

A woman with her eyes closed is lying on a white surface. Her skin is covered with a white, creamy substance, likely rice wax. Several dark red rose petals are scattered around her, some resting on her face and others on her hand and arm. The overall scene is soft and natural, suggesting a skincare or spa treatment.

WorléeOpac Eco 10 – Rice Wax-based Opacifier

Version 02/2022

Opacifier - Definition

Opacifiers are substances added to transparent or translucent cosmetic formulations to make them more opaque to visible light.

Opacifiers give products a pleasant, luxurious, creamy-white appearance.

Examples of current rinse-off products

Bath

Dove caring bath fine silk



Aqua, Sodium Laureth Sulfate, Glycerin, Cocamidopropyl Betaine, Sodium chloride, Parfum, Acrylates Copolymer, Citric acid, Guar Hydroxypropyltrimonium Chloride, Isopropyl Palmitate, Sodium benzoate, Sodium Lauryl Sulfate, **Styrene/Acrylates Copolymer**, Alpha-Isomethyl Ionone, Benzyl alcohol, Butylphenyl Methylpropional, Citronellol, Hexyl Cinnamal, Limonene, Linalool, CI 15985

Shower Gel

Fa Duschgel Bali Kiss



Aqua, Sodium Laureth Sulfate, Sodium Chloride, Disodium Cocoamphodiacetate, Cocamidopropyl Betaine, Parfum, Polyquaternium-7, **Styrene/Acrylates Copolymer**, PEG-7 Glyceryl Cocoate, PEG-40 Hydrogenated Castor Oil, PEG-60 Hydrogenated Castor Oil, PEG-120 Methyl Glucose Dioleate, Benzophenone-4, Tocopherol, Citric Acid, Hexyl Cinnamal, Limonene, Linalool, Sodium Benzoate, Sodium Salicylate, CI 47005, CI 15985, CI 14700

Liquid Soap

Palmolive Naturals Milk & Honey Liquid Handwash



Aqua, Sodium Laureth Sulfate, Sodium Chloride, Cocamidopropyl Betaine, Glycerin, Cocamide MEA, Parfum, Sodium Salicylate, Glycol Distearate, Sodium Benzoate, Citric Acid, Polyquaternium-7, **Styrene/Acrylates Copolymer**, Tetrasodium EDTA, Laureth-4, Lactose, Whey Protein, Mel, Benzyl Benzoate, Benzyl Salicylate, Hexyl Cinnamal, CI 16255, CI 19140

Facial Cleanser

Garnier The Gentle Sulfate-Free Cleanser



Aqua, Glycerin, Sodium Methyl Cocoyl Taurate, Coco-Betaine, Sodium Cocoyl Isethionate, Sodium Chloride, Phenoxyethanol, PEG-100 Stearate, PPG-5-Ceteth-20, Glyceryl Stearate, Coconut Acid, Acrylates/C10-30 Alkyl Acrylate Crosspolymer, Caprylyl Glycol, PEG-55 Propylene Glycol Oleate, Propylene Glycol, **Styrene/Acrylates Copolymer**, Salicylic Acid, Chlorphensin, Methylidihydrojasmonate, Sodium Hydroxide, Hydrogenated Coconut Acid, Polyquaternium-53, Coco-Glucoside, Disodium EDTA, Sodium Isethionate, PEG-30 Dipolyhydroxystearate, Trideceth-6, Benzoic Acid

Styrene/Acrylates Copolymer, a synthetic polymer is the current benchmark for opacifier


Environmentally Conscious Consumers



- Increasing public awareness of global issues and the environment
- Global concern on microplastics
- Restrictions and bans on microplastics are in force or in preparation
- Growing consumer demand for environmentally friendly and effective products
- Styrene/Acrylates Copolymer are non-biodegradable polymers and thus microplastics





Our solution:
WorléeOpac Eco 10
– a rice wax based
opacifier

Requirements & Needs

- 
- ✓ Alternative to polymeric opacifiers
 - ✓ High content of renewable ingredients
 - ✓ Pure & brilliant creamy white look
 - ✓ Very low viscosity, minimum comparable to standard
 - ✓ Very easy handling
 - ✓ No storage limitations

WorléeOpac Eco 10 - Product profile

Properties	
INCI	Oxidized Rice Bran Wax, Ceteareth-20
Natural Origin Content (ISO 16128)	95.5% with water 85.3% without water
Appearance	white low viscous liquid
Dry residue	29.0 - 31.0%
Preservative	0.5% Sodium Benzoate
pH-Value	4.5 - 5.5
Viscosity	< 1000 mPas
Recommended Use Level	1 - 3 %

Applications	
	Bath & Shower
	Liquid Soaps
	Facial Cleansing
	Shampoos

WorléeOpac Eco 10 is a wax-based alternative to polymers defined as microplastics for rinse-off applications.

