Active Beauty
Unimer series

Givaudan

engage your senses

Unimer polymers
Film-forming polymers for cosmetics

Unimer Types: N-Vinylpyrrolidone-Copolymers

Main properties

1. Enhanced Wash-off Resistance
2. SPF-Boosting
3. Moisture Balance
4. Pigments dispersion

Main applications

- Sunscreens,
- Color Cosmetics,
- Skin Care products.

INCI / CTFA Designation

- **Unimer U-15**: VP/Eicosene Copolymer ⇔ Antaron®/Ganex® V-220
- **Unimer U-151**: VP/Hexadecene Copolymer ⇔ Antaron®/Ganex® V-216
- **Unimer U-6**: Triacontanyl PVP ⇔ Antaron®/Ganex® WP-660
- **Unimer U-1946**: VP/Hexadecene Copolymer, Octyldodecanol ⇔ (no countertype)

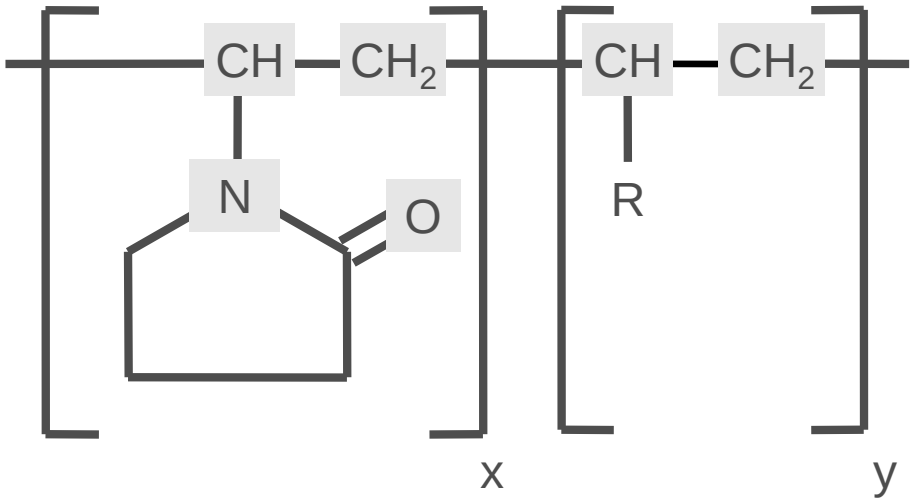
Chemical structure

Unimer U-15: R = C18H37; y= C20

Unimer U-151: R = C14H29; y= C16

Unimer U-6: R = C28H57; y= C30

Unimer U-1946: R = C14H29; y= C16



Film forming polymers for water and wear resistance, pigments dispersion

Available in solid (U-6/15)

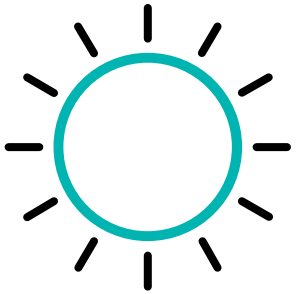
or liquid (U-151/U-1946) form

1. Film forming properties
2. Pigment dispersion/stabilization properties
3. Water resistant
4. Not animal derived
5. Excellent skin compatibility
6. Non toxic
7. Ready biodegradability

Applications

Sun screens

- Formation of water resistant, moisture balancing films
- Improvement of the substantivity of actives
- Enhancement of SPF

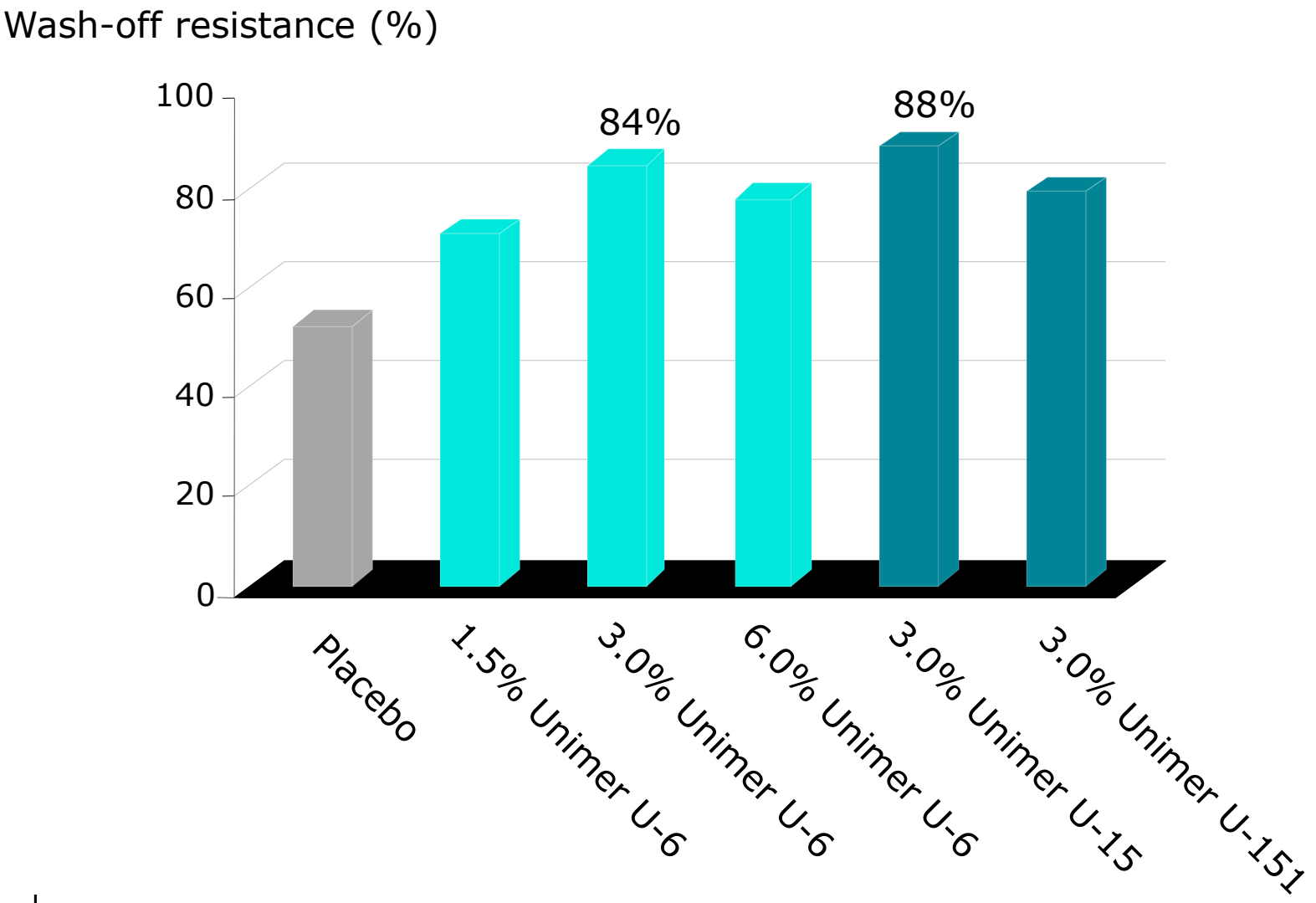


Color cosmetics

- Wear/water resistance
- Dispersion/stabilization of pigments

Wash-off resistance

Wash-off resistance
Unimer U-6, U-15, U-151



Unimer U-6

Unimer U-6, properties and use

Perfect for:

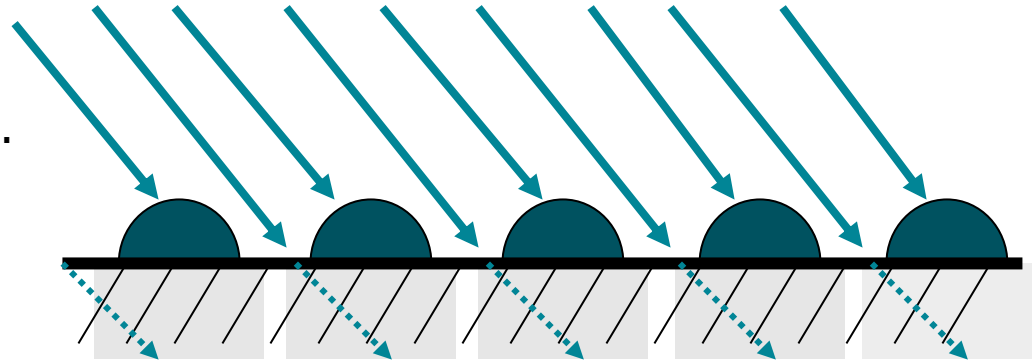
- skin,
- sun,
- lip care products,
- colour cosmetics.

