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BergaCare C-Shine

Gloss: It’s Ordered Physics!



Gloss / Shine / Luster

And its role in hair care

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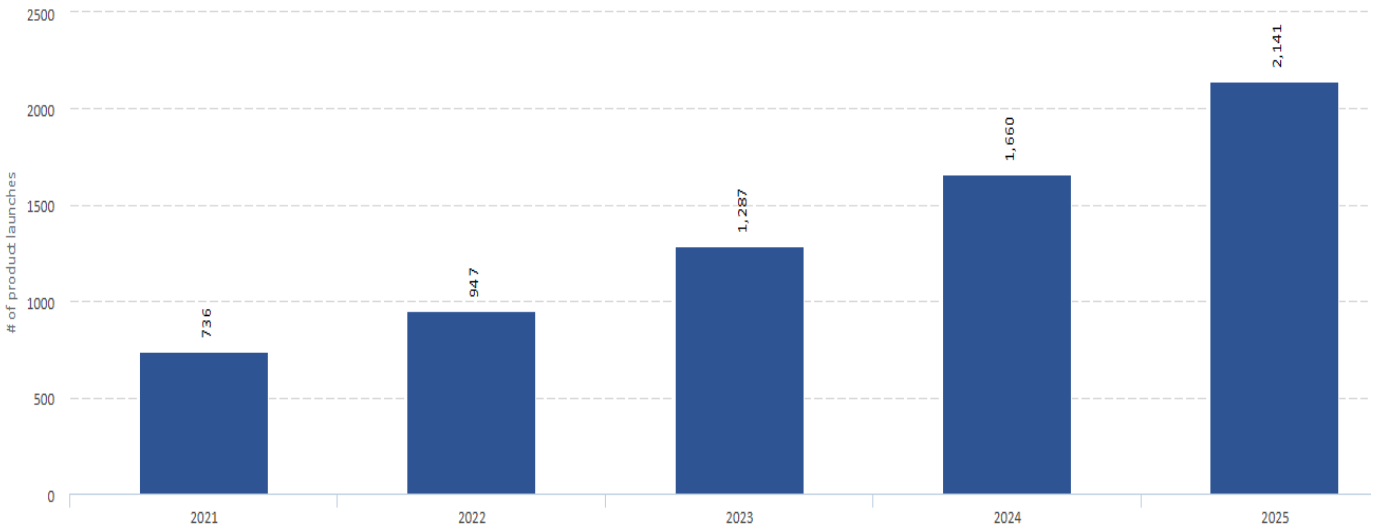
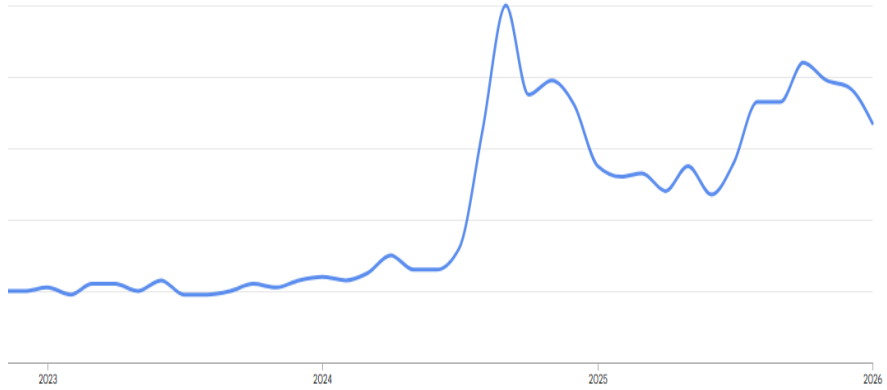
Gloss is associated with young, healthy, undamaged hair

Dull and lusterless hair is a consequence of damage, age, or “dryness”



Number of product launches per year, 2021-2025 with „gloss“ as claim
Source: Innova NPD, 2026/02/10



Google trends, „hair gloss“ searches, worldwide, 2026/01/26

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Glass Hair

An emerging trend

- Describes the pursuit of **ultra-smooth**, **mirror-like** hair surfaces driven by visual perfection
- High light reflection with exceptional clarity
- Ultra-sleek, polished appearance
- Achieved through a combination of **care products**: shampoos, conditioners, treatments, hair oils and serums, dedicated shine sprays
- Integration of **heat-protection** products & use of **straightening tools** to enhance the effect



The Physics of Gloss

What makes hair glossy?

