

UNIMER U-151

FILM-FORMING POLYMER FOR COSMETICS

UNIMER U-151

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1. Characteristics

Composition	Unimer U-151 is an alkylated vinylpyrrolidone copolymer
Appearance	Colorless to yellowish clear viscous liquid
Analytical data	See specifications.
Solubility	Easily soluble in cosmetic lipids such as mineral oil, ester oils or triglycerides. Insoluble in ethanol and water.
Properties	Unimer U-151 shows exceptional pigment dispersing properties as well as ideal film-forming characteristics. Unimer U-151 is not sticky. Unimer U-151 is an emollient with skin protecting properties. Unimer U-151 is non-toxic and not skin irritating.
Use	Unimer U-151 is an excellent pigment dispersant and film-forming agent and therefore mainly used in formulations for color cosmetics, e.g. eyeliners, mascaras, eye shadows and lipsticks. Unimer U-151 stabilizes the pigment dispersion and gives gloss and shine to the colors. Unimer U-151 is a versatile additive also for all types of face care and body care products. Unimer U-151 containing products form moisture balancing water-resistance films on the skin, which is of great value in protective creams and lotions. They are not sticky and have no occlusive effects.
Dosage	2-5 %
Storage	5°C - 25°C (see safety data sheet)
Shelf life	5 years (see specification)

Identification

INCI Monograph ID	INCI Name	Chinese Name	CAS No.
2649	VP/Hexadecene Copolymer	VP/十六碳烯共聚物	32440-50-9

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2. Unimer for water-resistant products

Influencing the water-resistance of sun-protection formula with Unifilter B-42 by means of various Unimer types

2.1 Introduction

Film-forming substances such as, for example, various types of Unimers by Induchem AG, are known to be capable of enhancing the water-resisting properties of sun-protection formulae with UV-absorbing filter substances. In order to be able to quantify these effects which are of special importance for the long-term effectiveness of sun-protection preparations, we commissioned an in vivo study of the water-resistance (wash-off resistance) of sun-protection preparations containing Unifilter B-42 and various fractions of a number of different types of Unimers.

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2.2 Materials and methods

To determine the influence of Unimer U-6, Unimer U-15 and Unimer U-151 (1) on water-resistance, sun-protection preparations were made up as indicated in the following table. The various formulations differed only in content and type of the various Unimers (varying from 0 to 6% merely at the expense of the water-content in each case). A 10% Unifilter B-42 (2) was used as UV-filter in all formulations.

Designation	INCI	L45872-1	L46033-2	L46033-3	L46033-4	L46033-5	L46033-6
Water	Aqua	61.6%	63.1%	61.6%	61.6%	64.6%	58.6%
Unicide U-13	Imidazolidinyl Urea	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Sepigel 305	Polyacrylamide C13-14 Isoparaffin Laureth-7	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Crodamol AB	C12-15 Alkyl Benzoate	20.0%	20.0%	20.0%	20.0%	20.0%	20.0%
Tegocare PS	Methyl Glucose Sesquistearate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Lipocol S-20	Steareth-20	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Uniphen P-23	Phenoxyethanol Methylparaben Butylparaben Ethylparaben Propylparaben	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
Silikonöl DC200-100	Dimethicone	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Unifilter B-42	Ethylhexyl Methoxycinnamate Ethylhexyl Triazone 4-Methylbenzylidene Camphor Glycereth-26	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Unimer U-6	Triacotanyl PVP	3.0%	1.5%				6.0%
Unimer U-15	VP / Eicosene Copolymer			3.0%			
Unimer U-151	VP / Hexadecene Copolymer				3.0%		
Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 1: The influence of Unimer U-6, Unimer U-15 and Unimer U-151 (1) on water-resistance

The water-resistance was determined by an external lab with 4 test samples each (3).

