

Active Beauty
Unimer U-1946
Smart polymer for colour & skincare cosmetics

Crafted by synthesis



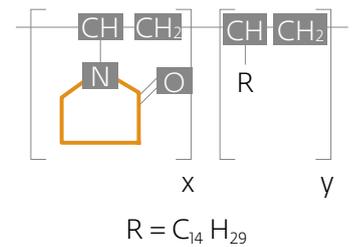
Focus on the product

What is Unimer U-1946 made of?

Unimer U-1946 is a combination of two ingredients:

- ▶ Octyldodecanol, an emollient often used as moisturiser, which provides a soft touch.
- ▶ VP/Hexadecene Copolymer, a well known polymer that helps in dispersion of pigments while providing a shiny and glossy effect.

Its improved amphiphilic structure allows for a special organisation of pigments as it comes in contact with water or oil.

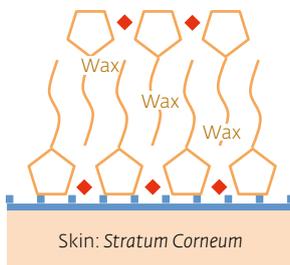


The result is a multi-faceted film-forming polymer which can be used in a wide range of products, and also bringing an antipollution function as an added value.

Unimer U-1946: the intelligent polymer

Unimer U-1946 adapts itself in the formulations thus showcasing their properties:

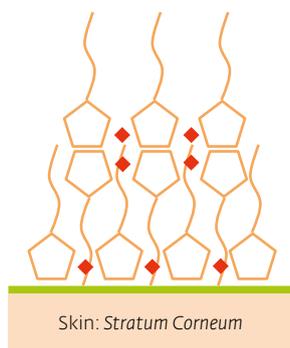
On lips



In a lipgloss/lipstick, it helps the pigments to disperse uniformly, stabilising them thus providing for a longer wear time. The final colour aspects of the product on lips stays intact without smearing or bleeding to the outer edges: an alternative way to keep the lips in shape!

Moisture film on the lips Pigments

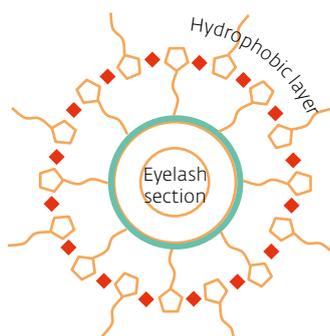
On skin



When incorporated in a foundation/sunscreen cream, Unimer U-1946, thanks to its amphiphilic form, is able to rearrange itself and capture the pigments. This results in a better spreading of pigments/filters, a long-lasting performance, wash-off resistance and sweat proof efficacy.

Hydrophilic film on the skin Pigments

On eyelashes



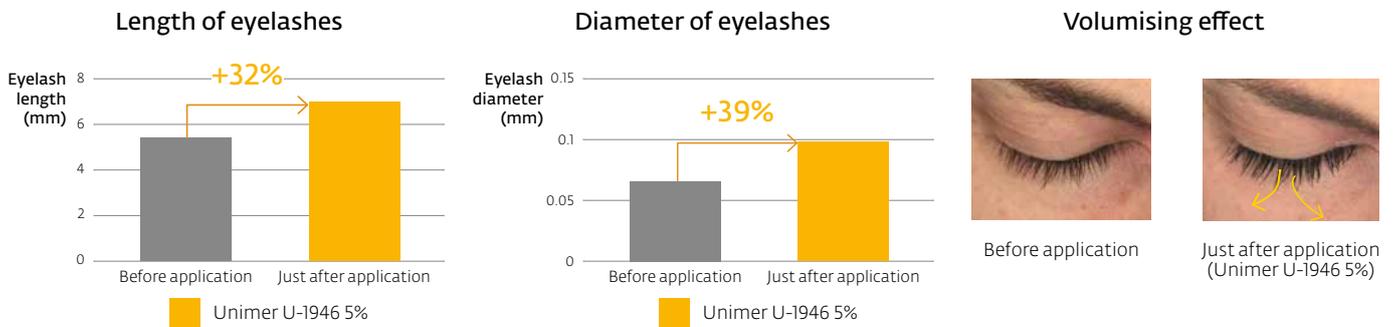
In a mascara, with its film-forming capacity, it provides a sheathing effect and improves the pigments spreadability around the eyelashes providing a volumising effect and the wear/water resistance, for a long-lasting result.