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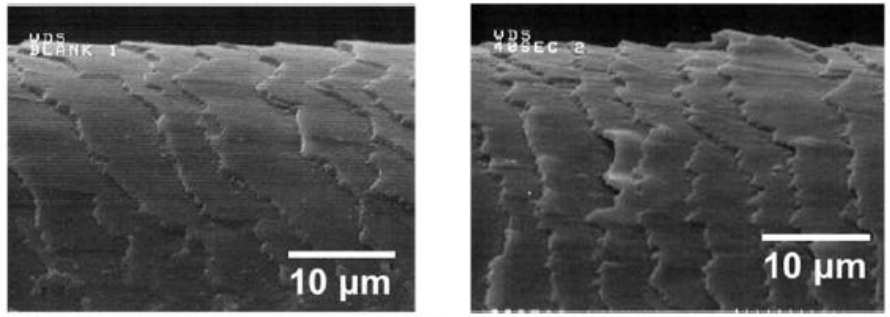
- Surface properties
- Internal structure / porosity
- Alignment of fibers

Roughness of the cuticle (flat or uplifted)



(a) SEM image of relatively flat cuticles (c) SEM image of uplifted cuticles



Left: flat cuticle/Right: uplifted cuticle

S. Nagase, *Cosmetics* **2019**, *6*, 43.

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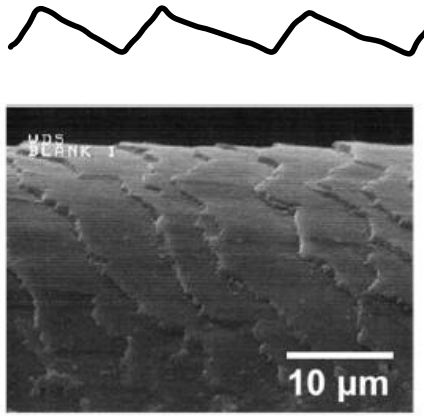
The Physics of Gloss

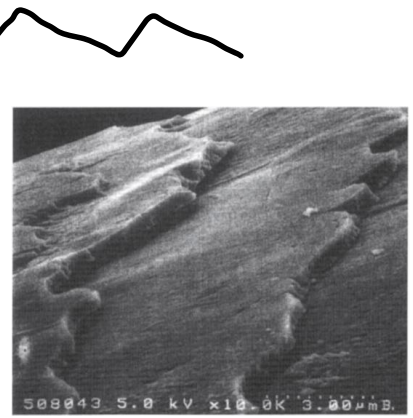
Not all Gloss is Created Equal

The surface of hair does not look like this:

…and not like this:

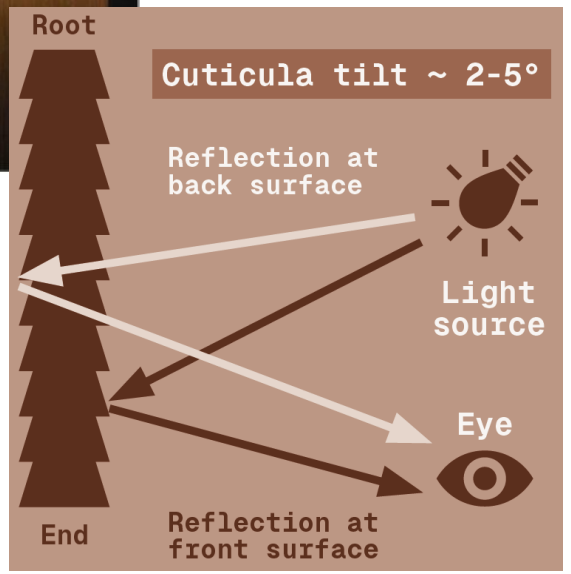
…but like this (somehow ordered):





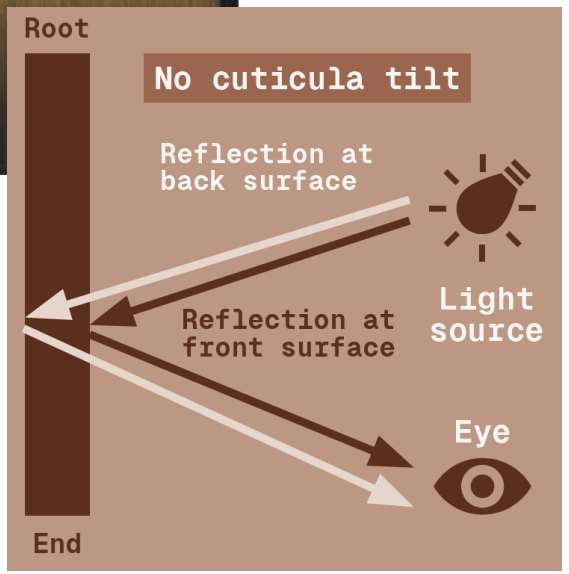
Natural hair





Artificial hair





Partly adapted from: S. Nagase, *Cosmetics* **2019**, *6*, 43.
H. C. Burstyn, Y. K. Kamath, *J. Cosmetic. Sci.* **2007**, *58*, 295-308.

