

PLANTASENS CRAMBISOL

INNOVATIVE FUNCTIONAL AGENT

Proven efficiency *- wide ranging benefits

Elaborated from natural and renewable sources

Ecocert approved

Extreme Comfort

- Smooth and luscious skin feel
- Exceptional skin suppleness

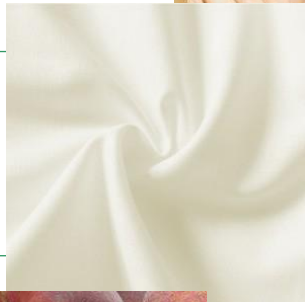


Skin Care

- Moisturising agent
- Protector of cutaneous barrier
- Cellular regeneration
- Emulsion stability

Skin Rejuvenation

- Protective veil
- Long lasting relaxing and smoothing effect



Hair Care

- Alleviates dryness
- Nourishes and protects
- Enhances hair care properties



Velvet Feel

- Sensual skin feel
- Skin texture improvement
- Sensation of well-being



Make Up

- Long lasting effect
- Color intensity
- Improves pigment dispersion



CRAMBISOL

INNOVATIVE FUNCTIONAL AGENT

Developed by CRM International, **Crambisol** is a new intelligent, efficient, conditioning agent, with a unique skin feel when introduced in formulations.

Crambisol combines and accentuates the positive effect of Crambe Oil with the bio-active effects of Phytosterols.

Crambisol is elaborated by a green process which respects the environment.

CRAMBISOL CLAIMS

- Exceptional multifunctional agent in formulation - New skin sensations

- Targeted actions

For the skin

- moisturizing activity
- protective action
- repairing effect
- long lasting

For the hair

- enhances brightness
- reinforces hair fiber
- increases the hair volume
- improves the combing on wet hair
- induces no electrostatic effect

In formulation

- co-emulsifier
- stabilizer
- effective at low concentration
- wide compatibility

- Proven efficiency – in vivo tests

- For all cosmetic ranges
 - skincare – moisturizing cream, anti-ageing cream, body milk and lotion...
 - suncare, aftersun product – cream, milk, lotion, oil...
 - cleansing product – facial cleanser, make up remover, liquid soap, shower gel...
 - make up – lipstick, gloss, foundation...
 - haircare – shampoo, after-shampoo, repairing mask...

- Natural ingredient - Ecocert approved

- Liquid form - very easy to use

SENSORIAL EFFECTS

The texturing properties that Crambisol creates are new and pleasantly surprising for the senses. – Annex I - Sensorial profile



Extreme Comfort

Cosmetics including **Crambisol** will be first felt as **smooth and luscious**, like a **caress** on the skin.

Crambisol creates a **delicate film** which ensures maximum comfort and suppleness for the skin.

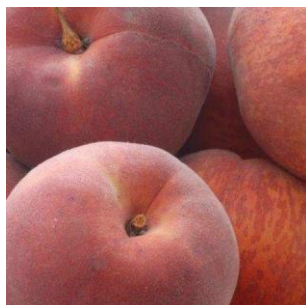


Skin Rejuvenation

Crambisol in formulations leaves a **protective veil** like a second skin.

The result induces a **genuinely natural** look with a non-greasy and non-sticky after-feel.

After using cosmetics including **Crambisol**, the skin is immediately relaxed and smoothed with a **lasting effect**.



Velvet feel

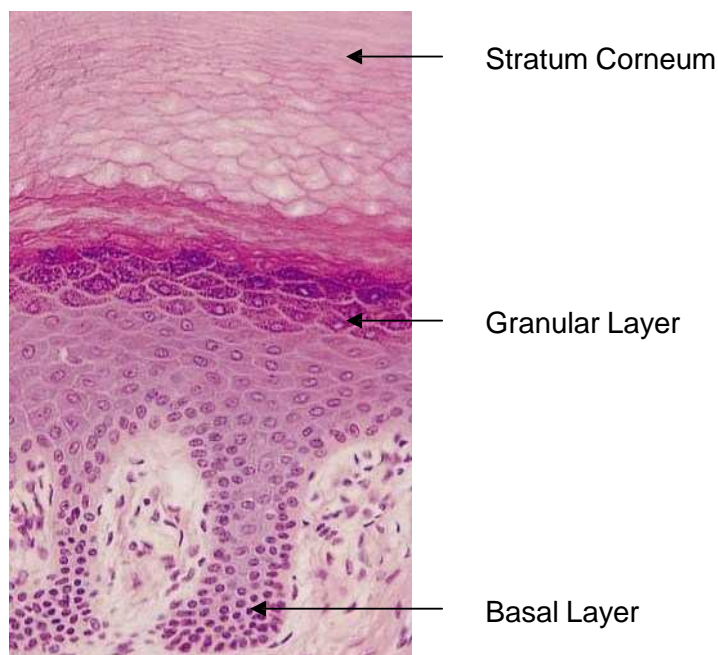
Crambisol confers to cosmetics the ability to promote skin well-being and to improve **skin texture**.

Crambisol in formulations gives a unique **velvet skin touch** like a peach skin, which makes it unique.

ACTIONS ON THE SKIN

Crambisol acts directly on the epidermis at several levels:

- **Crambisol** reduces TEWL (Trans Epidermal Water Loss) by forming a thin non occlusive film on skin surface and so regulates the hydration level of the epidermis.
- **Crambisol** helps to maintain the integrity of the cutaneous barrier thus protecting from environmental factors (pollution, UV's ...). It reduces skin dryness and regulates desquamation of the stratum corneum.
- **Crambisol** regulates the hydrolipidic balance and improves the activity of the lipids in the layers of the epidermis. Thus, Crambisol plays an important part in the retention of moisture on the skin.
- **Crambisol** stimulates the skin regeneration process by favouring cellular turnover in basal layer.



The structure of the epidermis

Dermatological tests confirm that **Crambisol** is not a skin irritant even under highly exaggerated exposure conditions – Annex II – Irritation test

ACTIONS ON THE HAIR

Crambisol acts on the hair fiber at different layers.