WorléeOpac Eco 10 - Benefits

Extra fine particular wax dispersion

- Vegan, the product is free from animal derived materials
- Particle Size: approx. 140 nm (D50)
- Very low viscosity compared to other dispersions
- Excellent stability, due to very high melting point of the wax at 75°C
- Round wax particles provides light scattering and thus a dense white opacity



Very fine particle size and favorable low viscosity result in outstanding product stability and very advantageous application properties.

WorléeOpac Eco 10 - Ecological profile



Ecological profile

- 🌿 Natural Origin Content (ISO 16128) of 95.5% with water / 85.3% without water
- 🌿 Palm oil based raw material (Ceteareth-20) is certified according to RSPO mass balance
- 🌿 Fast and cold processable

WorléeOpac Eco 10
a natural origin
based alternative
to synthetic
polymers as
opacifier

WorléeOpac Eco 10 - Easy to process



Very Low Viscosity

- Similar to styrene/acrylate copolymers even at room temperature
- Easy pumping and dosing

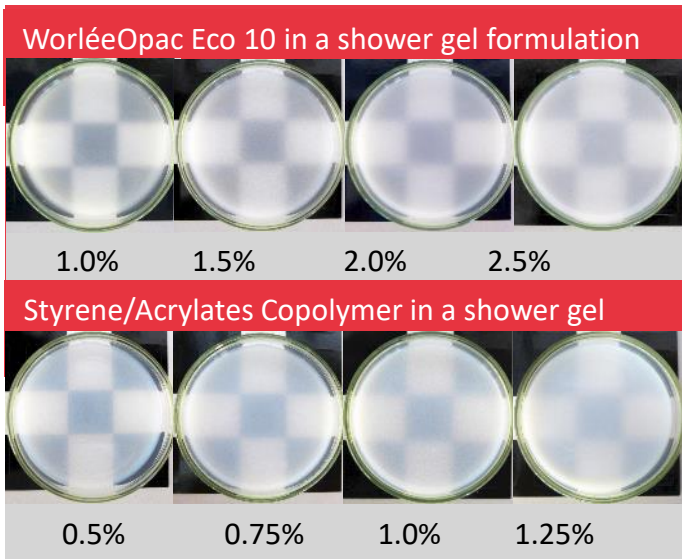
Long product stability

- Stable and fine dispersion over time
- No sedimentation or deposits

Easy to use

- Can be added at any time in the production process
- No dilution or special mixing steps are necessary due to the fine-particle dispersion and low viscosity
- Very short mixing times
- Improved temperature tolerance due to the high melting point of wax
- No pearlescent effect due to storage at high temperatures

WorléeOpac Eco 10 - Opacity in a rinse-off formulation



Comparative study

Evaluation of the opacity of WorléeOpac Eco 10 in a shower gel formulation to a benchmark product (INCI: Styrene/ Acrylates Copolymer) at different application concentrations.

Key results

- WorléeOpac Eco 10 shows a pure clear white appearance comparable to the benchmark
- A concentration ratio of 2 to 1 (WorléeOpac Eco 10 vs. Styrene/Acrylates Copolymer) is recommended for a comparable degree of whiteness
- The turbidity effect can be adjusted to the respective formulation concept via the input concentration

Shower Gel with SLES/CAPB	L*	a*	b*
1% Styrene/Acrylates Copolymer	81.23	-3.20	-3.83
2% WorléeOpac Eco 10	79.24	-1.99	-3.15

Comparative measurements

Visual impression of WorléeOpac Eco 10 compared to opacifiers with Glycol Distearate