- Recommended use concentration: 1-5%
- Not sticky
- Waxy emollient with skin protecting properties
- Solid, white to yellowish pellets, waxy with characteristic odour
- Melting range 70 - 75°C

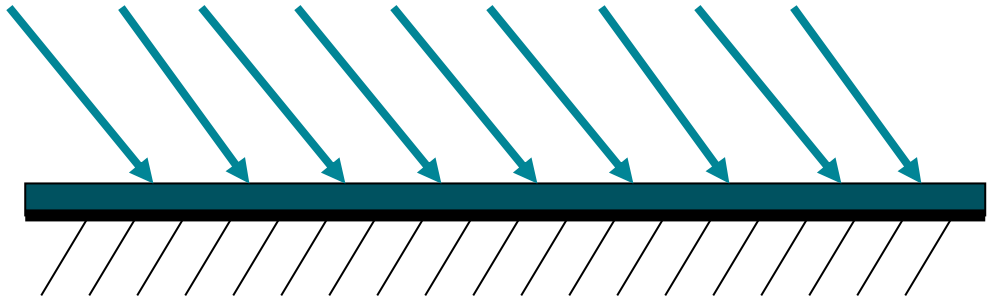
SPF boosting effect of Unimer U-6

Droplets or Film forming

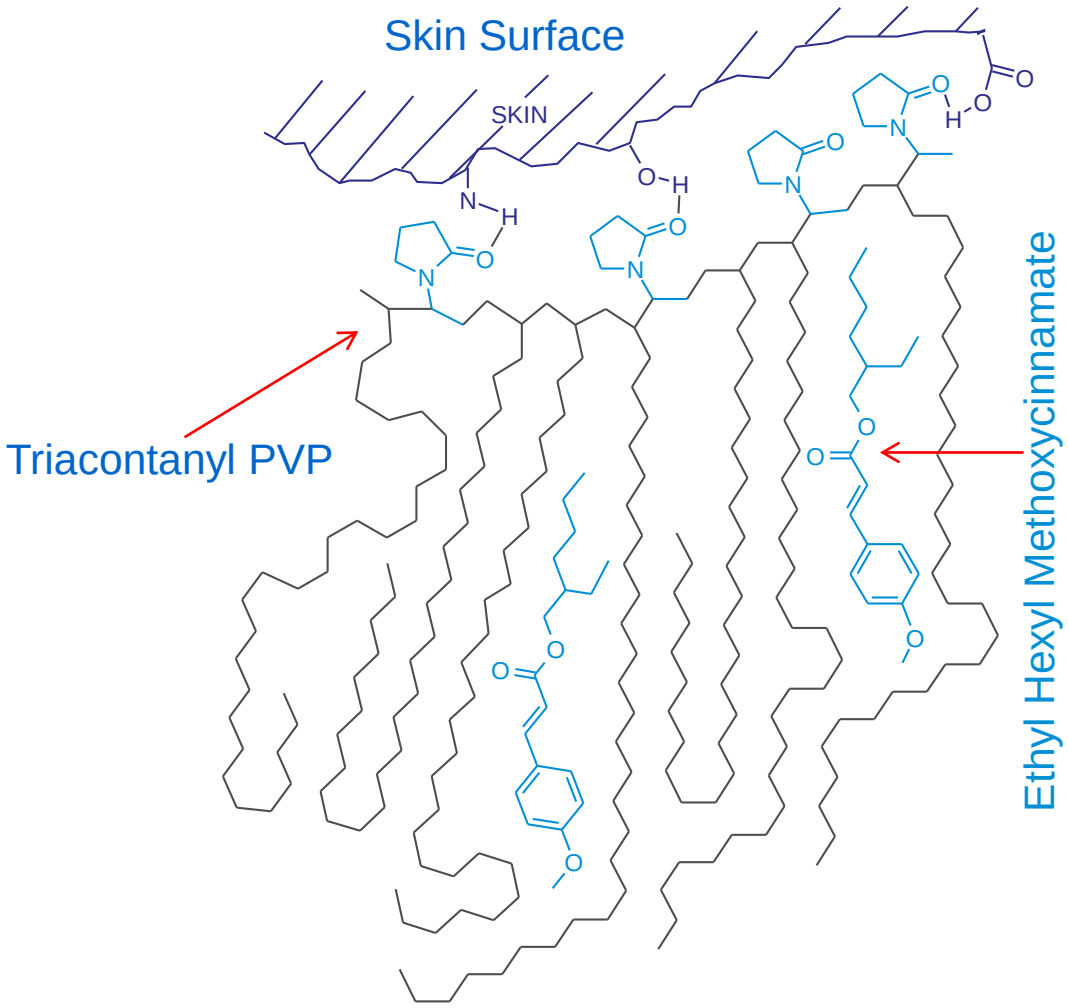
Droplets formed by surface tension. They give an irregular covered skin surface with resulting poor skin protection.



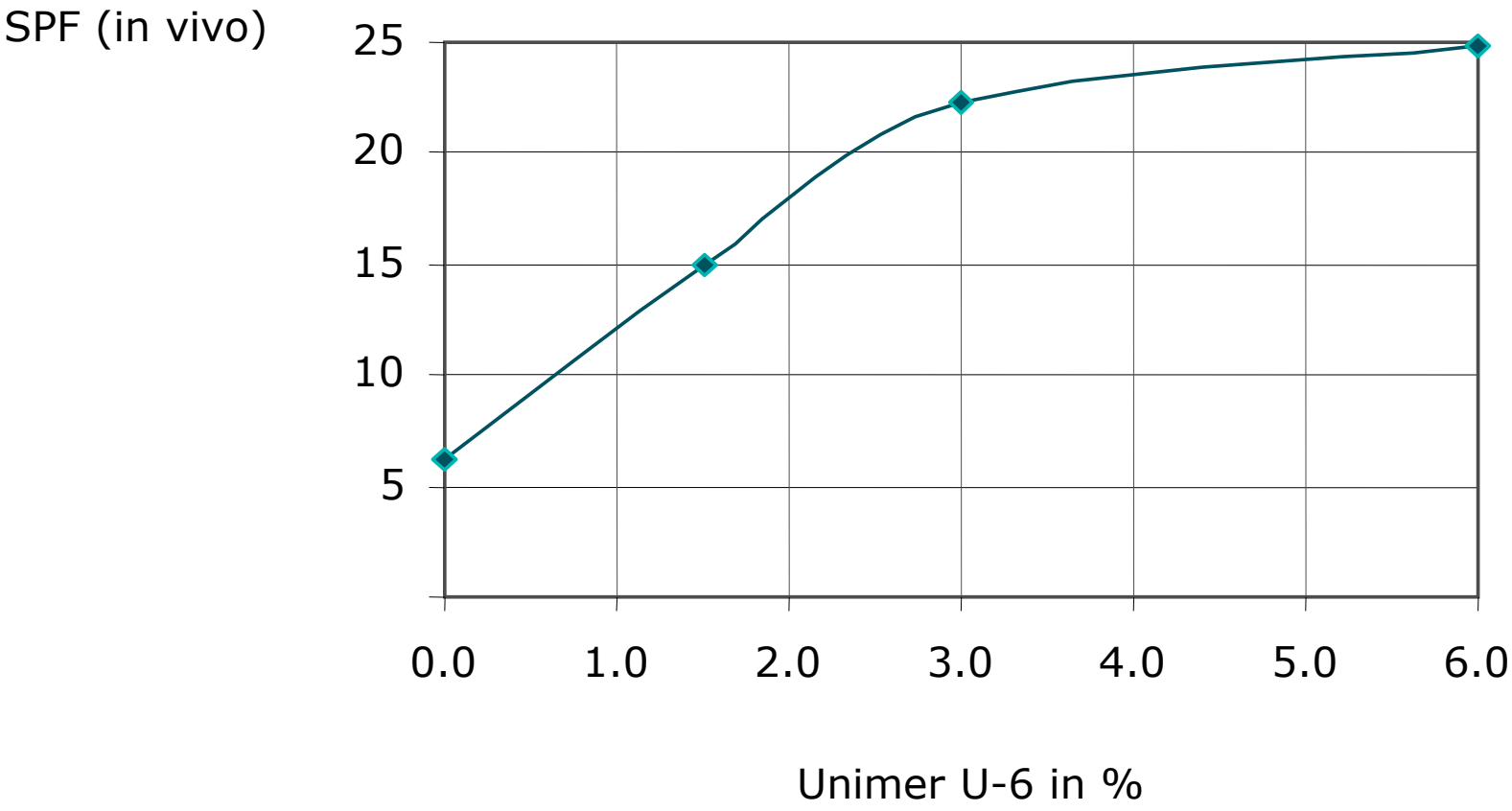
A coherent product layer will give a complete cover of the skin and improve the protective effect of the sunscreen formulation.



