VOELPKER | cosmetic + pharma series

FOR BETTER CARE PRODUCTS

Skin protection

Dispersing

Viscosity-regulating

SPECIAL WAXES FOR COSMETIC FORMULATIONS

Introduction

With more than 115 years of production history, Voelpker is one of the most long-standing wax producers in Europe and is internationally renowned as a reliable manufacturer and supplier of montan waxes and special wax blends. True to the motto `to make ideas work´, we do everything to improve and optimise our customers' products and processes. Our WARADUR® and CEVO® brand wax additives are used in numerous industrial fields. You can find our standard products in the corresponding product line ("series"). These comprise all types of our multifunctional montan waxes, as well as wax blends developed for specific applications. In this brochure we present products, that are specially suited for cosmetic applications.

VOELPKER | cosmetic + pharma series

The products from the VOELPKER Cosmetic + Pharma Series include INCI-listed montan waxes, which are widely used in cosmetic formulations - and proprietary blends of waxes for the cosmetic industry (CEVO®-cos waxes).

Waxes from the VOELPKER® Cosmetic + Pharma Series have an oil-binding effect, can increase the stability of formulations (e.g. water/oil emulsions) and improve skin protection. They are used, for example, to influence the hardness and strength of decorative cosmetics (e.g. lipsticks and lip care products, mascara sticks, eyeliners, deodorant sticks). Due to their specific properties, **WARADUR®** and **CEVO®-cos waxes** can also be used to re-formulate recipes based on Carnauba wax or Candelilla wax (see suggested formulations in this brochure).

Montan Waxes – When Performance Counts

In cosmetic formulations, INCI-listed montan waxes can support the stability of the formulation and improve skin protection. They can trigger an occlusion effect, which reduces skin moisture evaporation and provides the skin with a protective, breathable film. This property can also improve the cold protection of cosmetic formulations at low temperatures and strong wind respectively. In w/o emulsions these functionalised waxes act in a stabilising and oil-binding manner. In concentrations above 1 % for example, **WARADUR® GE** (INCI: Glyceryl Montanate) can improve the long-term stability and provide a soft skin sensation. Exemplary applications are deodorant sticks, eye creams and sun lotions.

WARADUR® GE | Deodorant Stick Natural – Base Formulation | Formula No 22-16-3-5

Composition

Phase	Trade name	INCI name	Supplier	Weight [%]
Oil phase	CEVO®-cos K-8560	C18-36 Acid Triglyceride	VOELPKER	4.50
	Sabonal C18	Stearyl Alcohol	Sabo/ Polygon	18.50
	dermofeel® TEC eco	Triethyl Citrate	Dr. Straetmans	5.00
	Cutina® CP	Cetyl Palmitate	BASF	25.00
	Tegosoft® MM	Myristyl Myristate	Evonik	10.00
	Myritol® 312	Caprylic/ Capric Triglyceride	BASF	31.00
	Cetiol® C5	Coco-Caprylate	BASF	5.00
Perfume phase	Cotton Water E_1407987	Fragrance	Mane	1.00

Preparation

1. Heat the oil phase to 80 °C.
2. Allow to cool down to 65 °C while stirring and then add the perfume phase.
3. Stir for 1 minute and fill into the container.

Formula Specifications

Appearance: white, solid stick
Centrifugation
(15 min at 4,000 rpm): no separation

Stability Data

Storage Stability in Terms of Appearance

- stable at room temperature
- stable at 5 °C … 40 °C for at least 3 months
- stable at 50 °C for at least 1 month