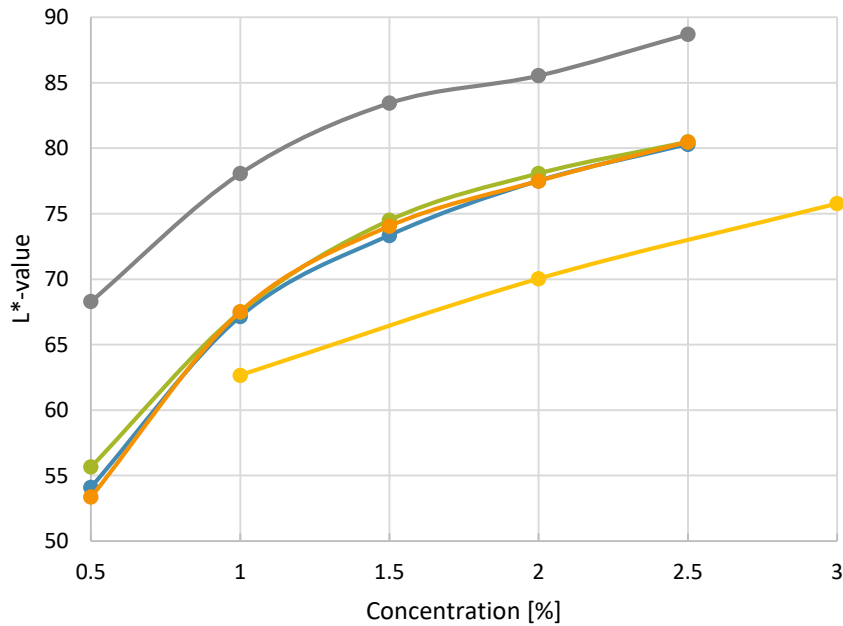


Comparative measurements

Measurement of L* for perceived brightness in a SLES/CAPB shower gel (P071.SAM.018)

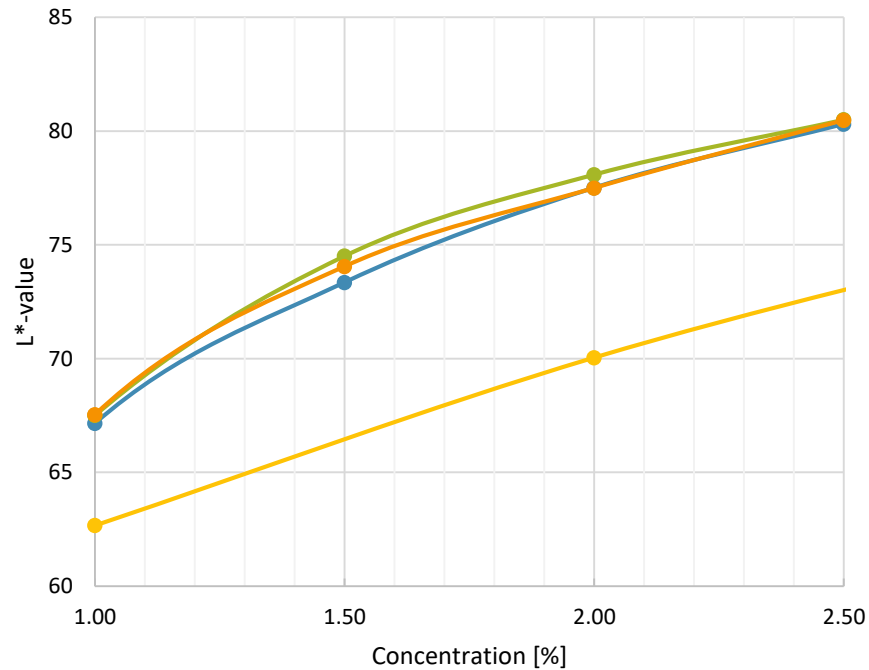
A high L* value represents a white and opaque visual impression of the product

L*-value in P071.SAM.018



- Competitor A
- Competitor B
- Competitor C
- WorléeOpac Eco 10
- Styrene/Acrylates Copolymer

L*-value in P071.SAM.018



- Competitor A
- Competitor B
- Competitor C
- WorléeOpac Eco 10

WorléeOpac Eco 10 shows the best degree of whiteness of the alternative opacifiers. Competitor C falls exceptionally far behind.