Lipdic film on the eyelash Pigments

Visual benefits - Eyelashes

High efficiency polymer for mascara (clinical efficacy)

A mascara containing Unimer U-1946 at 5% or a benchmark reference polymer at 13.3% were tested on 20 volunteers, one on each eye, during one week. The objective of this double-blind test was to evaluate the efficacy of Unimer U-1946 on the length, diameter and volume of eyelashes. Pictures were taken before and after application and images were analysed to get the results. Three trained assessors evaluated the volumising effect, the appearance of eyelashes and the long lasting effect of the products.

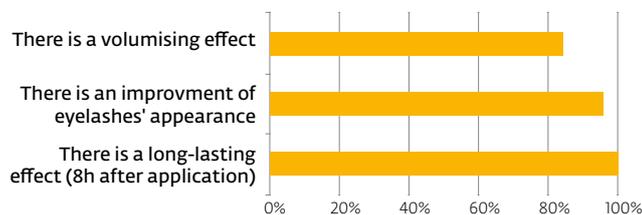


By using Unimer U-1946 5%, results are impressive just after application of the mascara:

- ▶ +32% of the eyelashes length
- ▶ +39% of the eyelashes diameter
- ▶ +163% of the eyelashes volume

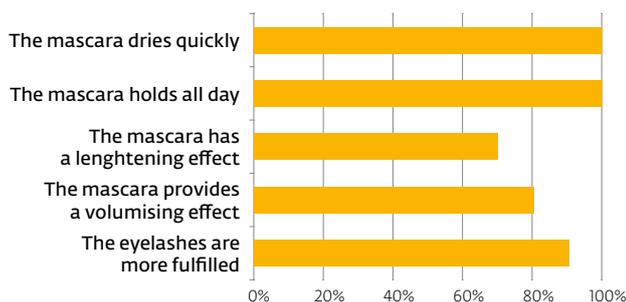
Same results could be obtained with the reference benchmark polymer but by using more than two times more of this reference.

Assessors' evaluation just after application:



Assessors confirm the results measured and see a **long-lasting performance** of the product containing Unimer U-1946.

Self evaluation:



During the self-evaluation of the product containing Unimer U-1946, the effects that were measured and confirmed by the assessors, are also noticed by the testers **after one week of use**.