The Physics of Gloss

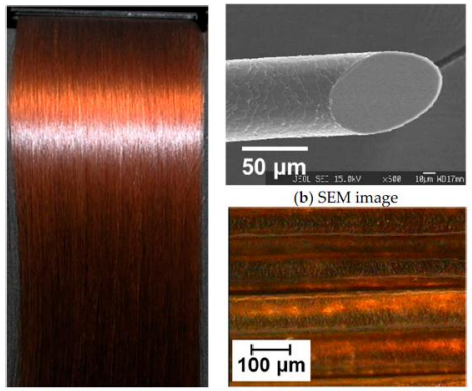
What makes hair glossy?

Surface properties

Internal structure / porosity

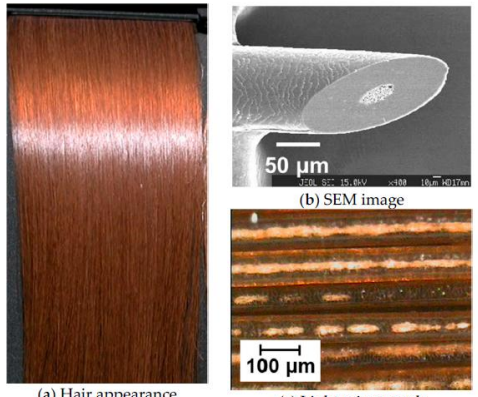
Alignment of fibers

Pore-less structure / no medulla



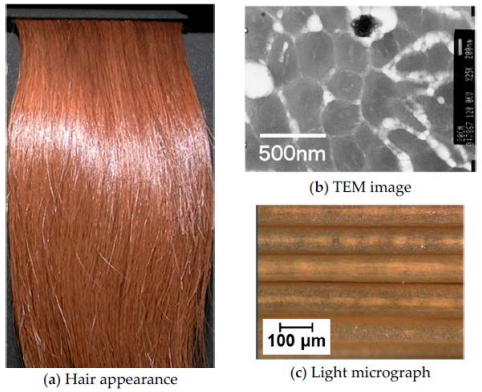
(a) Hair appearance (b) SEM image (c) Light micrograph

Porous medulla



(a) Hair appearance (b) SEM image (c) Light micrograph

Porous cortex



(a) Hair appearance (b) TEM image (c) Light micrograph

S. Nagase, *Cosmetics* **2019**, *6*, 43.

The Physics of Gloss

What makes hair glossy?

Surface properties

Internal structure / porosity

Alignment of fibers

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Straight hair



(a) Only straight hair (b) 5% Meandering hair (c) 10% meandering hair

S. Nagase, *Cosmetics* **2019**, *6*, 43.

Curly hair



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BergaCare C-Shine

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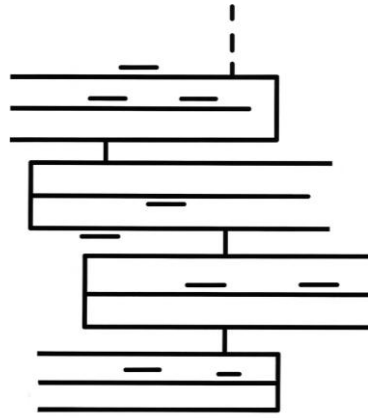
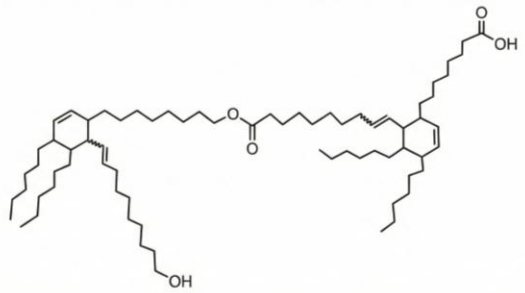
Overview

