

UNIMER U-15

FILM-FORMING POLYMER FOR COSMETICS

UNIMER U-15

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1. Characteristics

Composition	Unimer U-15 is an alkylated vinylpyrrolidone copolymer.
Appearance	White to yellowish waxy solid Melting range 32 - 36°C
Analytical data	See specifications.
Solubility	Soluble in cosmetic lipids such as mineral oil, ester oils or triglycerides Insoluble in ethanol and water
Properties	Unimer U-15 shows excellent pigment dispersing properties as well as ideal film-forming characteristics. Unimer U-15 is not sticky. Unimer U-15 is an emollient with skin protecting properties. Unimer U-15 is non toxic and not skin irritating.
Use	Because of the film-forming and water-repellent properties, the favored application of Unimer U-15 is for sun care products. Even in a low concentration, the addition of Unimer U-15 gives a significant increase of the sunburn protection factor (SPF) and the wash-off resistance of the formulation. Furthermore Unimer U-15 is an excellent pigment dispersant and film-forming agent and therefore a useful ingredient for color cosmetics, e.g. eyeliners, mascaras, eye shadows and lipsticks. Unimer U-15 is a versatile additive also for all types of face care and body care products. Unimer U-15 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	4 - 10%, for special applications up to 30%
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.
2647	VP/Eicosene Copolymer	VP/二十碳烯共聚物	28211-18-9

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2. Unimer for wash-off resistant products

Influencing the wash-off 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 formulation 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.

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%

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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	Triaccontanyl 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).

2.3 Results

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

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

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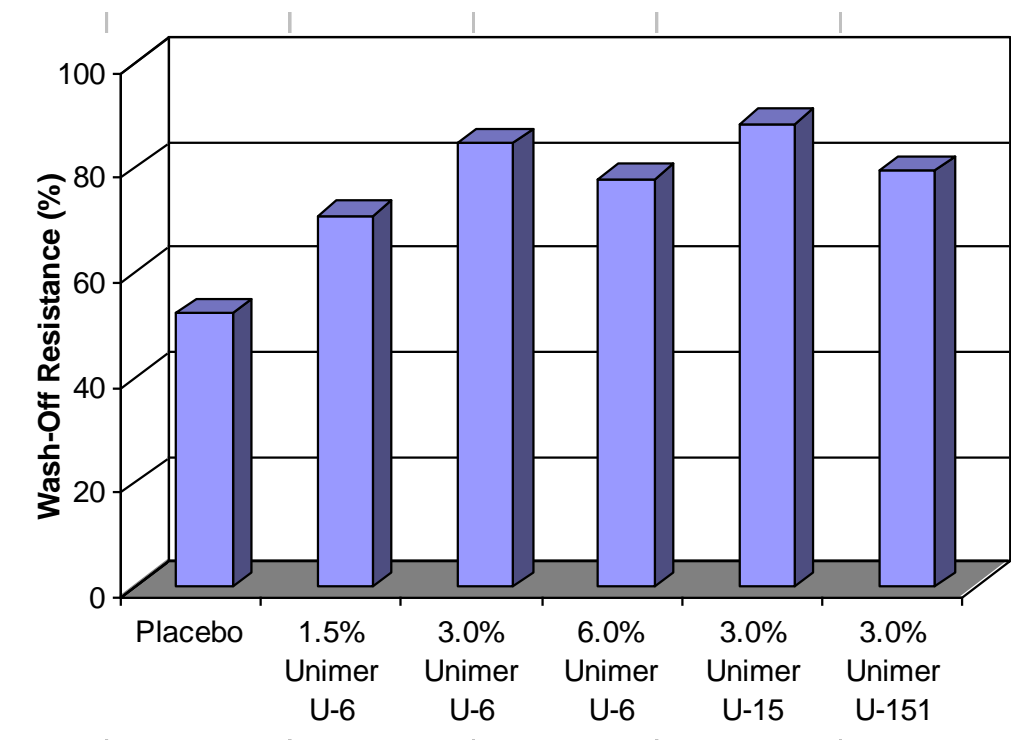


Figure 1: Results

2.4 Conclusions

The investigations showed that by adding Unimers to sun-protection formulation, 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.