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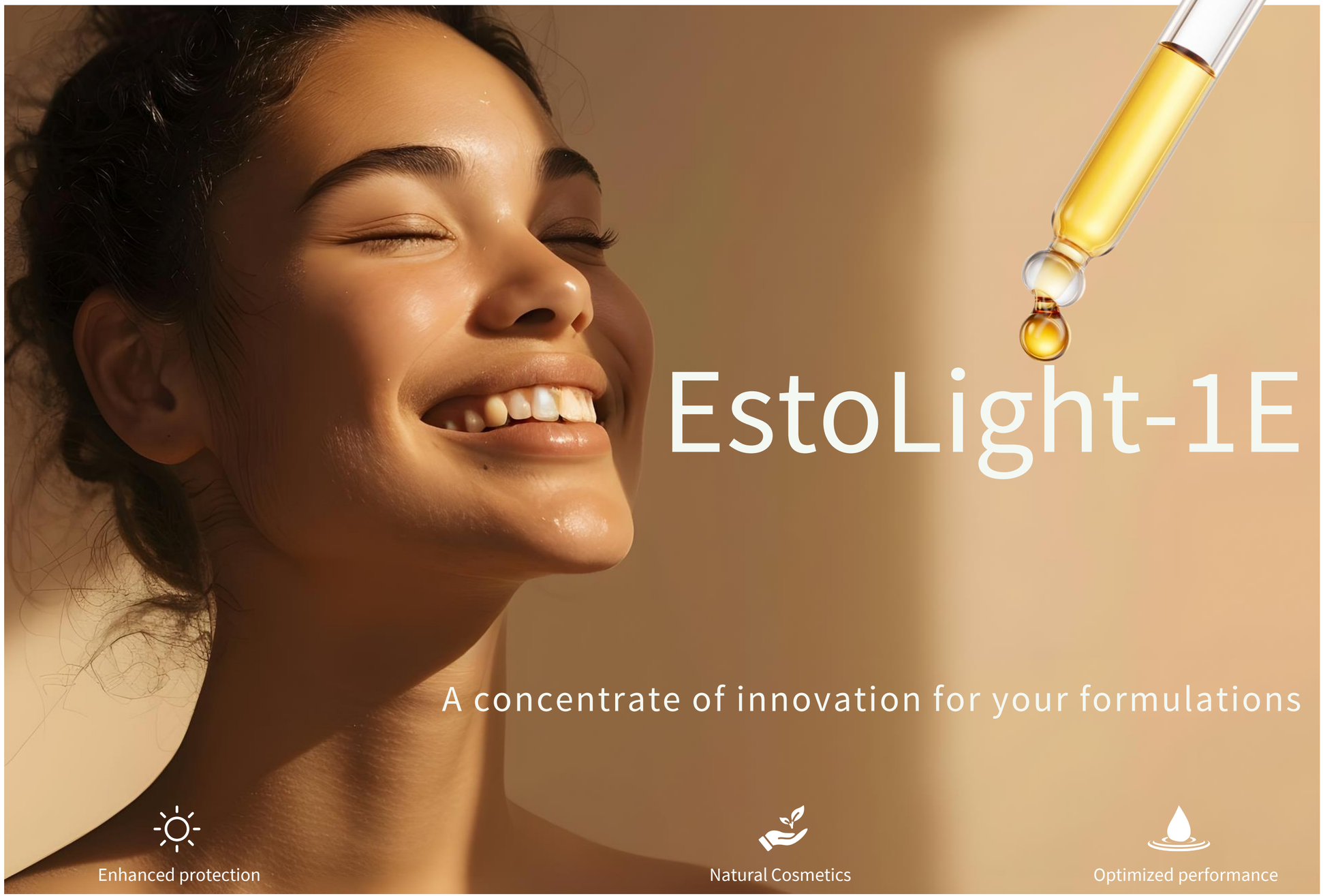
FORMULATION
FEATURES



EstoLight-1E

A concentrate of innovation for your formulations

Enhanced protection

Natural Cosmetics

Optimized performance

What is EstoLight-1E and what is it used for?

