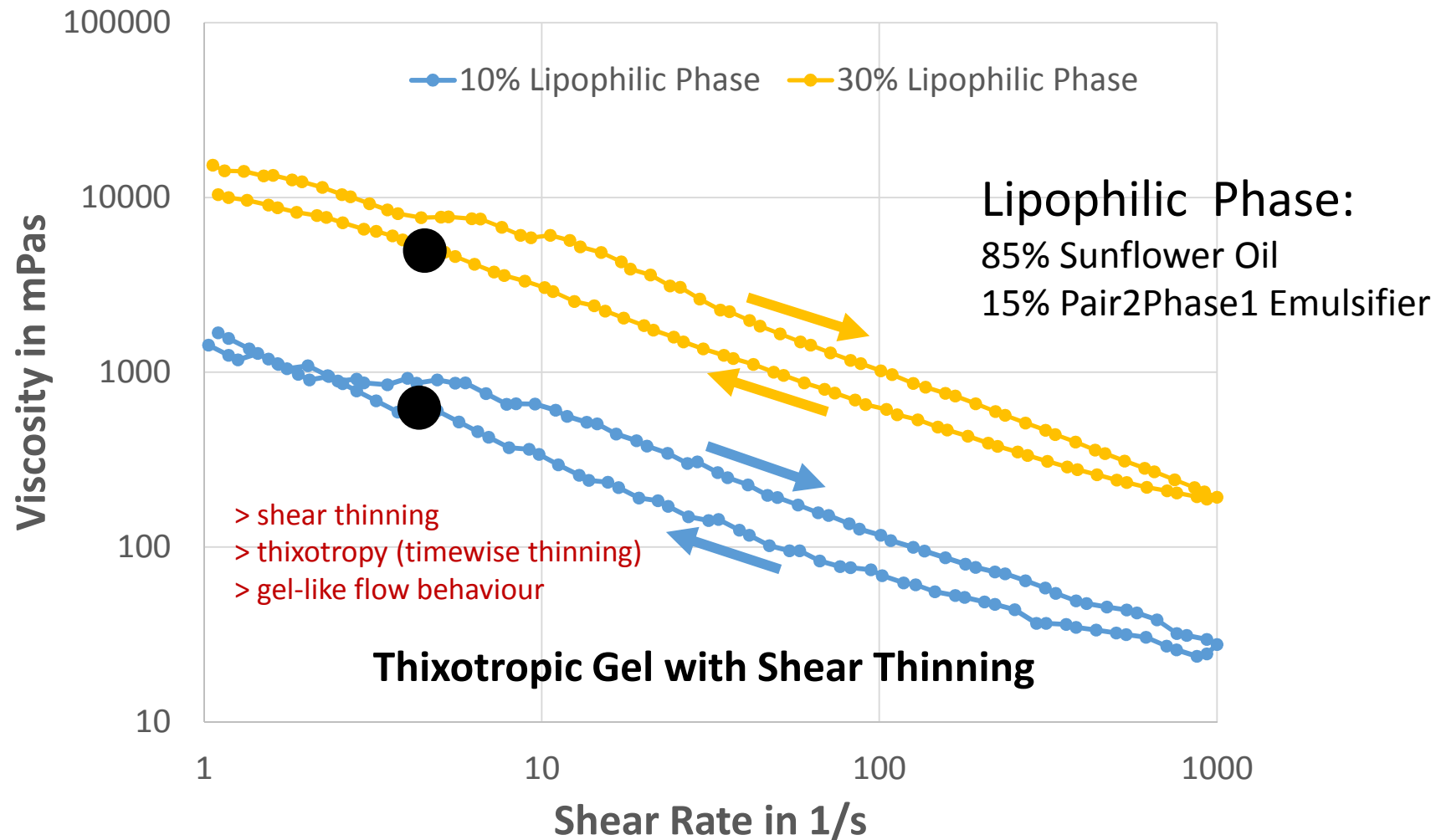7.5-100% Pair2Phase1 Emulsifier

Hydrophilic Phase:

Water

Emulsion:

15% Lipophilic Phase   pH 7.0
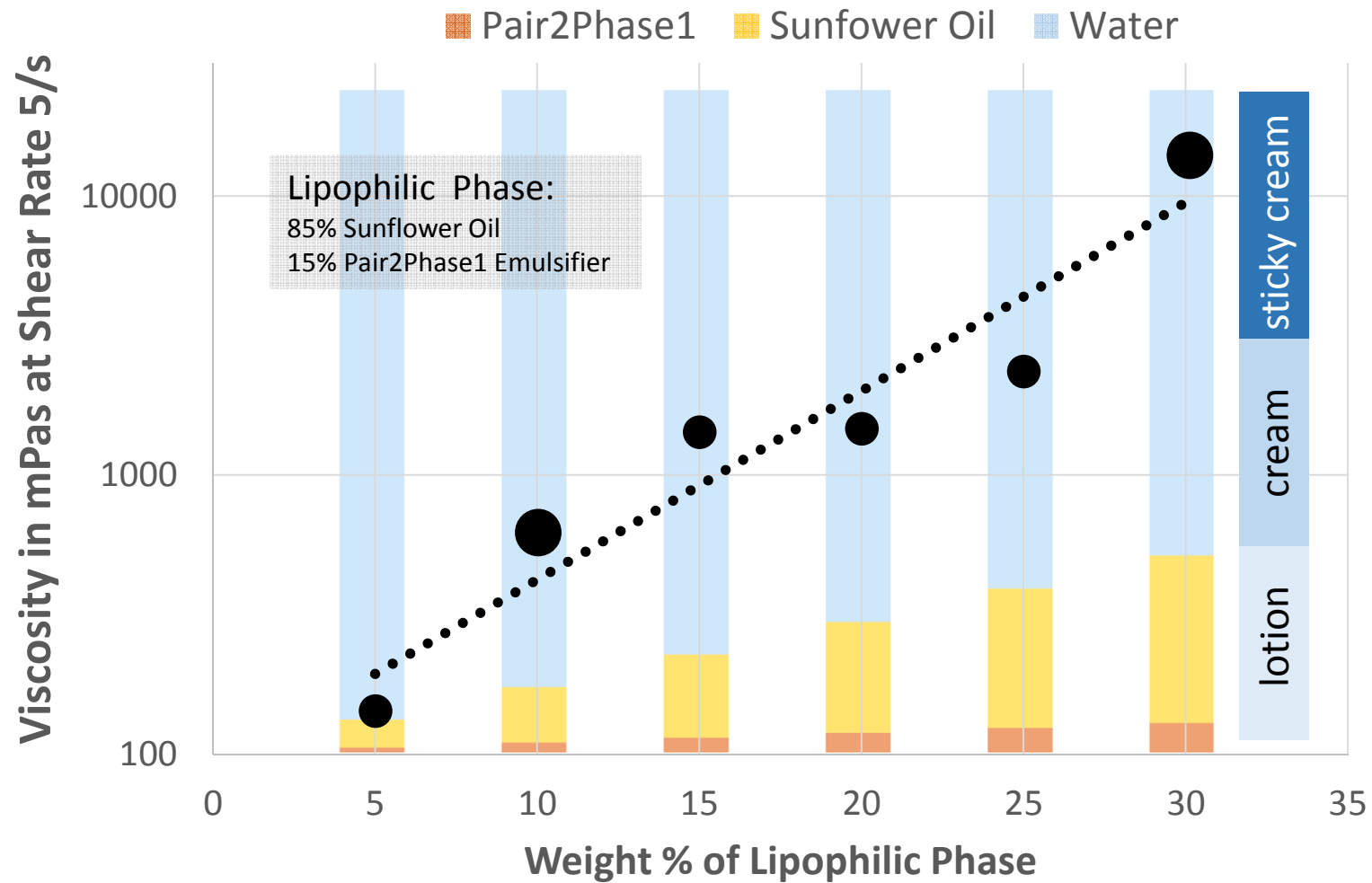