Comparative measurements

Measurement of color differences in a SLES/CAPB shower gel (P071.SAM.018)

The delta E* (dE*) is a measure of the distance between two colors in the CIE-Lab system and is named color distance Delta E. Delta E 2000 is the most recent formula and was standardized in 2013. This can be used to assign numbers to differences perceived by human perception between two colors, such as between original and copy.

Product (2%)	L*	a*	b*	dL*	da*	db*	dE*	dE* 2000
WorléeOpac Eco 10	78.09	-1.98	-4.57	0.03	1.47	2.93	3.28	2.76
Competitor A	77.51	-1.04	-2.25	-0.55	2.42	5.24	5.80	5.04
Competitor B	77.50	-1.26	-3.16	-0.57	2.20	4.33	4.89	4.24
Competitor C	70.04	-1.77	-5.70	-8.03	1.69	1.79	8.40	3.79

1,0% Styrene/Acrylates Copolymer as reference

WorléeOpac Eco 10 shows the most similar color impression to a Styrene/Acrylates Copolymer of all tested products.

Color stability after storage

Measurement of L* for perceived brightness after storage at 50°C in a SLES/CAPB shower gel (P071.SAM.018)

Product (2%)	L*	L* (1month/50°C)	Difference
WorléeOpac Eco 10	78.09	75.37	3.48%
Competitor A	77.51	72.01	7.10%
Competitor B	77.50	73.65	4.97%
Competitor C	70.04	63.96	8.68%



WorléeOpac Eco 10



Competitor A



Competitor B



Competitor C

Initial



Stability at 50°C

WorléeOpac Eco 10 shows the best storage stability and, unlike the opacifiers with glycol distearate, does not develop a pearlescence due to the temperature-resistant rice wax base.

WorléeOpac Eco 10 - Formulation notes




Guidelines

- Usage: 1 - 3 % according to the desired degree of whiteness in the final formulation
- For the replacement of opacifiers based on synthetic polymers (e.g. Styrene/Acrylate copolymers) a concentration ratio of 2 to 1 (WorléeOpac Eco 10 vs. Styrene/Acrylates Copolymer) is recommended for comparable whiteness
- Preferred thickeners/stabilizers are Acrylates Copolymer (e.g. WorléeAqua Thix), Polyglyceryl-3 Caprate, Xanthan Gum, Carrageenan, Gellan Gum, Carbomer and the like
- Cationic polymers like Polyquaternium-7 also stabilize the wax particles in the shower gel
- WorléeOpac Eco 10 can be added at any time during manufacture
- Temperatures above 60°C should be avoided

WorléeOpac Eco 10 - Summary

WorléeOpac Eco 10

-  Rice wax based opacifier
-  95% Renewable acc. to ISO 16128
-  Pure Brilliant White
-  High Covering Power
-  Easy to Formulate
-  Temperature and Storage Stability

WorléeOpac Eco 10 - Formulations



Name	Formulation
Shower Gel au Lait	P071.SAM.018
Sensitive Shower For Kids	P071.SAM.020
Gentle Body Wash	P071.SAM.022
Natural Milky Shower	P071.SAM.029
Creamy Body & Hair Cleansing	P071.SAM.038
Vitalizing Aloe Vera Shower Gel	P071.NB.310
Rich Vitamin Shower	P071.NB.320

Shower Gel au Lait - P071.SAM.018



Ingredients	INCI	% (w/w)	Function
Water	Aqua	69.40	
Dehyquart® CC7 BZ (BASF)	Polyquaternium-7	2.00	Conditioning Agent
Texapon® N 70 (BASF)	Sodium Laureth Sulfate	9.30	Surfactant
TEGOSOFT® PC 31 (Evonik)	Polyglyceryl-3 Caprate	2.50	Hydrophilic Emollient
Fragrance	Parfum	1.00	Fragrance
Glycerin	Glycerin	1.50	Humectant
TEGO® Betaine F 50 (Evonik)	Coamidopropyl Betaine	11.55	Surfactant
Sodium Benzoate gran. (Thor)	Sodium Benzoate	0.45	Preservative
Citric Acid (50%)	Citric Acid	0.30	pH Adjustment
WorléeOpac Eco 10 (Worlée)	Oxidized Rice Bran Wax, Cetareth-20	2.00	Opacifier