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2.3 Results

The results obtained can be seen from the following figure and table:

Formulation	Unimer U-6	Unimer U-15	Unimer U-151	Wash-Off Resistance (in vivo)
L-46033-5 (Placebo)				52.3 %
L-46033-2	1.5 %			70.8 %
L-45872-1	3.0 %			84.6 %
L-46033-6	6.0 %			77.8 %
L-46033-3		3.0 %		88.3 %
L-46033-4			3.0 %	79.3 %

Table 2: Results

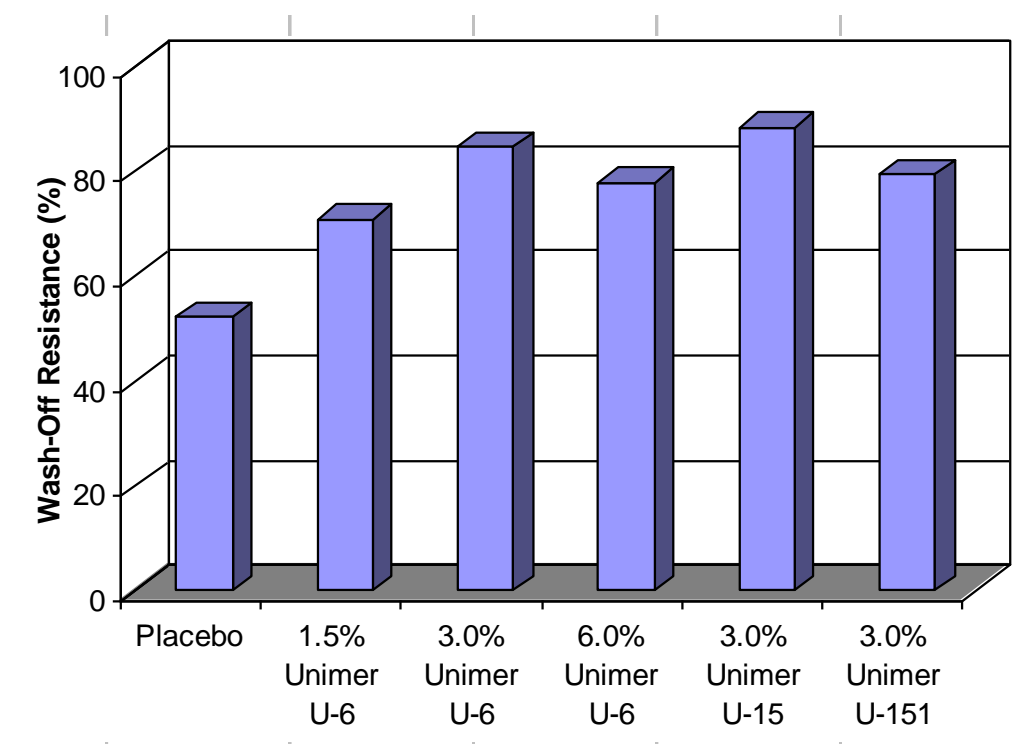


Figure 1: Results

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2.4 Conclusions

The investigations showed that by adding Unimers to sun-protection formulae, a considerable enhancement of water-resistance can be achieved. Whereas with a placebo formulation devoid of Unimer, a water-resistance of around 50% can be achieved, by adding 3% Unimer an improvement of some 80% was noted. The difference between the various types of Unimer resides in the area of precision of measurement. The addition of 3% Unimer seems, for the tested formulations at least, to be the optimum concentration.

2.5 References

1. Induchem AG: Unimer U-6, Unimer U-15, Unimer U-151 sales documentation.
2. Induchem AG: Sales documentation Unifilter B-42.
3. Schwarzenbach, R. *et al.* Determination of Wash-Off Resistance of UV-Filters *Cosmetics and Toiletries Manufacture Worldwide* 193-195 (1996).

Our indications and recommendations have been worked out to the best of our knowledge and conscience, but without any obligation from our part. In particular, we do not take any responsibility concerning protection rights of a third party.