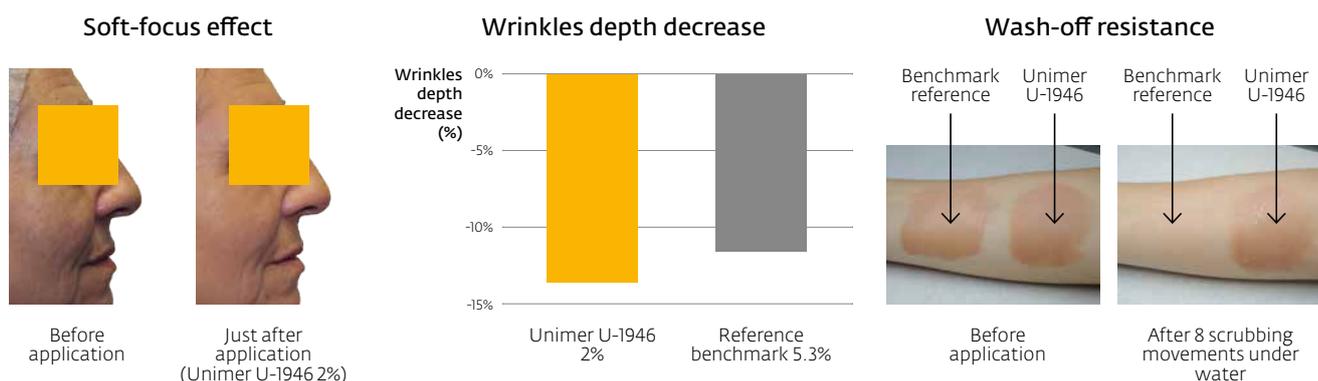
Visual benefits - Skin

High performance for colour cosmetics products (clinical efficacy)

A foundation containing Unimer U-1946 at 2% or the benchmark reference polymer at 5.3% was tested on 20 volunteers on each side of their face during one week. This double-blind test allowed to evaluate the performance of Unimer U-1946 particularly to decrease wrinkle depth (Primos 3D measurement), and improve the soft-focus and the long lasting effect of the foundation.

Pictures were taken just after product application, after 4h and 8h. Images analysis were run and three trained assessors evaluated these factors under blind conditions.

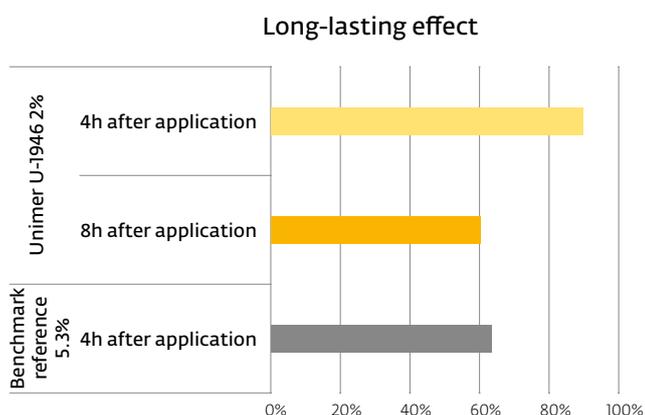
Measured and instant visible effects:



5 min after application the product containing the **Unimer U-1946 at 2%**:

- ▶ **Decrease of wrinkles' depth by -13%**, whereas with the benchmark reference, it only reduces it by -11.3%
- ▶ The **soft focus effect** is visibly remarkable
- ▶ Compared to the benchmark reference, there is an **oustanding wash-off resistance**

Assessors' evaluation:

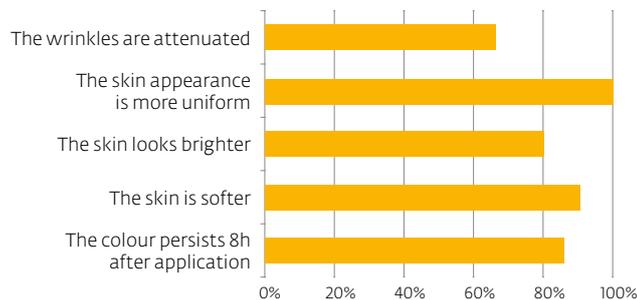


The **long-lasting effect is confirmed by the assessors**, and the product containing Unimer U-1946 at 2% after 8h shows nearly the same results than the one containing the benchmark reference at 5.3% after 4h.

Visual benefits - Lips

High performance for colour cosmetics products (clinical efficacy)

Self evaluation:



During the self-evaluation of the product containing Unimer U-1946, the effects that were measured and confirmed by the assessors, are also noticed by the testers after **one week of use**.

Lipgloss holding and gloss effect evaluation (clinical efficacy)

A lipgloss containing Unimer U-1946 at 5% was tested on 20 volunteers. This test was done to evaluate the long-lasting properties and the gloss effect of the lipgloss.

Pictures were taken just after product application and after 1h. Images analysis were run (using Nikon D300 camera) and three trained assessors evaluated these factors under blind conditions.