SPF boosting effect of Unimer U-6



SPF boosting effect of Unimer U-6



Unimer U-15

Unimer U-15, Properties and use

Perfect for:

- Skin care,
- Sun care,
- Lip care products,
- Colour cosmetics

- Solid, gravel-size pieces
- Melting range 32 - 36°C
- Not sticky
- Emollient with skin protecting properties
- Recommended use concentration: 1-10%

Unimer U-151

Unimer U-151, Properties and use

Perfect for:

- Skin care,
- Sun care,
- Lip care products,
- Colour cosmetics

- Slightly yellowish, clear, viscous liquid
- Recommended use concentration:1-4%

Enhancing Photo Protection with Unimer U-15

Ingredients		290188/D	290188/C
Ethylhexyl Methoxycinnamate		6.0	6.0
2-Phenylbenzimidazole-5-sulfonic acid		2.0	2.0
Unimer U-15		**-**	**2.0**
Excipient	q.s. to	100.0	100.0
Indicative SPF (5 individuals) Before/after water immersion		10.5/11.5	16.5/16.0

Givaudan Switzerland

Unimer U-1946
An exclusive polymer…

New generation of polymer for colour and skincare

Unimer U-1946 is an optimized ratio between:

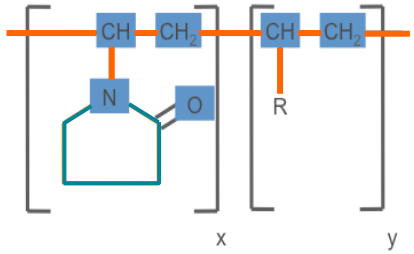
VP/Hexadecene copolymer:

an amphiphilic structure which helps in dispersion of pigments and provides shiny and glossy effect

combined with

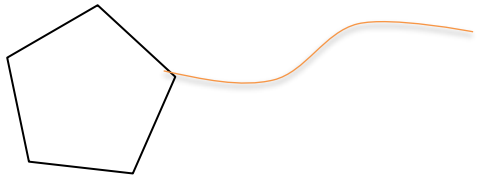
Octyldodecanol:

to provide a soft touch after application



$R = C_{14}H_{29}$

Chemical structure of Unimer U-1946



Visual representation of Unimer U-1946

Intrinsic properties

Characteristics	Reference commercial polymer for mascara and foundation (INCI: Acrylates Copolymer)	Reference commercial polymer for lipgloss/lipstick	Unimer U-1946
Smell	Strong recognizable 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

→ Formulate lipsticks/lipgloss and foundations with yet unreached final properties

Advantages of its use

Characteristics	Mascara and foundation reference (INCI: Acrylates Copolymer)	Reference commercial polymer for lipgloss/lipstick	Unimer U-1946
Incorporation	At the end	At any time in the oil phase or after emulsification	At any time in the oil phase or after emulsification
Temperature	Temperature < 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		

→ U-1946 possesses outstanding formulation properties

Unimer U-1946
In mascara

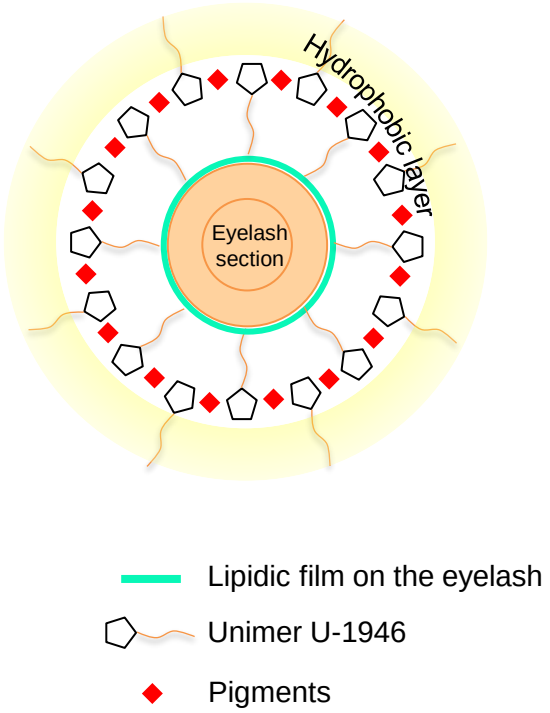
Action of Unimer U-1946

In a mascara, Unimer U-1946:

1. provides a sheathing effect

2. improves the pigments spreadability around the eyelashes

3. Volumizing effect, water resistance and long-lasting result



Benefits of Unimer U-1946

Clinical Protocol:

- Double-blind test on 20 women
- During one week
- A mascara with 5% of Unimer U-1946 on one eye
- A mascara with 13.3% of a benchmark polymer on the other eye

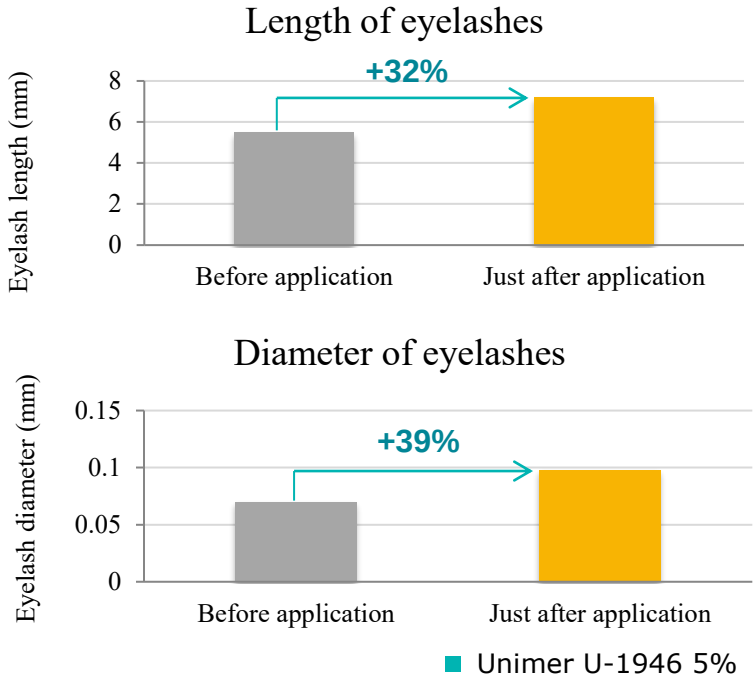
Results:

measured after one single application:

+ 32% eyelashes length

+ 39% eyelashes diameter

+163% eyelashes volume in a minute



Visible volumizing effect

Before application | Just after application

Benefits of Unimer U-1946

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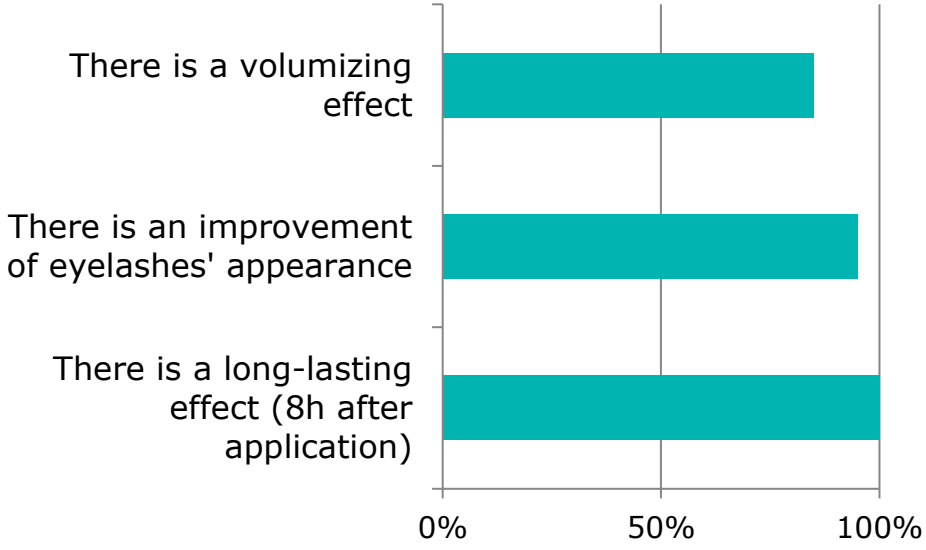
Trained assessors' evaluation after a single application



Results:

Obtained after picture analysis:

Properties confirmed by assessors

Long lasting effect: 8h

Benefits of Unimer U-1946

Clinical Protocol:

- Double-blind test on 20 women
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- A mascara with 5% of Unimer U-1946 on one eye
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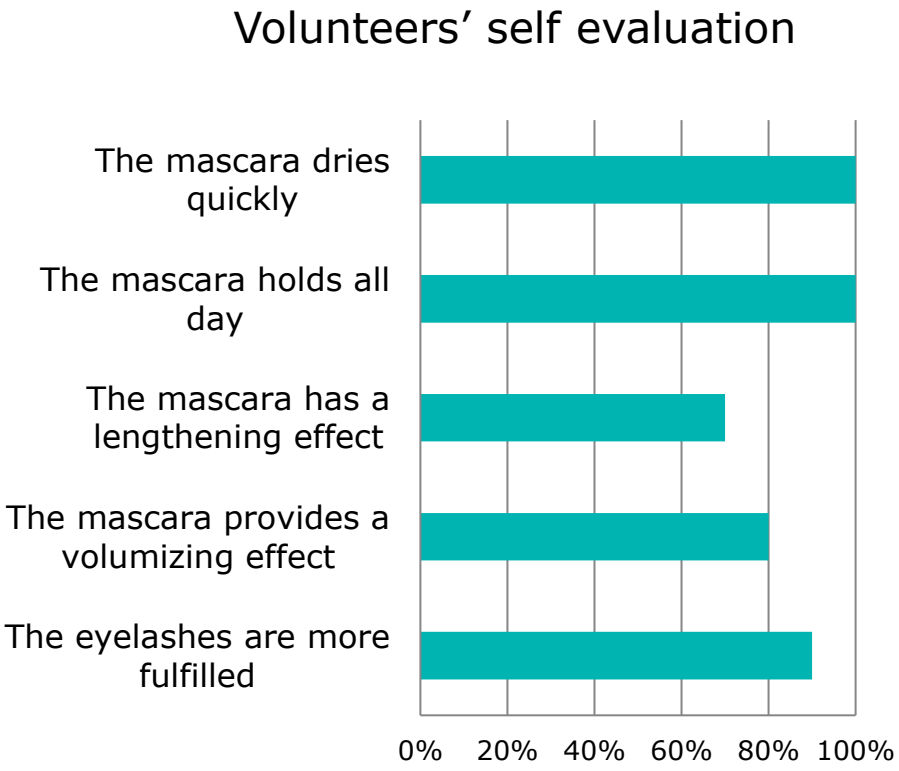
Results:

Based on questionnaire's answers after one week of use

Women confirmed the benefits

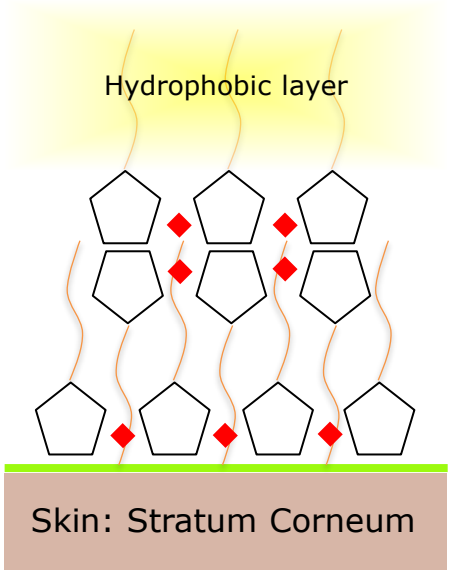


Unimer U-1946
In Foundation and suncare

Action of Unimer U-1946

On skin surface, Unimer U-1946:

1. Rearranges itself
2. ''Captures'' pigments/sun filters
3. Improves their spreading
4. Increases wash-off resistance



Long-lasting performance

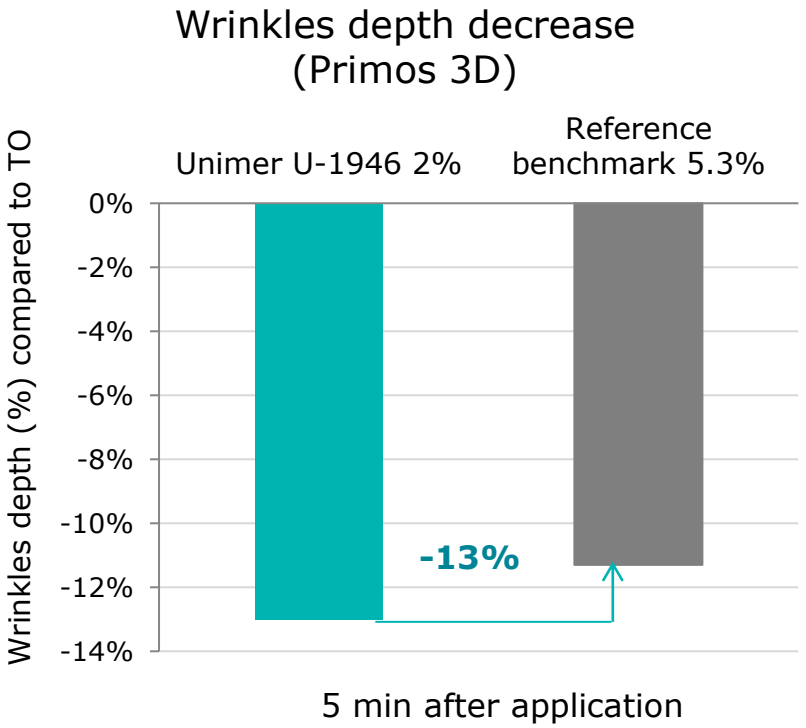
Benefits of Unimer U-1946 in a foundation

Clinical Protocol:

- Double-blind test on 20 women
- During one week
- A foundation with 2% of Unimer U-1946 on one side of the face
- A foundation with 5.3% of a benchmark polymer on the other side of the face

Results after 1 application:

Wrinkles decreased **by -13% 5 minutes after application** for the foundation containing Unimer U-1946



Benefits of Unimer U-1946 in a foundation

Clinical Protocol:

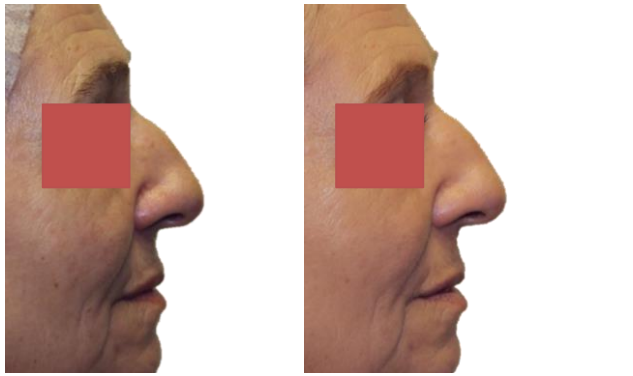
- Double-blind test on 20 women
- During one week
- A foundation with 2% of Unimer U-1946 on one side of the face
- A foundation with 5.3% of a benchmark polymer on the other side of the face

Results after 1 application:

Based on picture analysis

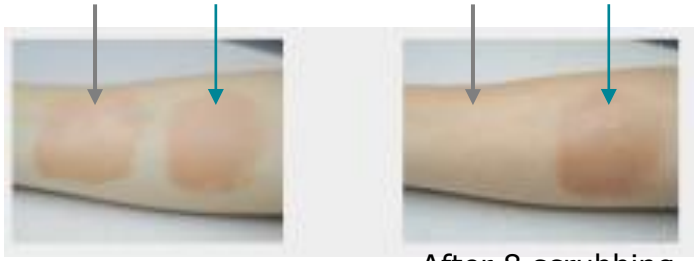
Outstanding soft-focus effect and wash-off resistance.

Skin tone uniformity effect (soft focus)



Before application | 5min after application

Wash-off resistance



After application | After 8 scrubbing movements under water

Benchmark reference

Unimer U-1946

Benefits of Unimer U-1946 in a foundation

Clinical Protocol:

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- During one week
- A foundation with 2% of Unimer U-1946 on one side of the face
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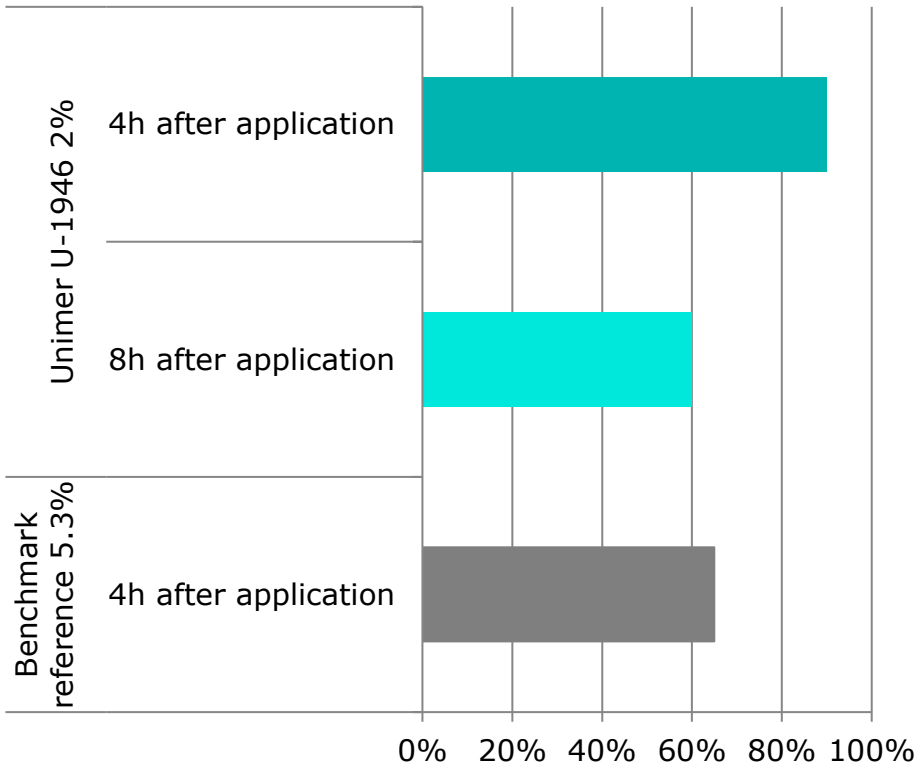
Results after 1 application:

Based on picture analysis

Long lasting effect (8h): same results than 4h after application with benchmark reference.