WARADUR® GE | Sun Lotion SPF 15 – Base Formulation | Formula No 22-16-1-7

Composition

Phase	Trade name	INCI name	Supplier	Weight [%]
Water phase	Deionised Water	Aqua		62.60
	Glycerine 99.5 %	Glycerine	AOT	4.00
	Magnesium Sulphate	Magnesium Sulphate	Inter-Harz	0.70
	Potassium Sorbate	Potassium Sorbate	Inter-Harz	0.50
	Citric Acid	Citric Acid	Inter-Harz	0.20
Oil phase	CEVO®-cos K-8560	C18-36 Acid Triglyceride	VOELPKER	1.50
	dermofeel® PGPR	Polyglyceryl-3 Polyricinoleate	Dr. Straetmans	5.00
	Tegosoft® CT	Caprylic/Capric Triglyceride	Evonik	5.00
	Cosmacol® ESI	Tridecyl Salicylate	Sasol	5.00
	Cosmacol® OE	Dicaprylyl Ether	Sasol	5.00
	Solaveil™ XT-300-LQ-(WD)	Titanium Dioxide (and) Caprylic/Capric Triglyceride (and) Polyhydroxystearic Acid (and) Stearic Acid (and) Alumina	Croda	10.00
Perfume phase	Cotton Water E_1407987	Fragrance	Mane	0.50

Preparation

1. Heat the water phase and the oil phase to 80 °C.
2. Add the water phase slowly into the oil phase while stirring.
3. Homogenise for 1 minute with the SilentCrusher/ULTRA-TURRAX® at 20,000 rpm.
4. Allow to cool down while stirring with the IKA paddle stirrer at 300 rpm.
5. Add the perfume phase at a temperature of below 40 °C and homogenise for 1 minute with the SilentCrusher/ULTRA-TURRAX® at 20,000 rpm. The sun lotion is now ready for packaging.

Formula Specifications

Appearance: white, soft w/o emulsion
Viscosity (Brookfield DV3T,
spindle 6/speed 10/time 30 s): 18,900 mPas
Centrifugation
(15 min at 4,000 rpm): no separation

Stability Data

Storage Stability in Terms of Appearance

- stable at room temperature
- stable at 5 °C … 40 °C for at least 3 months
- stable at 50 °C for at least 1 month

WARADUR® GE | Natural Eye Cream – Base Formulation | Formula No 22-16-2-4				
Composition				
Phase	**Trade name**	**INCI name**	**Supplier**	**Weight [%]**
Water phase	Deionised Water	Aqua		66.65
	Glycerine, 99.5 %	Glycerine	AOT	5.00
	Arginine HCL	Arginine Hydrochloride	Azelis	0.10
	dermosoft® 1388 eco	Aqua (and) Glycerine (and) Sodium Levulinate (and) Sodium Anisate	Dr. Straetmans	4.00
	Violet Flower Extract	Glycerine (and) Aqua (and) Viola Odorata Flower Extract	Botanica	1.00
Oil phase	WARADUR® GE	Glyceryl Montanate	VOELPKER	0.80
	Cutina® GMS-SE	Glyceryl Stearate SE	BASF	5.50
	Hydrogenated Rapeseed Oil	Hydrogenated Rapeseed Oil	Henry Lamotte	1.20
	Plantasens® Olive Squalane	Squalane	Clariant	1.00
	LexFeel® Natural	Heptyl Undecylenate	Inolex	8.00
	dermofeel® MT 70	Tocopherol (and) Helianthus Annuus Seed Oil	Dr. Straetmans	0.50
Thickener phase	Keltrol® CG-SFT	Fragrance	Mane	0.25
	Myritol® 312	Caprylic/Capric Triglyceride	BASF	6.00

Preparation

1. Heat the water phase and the oil phase to 80 °C.
2. Add the oil phase to the water phase while stirring with the SilentCrusher/ULTRA-TURRAX® at 10,000 rpm and then add the thickener phase.
3. Homogenise for 1 minute with the SilentCrusher/ULTRA-TURRAX® at 20,000 rpm.
4. Allow to cool down while stirring with the IKA paddle stirrer at 300 rpm. The natural eye cream is now ready for packaging.