Product Name	INCI	Viscosity	Refractive Index	Description
BergaCare C-Shine Sun 700	Oleic/ Linoleic/ Linolenic Poly-glycerides	~700 mPas (40 °C)	1.4776	The natural sunflower-based film former for everyday shine and smoothness – balancing care, lightness and manageability. Available in 3 different grades for thin to thick hair
BergaCare C-Shine Sun 6000		~6000 mPas (40 °C)	1.4782	
BergaCare C-Shine Sun 13000		~13000 mPas (40 °C)	1.4777	
BergaCare C-Shine 4D low	Dimer Dilinoleyl Dimer Dilinoleate	~11.000 mPas (25 °C)	1.4842	A naturally derived, high-performance ester that wraps the hair in shine, softness and smooth control – from glassy finish to frizz-free definition. Available in 2 grades for lower or higher substantivity
BergaCare C-Shine 4D high		~200.000 mPas (25 °C)	1.4853	



Schematic structure of BergaCare C-Shine Sun.



Molecular structure of a building block of BergaCare C-Shine 4D.

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BergaCare C-Shine

Refractive index

Did you know?

Light travels at different speeds in air, liquids, and solids

This effect is caused by the different refractive indices of these materials

Shiny materials have particularly high refractive indices. For comparison:

- Air: **1.0**
- Hair: **1.55** – similar to **emeralds or quartz**
- Diamonds: **2.42**

Treating hair with ingredients that have a high refractive index can enhance its ability to reflect light and boost its natural gloss.





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Measurable & Visible Effects

Measuring Gloss

Principle of a Glossmeter

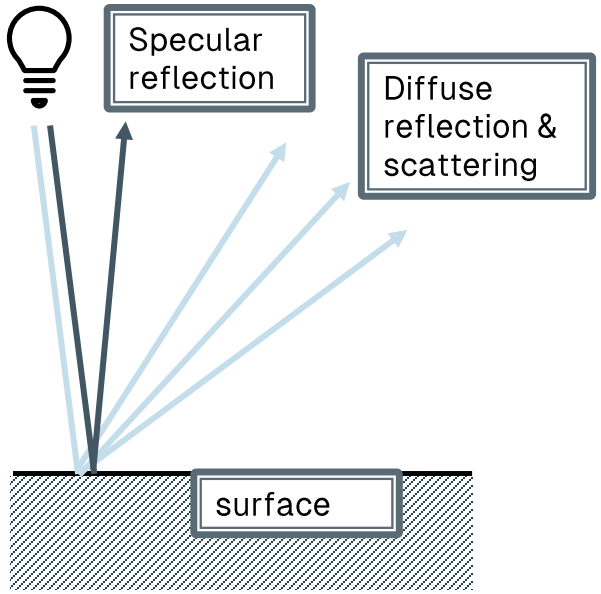
Original photographs; background digitally adjusted for improved visibility.



Human hair tresses, treated



Gloss measurement in hair clamp (scanning mode) → 1000 points in 2 seconds



Smooth surface: more light reflected directly
Rough surface: less light reaches the sensor → lower gloss