ID card

- INCI: **Methyl polyricinoleate**
- CAS: **1009828-51-6**
- Plant-based: **Castor-derived, palm-free**
- Regulatory: **Exempt from REACH (polymer status)**
- Natural Origin index (ISO 16128): **> 0.99**
- Appearance: **Yellow/orange viscous liquid**
- Odor: **Light oil scent**
- Solubility: **Vegetable oils, butters, waxes, esters**
- Oxidative stability NF ISO 6886: **> 70 h**

Usage

- Function: **Dispersant**
- Compatibility: **Direct and inverse emulsions, anhydrous formulas**
- Types of dispersed particles: **Mineral, organic, synthetic**
- Tested usage levels: **1 to 5%**
- Tested pigment loadings: **1 to 50%**

What are the benefits of EstoLight-1E?

Usage

- Liquid, does not crystallize, no preheating or melting required
- Ready to use
- Cold-process compatible
- Chemically neutral and compatible with cosmetic ingredients

Naturality

- Bio-based, Natural Origin Index >99%
- Biodegradable
- Non-toxic, non-ecotoxic

Efficiency

- Low percentage of use: 1-5% depending on the application
- Suitable for concentrated pigment bases, emulsions, or 100% anhydrous bases
- SPF boost vs conventional dispersant (PHS) in organic sunscreens

Sensoriality

Ease of application

- Improves spreadability and even coverage on the skin
- Enhances penetration, non-greasy feeling

Examples of formulations made with EstoLight-1E

Pigment dispersion

Mineral sunscreen formulations

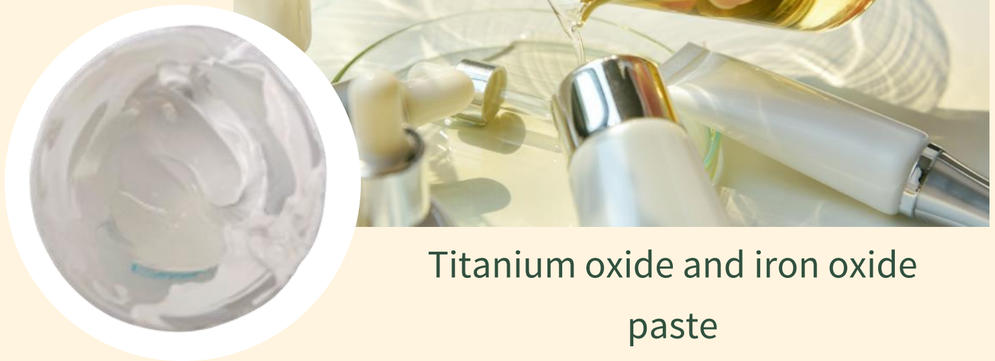
Organic sunscreen formulations

Foundation

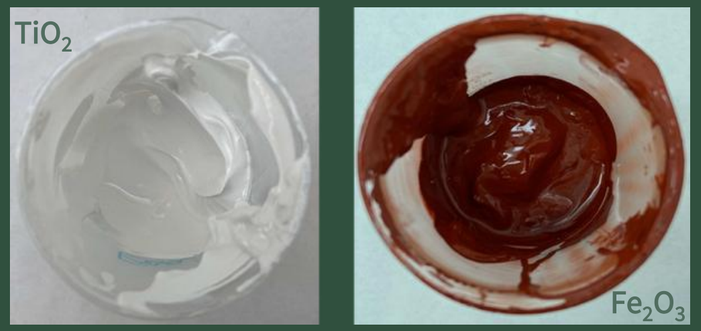
Shimmering oil

Pigmented lotion

Pigment dispersion



Titanium oxide and iron oxide paste



With EstoLight-1E

With PHS

Objective

Compare dispersing properties of EstoLight-1E compared to PHS (polyhydroxystearic acid) in concentrated phase

Composition & Operating mode

- **4.5% EstoLight-1E** ; 50% pigment ; qsp caprylic/capric triglycerides
- Manual mixing with spatula then 3 passes through three-roll mill

Observations & Benefits

- **Easy to manually disperse** EstoLight-1E (No melting required)
- Similar appearance and stability to PHS

Mineral Sunscreen Formulation

Water-in-oil emulsion & direct emulsion

Mineral sunscreen formulations

(W/O emulsion)

PHASE	INCI	%
Phase A	Caprylic/Capric Triglyceride	10.65
	C15-19 Alkane	7.00
	Pongamia Glabra Seed Oil	4.00
	Polyglyceryl-3 Polyricinoleate, Polyglyceryl-4 Oleate	3.00
	Hydrogenated Castor Oil/Sebacic Acid Copolymer, Caprylic/Capric Triglyceride	0.75
	Helianthus Annuus Seed Oil, Tocopherol	0.25
	Titanium Dioxide, silica	10.00
	Zinc Oxide	7.50
	EstoLight-1E	**1.30**
Phase B	Aqua	54.15
	Potassium citrate	0.40
	Caprylyl Glycol, Glyceryl Caprylate/Caprate, Glycerin	1.00
		100.00