Formula Specifications

Appearance:	white, slightly yellowish emulsion
Viscosity (Brookfield DV3T, spindle 6/speed 10/time 30 s):	15,000 mPas
pH value:	6.9
Centrifugation (15 min at 4,000 rpm):	no separation

Stability Data

Storage Stability in Terms of Appearance

- stable at room temperature
- stable at 5 °C … 40 °C for at least 3 months

WARADUR® OP (Butylene Glycol Montanate) and **WARAMONT CA** (INCI: Calcium Montanate) can be used as anti-caking agent for pressed and loose cosmetic powders. In peeling formulations, it is also suitable as a natural substitute for microparticles made of polyethylene.

Cera Montanglycoli – Specified According to German Pharmacopoeia (DAB)

WARADUR® XE complies with the parameters set out in the specifications of the Deutsches Arzneibuch (DAB – German Pharmacopoeia; Table 1) for "Montanglycolwachs" (Cera montanglycoli, montan glycol wax)[2]. It is used as a (retarding) matrix for pharmaceutical active ingredients and as a polishing agent and coating wax[3].

[1] International Nomenclature of Cosmetic Ingredients | [2] WARADUR® XE documentation; available upon request
[3] https://www.gelbe-liste.de/wirkstoffe/Montanglycolwachs_16814 (27. November 2019)

Delivery Specifications			
Characteristics	**Unit**	**Specification**	**Method**
Acid value	mg KOH/g	15 – 20	DAB
Saponification value	mg KOH/g	130 – 160	DAB
Drop point	°C	79 – 85	Ph. Eur. 2.2.17
Colour (Iodine colour)	–	1.0 – 20.0	Iodine colour number
Peroxide value	meq O2/kg	0.0 – 5.0	DAB
Ash	%	0.0 – 0.3	Ph. Eur. 2.4.16
Free ethylene glycol	%	0.0 – 0.3	GC, DAB
Chromium (III)	mg/kg	0.0 – 10.0	Ph. Eur. 2.2.23 II
Relative density	g/cm3	1.01 – 1.03	DAB 2.2.N1

Table 1: WARADUR® XE – Specification according to DAB (`Deutsches Arzneibuch´; German Pharmacopoeia)

CEVO®-cos – Proprietary Cosmetic Wax Blends and Bio-based Wax Derivatives

Patented, bio-based certified waxes such as **CEVO®-cos K-4418** and **CEVO®-cos K-4419** are made from renewable plant waxes. They are very similar to montan waxes in terms of chain length and structure and are used in the same manner. CEVO®-cos waxes also include proprietary blends of cosmetic-compliant ingredients, carefully designed for the formulation of cosmetic products, for example: sticks for decorative cosmetics/deodorant sticks, body butter, hair wax, lip butter – to mention only a few.

CEVO®-cos K-4418 has an oil-binding effect. It can increase the stability of emulsions, optimise the texture and is also used as a dispersing aid for pigments in decorative cosmetics; INCI: classified as emulsifying, skin nourishing, opacifying.

We sell our CEVO® products in Benelux countries under the brand name VOELPKER®.

CEVO®-cos K-4418 or WARADUR® E | Lipstick – Base Formulation | Formula No V-cos-002

Composition

Phase	Trade name	INCI name	Supplier	Weight [%]
Fat phase	WARADUR® E or CEVO®-cos K-4418	Glycol Montanate, Carnauba Acid Wax Glycol Ester	VOELPKER	5.40
	Sasol 6403	Paraffin	Sasol	1.80
	Ceraphyl ™ 50	Myristyl Lactate	Ashland	3.60
	Castor Oil	Castor Oil	Lanxess	64.18
	Oxynex® 2004	Propylene Glycol (and) BHT (and) Ascorbyl Palmitate (and) Glyceryl Stearate (and) Citric Acid	Merck	0.02
Extra phase	Pearlescents		Gold Mann	20.00
	Colour pigments		Gold Mann	5.00

Preparation

1. Melt position 1 to 3 and add the castor oil to the mixture.
2. Work in the pearlescent and colour pigments.
3. Allow to cool down while stirring.