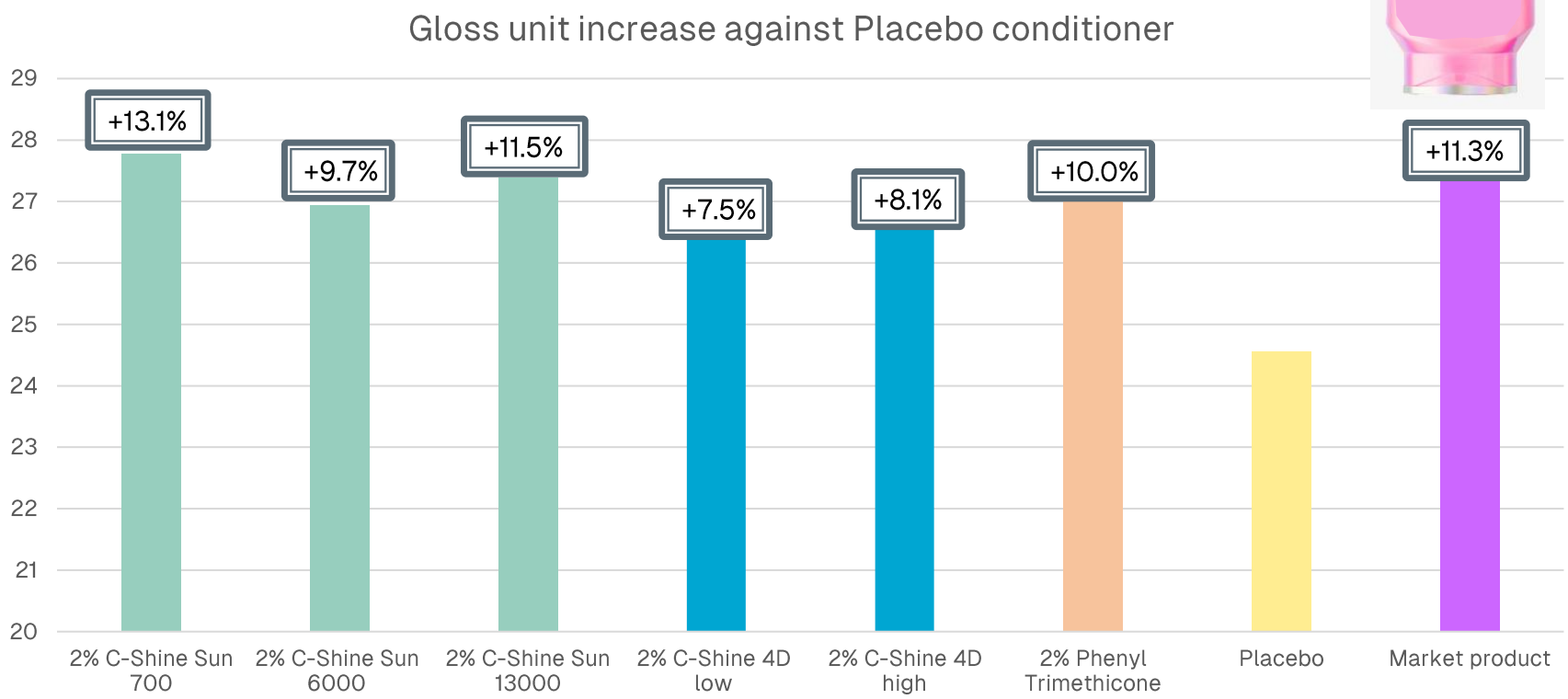


Dark hair reflects less light than light hair

Gloss enhancement

Measured with glossmeter





Hair tresses:

Caucasian hair, virgin, 1,5 cm width, 15 cm long (13 cm free hair) of the same batch

Preconditining:

3x with 10% SLES solution

Treatment:

Conditioner (based on GSC as emulsifier) with 2% test ingredient

250 µL per tress, massage 1 min, wait 30 s, rinse 15 s

Air-dry over night, then measure

Each tress was measured 3x6 times (3x take out of clamp and put back again)

Gloss enhancement

Test formulation

Trade Name	INCI	Supplier	Use conc. (%)
Dem. Wasser	Aqua	-	Up to 100%
Glycerin	Glycerin	Various	10.0
Xanthan Gum	Xanthan Gum	Cosphatec	1.30
Pentylene Glycol	Pentylene Glycol	Cosphatec	5.00
GreenGard PA3	Sodium Phytate, Aqua, Alcohol	GreenLine	0.10
Vegarol 1618 (50:50)	Cetearyl Alcohol	Berg+Schmidt	4.00
Vegarol 2270	Behenyl Alcohol	Berg+Schmidt	1.00
BergaCare FG S12	Dodecane, Hydrogenated Olive Oil Unsaponifiables, Coco-Caprylate / Caprate	Berg+Schmidt	5.00
BergaCare SB	Butyrospermum Parkii (Shea) Butter	Berg+Schmidt	1.00
BergaBest MCT Oil 60/40	Caprylic/ Capric Trigyceride	Berg+Schmidt	5.00
Glyceryl Stearate Citrate	Glyceryl Stearate Citrate	Various	4.00
Test ingredient			2.00
Sodium Hydroxide (25% aq.)	Aqua, Sodium Hydroxide		adjust pH
			100