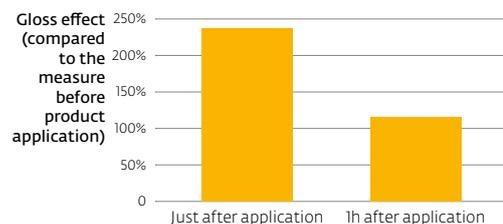
The gloss effect was measured by means of a CM-700d spectrophotometer/colourimeter, by acquiring the gloss value.

Measured and visible effects:

Gloss effect



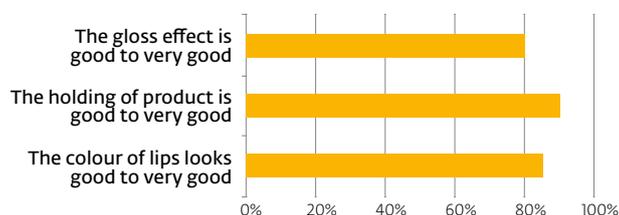
Gloss effect of the lipgloss



The product containing the **Unimer U-1946 at 5%**:

- ▶ Shows **+238% of gloss effect** just after application and **+115% 1h after application**
- ▶ The **gloss effect is visibly outstanding**

Measured and visible effects 1h after application:



After a week of use, women noticed a good to very good gloss effect, holding of the products and lips colour.

Formulation performance

The best polymer for all kinds of formulation

Characteristics	Reference commercial polymer for mascara and foundation	Reference commercial polymer for lipgloss/lipstick	Unimer U-1946
Smell	Strong recognisable smell	Neutral smell	Neutral smell
Taste	Unpleasant taste	Neutral taste	Neutral taste
Solubility	Water-soluble	Oil-soluble	Oil-soluble
Preservation	Preservative	No preservative	No preservative

Unimer U-1946 possesses general impressive characteristics: thanks to its neutral smell and taste, and due to its solubility in oils, Unimer U-1946 is the ideal candidate for anhydrous formulations.

This all in one polymer now allows to formulate lipsticks, lipgloss and water-resistant foundation easily.

Unimer U-1946: an easy-to-formulate polymer

Characteristics	Reference commercial polymer for mascara and foundation	Reference commercial polymer for lipgloss/lipstick	Unimer U-1946
Incorporation	Only at the end	At any time in the oily phase or after emulsification	At any time in the oily phase or after emulsification
Temperature	Only at temperature under 40°C	Can be incorporated at hot and cold temperatures	Can be incorporated at hot and cold temperatures
Viscosity	Unimer U-1946 helps having faster a higher viscosity than with the benchmark		
Concentration	2.5 times less Unimer U-1946 is needed for the same results than with the benchmarks for mascara and foundation		

Unimer U-1946 has outstanding formulating properties. It is easier to use than the benchmark references since it is possible to add it to your formulations at any time and temperature.

It helps increase viscosity. Most importantly due to its high concentration in polymer, less Unimer U-1946 is required compared to the benchmarks to get the same results for mascara and foundation formulations.

Anti-Pollution

Background on skin pollution

External pollution factors and skin

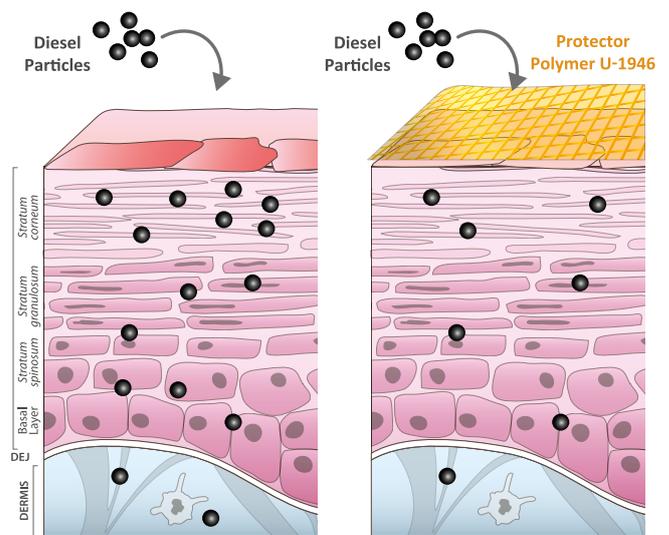
The environmental pollution strongly influences the human health through the development of respiratory and cardiovascular injuries, but also disruption of the skin's barrier function. The skin is a common pathway for pollutant aggressions through the important contact surface with the external environment¹.