Trained assessors' evaluation:
long-lasting effect



Benefits of Unimer U-1946 in a foundation

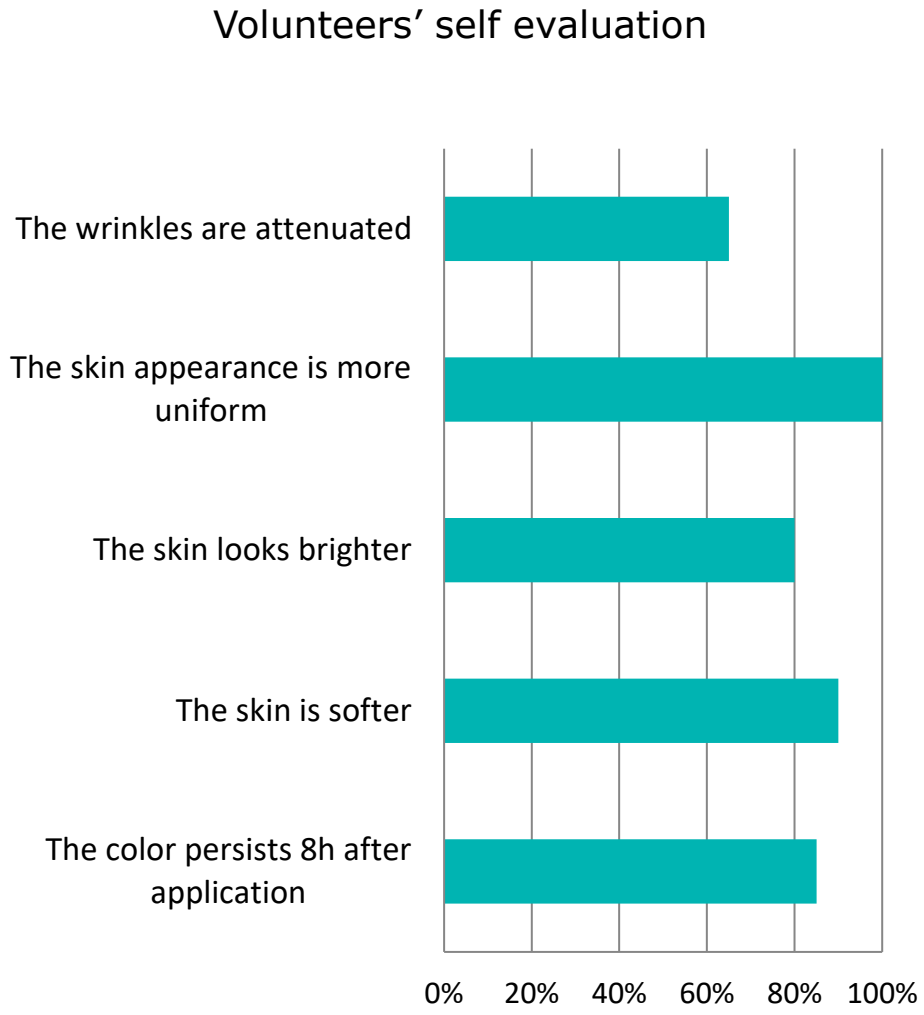
Clinical Protocol:

- Double-blind test on 20 women
- During one week
- A foundation with 2% of Unimer U-1946 on one side of the face
- A foundation with 5.3% of a benchmark polymer on the other side of the face

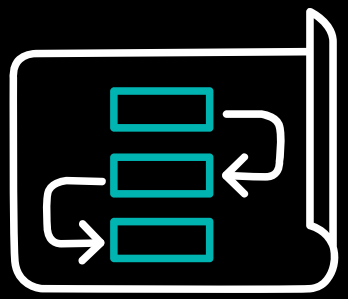
Results after 1 week of use:

Based based on questionnaire's answers

Long lasting effect (8h): has been confirmed by the consumers.



Formulas with Unimer U-1946 Foundation & Suncare



Uniformity, long lasting foundation

Process:

- Add phase 2 to phase 1 and stir until the phase is homogeneous.
- Add phase 4 to phase 3.
- Add phase 3+4 in phase 1+2.
- Heat this mix up to 75°C.
- Heat phase 5 up to 75°C.
- Add phase 5 to phase 1+2+3+4.
- Adjust the pH with phase 6.
- Add phase 7.

Phase	Ingredient / INCI	%
Phase 1: aqueous phase for pigment dispersion		
	Aqua / Water	10.00
	Magnesium Aluminum Silicate	0.60
Phase 2: pigmented phase		
	Titanium Dioxide / CI 77891	6.95
	CI 77492	0.90
	CI 77491	0.30
	CI 77499	0.10
Phase 3: main aqueous phase		
	Aqua / Water	57.47
	Disodium EDTA	0.10
	Glycerin	2.00
	Methylpropanediol	4.00
	Sodium Cetearyl Sulfate	0.20
Phase 4: gel phase		
	Xanthan Gum	0.05
Phase 5: oily phase		
	Arachidyl Aclohol, Behenyl Alcohol, Arachidyl Glucoside	2.00
	Cetyl Palmitate	0.50
	Cetearyl Alcohol	0.15
	Neopentyl Glycol Diheptanoate	3.00
	Dimethicone	1.50
	Polyglyceryl-3 Diisostearate	1.00
	C18-21 Alkane	4.00
	C13-15 Alkane	2.00
	VP/Hexadecene Copolymer, Octyldodecanol	**2.00**
Phase 6: phase for pH control		
	Aqua / Water	0.162
	Sodium Hydroxide	0.018
Phase 7: phase with preservative		
	Aqua / Water, Benzyl Alcohol, Dehydroacetic Acid	1.00
		100

Sunergy, Water-resistant suncare lotion

Process:

- Heat phase 1 up to 85°C.
- Add phase 2 to phase 1.
- Heat phase 3 up to 85°C.
- Add phase 4 to phase 3.
- Add phase 3+4 to phase 1+2.
- Cool down and add phase 5.
- Add phase 6.
- Add phase 7.

Phase	Ingredient / INCI	%
Phase 1: oily phase		
	Cetearyl Alcohol	1.80
	Tocopheryl Acetate	0.50
	Dicaprylyl Carbonate	3.00
	C12-15 Alkyl Benzoate	3.00
	C10-18 Glycerides / Hydrogenated Palm Kernel Glycerides, Hydrogenated Palm Glycerides	1.00
	UNIMER U-1946 VP/Hexadecene Copolymer, Octyldodecanol	**1.50**
	Inulin Lauryl Carbamate	0.80
	Potassium Cetyl Phosphate	2.50
Phase 2: phase with sunscreens		
	Homosalate	10.00
	Butyl Methoxydibenzoylmethane / Avobenzone	1.00
	Octocrylene	4.00
	Ethylhexyl Salicylate / Octisalate	4.50
	Polysilicone-15	0.99
	Benzophenone-3 / Oxybenzone	6.00
	Butyl Methoxydibenzoylmethane / Avobenzone, Ethylhexyl Salicylate / Octisalate, Polymethyl Methacrylate	6.00
Phase 3: aqueous phase		
	Aqua / Water	44.36
	Disodium EDTA	0.10
	Butylene Glycol	3.00
Phase 4: gel phase		
	Xanthan Gum	0.60
Phase 5: phase with preservatives		
	Phenoxyethanol, Ethylhexylglycerin	1.00
	Aqua / Water, Methylisothiazolinone, Ethylhexylglycerin	0.05
Phase 6: phase with perfume		
	Parfum	0.30
Phase 7: phase with active ingredients		
	D-PANTHENYLTRIACETATE	**1.00**
	UNIPROTECT PT-3	**1.00**
	UNISOOTH ST-32	**1.00**
	UNIREPAIR T-43	**1.00**
		100