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Code: Conditioner N23

Efficacy

Curl Definition

Curl treated with conditioner
Without BergaCare C-Shine Sun 13000



Curl treated with conditioner
With 2% **BergaCare C-Shine Sun 13000**

Efficacy/performance

Glossyness of formulations: Example **BergaCare C-Shine 13000**

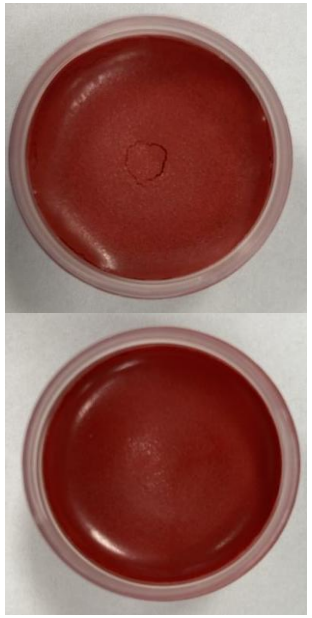
Conditioner



Without

With 2%

Lipbalm



Without

With 1%

Basic Lipstick

With and Without BergaCare C-Shine

Phase	Product	INCI	Supplier	% (w/w)	% (w/w)
A	Beeswax	Cera Alba	-	8.00	8.00
	Sunflower Wax	Helianthus Annuus (Sunflower) Seed Wax	Various	6.00	6.00
	Carnauba Wax	Copernica Cerifera (Carnauba) Cera	Henry Lamotte	5.00	5.00
	BergaCare SB	Butyrospermum Parkii (Shea) Butter	Berg+Schmidt	3.00	3.00
	BergaCare C-Shine Sun 13000	Oleic/Linoleic/Linolenic Polyglycerides	Berg+Schmidt	1.00	-
	Jojoba Oil	Simmondsia Chinensis Seed Oil	Henry Lamotte	15.00	15.00
	BergaCare FG Olive Squalane	Hydrogenated Olive Oil Unsaponifiables	Berg+Schmidt	10.00	10.00
	BergaBest MCT Oil 60/40	Caprylic/ Capric Triglyceride	Berg+Schmidt	20.00	20.00
	Castor Oil	Ricinus Communis (Castor) Seed Oil	Henry Lamotte	13.30	13.30
	Toco 70	Tocopherol, Helianthus Annuus (Sunflower) Seed Oil	Various	0.50	0.50
	BergaCare EM-OC	Ethylhexyl Cocoate	Berg+Schmidt	5.00	5.00
B	Titanium Dioxide	Titanium Dioxide (CI 77891)	Various	8.00	8.00
	Iron Oxide	Iron Oxide (CI 77491)	Various	5.00	5.00
	Aroma	Aroma/Flavor	Various	0.20	0.20

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Manufacturing Procedure

1. Weigh Phase A into beaker and heat up until the mixture is liquid.
2. Add phase B while stirring.
3. Pour lipstick mass into the mould.
4. Let allow to cool (30 min at refrigerator), then remove the sticks from the mould.



Viscosity (24 h, Brookfield, 20 rpm) =NM
Internal Ref.: CS-01.2-0126
Stability: Stable for 1 month at 20°C, 40°C and 4°C

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Sensory Profile

Sensory Positioning of C-Shine Hair

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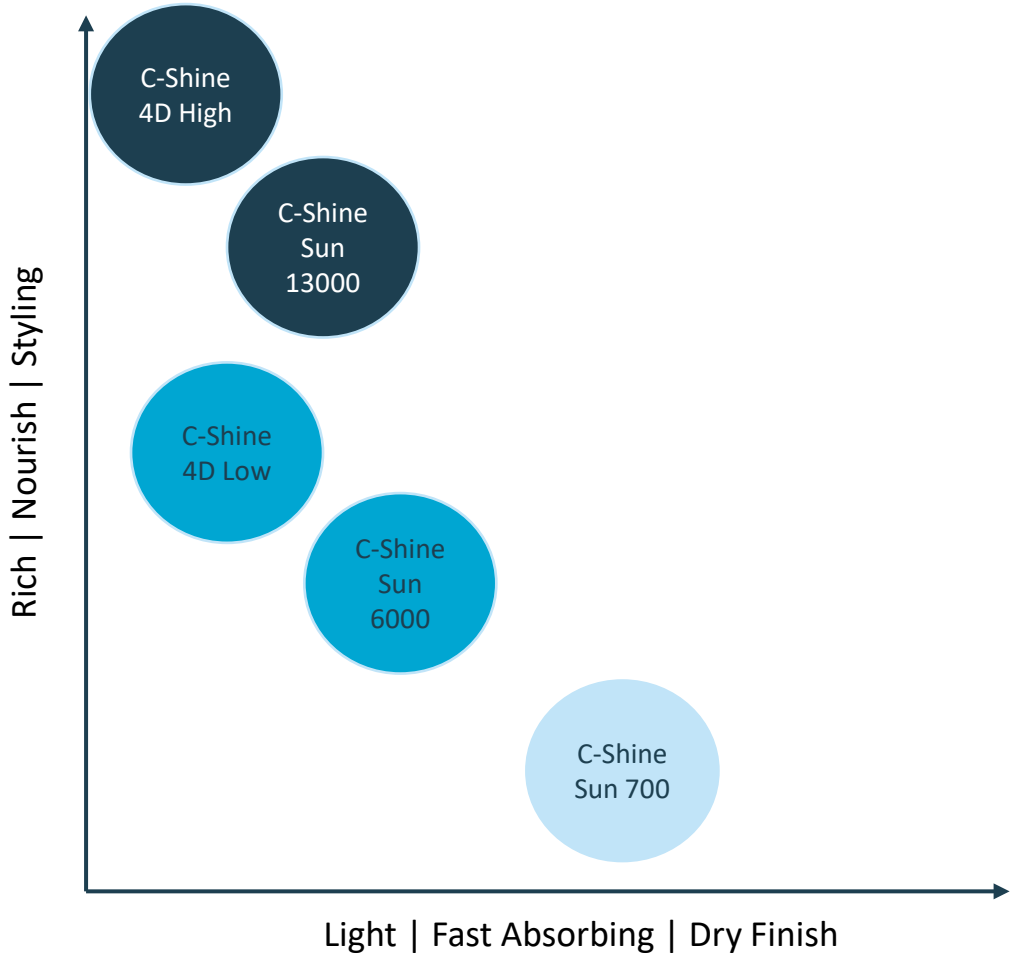