CEVO®-cos K-5130 has been created to imitate Candelilla wax, especially for body butter, lip butter and hair wax formulations. Comparative studies have proven equivalent performance in these applications. Also physical key parameters, like melting behaviour have been adjusted to match the properties of Candelilla wax (Fig. 1).

CEVO®-cos K-5130 | Lip Butter – Base Formulation | Formula No 22-17-5-4

Composition

Phase	Trade name	INCI name	Supplier	Weight [%]
Oil phase	CEVO®-cos K-5130	Ceresin(and)Copernicia Cerifera (Carnauba)Wax (and) Shorea Robusta Resin	VOELPKER	11.00
	SonneNatural®	Olus Oil	Sonneborn	48.00
	Cetiol® SB 45	Butyrospermum Parkii (Shea) Butter	BASF	2.00
	Cacao Butter	Theobroma Cacao (Cocoa) Seed Butter	Gustav Heess	1.00
	dermofeel® Toco 70 non-GMO	Sorbitan Stearate	Croda	2.00
Oil phase	Elfacos® C 26	Tocopherol + Helianthus Annuus (Sunflower) Seed Oil	Dr. Straetmans	1.00
	Tegosoft® CT	Caprylic/Capric Triglyceride	Evonik	35.00

Preparation

1. Heat the oil phase to 90 °C.
2. Allow to cool down to 65 °C while stirring (IKA paddle stirrer).
3. Bottle the lip butter while still hot. The lip butter is now ready to use.

Formula Specifications

Appearance: waxy emulsion
Centrifugation
(15 min at 4,000 rpm): no separation

Stability Data

Storage Stability in Terms of Appearance

- stable at room temperature
- stable at 5 °C … 40 °C for at least 30 days

CEVO®-cos K-5130 | Hair Wax – Strong Hold | Formula No 22-17-7-7

Composition

Phase	Trade name	INCI name	Supplier	Weight [%]
Water phase	Deionised Water	Aqua		57.90
	Biostyle® CGP	Maltodextrin VP Copolymer	AkzoNobel Surface Chemistry	8.00
	Structure® XL	Hydroxypropyl Starch Phosphate	AkzoNobel Surface Chemistry	4.00
Oil phase	CEVO®-cos K-5130	Ceresin(and)Copernicia Cerifera (Carnauba)Wax(and) Shorea Robusta Resin	VOELPKER	8.00
	Lanette® O	Cetearyl Alcohol	BASF	9.00
	Isofol® 20	Octyldecanol	Sasol Performance Chemicals	4.00
	Tego® Care 450	Polyglyceryl-3 Methylglucose Di-stearate	Evonik	5.00
Extra phase	Dermosoft® OMP	Methylpropandiol, Caprylyl Glycol, Phenylpropanol	Dr. Straetmans	4.00
	Cotton Water E_1407987	Parfum	Exilva	0.10

Preparation

1. Heat the water phase to 80 °C and the oil phase to 90 °C.
2. Add the oil phase to the water phase while stirring at 6,000 rpm (Silverson mixer) and then add the extra phase.
3. Homogenise for 2 minutes at 9,000 rpm (Silverson mixer).
4. After homogenisation, bottle the hair wax while still hot.