Unimer U-1946
For lipgloss

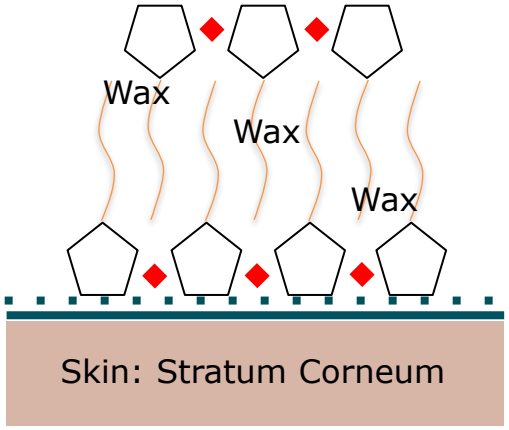
Action of Unimer U-1946

In a lipgloss / lipstick, Unimer U-1946:

1. helps the pigments to disperse

2. maintains the natural moisture of lips

3. stabilizes pigments



Long wear time

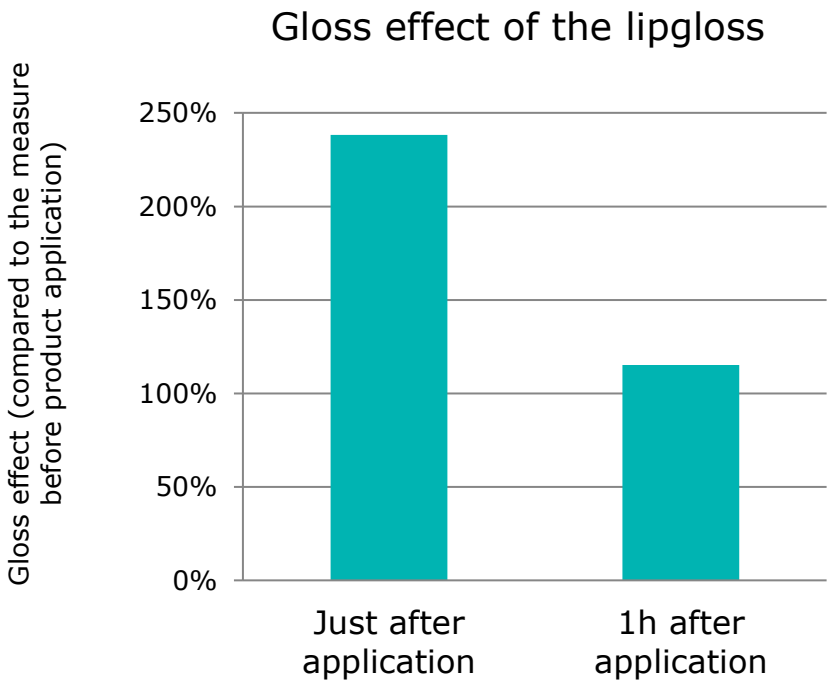
Same color on lips as seen in the formula

Unchanged color upon time

Benefits of Unimer U-1946 in a lipgloss

Clinical Protocol:

- Double-blind test on 20 women
- During two weeks
- A lipgloss with 5% of Unimer U-1946 during one week
- A lipgloss with 4% of a benchmark polymer during one week



Results:

Based on picture analysis

+239% of the gloss effect just after application and +115% after 1h

1h after application

Benefits of Unimer U-1946 in a lipgloss

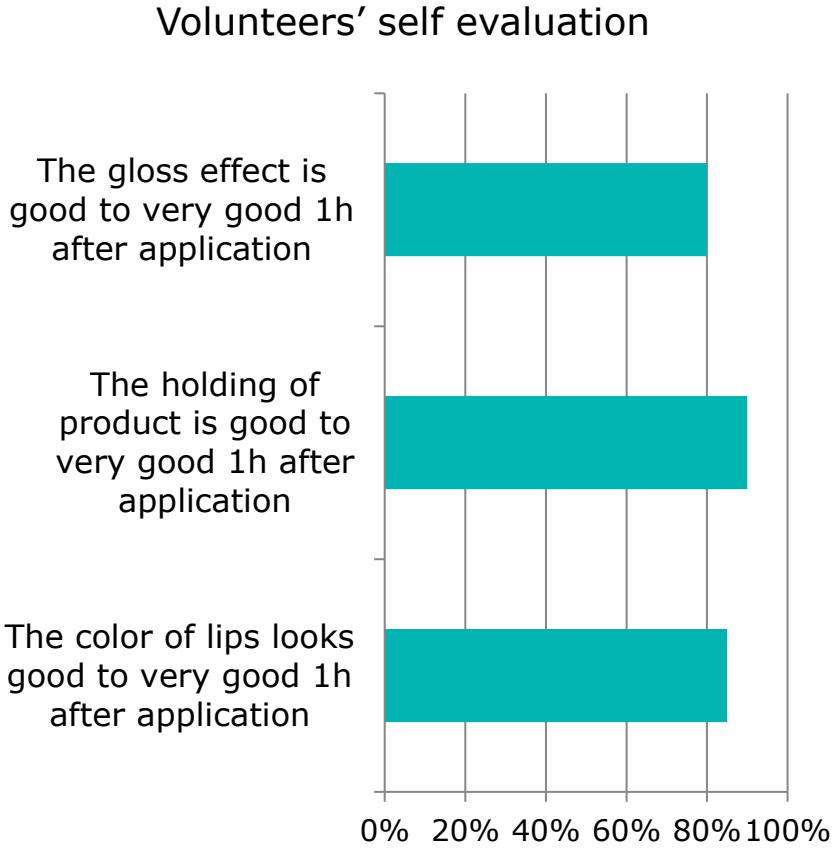
Clinical Protocol:

- Double-blind test on 20 women
- During 2 weeks
- A lipgloss with 5% of Unimer U-1946 during one week
- A lipgloss with 4% of a benchmark polymer during one week

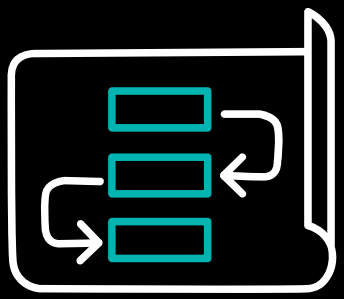
Results after 1 week of use:

Based on questionnaire's answers

Very good holding and gloss effect



Formulas with Unimer U-1946 Lipgloss



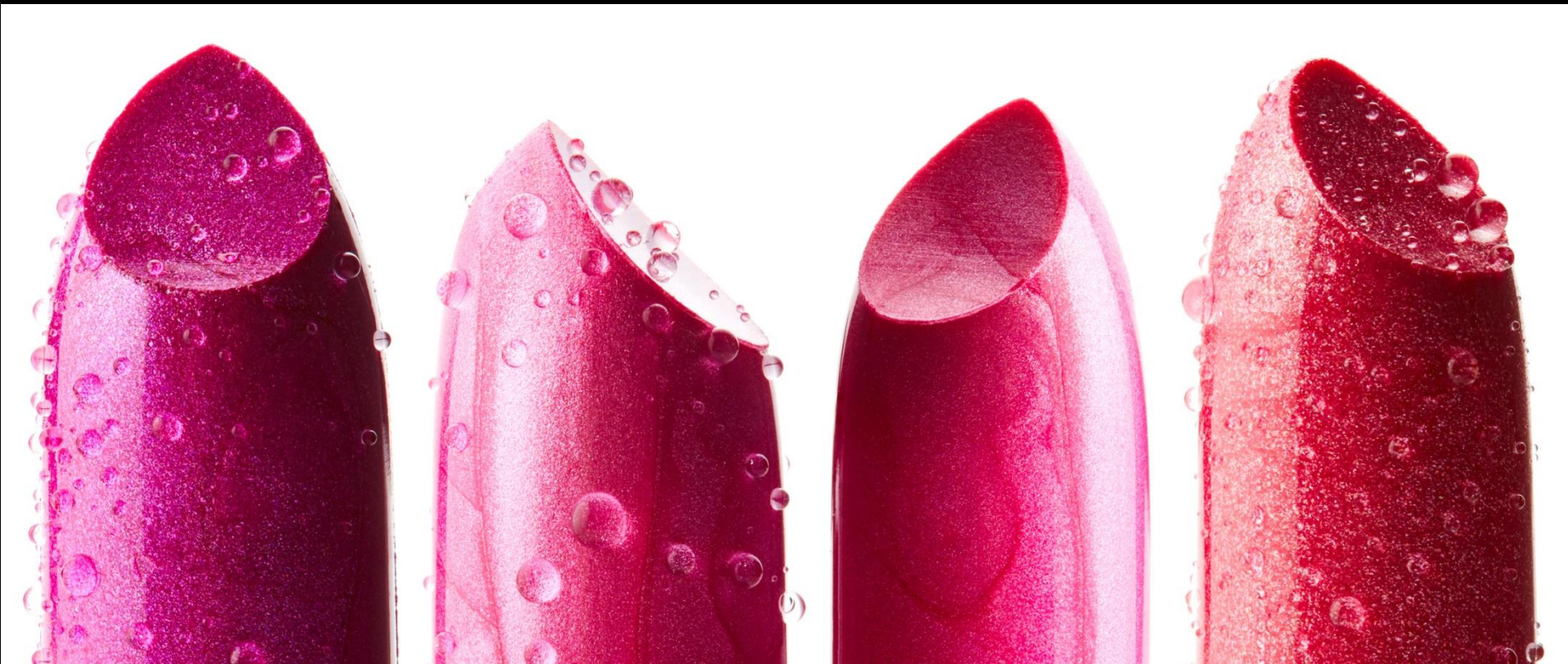
Liplocked, Everlasting gloss

Process:

- Heat phase 1 up to 85°C. Then cool it down.
- At 65°C add phases 2 and 3.
- Mix for 5 minutes.
- Add phase 4.
- Cool down.