Benzopyrene and skin penetration

Benzopyrene is an organic compound, which can generate pyrene and phenylene groups. It can be found in coal tar, wood or cigarette smoke, and burnt foods, and is then a frequent and important pollutant. The skin penetration of Benzopyrene is clearly described in the literature at *in vitro* and *ex vivo* levels². As many other pollutants, it disrupts the skin barrier function and promotes skin barrier defaults, inflammation and can also speed up the appearance of skin diseases, such as atopic dermatitis.

¹ Pan et al. 2015

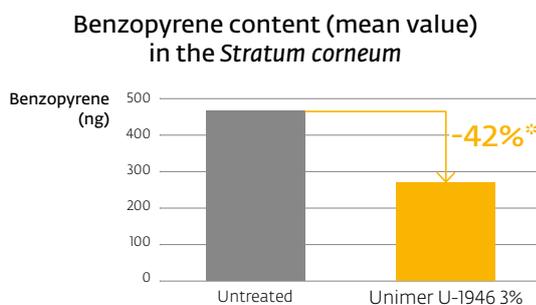
² Werter et al. 1990



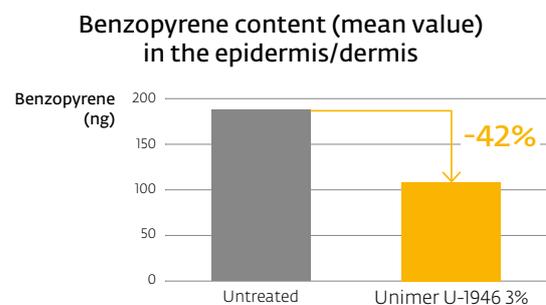
Unimer U-1946 mode of action against pollutants skin penetration

Unimer U-1946 effect on skin penetration of benzopyrene (*ex vivo*)

9 skin explants from 3 different donors were used (women, 34 to 58). These explants were placed into Franz diffusion cells (diffusion area of approximately 2 cm²). After an equilibrium step, the U-1946 gel at 3% was gently applied to the surface of skin explants. The amount of the formulation applied on skin samples was 5 mg.cm⁻². An amount of 125 µL of benzo[a]pyrene is then placed on the surface of skin samples for 24 hours. The surface of each skin explant is then cleaned 3 times with a micellar solution, and rinsed with deionised water. Transdermal penetration of Benzopyrene with and without U-1946 at 3% is then determined both in the *Stratum corneum* and epidermis/dermis.



*p<0.05, Student's t-test



Results: U-1946 at 3% enables a reduction of the Benzopyrene penetration in the *Stratum corneum* and in the epidermis/dermis layer with:

- ▶ A significant decrease of the amount of Benzopyrene in the *Stratum corneum* **down to - 42%**.
- ▶ A decrease of the amount of Benzopyrene in the epidermis/dermis **down to - 42%**.

Summary



Technical information

INCI:	VP/Hexadecene Copolymer (and) Octyldodecanol
Preservation:	Preservative free
Appearance:	Clear, colourless to yellowish, viscous liquid
Solubility:	Soluble in oil
Dosage:	2-5%
Monomer:	Max. 50ppm of residue (NVP)

Claims

Claims:	Long-lasting effect, increased pigments spreading, uniformisation of pigments on skin, increased wash-off resistance, eyelashes volumising effect, sweat proof, antipollution.
Applications:	Mascara, foundation, lipstick, lipgloss, sunscreen, antipollution formulation.

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