Formula Specifications

Appearance: buttery hair wax
Centrifugation
(15 min at 4,000 rpm): no separation

Stability Data

Storage Stability in Terms of Appearance

- stable at room temperature
- stable at 5 °C … 40 °C for at least 1 month

CEVO®-cos K-5130 | Body Butter – Base Formulation | Formula No 22-16-4-2				
Composition				
Phase	**Trade name**	**INCI name**	**Supplier**	**Weight [%]**
Water phase	Deionised Water	Aqua		57.30
	Dermosoft® 1388 ECO	Aqua + Glycerine + Sodium Levulinate + Sodium Anisate	Dr. Straetmans	4.00
	Structure® XL	Hydroxylpropyl Starch Phosphate	AkzoNobel Surface Chemistry	4.00
Thickener phase	Glycerine 99.5%	Glycerine	AOT	5.00
	Keltrol® CG-SFT	Xanthan Gum	CP Kelco	0.10
	Cosmedia® SP	Sodium Polyacrylate	BASF	0.50
Oil phase	CEVO®-cos K-5130	Ceresin (and) Copernicia Cerifera (Carnauba) Wax (and) Shorea Robusta Resin	VOELPKER	4.00
	Eumulgin® SG	Sodium Steaoryl Glutamate	BASF	0.50
	Emulgade® PL 68/50	Cetearyl Glucoside, Ceteryl Alcohol	BASF	3.00
	Cutina® GMS V	Glyceryl Stearate	BASF	3.00
	Cetiol® CC	Dicaprylyl Carbonate	BASF	7.00
	Sweet Almond Oil	Prunus Amygdalus Dulcis (Sweet Almond) Oil	AOT	5.00
	BRB Silicone Oil 100cS	Dimethicone	BRB	1.00
	Softigen® Pura	Olus oil	IOI Oleo GmbH	5.00
Extra phase	Cotton Water E_1407987	Parfum	Exilva	0.60

Preparation

1. Heat the water phase to 80 °C and the oil phase to 90 °C.
2. Add the oil phase to the water phase while stirring at 6,000 rpm (Silverson mixer) and then add the thickener phase.
3. Homogenise for 2 minutes at 9,000 rpm (Silverson mixer).
4. Allow to cool down while stirring with the IKA paddle stirrer at 300 rpm.
5. Once the temperature has reached 30 °C, add the extra phase and stir for another five minutes. Ready.

Formula Specifications

Appearance: buttery hair wax
Viscosity (Brookfield DV3T, spindle 6/speed 10/time 30 s): 321.0 mPas
ph value: 5.8 – 6.1
Centrifugation (15 min at 4,000 rpm): no separation

Stability Data

Storage Stability in Terms of Appearance

- stable at room temperature
- stable at 5 °C … 40 °C for at least 1 month

Ingredients and Structures

WARADUR® S is a mixture of linear, long-chain montanic acids (C28-32). **WARADUR® E, WARADUR® XE, WARADUR® GE** and **WARADUR® OP** consist of esters from montanic acids with ethylene glycol, glycerol and butylene glycol respectively. In addition to the montanic acid esters, **WARADUR® OP** also contains calcium montanate. As a result of the long, linear carbon chain, the montan waxes exhibit a good thermal stability and a low volatility.

Our proprietary **CEVO®-cos** wax formulations are made of carefully selected ingredients, for example regrowing ester waxes, natural resins and hydrocarbon waxes. All ingredients are listed in INCI and/or in the European Pharmacopoeia and/or fulfil criteria according to relevant cosmetics regulations. We will be glad to help you with applications and their regulatory issues. Tables 2.1 and 2.2 list our standard products in the VOELPKER Cosmetic + Pharma Series.