- **Crambisol** enhances the brightness of the hair by acting on the cuticle constituted of patches connected by ceramide that reflect naturally the light.
- **Crambisol** facilitates hair combing under wet conditions and thus decreases the number of hair lost during hair styling.
- **Crambisol** has an immediate and long lasting effect on hair volumizing by leaving a film at the hair surface. A filming effect positively correlates with hair moisturisation.
- **Crambisol** acts in the cortex of the hair fiber by reinforcing the elasticity of the hair and making it stronger against physical aggressions (combing, styling...)
- **Crambisol** induces none electrostatic effect on hair.

Cortex

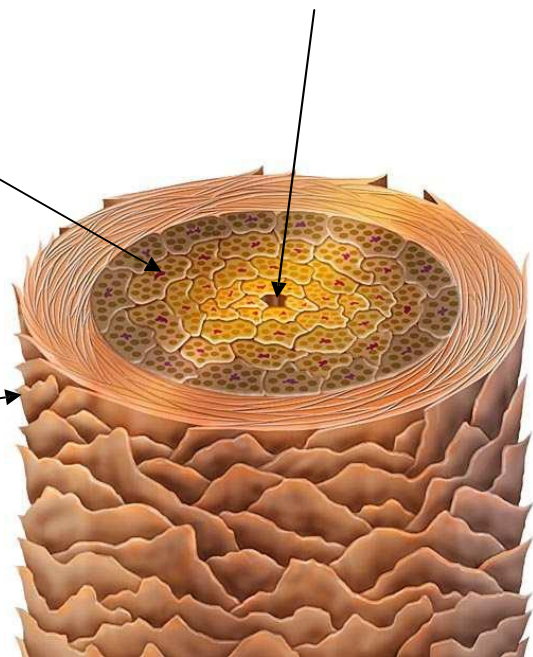
- Contains keratin and melanin
- Determines hair resistance and elasticity
- Gives colour to hair

Medulla

- Amorphous layer
- Can be continuous or discontinuous

Cuticle

- Constituted of patches connected by ceramide
- Reflects light
- Preserves internal hydration
- Protects from aggression



Section of a hair shaft

CRAMBISOL IN FORMULATION

Crambisol is a unique ingredient which allows the elaboration of formulations with an original skin feel associated to a proven efficiency.

The properties of **Crambisol** are of great interest in all areas of cosmetic products.

SKINCARE FORMULATIONS



Cosmetic properties

- For all skin types
- Unique skin feel
- Moisturising agent – Annex III - Hydration studies

👉👉 With 2% of **Crambisol** in a formulation, the moisturising gain is up to 50% after 3 hours as compared to a placebo formulation.

👉👉 After 5 days using a formulation containing 2% of **Crambisol** : obtention of an increase of the hydration rate over 80% as compared to the placebo formulation

- Protector of cutaneous barrier – Annex IV - TEWL study

👉👉 TEWL decrease by forming a non occlusive thin film

- Cellular regeneration

👉👉 Stimulation of cell proliferation

👉👉 Cell metabolism increase

- Compatible with most oils used in cosmetics (vegetable, synthetic, mineral) – Annex V - Miscibility tests
- Presents co-emulsifier properties – Annex VI - Co-emulsifying evaluation
- Capable of self-emulsification – Annex VII - Emulsion stabilizer
- Enhances stability of emulsions O/W and W/O
Stabilizes the oil phase

Recommended level of use : 2 - 12%

Studies have shown that **PLANTASENS Natural Emulsifiers CP5 and HP 10** can be used with advantage in formulations incorporating **Crambisol**.

HAIR CARE FORMULATIONS

Cosmetic properties

- Nourishing and protecting actions
- Enhances hair care properties – Annex VIII – Study of the efficacy of Crambisol in hair care

👉👉 At 5 % in an after shampoo and after 12 washings, **Crambisol** offers many benefits compared to a placebo formulation:

- + 50 % brightness
- + 191 % elasticity
- + 180 % film forming
- Improvement of hair combing
- No negative effect on electrostaticity



- **Crambisol** assists in regulation of hydrolipidic balance of the scalp, thus counteracting the drying effects of surfactants on the hair and scalp.
- **Crambisol** is the natural solution for healthy, stronger and repaired hair.

Recommended level of use : 0,5 - 5%

FOAMING PRODUCT FORMULATIONS

Cosmetic properties

- Reduces damage and dryness of the skin barrier caused by surfactants
- Helps to formulate mild cleansers

- Does not reduce foam volume - Annex IX - Effects on foam formation
Foam levels between formulation with and without **Crambisol** are very close.
- Stabilizes foam
Foam produced by a cleanser containing **Crambisol** is denser.



Recommended level of use : 0,5 - 2%

MAKE UP FORMULATIONS

Cosmetic properties

- Improves color intensity and dispersion
- Has long lasting effect
- Increases the cohesion and elasticity (lip care products)
- Improves pigment dispersion – pigment wetting capacity of **Crambisol** is very close to that of Castor Oil - Annex X - Pigment dispersion study
- Stabilizes pigment in emulsion
- Has a positive role in the dispersion stability of pigments



Recommended level of use: 2 - 15 %
Depends on exact type of makeup product.

CRAMBISOL MAIN CHARACTERISTICS

Appearance, 25°C	Oily liquid
Color	Light yellow
Odor	Faint, characteristic
Density, 25°C	0,895 – 0,915
Refractive index, 25°C	1,460 – 1,480
Acid value	0,5 max.
Iodine value	85 - 105
Saponification value	160 - 185
Peroxide value	15,0 max.