Formulation technology

- Emulsion type : Water-in-oil (W/O)
- Mineral Filters : 17.5% ZnO + TiO2
- Dispersant : **EstoLight-1E (1.3%)** vs PHS

Operating mode

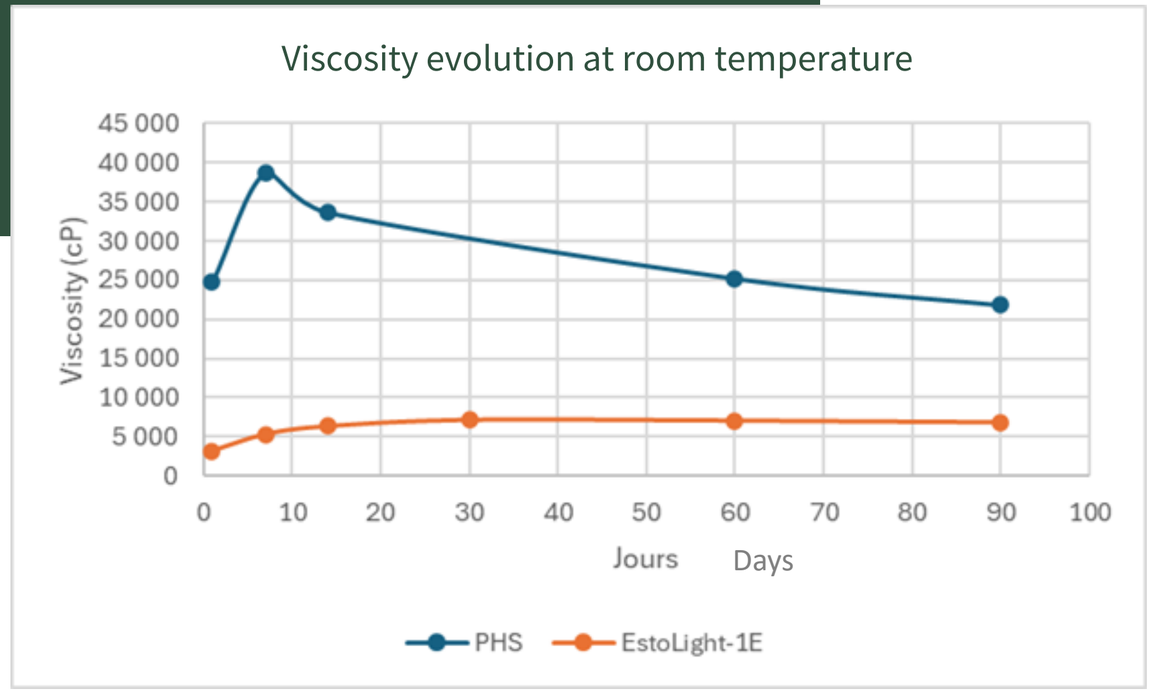
- **Phase A:**
  - Heat at 85°C
  - Stir gently for 15 min
- **Phase B:**
  - Heat at 85°C
  - Emulsify in A under high shirring (15 min)

With EstoLight-1E

With PHS

Visual and sensory results

- **Improve texture** and **greater fluidity** with EstoLight-1E
- **Enhanced Homogeneity**: better pigment dispersion
- **Thermal stability:** no separation after 3 months at 40°C or 50°C
- **Comfort during application**:
  - Spreading facilitated
  - No white marks