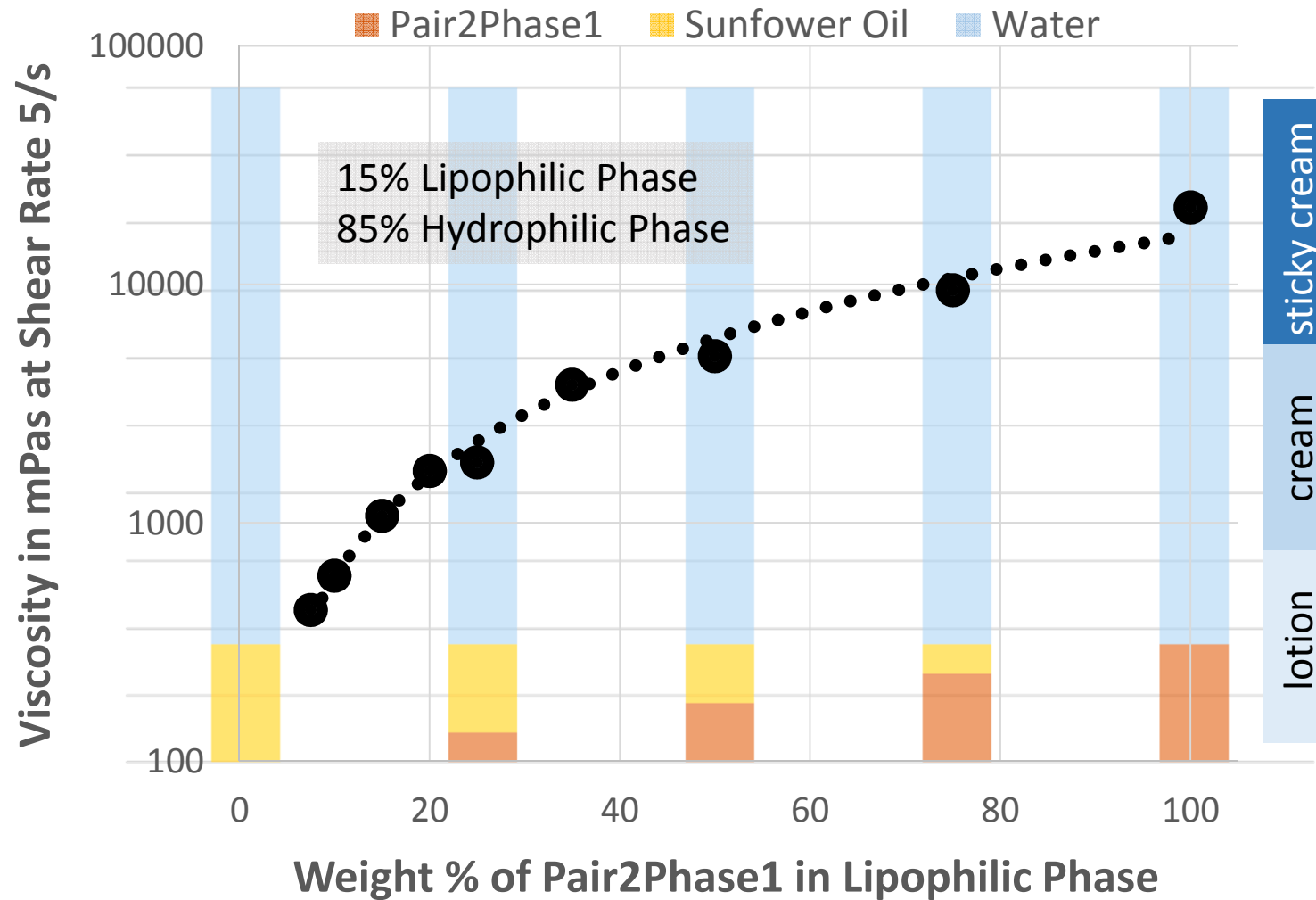85% Hydrophilic Phase