**Viscosity (Brookfield LV, DVII+
Viscometer, Spindle 3, 10 RPM,
23°C)**
 10,000-13,000 mPas

pH-Value
 5.0 - 5.5

Stability
 >3 months at 20°C and 45°C

Sensitive Shower For Kids - P071.SAM.020



Ingredients	INCI	% (w/w)	Function
Water	Aqua	62.85	
Glycerin	Glycerin	3.00	Humectant
Kahlgum 6655 TQT80 (KahlWax)	Xanthan Gum	1.00	Rheology Additive
Plantacare® 818 UP (BASF)	Coco-Glucoside	15.38	Surfactant
PROTELAN AGL 95/C (Zschimmer & Schwarz)	Sodium Cocoyl Glutamate	11.76	Surfactant
Fragrance	Parfum	1.00	Fragrance
Sodium Benzoate gran. (Thor)	Sodium Benzoate	0.50	Preservative
Citric Acid (50%)	Citric Acid	2.50	pH Adjustment
WorléeOpac Eco 10 (Worlée)	Oxidized Rice Bran Wax, Cetareth-20	2.00	Opacifier

**Viscosity (Brookfield LV, DVII+
Viscometer, Spindle 3, 10 RPM,
23°C)**
6,500 – 8,500 mPas

pH-Value
4.8 - 5.2

Stability
>3 months at 20°C and 45°C

Gentle Body Wash – P071.SAM.022



**Viscosity (Brookfield LV, DVII+
Viscometer, Spindle 3, 10 RPM,
23°C)**
6,000 – 8,000 mPas

pH-Value
4.4 – 4.8

Stability
>3 months at 20°C and 45°C

Ingredients	INCI	% (w/w)	Function
Water	Aqua	69.50	
Glycerin	Glycerin	3.00	Humectant
KahlGum 6673 FEE (KahlWax)	Xanthan Gum	1.00	Rheology Additive
Plantacare® 818 UP (BASF)	Coco-Glucoside	11.50	Surfactant
Texapon® K 30 UP (BASF)	Sodium Coco-Sulfate	10.30	Surfactant
Fragrance	Parfum	1.00	Fragrance
Sodium Benzoate gran. (Thor)	Sodium Benzoate	0.50	Preservative
Citric Acid (50%)	Citric Acid	1.20	pH Adjustment
WorléeOpac Eco 10	Oxidized Rice Bran Wax, Ceteareth-20	2.00	Opacifier

Natural Milky Shower - P071.SAM.029



**Viscosity (Brookfield LV, DVII+
Viscometer, Spindle 3, 10 RPM,
23°C)**
 8,000 – 10,500 mPas

pH-Value
 4.3 – 4.7

Stability
 >3 months at 20°C and 45°C

Ingredients	INCI	% (w/w)	Function
Water	Aqua	69.40	
Glycerin	Glycerin	3.00	Humectant
KahlGum 6673 FEE (KahlWax)	Xanthan Gum	0.70	Rheology Additive
Genuvisco® TPC-1 (CP Kelco)	Carrageenan	0.40	Rheology Additive
Plantacare® 818 UP (BASF)	Coco-Glucoside	11.50	Surfactant
Texapon® K 30 UP (BASF)	Sodium Coco-Sulfate	10.30	Surfactant
Fragrance	Parfum	1.00	Fragrance
Sodium Benzoate gran. (Thor)	Sodium Benzoate	0.50	Preservative
Citric Acid (50%)	Citric Acid	1.20	pH Adjustment
WorléeOpac Eco 10 (Worlée)	Oxidized Rice Bran Wax, Cetareth-20	2.00	Opacifier