Phase	Ingredient / INCI	%
Phase 1: Oily phase		
	Diisostearyl Malate	33.90
	Polyisobutene	34.10
	Octyldodecanol	6.50
	Caprylyl Caprylate / Caprate	2.40
	Glyceryl Behenate	2.50
	VP/Hexadecene Copolymer, Octyldodecanol	**5.00**
	Helianthus Annuus (Sunflower) Seed Wax, Tocopherol, Ascorbyl Palmitate	2.50
	Beeswax	5.00
	Hydrogenated Polyisobutene	2.00
	Propylparaben	0.10
Phase 2: phase with antioxidant		
	Tocopherol	0.50
Phase 3: perfumed phase		
	Vanillin	0.30
Phase 4: colored phase		
	Calcium Sodium Borosilicate, Titanium Dioxide	1.00
	Mica, Titanium Dioxide	4.00
	CI 15850 / Red 6 Lake	0.20
		100

Unimer U-1946
For lipsticks



Improves pigments dispersion
Evaluation of 3 typical pigments for lipsticks

Evaluation of 3 typical pigments for lipsticks:

2 pigments known to create agglomerates and particles:

- Titanium dioxide (Anatase)
- D&C Red 7 Ca Lake

1 softer and easier to disperse pigment:

- Yellow iron oxide

Preparation of a premix:

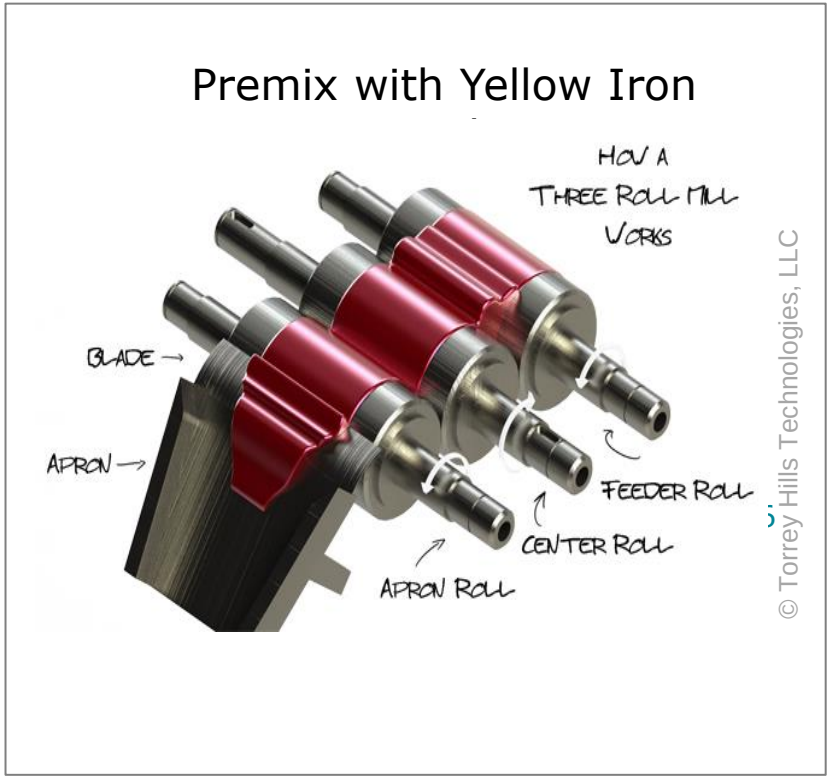
with or without 2,5% Unimer U-1946
with castor oil

Premix without Unimer:

processed 2 times in the 3-rolls mill

Premix with Unimer U-1946:

processed only once in the 3-rolls mill



Improves pigments dispersion and wettability
Evaluation of 3 typical pigments for lipsticks

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processed 2 times in the 3-rolls mill

Premix with Unimer U-1946:

processed only once in the 3-rolls mill

Premix with TiO_2

Without Unimer U-1946

(viscous-pasty)

With Unimer U-1946

(fluid-flowing)

Improves pigments dispersion and wettability
Evaluation of 3 typical pigments for lipsticks

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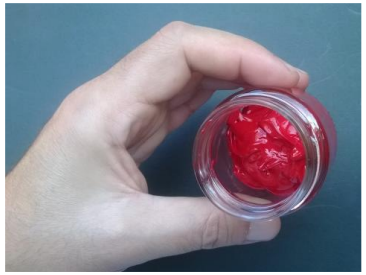
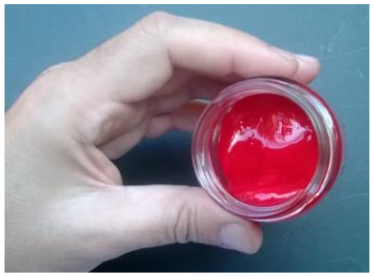
processed only once in the 3-rolls mill

Premix with Red 7 Ca Lake



Without Unimer U-1946

(viscous-pasty)



With Unimer U-1946

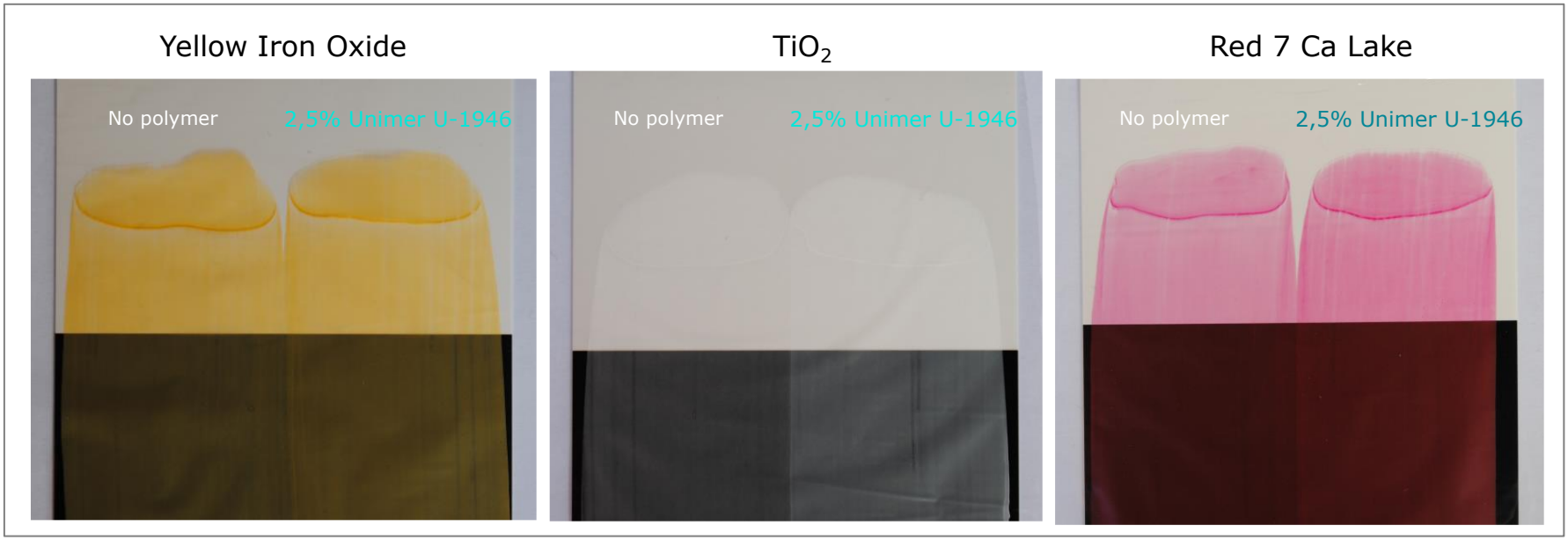
(fluid-flowing)

Unimer U-1946 promotes a better wettability of the pigments, which results is a better and homogeneous pigments dispersion into the oil.

Unimer U-1946 increases color yield (intensity)

Drawdown test

Each sample has been spread on black and white cards with uniform thickness to evaluate the masstone of the pigments dispersion an the transparency.



Unimer U-1946 helps to get a better colour rendering:

The shade of the final product will be deeper and more brilliant, coverage of the texture will be more even.