INCI Crambe Abyssinica Seed Oil Phytosterol Esters

CAS 1204225-86-4

EINECS --

Packaging : Plastic drums, 25 kg net, packed under nitrogen

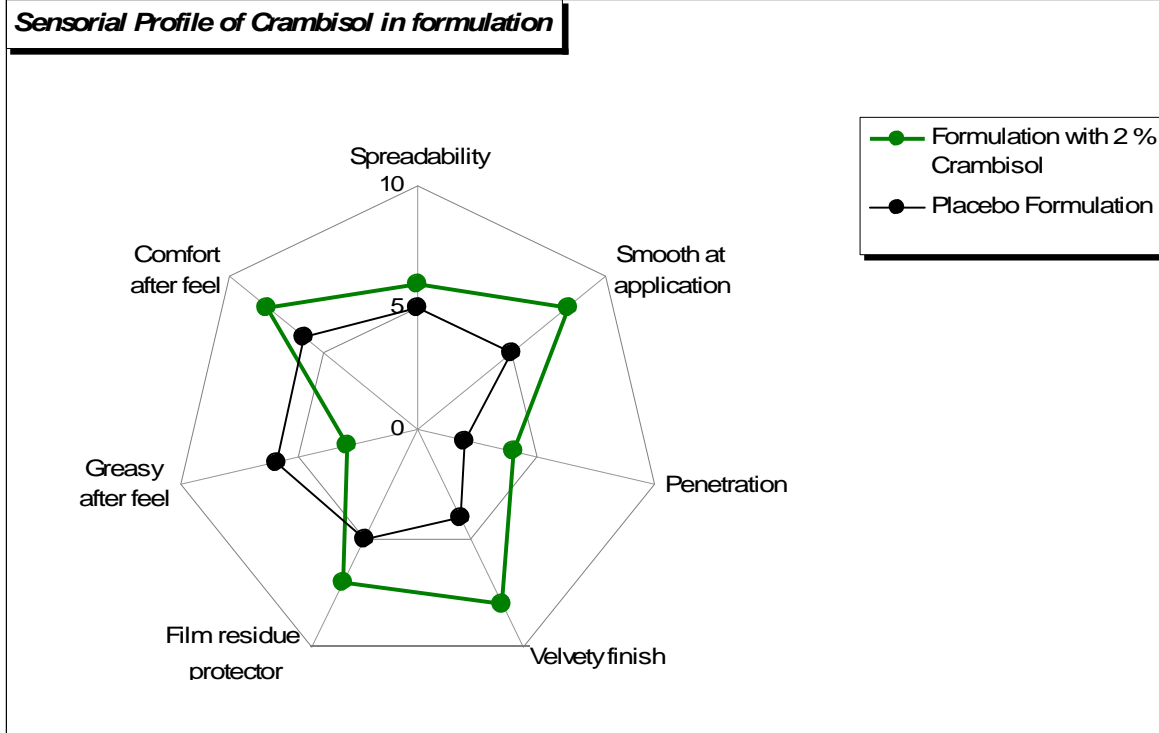
Storage : Store at approx. 25°C in original unopened packaging.

Shelf life : 24 months in original unopened packaging.

Safety : Not considered as hazardous. Refer to SDS.

ANNEX I

Sensorial agent



In formulation,

- Crambisol is easily absorbed by the skin, leaving a soft and velvety feel.
- Even at high concentration, Crambisol does not leave a greasy, sticky touch to cosmetic products.
- Crambisol can create new sensorial after-feel in emulsions.

ANNEX II

Irritation test (patch test)

Irritation tests have been performed by an accredited laboratory under the responsibility of a dermatologist. Laboratoire Cosmepear, Dermatologist, Doctor Samira Mansouri.

Crambisol has been tested in an in-vivo study at an extreme percentage (15% in concentration)
A single application has been applied on the skin of 21 volunteers of different age, sex and caryotype.
The contact time was of 48h00.

Results of the in-vivo skin study:

No clinical manifestation was observed following occlusive application of Crambisol by patch test for a period of 48 hours.

Full results of these tests are available if required.

ANNEX III

Hydration Studies

Studies have been carried out to evaluate the skin hydration of a formulation containing Crambisol at 2% as compared to a placebo formulation:

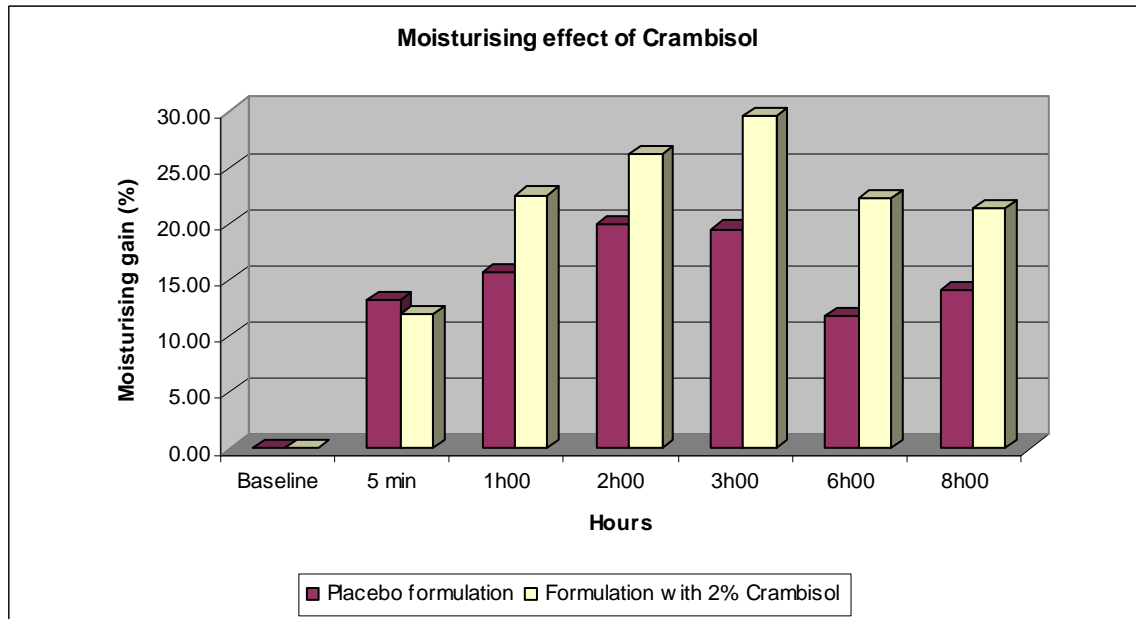
- Study during 8 hours
- Study during 5 days

The tests were carried out in vivo on 20 volunteers using Corneometer® CM825.