Trade name	INCI name/ classification	Chemical nature	DSC Melting range [°C]	Viscosity [mPas] @ 120 °C	Effect	Application
WARADUR® E	Glycol Montanate/ emulsifying, skin nourishing, opacifying	Montan ester wax	approx. 62 – 85	15 – 20	Has an oil-binding effect, can increase the stability of emulsions, optimises the texture, dispersing aid for pigments in decorative cosmetics	Care products, sun protection formulations, deodorant formulations, mascara, eyeliner, peeling formulations, substitute for C18-36 Acid Glycol Ester (INCI)
WARADUR® XE	DAB: Cera Montanglycoli, Montanglycolwachs, Glycol Montanate	Montan ester wax	approx. 60 – 85	20	Matrix for pharmaceutical active ingredients, retardant, polishing agent, coating wax	Tablets, coated tablets
WARADUR® GE	Glyceryl Montanate/ emulsifying, anti-static, binding, opacifying, viscosity-regulating	Montan ester wax	approx. 63 – 80	10 – 30	Has an oil-binding effect, can increase the stability of emulsions, optimises the texture, dispersing aid for pigments in decorative cosmetics	Care products, hair wax, sunscreen formulations, mascara, eyeliner; Candelilla wax substitute
WARADUR® OP	Butylene Glycol Montanate/ making skin supple	Montan ester wax	approx. 53 – 100	150 – 300	Hard wax with a high melting point, available as a powder made of particles with an irregular structure	Peeling formulations, natural substitute for microparticles made of polyethylene (WARADUR® OP powder)
WARADUR® S, L, LS	Montan Acid Wax/ anti-static, binding, viscosity-regulating	Montanic acids	approx. 78 – 83	10 – 15	Emulsions/creams: due to its high acid number, WARADUR® S (L, LS) can be easily saponified	Emulsions, creams
WARAMONT CA	Calcium Montanate/ anti-caking agent, viscosity-regulating	Montanic acids, calcium salts	approx. 44 – 114	–	Acts as an anti-caking agent, allowing the free movement of solid powders	Pressed and loose cosmetic powders, peeling formulations, natural substitute for microparticles made of polyethylene
WARADUR® GSM	Montan/Stearic Glycerides/ skin conditioning, occlusive, emulsifying	Ester wax	approx. 52 – 80	10 – 20	Used to adjust the hardness and strength of cosmetic products	Lipsticks and lip balms, eye shadow, blush and colouring pencils, sunscreen sticks, antiperspirant/deodorant sticks, water/oil emulsion creams, hair styling creams

Table 2.1: INCI-listed montan waxes, widely used in cosmetic formulations

Trade name	INCI name/ classification	Chemical nature	DSC Melting range – main peaks [°C]	Viscosity [mPas] @ 120 °C	Effect	Application
CEVO®-cos K-4418	Carnauba Acid Wax Glycol Esters/ emulsifying, skin nourishing, opacifying	Plant wax ester	approx. 63 – 89	approx. 10 – 20	`Bio-based´ certified, has an oil-binding effect, can increase the stability of emulsions, optimises the texture, dispersing aid for pigments in decorative cosmetics	Care products, sun protection formulations deodorant formulations, mascara, eyeliner, peeling formulations
CEVO®-cos K-4419	Carnauba Acid Wax*/anti-static, binding, viscosity-regulating	Plant wax, long-chain carbonic acids	approx. 64 – 86	approx. 5 – 23	`Bio-based´ emulsions/ creams: due to its high acid number, CEVO®-cos K-4419 can be easily saponified	Emulsions, creams
CEVO®-cos K-4420	Carnauba Acid Wax Butylene Glycol Ester (and) Calcium Carnaubate/ skin conditioning, emollient	Plant wax ester, partially saponified	approx. 84 – 100	n.a.	Substitute for microparticles made of polyethylene (CEVO®-cos K-4420 powder)	Peeling formulations
CEVO®-cos K-4421	Carnauba Acid Wax Glycerol Ester**/ emulsifying, anti-static, binding, opacifying, viscosity-regulating	Plant wax ester	approx. 64 – 84	15 – 30	`Bio-based´, has an oil-binding effect, can increase the stability of emulsions, optimises the texture, dispersing aid for pigments in decorative cosmetics	Care products, hair wax, sunscreen formulations, mascara, eyeliner; Candelilla wax substitute
CEVO®-cos K-8560	C18-36 Acid Triglyceride/ skin conditioning, occlusive, emulsifying	Ester wax	approx. 56 – 62	approx. 10 – 30 @ 100°C	Used to adjust the hardness and strength of cosmetic products	Lipsticks and lip balms, eye shadow, blush and colouring pencils, sunscreen sticks, antiperspirant/deodorant sticks, water/oil emulsion creams, hair styling creams
CEVO®-cos K-5130	Ceresin (and) Copernicia Cerifera (Carnauba) Wax (and) Shorea Robusta Resin/ hair fixatives, adjustment of hardness and fixedness of cosmetic products	Formulation made of Ceresin, natural ester waxes and resins	approx. 51 – 68	approx. 5 – 20 @ 100°C	Candelilla wax substitute	Pens for decorative cosmetics, deodorant sticks, body butter, hair wax