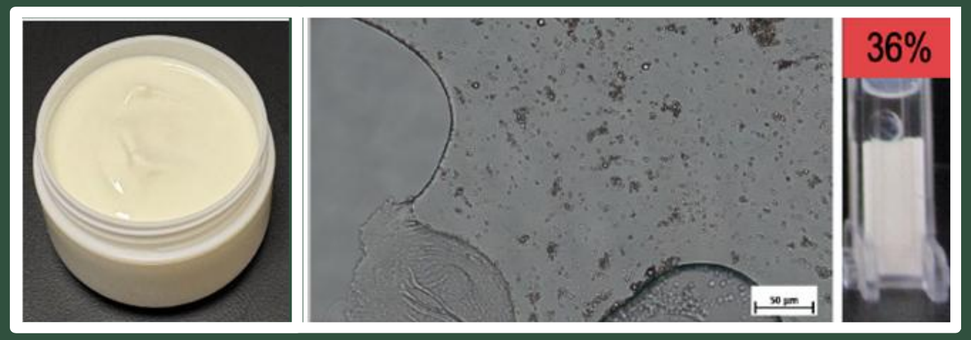


Physical stability

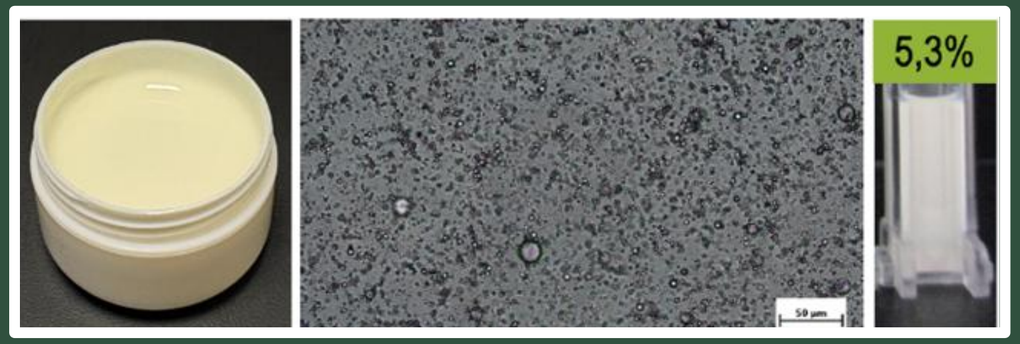
LUMiFuge test (2000xg / 25°C / 2h) – Accelerated aging test by centrifugation

- With EstoLight-1E : Separation index= 5.3%
- With PHS : Separation index= 36.0 %

→ **EstoLight-1E significantly improves the stability** of the emulsion



With PHS



With EstoLight-1E

Mineral sunscreen formulations

(O/W emulsion)

PHASE	INCI	COMMERCIAL NAME	%
A	Caprylic/Capric Triglyceride	SpecKare GTCC	10.00
	Cellulose olivate ; Polyglyceryl-3 cocoate	ProDermis CE	5.00
A1	**Methyl polyricinoleate**	**EstoLight-1E**	**5.00**
	Zinc Oxide/phosphates de magnésium	Silazinc Eco	15.00
	Olea europaea fruit oil	Olive oil	10.00
B	Aqua	Purified water	50.30
	Xanthan Gum	Xanthan gum	0.30
	Glycérin	Glycerin	3.00
C	-	Fragrance Cosmetic Monoï	0.30
	Benzyl alcohol ; Dehydroacetic acid ; Aqua	Cosgard	1.00
	Tocopherols (mixed) ; Helianthus annuus seed oil	Vitamin E	0.10
			100.00

Formulation technology

MAPRECOS

- Emulsion type : Oil-in-water (O/W)
- Mineral filters : 15% ZnO
- Dispersant : **EstoLight-1E (5%)** vs 4 other dispersants

Operating mode

- **Phase A1:**
  - Predisperse the raw materials at room temperature
- **Phase A:**
  - Stir at 80°C
  - Add the phase A1 and homogenise
- **Phase B:**
  - Predisperse the ingredients and heat at 80°C
  - Emulsify phase A in B under high shirring
  - Cool down at room temperature
- **Phase C:**
  - Homogenise raw materials of phase C in B

Customer Feedback

MAPRECOS

“ ***All these dispersants* (see INCI below) were used in mineral sunscreen formulation containing exclusively ZnO (15%). These formulas have highlighted that your dispersant was more effective than the 4 others*** *(It made the formula more homogeneous and left fewer white marks when applied to the skin).* ”

INCI: [Lactobacillus/Brassica nigra seed ferment extract ; Octyldodecyl olivate] ; [Hexyldecanol] ; [Octyldodecanol] ; [Butyloctyl Salicylate].