Formulations

Phase	Placebo Formulation		Formulation with Crambisol	
	Ingredients	%	Ingredients	%
A	Water	Up to 100%	Water	Up to 100
A	Glycerin	2.00	Glycerin	2.00
B	PLANTASENS Natural Emulsifier HP 40	5.00	PLANTASENS Natural Emulsifier HP 40	5.00
B	PLANTASENS Refined Shea Butter	2.00	PLANTASENS Refined Shea Butter	2.00
B	PLANTASENS Sweet Almond Oil	5.00	PLANTASENS Sweet Almond Oil	5.00
B	PLANTASENS Jojoba Oil	3.00	PLANTASENS Jojoba Oil	3.00
B	Caprylic/capric triglycerides	12.00	Caprylic/capric triglycerides	10.00
B	/		Crambisol	2.00
C	Preservatives	As needed	Preservatives	As needed

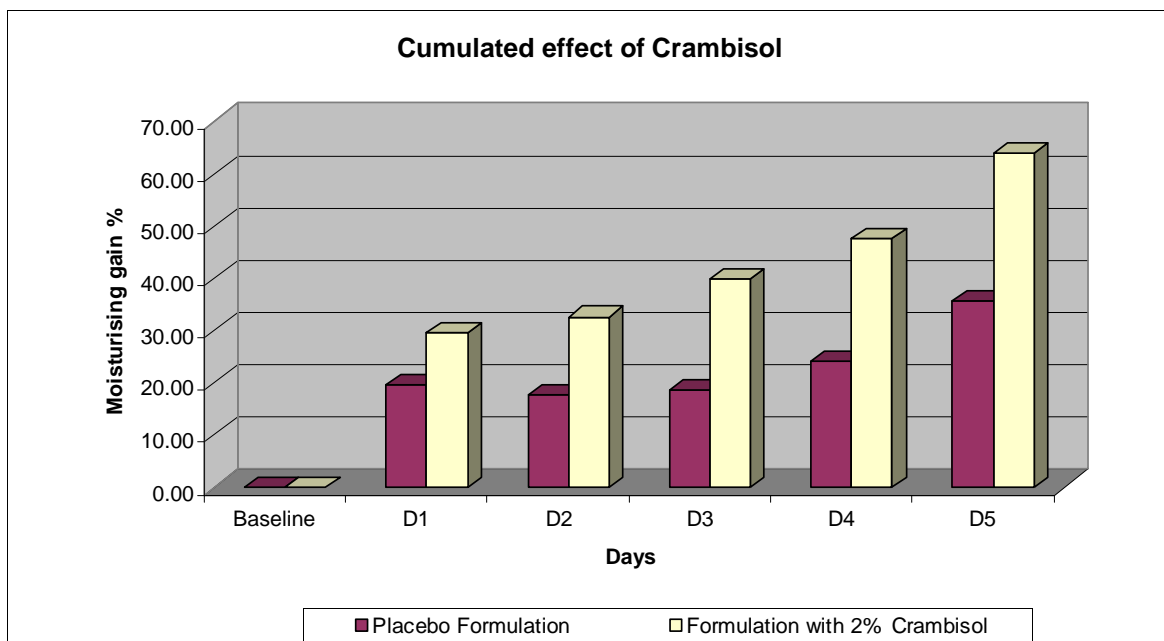
Results of 8 hour study



With a single application, Crambisol has a significant moisturising effect even with 2% in a formulation. When compared to a placebo formulation, the hydration rate increases to almost 50% after 3 hours and lasts until 8 hours.

The moisturising effect is long lasting.

Results of 5 day study



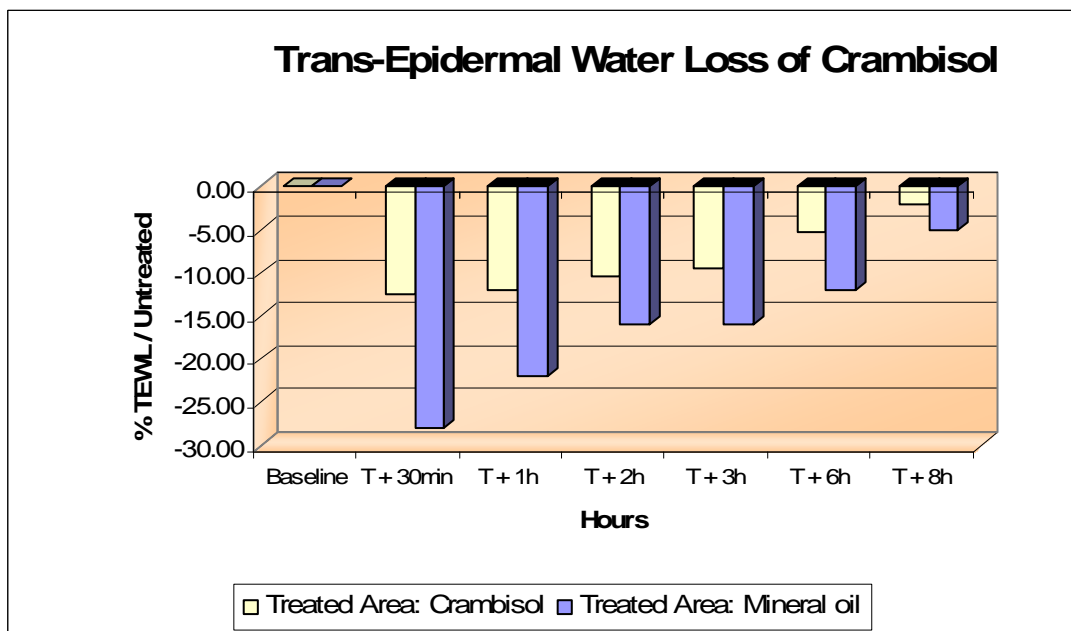
With a single application per day, the formulation containing 2% of Crambisol shows a very significant cumulated effect on hydration, over 80% as compared to the placebo formulation.

Tewameter test

TEWL (Trans Epidermal Water Loss) function evaluates the efficiency of the cutaneous barrier. The study was performed during 8 hours with one application of Crambisol to show its cutaneous barrier function.

The test is realized in vivo on 20 volunteers with Tewameter® TM300 by direct application of the products.