Sensory Profile Overview for Hair Care Performance

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Product	Light weight	Fast-absorbing	Silky	Velvety	Oily	Rich	Gloss	Sticky
C-Shine Sun 700	●	●	●	●	●		●	
C-Shine Sun 6000	●	●	●	●	●		●	
C-Shine Sun 13000				●	●	●	●	●
C-Shine 4D High				●	●	●	●	●
C-Shine 4D Low		●		●	●	●	●	●

Sensory Profile Overview for Hair Care Performance with Dodecane

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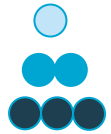

Product	Light weight	Fast-absorbing	Silky	Velvety	Oily	Rich	Gloss	Sticky
C-Shine Sun 700	●●●	●●	●●	○	○	●●	●●●	○
C-Shine Sun 6000	○	○	●●	●●	●●	●●	●●●	●●
C-Shine Sun 13000			○	●●	●●●	●●●	●●●	●●
C-Shine 4D High				○	●●●	●●●	●●●	●●●
C-Shine 4D Low	○	○		●●	●●	●●	●●●	●●

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Application Suitability in Hair Care Formulations

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Product	Daily Care	Styling	Leave in Care	Night Care	Sun Care
C-Shine Sun 700	✓✓✓	✓	✓✓✓	✓✓	✓✓✓
C-Shine Sun 6000	✓✓✓	✓	✓✓✓	✓✓	✓✓✓
C-Shine Sun 13000	✓	✓✓✓	✓✓	✓✓✓	✓
C-Shine 4D High	✓	✓✓✓	✓✓	✓✓✓	✓
C-Shine 4D Low	✓✓	✓✓✓	✓✓	✓✓	✓✓

✓ suitable
✓✓ very suitable
✓✓✓ optimal

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BergaCare C-Shine

How to use

How to Work with BergaCare C-Shine

Formulation Advice



BergaCare
C-Shine Sun



BergaCare
C-Shine 4D

How to work with

Formulation advice

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BergaCare C-Shine 4D low	BergaCare C-Shine 4D high
+ Transparent dark yellow liquid	+ Transparent light-yellow liquid
+ relatively thick consistency	+ very thick almost solid consistency
+ Cold/Hot process	+ Hot process
+ Should be added into oil phase	+ Should be added into oil phase
+ Good compatibility with other emollients	+ Good compatibility with other emollients
+ Use concentration 1-8%	+ Use concentration 1-8%



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How to work with

Formulation advice

BergaCare C-Shine 4D low



BergaCare C-Shine 4D high



How to work with

Formulation advice

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BergaCare C-Shine Sun 700



BergaCare C-Shine Sun 6000/13000





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Basic Conditioner

Phase	Product	INCI	Supplier	% (w/w)
	Demin. Water	Aqua	-	Up to 100
A	Glycerin	Glycerin	Various	5.00
	Cosphaderm® Pentiol natural	Pentylene Glycol	Cosphatec	5.00
B	Vegarol 1618 (50:50)	Cetearyl Alcohol	Berg+Schmidt	4.50
	BergaCare C-Shine Sun 700	Oleic/Linoleic/Linolenic Polyglycerides	Berg+Schmidt	2.00
	VariSOFT EQ 65MB	Distearoylethyl Dimonium Chloride, Cetearyl Alcohol	Evonik	5.00
C	NaOH (25% aq.)	Aqua, Sodium Hydroxide	-	adjust pH