Table 2.2: VOELPKER CEVO®-cos waxes for cosmetic applications

* Japan Cosmetic Industry Association (JCIA): listed; Acceptance no 20311.
Inventory of Existing Cosmetic Ingredients in China (IECIC): listed; Index no 01093.
** INCI name proposal

Differential Scanning Calorimetry: CEVO®-cos K-5130 vs. Candelilla wax

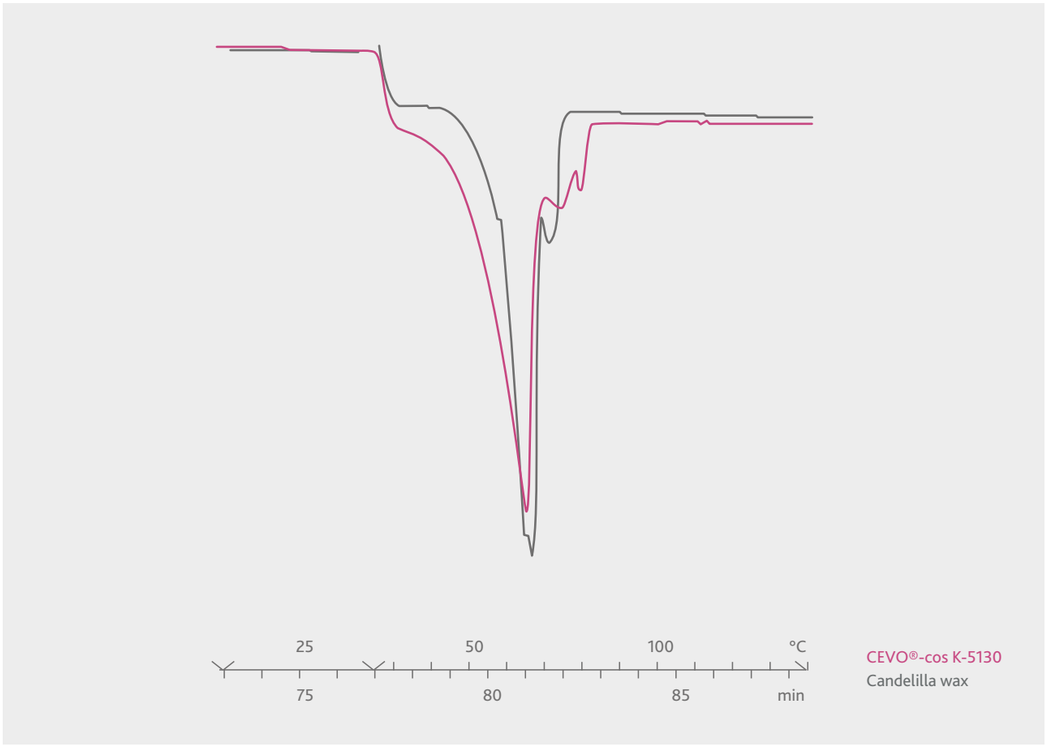

Fig. 1: CEVO®-cos K-5130 shows similar melting behaviour as Candelilla wax: The detected melting range provides information about the temperature at which a wax begins to melt and the temperature at which it is completely melted. The knowledge about this temperature interval is important for the processing of waxes to be able to produce a homogeneous melt.

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4th edition | September 2020

VOELPKER is member of the German Cosmetic, Toiletry, Perfumery and Detergent Association

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