Results



In comparison with Mineral oil, Crambisol is less occlusive but even so reduces the TEWL by formation of a thin surface film on the skin. This film is slowly absorbed by the skin.

ANNEX V

Miscibility test with different oils

Evaluation of Crambisol /Oil blends at ambient temperature, 25°C.

	Blend aspect Crambisol 75% - Oil 25%	Blend aspect Crambisol 50% - Oil 50%	Blend aspect Crambisol 25% - Oil 75%
Sweet Almond Oil	M (T)	M (T)	M (T)
Castor Oil	M (T)	M (T)	M (T)
Caprylic / Capric Triglycerides	M (T)	M (T)	M (T)
Jojoba Oil	M (T)	M (T)	M (T)
Dimethicone	O S (30)	O S (2)	O S (30)
Cyclomethicone	M (T)	M (T)	M (T)
Isohexadecane	M (T)	M (T)	M (T)
Octyldodecanol	M (T)	M (T)	M (T)
Isostearyl isostearate	M (T)	M (T)	M (T)
Mineral oil	M (T)	M (T)	M (T)
Olive Squalane	M (T)	M (T)	M (T)
Olive Squalene	M (T)	M (T)	M (T)

M = Miscible
O = Opalescent

T = Transparent blend
S = Separation time (mins)

Crambisol is compatible with many different polarities of oil phases (vegetable, mineral, synthetic).

ANNEX V

Evaluation of Crambisol as a co-emulsifier

Method :

Water and Sweet Almond Oil are blended, in equal amount by weight at 25°C.

Different products (Paraffinum liquidum, Crambisol or Glyceryl Oleate as standard co-emulsifier) are added in increasing percentages. The final blends are homogenised 1 minute at 10000 rpm.

% of added ingredient	2 %	5 %	7 %	10 %
Appearance of blend with Paraffinum liquidum	white liquid emulsion Separation time 1 min	white liquid emulsion Separation time 2 mins	white liquid emulsion Separation time 2 mins	white liquid emulsion Separation time 3 mins
Appearance of blend with Crambisol	Pale yellow liquid emulsion Separation time 4 mins	Pale yellow liquid emulsion Separation time 10 mins	Pale yellow liquid emulsion Separation time 12 mins	Pale yellow liquid emulsion Separation time 19 mins
Appearance of blend with Glyceryl oleate	Ivory liquid emulsion Separation time 9 mins	Ivory liquid emulsion Separation time 15 mins	Ivory liquid emulsion Separation time 20 mins	Ivory liquid emulsion Separation time 28 mins

Results show

- Crambisol has a greater stabilising effect on the oil phase in emulsion as compared to Paraffinum liquidum.
- The higher the concentration of Crambisol in the final blend, the greater the stability of the final emulsion
- Compared with the widely used co-emulsifier, Glyceryl Oleate, the results with Crambisol are close.
- **Crambisol shows a significant effect as a co-emulsifier.**

ANNEX VII

Evaluation of the self-emulsifying characteristic of Crambisol

The purpose of this test is to evaluate the self-emulsifying properties of Crambisol as compared to a typical vegetable oil.

A blend of water and the oil (ratio 50/50 by weight) is mixed 30 seconds at 10000 rpm at 25°C.

50/50 Sweet Almond Oil / Water



T0



After 5 minutes,
immediate separation

50/50 Crambisol / Water



T0



Stable for more than 3 hours

Photos show that a mixture of Crambisol and water forms an emulsion. This phenomenon demonstrates the self-emulsifying property of Crambisol.

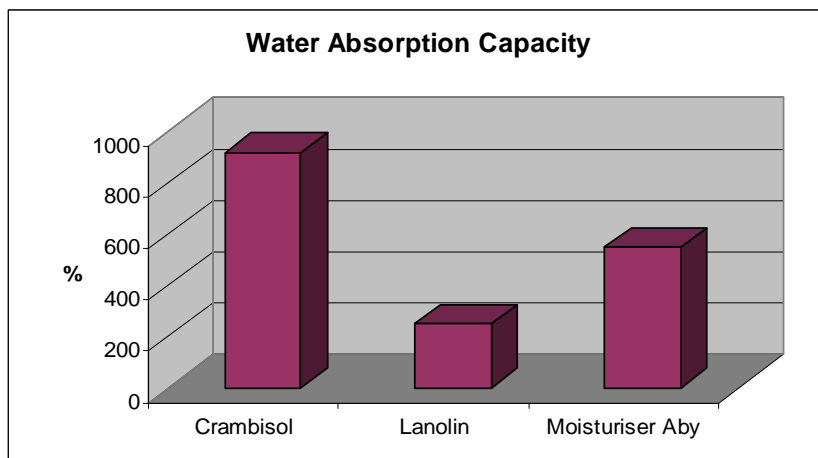
Conclusion:

Crambisol helps to stabilise emulsions and allows a decrease in the % of emulsifier.

Water absorption capacity

The water absorption capacity is the quantity of water that can be absorbed by a product. Results are expressed in %.

Water is added to the product by small volumes. The product is mixed manually with the water after each addition until water is no longer absorbed by the product.



These results show that Crambisol can absorb a high quantity of water (more than 8 times its weight in water.)

Thus Crambisol reinforces the water retention in the epidermal layers.

ANNEX VIII

Study of the efficacy of Crambisol in hair care

The aim of the study is to evaluate the efficacy of Crambisol introduced in an after shampoo formulation on natural hair locks compared to a placebo formulation. Different hair properties (brightness, elasticity, combing, volume and electrostaticity) have been measured by means of instrumental or experimenter evaluation after 1, 4, 8 and 12 products applications.