Physical stability

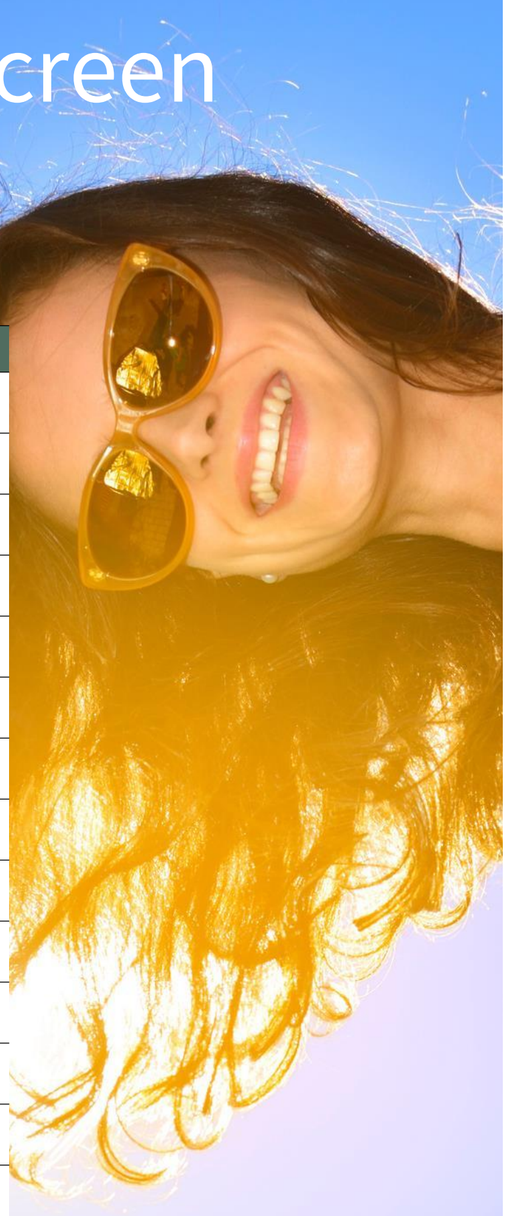
- Excellent dispersion during formulation preparation.
- When spreading, penetration is rapid and the formula is homogeneous.
- The white effect disappears upon application much faster than in tests with other dispersants.

Mineral sunscreen – O/W Emulsion

Organic Sunscreen Formulation

Oil-in-water emulsion

Organic sunscreen formulation



PHASE	INCI	%
A1	Aqua	29.56
A2	Glycerin	3.00
	Pentylene glycol	2.00
A3	Phenylbenzimidazole Sulfonic Acid (solution 15%)	16.67
	Sodium Phytate	0.10
	Lauryl Glucoside, Polyglyceryl-6 Laurate, Myristyl Glucoside	3.00
B	Diethylamino Hydroxybenzoyl Hexyl Benzoate (DHHB)	8.50
	Ethylhexyl Triazone (EHT)	4.90
	Bis-Ethylhexyloxyphenol Methylphenyl Triazine (BEMT)	5.50
	Isopropyl Lauroyl Sarcosinate	12.00
	Hexyl Laurate	10.00
	EstoLight-1E	**1.27**
C	Polyacrylate Crosspolymer-6	0.70
D	Microcrystalline Cellulose, Cellulose Gum	2.00
	Hydroxyacetophenone	0.50
E	Arginine	0.30
		100,00

Formulation technology

- Emulsion type : Oil-in-water (O/W)
- Organic filters : DHHB (8.5%), EHT (4.9%), BEMT (5.5%)
- Dispersant : **EstoLight-1E (1.3%)** vs PHS

Operating mode

- **Phase A :**
  - Disperse slowly under stirring to thicken the phase aqueous
- **Phase B :**
  - Heat at 75–80°C and stir until filters are completely dissolved
  - Emulsify in A under strong stirring (15 min)
  - Adjust viscosity and pH

Observations & Benefits

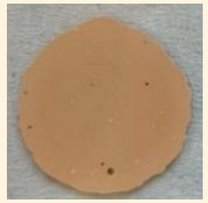
- **Fluid** formulation: Estolight-1E (~7000 cP) vs PHS (~10000 cP)
- **Facilitates spreading and penetration**(Reduction of the greasy finish)
- EstoLight-1E **boosts SPF** : **+74% with EstoLight-1E** vs PHS (Labsphere measurement according to adapted ISO 24443)