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Manufacturing Procedure

1. Weigh in all raw materials and start to heat up to 70 °C under stirring.
2. Ensure that everything is dissolved and the blend appears homogeneous.
3. When required temperature has reached, ensure that everything is dissolved and homogenize for one minute.
4. Switch to slow stirring at 100 rpm with a paddle stirrer and continue to stir during cooling down until the texture becomes fluffy. Do not stir for too long, otherwise the texture will become too thick.
5. Adjust the pH.

pH = 4.5
Appearance: White
Viscosity (24h, Brookfield, 20 rpm) = 32,200 mPas
Internal Ref.: SHN-01.18(-20)-0825
Stability: Stable for 3 months at 20°C, 40°C

Curly Embrace Definition Conditioner

Phase	Product	INCI	Supplier	% (w/w)
A	Demin. Water	Aqua	-	Up to 100
	Glycerin	Glycerin	Various	5.00
	Cosphaderm® Pentiol natural	Pentylene Glycol	Cosphatec	5.00
	BergaCare Re-Lite	Aqua, Glycolic Acid, Arginine, Starch Hydroxypropyltrimonium Chloride, Sodium Chloride	Berg+Schmidt	3.00
	GreenGardTM PA3	Sodium Phytate, Aqua, Alcohol	GreenLine	0.10
B	Vegarol 1618 (50:50)	Cetearyl Alcohol	Berg+Schmidt	4.50
	Argan Oil	Argania Spinosa Kernel Oil	Henry Lamotte	2.00
	BergaCare SB	Butyrospermum Parkii (Shea) Butter	Berg+Schmidt	2.00
	BergaCare C-Shine 4D low	Dimer Dilinoleyl Dimer Dilinoleate	Berg+Schmidt	1.00
	VariSOFT EQ 65MB	Distearoylethyl Dimonium Chloride, Cetearyl Alcohol	Evonik	5.00
C	NaOH (25% aq.)	Aqua, Sodium Hydroxide	-	adjust pH

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Manufacturing Procedure

1. Weigh in all raw materials from phase A and start stirring.
2. Weigh in phase B and heat both phases up to 70 °C.
3. When both phases have reached the required temperature and everything has dissolved, combine phases A and B and homogenize for one minute.
4. Switch to slow stirring at 100 rpm with a paddle stirrer and continue to stir during cooling down until the texture becomes fluffy. Do not stir for too long, otherwise the texture will become too thick.
5. Adjust the pH to 3.8–4.3

pH = 3.90
Appearance: White
Viscosity (24h, Brookfield, 20 rpm) = 29,000 mPas
Internal Ref.: SHN-01.21(22)-0825
Stability: Stable for 3 months at 20°C, 40°

Liquid Silk Reflection Mask

Phase	Product	INCI	Supplier	% (w/w)
A	Demin. Water	Aqua	-	Up to 100
	Glycerin	Glycerin	Various	5.00
	Cosphaderm® Pentiol natural	Pentylene Glycol	Cosphatec	5.00
B	Vegarol 1618 (50:50)	Cetearyl Alcohol	Berg+Schmidt	4.50
	Keltrol® CG-SFT	Xanthan Gum	CP Kelco	0.65
	BergaCare FG S12	Dodecane, Hydrogenated Olive Oil Unsaponifiables, Coco-Caprylate/Caprate	Berg+Schmidt	4.00
	BergaCare C-Shine Sun 13000	Oleic/Linoleic/Linolenic Polyglycerides	Berg+Schmidt	3.00
	GreenWax™ GSC POF	Glyceryl Stearate Citrate	GreenLine	2.50
C	Citric Acid (25% aq.)	Aqua, Citric Acid	Various	adjust pH

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Manufacturing Procedure

1. Weigh in all raw materials from phase A and start stirring.
2. Weigh in phase B and heat both phases up to 70 °C.
3. When both phases have reached the required temperature and everything has dissolved, combine phases A and B and homogenize for one minute.
4. Cool down to below 40 °C under stirring, adjust pH and add phase D.

pH = 5.1
Appearance: White to white off
Viscosity (24h, Brookfield, 20 rpm) = 12,000 mPas
Internal Ref.: SHN-02.1-1025
Stability: Stable for 3 months at 20°C, 40°C

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Thank you!