After hair locks preparation, a treatment with the two formulations was carried out with the following procedure:

Natural hair locks before treatment (T0)

↓

1	Washed with a neutral shampoo
2	Rinsed off and then dried
3	Placebo After shampoo is applied
4	Rinsed off

↓

1	Washed with a neutral shampoo
2	Rinsed off and then dried
3	After shampoo with 5 % Crambisol is applied
4	Rinsed off

Evaluated parameters:

Hair brightness

Hair elasticity

Hair combing

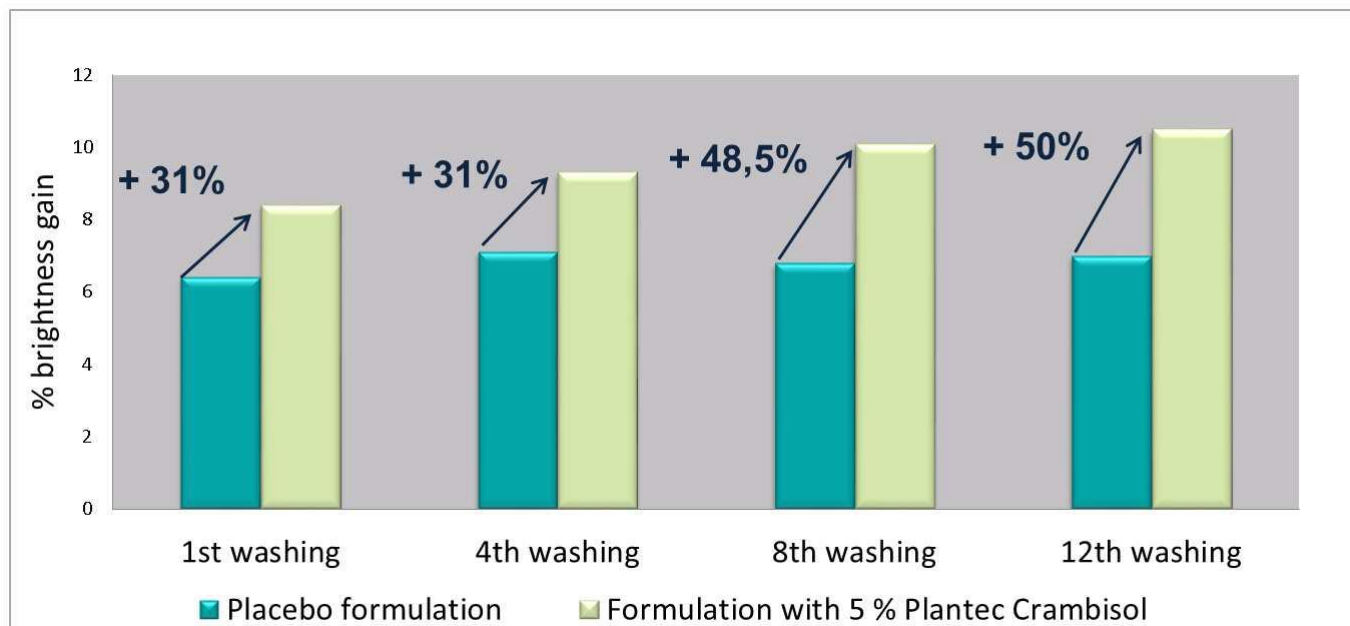
Hair electrostaticity

Filming properties

The different parameters are evaluated after 1, 4, 8 and 12 washings/treatments except for hair elasticity that is evaluated only at T0 and after 12 washings.

Brightness

The hair brightness is evaluated by using a spectrophotometer/colorimeter.

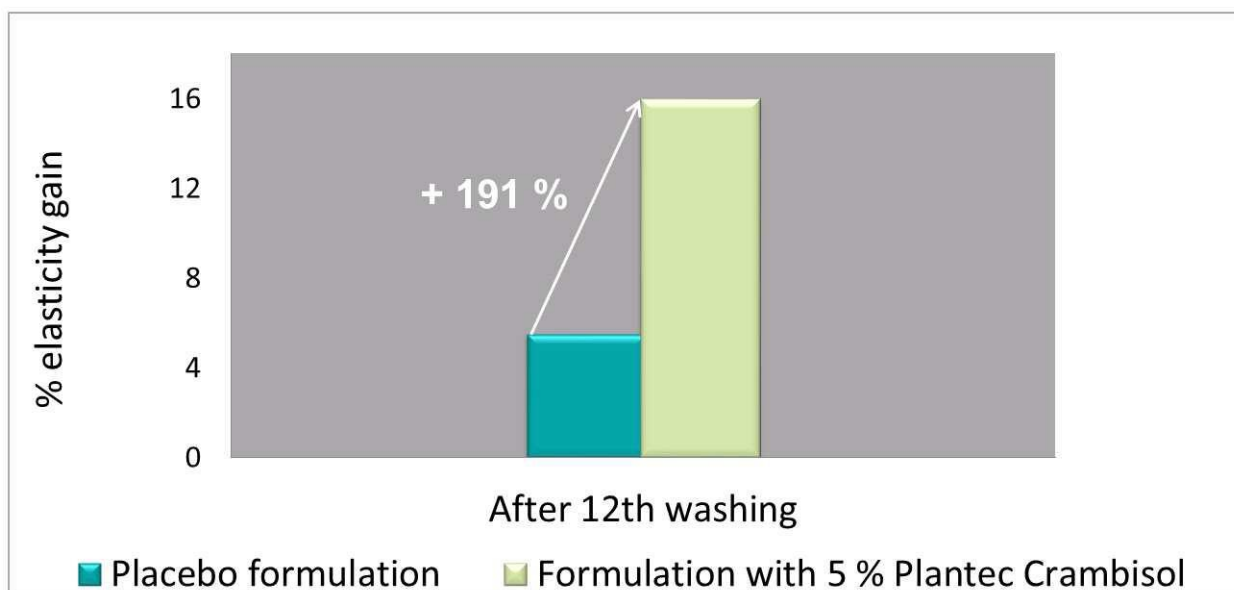


After 12 washings/treatments, the brightness of hair treated with the formulation containing **Crambisol** is increased of 50%.

Crambisol in formulation provides immediate and long lasting effect on hair brightness.

Hair elasticity

The hair elasticity is evaluated using a dynamometer. It is calculated as the force needed to break a single hair fiber.