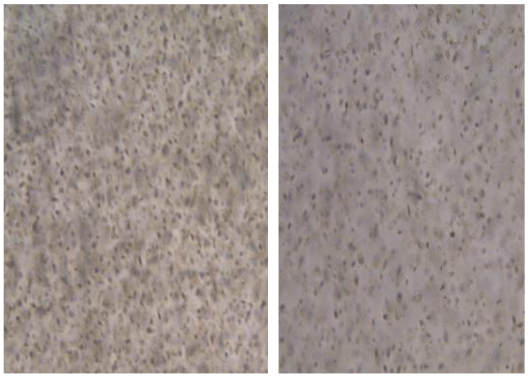
Unimer U-1946 improves texture

Microscope evaluation

Each sample has been analyzed using a 1000x magnification under a microscope.

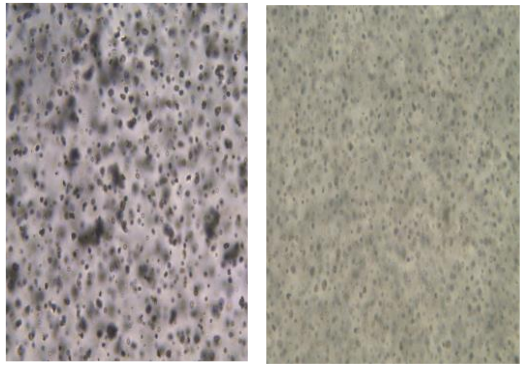
Yellow Iron Oxide

No polymer | 2,5% Unimer U-1946



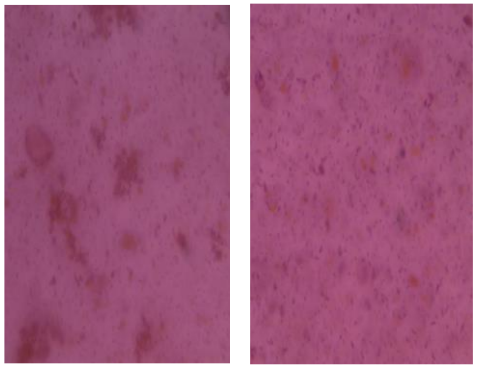
TiO_2

No polymer | 2,5% Unimer U-1946



Red 7 Ca Lake

No polymer | 2,5% Unimer U-1946



Unimer U-1946 helps perfectly disperse pigments in the texture:

Better dispersion after one pass in the 3-rolls mill than after 2 passes without the polymer

The manufacturing of the finished product: shorter process time with cost and energy saving.

Formulation of a lipstick

Procedure

- Melt Phase I at 95-97°C and stir until waxes are fully melted and the phase is clear
- Decrease the temperature at 83-84°C and add Phase
- II. Stir until the bulk is homogeneous
- Wet Phase III with a correct part of Phase I+II, pass it twice at the three roll mill then add to the rest of Phase I+II
- Mix until the pigments are homogeneously dispersed
- Pour in a mold, cool and stick

PHASE		%
I		30,00
		18,00
		6,50
		9,00
		2,50
II		12,30
		8,50
	nol	5,00
		0,10
III	ene	0,10
		6,30
		0,40
		1,30

The lipstick containing Unimer U-1946 creates a more uniform film on the lips, has a better lasting during the time and more shine.

Technical information

INCI	VP/Hexadecene Copolymer, Octyldodecanol
Origin	
Preservation	Preservative free
Appearance	Clear, colorless to yellowish viscous liquid
Solubility	Soluble in oil
Dosage	2% to 8%
Processing	Mascara: 5% - 8% Foundation: 2% - 5% Sunscreen: 2% - 5% Lipgloss: 5% - 8% Lipstick: 5% - 8%
Compliance	IECIC LISTED INCI CHINA IECIC LISTED CERTIFIED HALAL CERTIFIED SUITABLE VEGAN SUITABLE

A 360° polymer!

Unimer U-1946 is a unique polymer for color cosmetics

PERFORMANCES

- It improves pigments dispersion
- It provides a long lasting effect
- It delivers a water resistance effect
- It gives better results than competitors' polymers
- It is easy to formulate, odorless, tasteless

COST RATIONALIZATION

- It can be used at lower concentration than other polymers
- It enables to rationalize your portfolio of polymers for your:
  - Mascara
  - Lipgloss
  - Lipsticks
  - Foundation
- It reduces the manufacturing times and energy (cost saving!)

New data

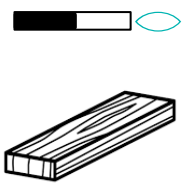
Unimer U-1946
To prevent pollution

Benzopyrene and skin penetration
Unimer U-1946

New data

Benzopyrene is an organic compound, which can generate pyrene and phenylene groups.

It can be found in:

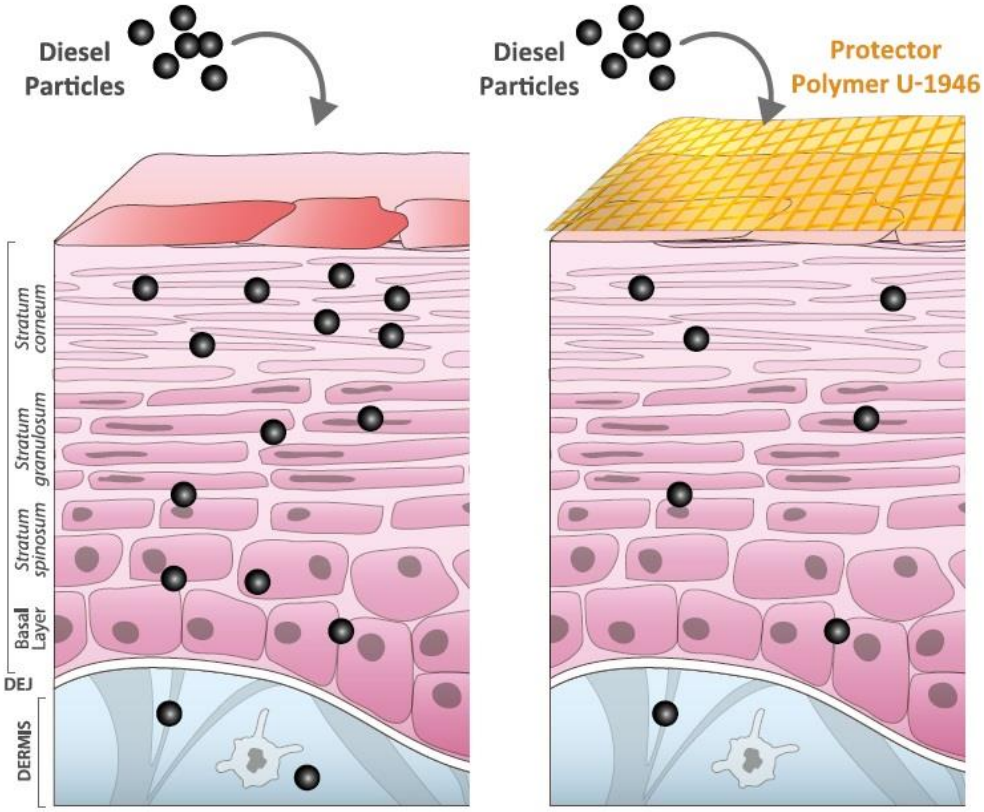


Cigarette

Wood

Coal tar

As many other other pollutants, it disrupts the skin barrier function and promotes skin barrier defaults.



Exclusive polymer
Unimer U-1946

Unimer U-1946 at 3% enables a reduction of the Benzopyrene penetration with a significant decrease of:

-42%

In both the Stratum corneum and the epidermis/dermis layer

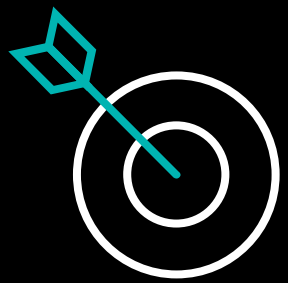
Protection against external pollution

Consumers benefits

Applications:

- Long-lasting daily protection
- Sports range to fight against pollution with water & sweat resistance
- Make-up for city life
- Antipollution sunscreen
- Lipstick protect

Which Unimer
For
Which application ?



Select the right Unimer for your applications

	Unimer U-6	Unimer U-15	Unimer U-151	Unimer U-1946
1) Pigment spreading	++	++	++	+++
2) Film forming	++	++	++	+++
3) Wash-off resistance	+	++	+++	++++
4) Volumizing effect		++		+++
5) Glossy effect	+	+	+	++
6) Viscosity (effect increase on final product)	++++	+++	+	++
7) Lipstick		(+)	(+)	++++
8) Sunscreen SPF boosting	+	No studies	No studies	No studies
9) Mascara	No studies	++	No studies	++++
10) Foundation				++++

Recommanded Application

Thank you

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