Foundation

Water-in-oil emulsion

PHASE	INCI	%
Phase A	Caprylic/Capric Triglyceride	13.000
	Coco-Caprylate/Caprate, Tocopherol	12.000
	Polyglyceryl-6 Polyricinoleate, Polyglyceryl-6 Polyhydroxystearate	4.000
	Hydrogenated Castor Oil/Sebacic Acid Copolymer, Caprylic/Capric Triglyceride	3.000
	Polyglyceryl-3 Polyricinoleate, Polyglyceryl-4 Oleate	2.000
	Jojoba Esters, Helianthus Annuus Seed Wax, Acacia Decurrens Flower Wax, Polyglycerin-3	1.500
	Iron oxydes	13.000
	EstoLight-1E	**1.455**
Phase B	Eau déminéralisée	40.045
	Glycerin	3.000
	Magnesium Sulfate	2.000
	Phenoxyethanol, Ethylhexylglycerin	1.000
Phase C	Glyceryl Rosinate, Aqua, Cellulose, Sodium Sulfate	4.000
		100.000

With PHS



With EstoLight-1E

Formulation technology

- Emulsion type : Water-in-oil (W/O)
- Mineral fillers : 13% iron oxide
- Dispersant : **EstoLight-1E (1.45%)** vs PHS

Operating mode

- **Phase A:**
  - Heat at 85°C
  - Stir gently for 15 min
- **Phase B:**
  - Heat at 85°C
  - Emulsify in A under strong stirring (15 min)
  - Add C once the temperature is below 40°C

Observations & Benefits

- **Fluid formulation** with Estolight-1E vs PHS
- **Better dispersion** with EstoLight-1E

Shimmering Oil

Liquid anhydrous base with dispersed pigment

PHASE	INGREDIENT	NOM INCI	%
Phase A	Caprylic/capric triglyceride	Caprylic/capric triglyceride	58.000
	Sunflower oil	Helianthus annuus oil	24.870
	Dicaprylyl carbonate	Dicaprylyl carbonate	14.000
	EstoLight-1E	**Methyl polyricinoleate**	**2.000**
	Mica	Calcium sodium borosilicate, Titanium dioxide	1.000
	Beeswax	Cera alba	0.125
			100.000

Formulation technology

- **Anhydrous formulation** charged with **mica (1%)**
- Use of **2% EstoLight-1E** compared to dispersant-free formulation

t=0min | t=15min | t=30min | t=60min | t=90min | t=120min

Left: without EstoLight-1E
Right : **with EstoLight-1E**

Observations & Benefits

- **Mineral fillers are maintained in dispersion** with only **2% of EstoLight-1E**

Pigmented Lotion

Pigmented oil-in-water emulsion

Formulation technology

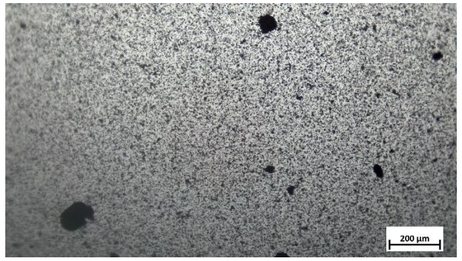
- Pigmented direct emulsion containing **1.0% of EstoLight-1E** and 1.5% of pigment

Operating mode

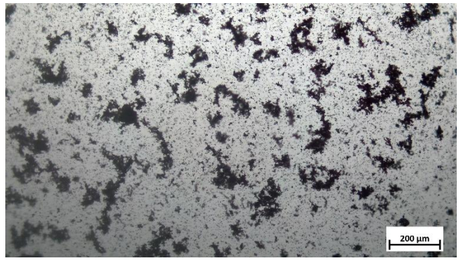
- **Phase A:**
  - Heat at 70°C and stir during 15min
- **Phase B:**
  - Heat at 70°C and stir during 15min
  - Emulsify in A under high shirring (Ultra-turrax at 8000 rpm (10 min))

PHASE	INGREDIENT	NOM INCI	%
Phase A	Water	Aqua	63.00
	Glycerin	Glycerin	5.00
	Sisterna SP70C	Sucrose stearate	1.00
	Sepimax Zen	Polyacrylate Crosspolymer-6	0.50
	Potassium sorbate	Potassium Sorbate	0.50
Phase B	Sunflower oil	Helianthus annuus oil	10.25
	Caprylic/capric triglyceride	Caprylic/capric triglyceride	10.25
	Shea butter	Butyrospermum parkii butter	5.00
	Dicaprylyl carbonate	Dicaprylyl carbonate	2.00
	EstoLight-1E	**Methyl polyricinoleate**	**1.00**
	Manganese violet, Kaolin	CI 77742	1.50
			100.00