Pair2Phase1
Water Resistance Test

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- **Difference between Standard P2 and Modified P2 only Emulsifier System**

- **Both tested in vivo according to COLIPA 2005 at Institut proDERM**

	INCI / Active Ingredient	Standard P2	Modified P2
	Aqua	77.5	77.5
A	Sorbitol	5.00	5.00
	Triethanolamine	1.00	1.00
	Lanolin	4.50	4.50
	Theobroma Cacao Seed Butter	2.00	2.00
	Glyceryl Stearate	3.00	---
	Stearic Acid	2.00	
B	Potassium Cetyl Phosphate (and) Behenyl Alcohol Pair2Phase1 (Schill+Seilacher GmbH)	---	5.00
	Octyl Dimethyl PABA	7.00	7.00
	Benzophenone-3	3.00	3.00
C	Preservatives	qs	qs

Pair2Phase1
Water Resistance Test

Schill+Seilacher
struktol®

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- **Both tested in vivo according to COLIPA 2005 at Institut proDERM**
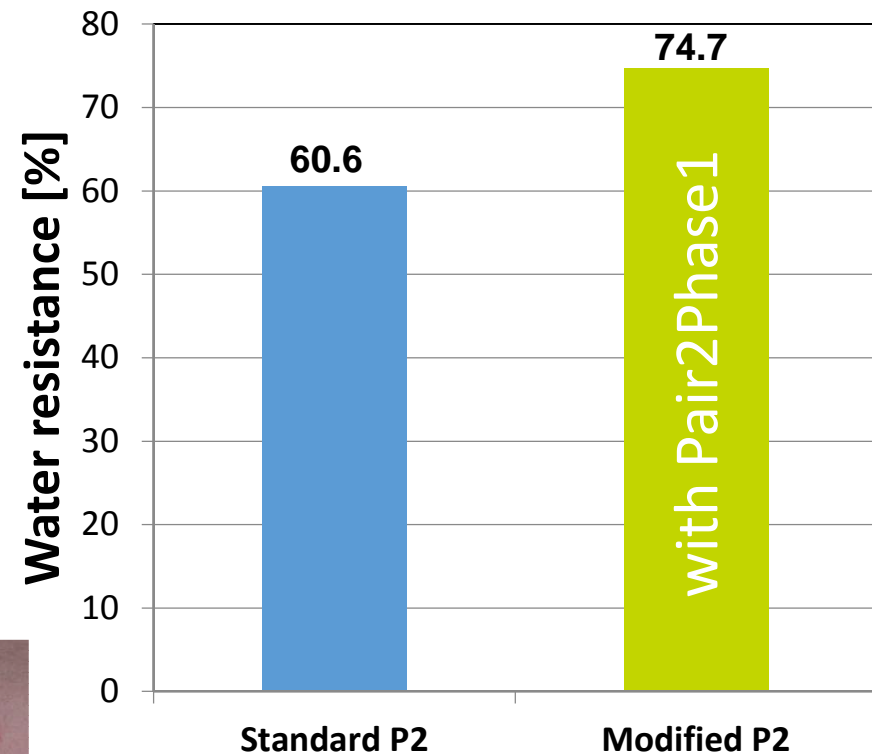
- **Modified P2 with Pair2Phase1 shows significant improvement in Water Resistance**

Water resistance [%]

Standard P2	Modified P2 with Pair2Phase1
60.6	74.7

Pair2Phase1
Formulation: Sun Cream

Schill+Seilacher
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Pair2Phase1 is an emulsifier blend. It allows the formulation of water resistant sun care products with soothing skin fell without stickiness. Application in certified cosmetic formulation. No Yellowing in sun care formulation.

	INCI / Active Ingredient	Tradename (Supplier)	Weight %
A	Aqua		62.80
	Glycerin		2.00
	Propylene Glycol		4.00
B	Potassium Cetyl Phosphate (and) Behenyl Alcohol	Pair2Phase1 (Schill+Seilacher GmbH)	5.00
	Simmondsia Chinensis (Jojoba) Seed Oil		4.00
	Butyrospermum Parkii (Shea) Butter		4.00
	Octocrylene		10.00
	Ethylhexyl Salicylate		4.00
	Butyl Methoxydibenzoylmethane		2.50
	Benzophenone-3		1.50
	Bisabolol		0.20
C	Citric Acid		qs to pH
D	Preservatives, Fragrances etc.		qs

- Heat **Part A** up to 75°C
- Heat **Part B** up to 75°C
- Add **Part B** to **Part A** and mix until formulation appears homogeneous
- Cool down to room temperature while stirring
- Adjust pH-Value with **Part C**
- Add **Part D**

Appearance	White cream
pH-Value	5.5

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Pair2Phase1
Formulation: Body Lotion

Schill+Seilacher
struktol

Pair2Phase1 is an emulsifier blend similar to skin phospholipids leading to an outstanding skin feel without stickiness.

	INCI / Active Ingredient	Tradename (Supplier)	Weight %
A	Aqua		81.00
	Glycerin		2.00
B	Potassium Cetyl Phosphate (and) Behenyl Alcohol	Pair2Phase1 (Schill+Seilacher GmbH)	2.50
	Dicaprylyl Carbonate		4.50
	Macadamia Ternifolia Seed Oil		4.00
	Squalane		3.00
	Glyceryl Oleate		3.00
C	Citric Acid		qs to pH
D	Preservatives, Fragrances etc.		qs

- Heat **Part A** up to 75°C
- Heat **Part B** up to 75°C
- Add **Part B** to **Part A** and mix until formulation appears homogeneous
- Cool down to room temperature while stirring
- Adjust pH-Value with **Part C**
- Add **Part D**

Appearance	White cream
pH-Value	5.5

Pair2Phase Series
Conclusion

- **Anionic emulsifier for cosmetic preparations such as creams and lotions for skin and body care**

- **Allows to formulate water resistant sun care products with soothing skin feel without stickiness**

- **Due to its driving force to form lamellar surfactant phases potassium cetyl phosphate takes care to regulate humidity on the skin.**

- **The surfactant property lowers the surface tension of cosmetic formulations and supports a uniform distribution on skin.**

- **Sophisticated benefits due to extraordinary micro structures**