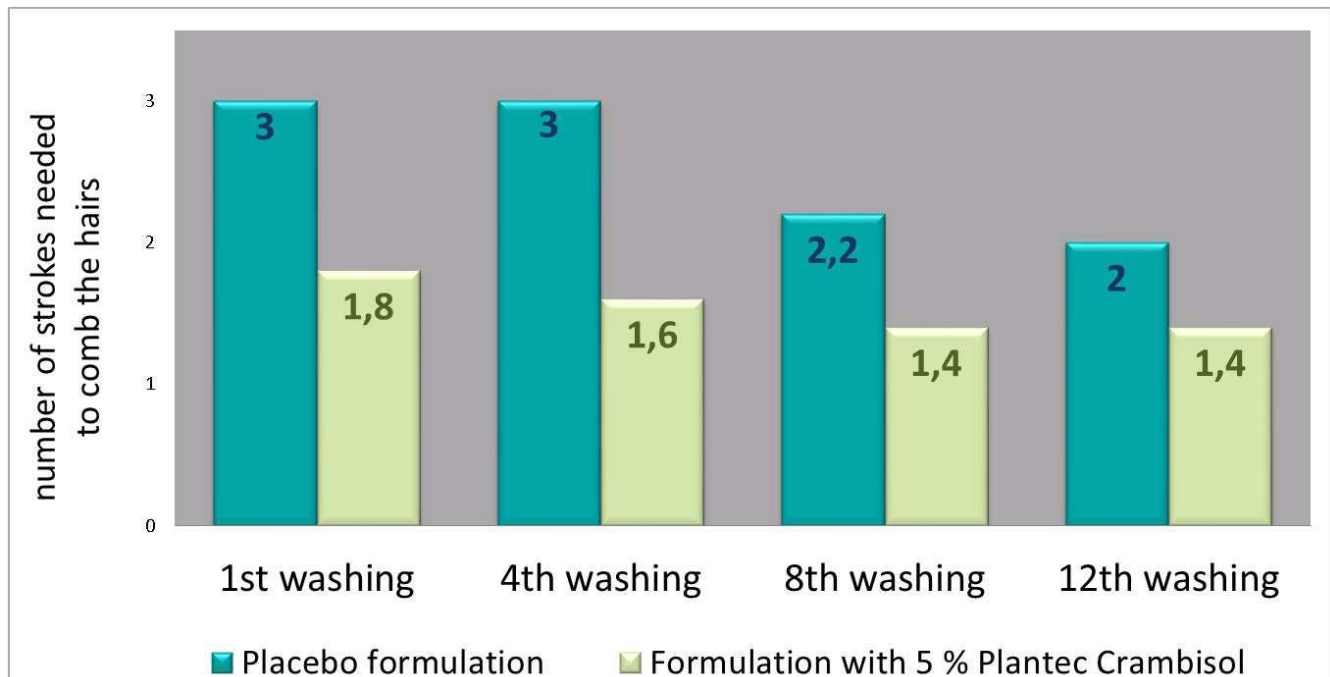
After 12 washings/treatments, hair locks treated with **Crambisol** are 191% more elastic compared to hair locks treated with the placebo formulation.

Crambisol improves the resistance of hair to traction (for example during combing).

ANNEX VIII

Hair combing

This study consists to evaluate the **Crambisol** effect in the improvement of the hair combing on wet hairs. The number of stroke to comb the hair locks is counted.



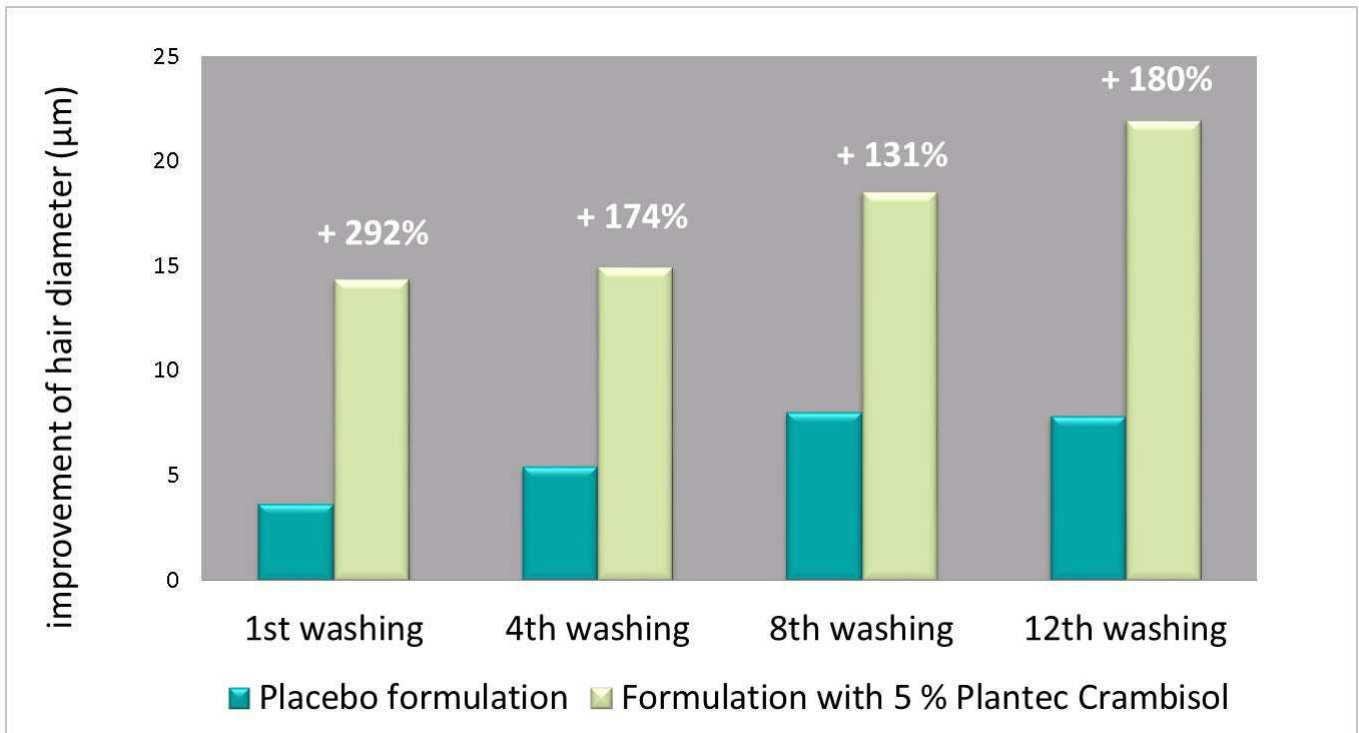
Crambisol in formulation facilitates hair combing under wet conditions.