Creamy Body & Hair Cleansing - P071.SAM.038



**Viscosity (Brookfield LV, DVII+
Viscometer, Spindle 3, 10 RPM,
23°C)**
8,500 – 10,500 mPas

pH-Value
4.0 – 4.2

Stability
>3 months at 20°C and 45°C

Ingredients	INCI	% (w/w)	Function
Water	Aqua	54.02	
Dehyquart® CC7 BZ (BASF)	Polyquaternium-7	2.00	Conditioning Agent
Zetesol NL-2 U (Zschimmer & Schwarz)	Sodium Laureth Sulfate	24.10	Surfactant
IMWITOR® PG3 C10 (IOI Oleo)	Polyglyceryl-3 Caprate	3.00	Hydrophilic Emollient
Fragrance	Parfum	1.00	Fragrance
Glycerin	Glycerin	1.50	Humectant
TEGO® Betaine F 50 (Evonik)	Coamidopropyl Betaine	11.55	Surfactant
Cosphaderm® CHA (Cosphatec)	Caprylhydroxamic Acid	0.08	Chelating
Citric Acid (50%)	Citric Acid	0.75	pH Adjustment
WorléeOpac Eco 10 (Worlée)	Oxidized Rice Bran Wax, Cetareth-20	2.00	Opacifier

Vitalizing Aloe Vera Shower Gel - P071.NB.310



**Viscosity (Brookfield LV, DVII+
Viscometer, Spindle 3, 10 RPM,
23°C)**
6,500 – 9,000 mPas

pH-Value
4.9 – 5.3

Stability
>3 months at 20°C and 45°C

Ingredients	INCI	% (w/w)	Function
Water	Aqua	43.55	
WorléeAqua Thix 200 (Worlée)	Acrylates Copolymer	6.50	Rheology Additive
Zetesol NL-2 U (Zschimmer & Schwarz)	Sodium Laureth Sulfate	34.73	Surfactant
Sodium Hydroxide (25%)	Sodium Hydroxide	0.57	pH Adjustment
Sodium Benzoate gran. (Thor)	Sodium Beonzoate	0.50	Preservative
TEGOSOFT® GC (Evonik)	PEG-7 Glyceryl Cocoate	1.40	Hydrophilic Emollient
TAGAT® CH 40 (Evonik)	PEG-40 Hydrogenated Castor Oil	0.80	Solubilizer
Fragrance	Parfum	1.00	Fragrance
TEGO® Betaine F 50 (Evonik)	Coamidopropyl Betaine	7.50	Surfactant
Citric Acid (50%)	Citric Acid	1.20	pH Adjustment
WorléeOpac Eco 10 (Worlée)	Oxidized Rice Bran Wax, Cetareth-20	2.00	Opacifier
WorléeSoft Beads Aloe Vera 0510 (Worlée)	Mannitol, Microcrystalline Cellulose, Hydroxypropyl Methylcellulose, Aloe Barbadensis Leaf Juice Powder, CI 74260, Algin	0.25	Active Ingredient

Rich Vitamin Shower - P071.NB.320



**Viscosity (Brookfield LV, DVII+
Viscometer, Spindle 3, 10 RPM,
23°C)**

6,500 – 9,000 mPas

pH-Value

6.2 – 6.6

Stability

>3 months at 20°C and 45°C

Ingredients	INCI	% (w/w)	Function
Water	Aqua	46.00	
WorléeAqua Thix 100 (Worlée)	Acrylates Copolymer	8.00	Rheology Additive
Zetesol NL-2 U (Zschimmer & Schwarz)	Sodium Laureth Sulfate	25.00	Surfactant
Sodium Hydroxide (25%)	Sodium Hydroxide	0.80	pH Adjustment
TEGOSOFT® GC (Evonik)	PEG-7 Glyceryl Cocoate	1.80	Hydrophilic Emollient
TAGAT®CH 40 (Evonik)	PEG-40 Hydrogenated Castor Oil	0.80	Solubilizer
Fragrance	Parfum	1.00	Fragrance
Protelan AGL 95/C (Zschimmer & Schwarz)	Sodium Cocoyl Glutamate	2.00	Surfactant
Microcare PM2 (Thor)	Phenoxyethanol, Ethylparaben, Methylparaben	1.00	Preservative
Plantacare® 818 UP (BASF)	Coco-Glucoside	5.00	Surfactant
TEGO® Betaine F 50 (Evonik)	Coamidopropyl Betaine	7.50	Surfactant
WorléeOpac Eco 10 (Worlée)	Oxidized Rice Bran Wax, Ceteareth-20	2.00	Opacifier
WorléeSoft Beads Vitamin E 0812 (Worlée)	Mannitol, Microcrystalline Cellulose, Hydroxypropyl Methylcellulose, CI 77492, Tocopheryl Acetate, Algin	0.25	Active Ingredient



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