Microscopy of pigmented oily phases



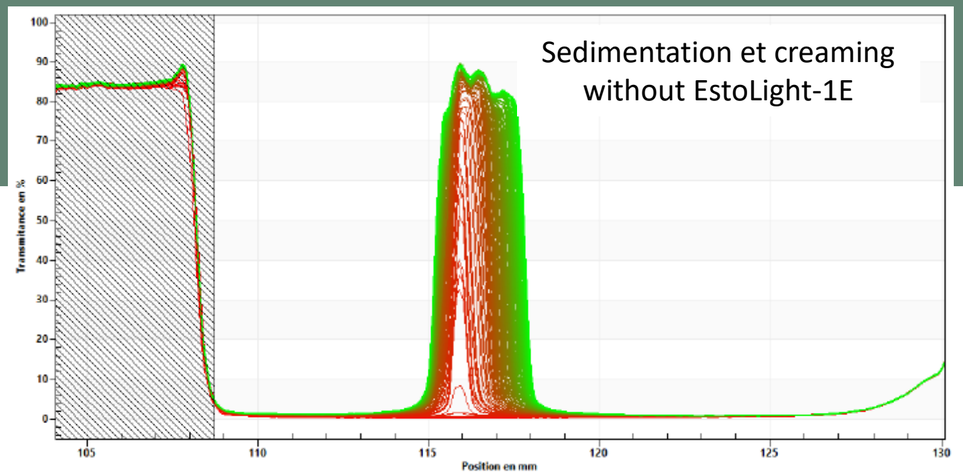
Fine and not aggregated dispersion with EstoLigh-1E

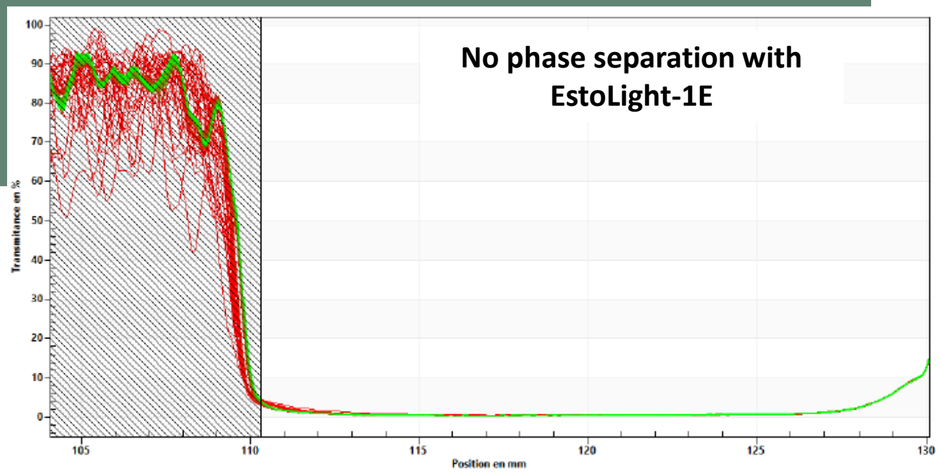


Without EstoLight-1E, the dispersion is aggregated

Test & Observations

- Centrifugal accelerated aging test with LUMiFuge: 25°C, 2h, 1000 xg
  - ➢ **Perfectly stable emulsion with EstoLight-1E**
- **Enhanced Homogeneity**: better pigment dispersion
- **EstoLight-1E improve the emulsion stability**





Without EstoLight-1E

With EstoLight-1E

Reminder on the uses of the EstoLight-1E

- Function: **Plant-based dispersant**
- Percentage of use: **between 1 and 5 %**
- Usage: **direct and reverse emulsions, anhydrous formulations**
- Percentage of charges that can be stabilized: **variable** (see table below)

TESTED FORMULATIONS	Pigmented dispersion	Mineral sunscreen formulations	Organic sunscreen formulations	Foundation	Shimmering oil	Pigmented lotion
Type of product	Anhydrous	W/O and O/W emulsions	O/W emulsion	W/O emulsion	Anhydrous	O/W emulsion
% of fillers	50.0%	15.0 - 17.5%	DHHB (8.5%), EHT (4.9%), BEMT (5.5%)	13.0%	1.0%	1.5%
% of EstoLight-1E	**4.50%**	**1.30 to 5.00%**	**1.27%**	**1.45%**	**2.00%**	**1.50%**

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