Crambisol can decrease the number of hair lost during hair styling.

ANNEX VIII

Filming properties

Filming properties consist to determine if the product delivers a film at the hair surface by measuring the hair diameter before and after product application with a light microscopy.



Crambisol in formulation has an immediate effect on the increase of hair volume by forming a film. A filming effect positively correlates with hair moisturisation.

Hair Electrostaticity

It consists to evaluate if the hair is frizzy/electrostatic 4 hours after hair drying.

With the placebo formulation, the hair is slightly electrostatic.

With the formulation containing 5 % **Crambisol**, the hair is not electrostatic.

None electrostatic effect on hair is observed once hair treated with **Crambisol**.

ANNEX IX

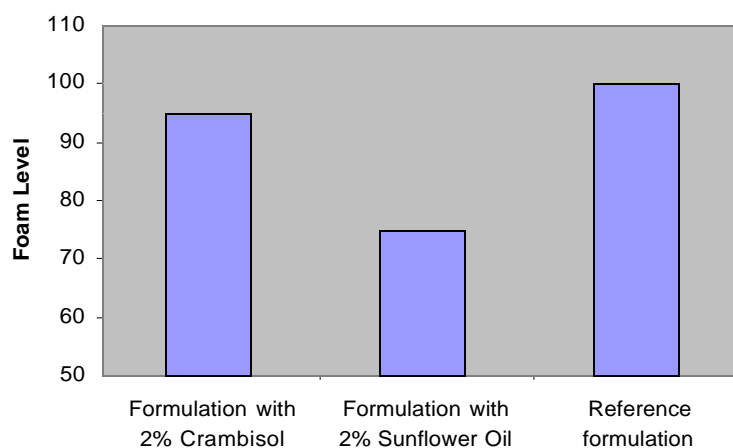
Effects on foam formation

Comparison of 2 cleanser formulations containing Crambisol (2%) and Sunflower Oil (2%) with a reference formulation, has been carried out by a method based on the Ross Miles foam volume test.

50 ml of each cleanser formulation was placed in a 250 ml graduated cylinder, fitted with IKA RW 16 high speed stirrer.

After a mixing time of 10 seconds, the foam height is measured.

Results:



The foam levels are very close between a formulation containing Crambisol and the reference formulation.

After one hour, it was noted that the foam produced with the formulation containing 2% Crambisol was more dense and stable than that of the reference formulation without Crambisol.

It is concluded that Crambisol does not have an adverse effect on foam formation of surfactant systems.



ANNEX X

Pigment dispersion

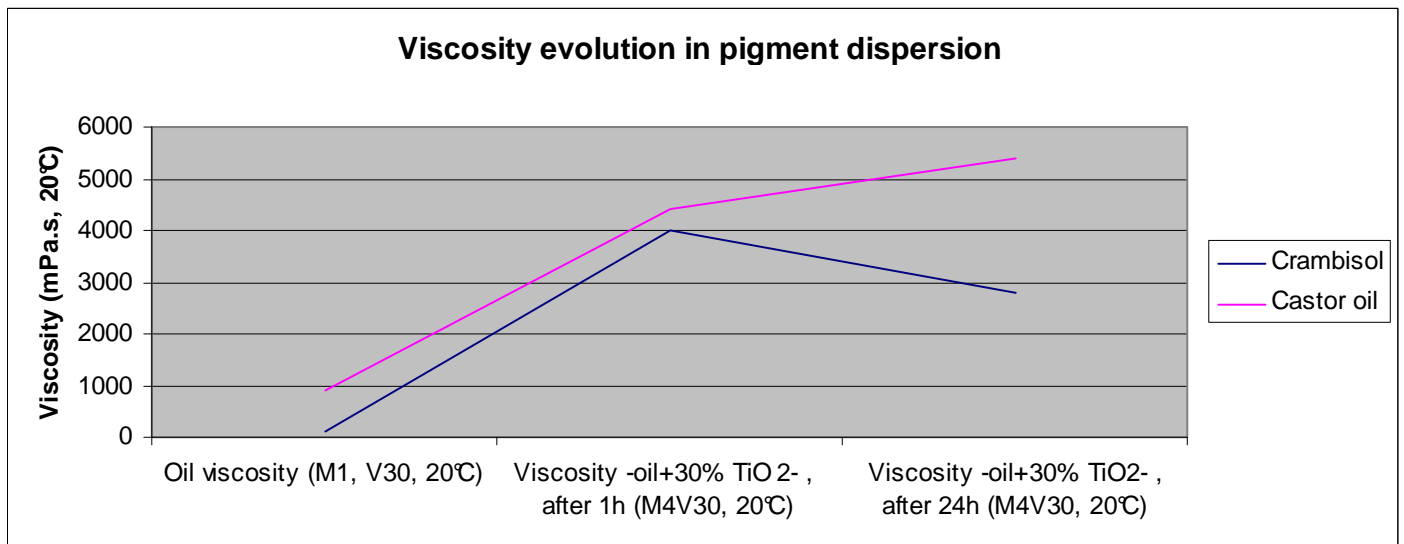
Viscosity measurement was used to evaluate the efficiency of wetting and pigment dispersion. The objective is to compare the wetting capacity of the Crambisol to the Castor Oil, known for its high pigment dispersion power.

Method

TiO₂ (SunPURO C47-5001/ SunChemical, anatase form, 170 nm) was chosen as pigment, being widely used in cosmetic formulations. Dispersions containing 30 % TiO₂ and oils are prepared. Each blend was stirred at 10 000 rpm for 5 minutes.

The dispersions viscosity is measured after 1 hour and 24 hours. Lower is viscosity of suspension after 24 hours; higher is the pigment dispersion capability.

Results:



The viscosity of the dispersion containing 30%TiO₂ in Crambisol after 24 hours is lower than the dispersion containing 30% TiO₂ in Castor Oil.

Crambisol appears to wet pigment better even than Castor Oil.