Beauty Care

Beauty comes in many shades. Our care protects them all.

Uvinul® A Plus

The UVA filter with highest free radical protection for

- effective anti-aging
- excellent sun protection
- safer self-tanning

BeautyCare Ingredients

BASF
The Chemical Company

Uvinul® A Plus for Outstanding Protection

Nowadays, the need for appropriate UV skin protection is widely recognized and understood. Many skin care products already contain UVB filters which protect mainly against sunburn. UVA light makes up 90 % of solar radiation and penetrates deep into the layers of the dermis where it is responsible for a number of detrimental long-term effects. Although it is well-known, there is still a lack of adequate, reliable and long-lasting UVA protection to be found particularly in daily care, self-tanning and color cosmetic products.

UVA radiation represents a constant threat, but the damage it causes is not noticed immediately:

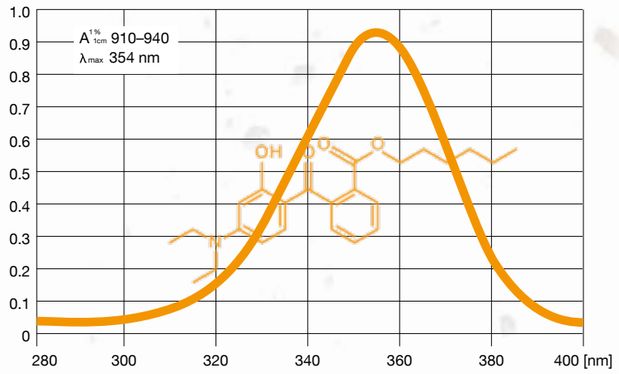
- Increased degradation of skin matrix proteins (elastin and collagen)
- Loss of skin elasticity
- Loss of skin moisture
- Increase of pigment disorders

The result: premature skin aging (photoaging).

Uvinul® A Plus provides all you need for outstanding UVA protection:

- High long-wave UVA absorption against deeply penetrating UV rays
- Strongest prevention against premature skin aging and skin damage
- Efficient protection against radical boost during self-tanning
- Effective SPF boosting – for high-performance products
- Reliable photostability – for long-lasting performance

ABSORBTION SPECTRA OF UVINUL® A PLUS

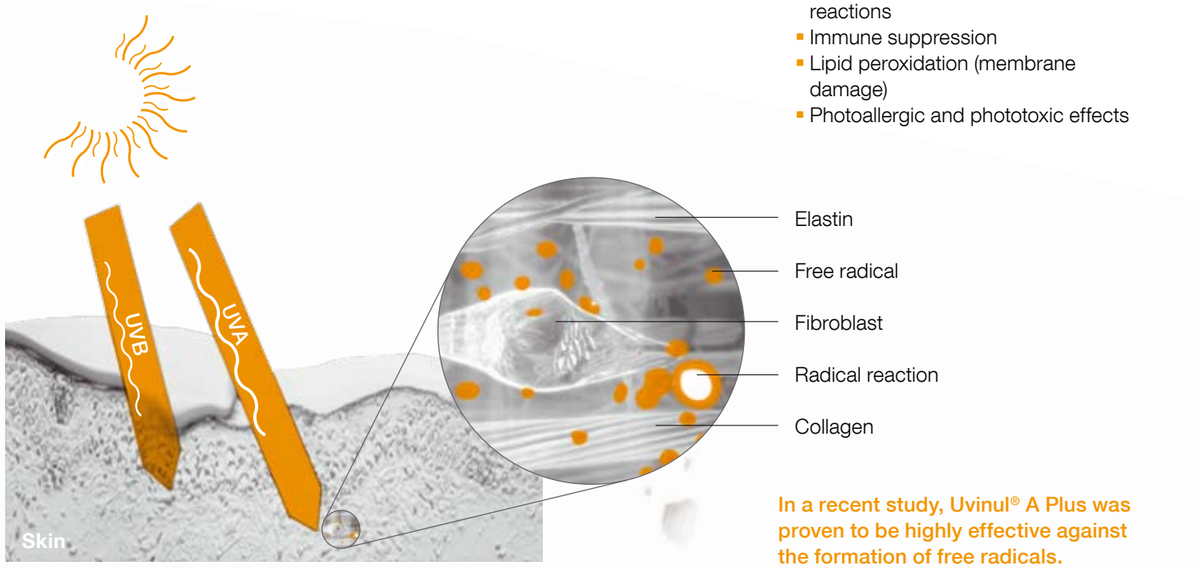


The Importance of High-performance, Long-lasting UVA Protection

UVA-induced skin damage becomes evident only after years of repeated exposure to even low UVA doses. The most commonly known effect of cumulative UVA exposure, even at low doses, is premature skin aging or “photoaging”. UVA radiation upregulates the formation of matrix metalloproteinases (MMPs), enzymes that degrade the matrix proteins elastin and collagen. After a number of years, this results in noticeably reduced skin elasticity and increased wrinkle depth.

UVA-induced skin damage, however, is not only a question of cosmetic beauty but also a serious hazard to human health:

- Nuclear and mitochondrial DNA damage
- Gene mutations and skin cancer
- Dysregulation of enzymatic chain reactions
- Immune suppression
- Lipid peroxidation (membrane damage)
- Photoallergic and phototoxic effects



In a recent study, Uvinul® A Plus was proven to be highly effective against the formation of free radicals.

UVA radiation causes damage indirectly via the generation of aggressive free radicals and oxygen species, the “Reactive Oxygen Species” (ROS, e. g. singlet oxygen and hydroxyl radical OH•). These highly reactive species readily attack biomolecules in their immediate environment, inside and outside the cells, initiating a large number of adverse reactions.

Free radicals are the most important source of UV-induced skin damage. 90 % of free radicals generated in skin by UV light in the dermis and epidermis are induced by UVA radiation.

Powerful Action Against Free Radicals

The most suitable method for detecting components with unpaired electrons – free radicals – is quantitative ESR (Electron Spin Resonance) Spectroscopy.

With this methodology it is possible to determine the protective performance of a topically applied cosmetic preparation against UV-induced free radicals. The performance can be expressed either as the Radical Skin/Sun Protection Factor (RSF) [1], comparing the number of free radicals generated in protected and unprotected (pig) skin biopsies after a defined dose of solar simulated UV light, or as the so-called Integrated Sun Protection Factor (ISPF) [2,3], the latter comparing the energy needed to induce a defined number of free radicals in protected and unprotected (human) skin biopsies.

Although both protection factors (RSF and ISPF) have their own specific approach and test protocol, the results have been proved to be qualitatively comparable.

BASF has investigated the protective effect of different UV filters in the same o/w formulation against the formation of free radicals in skin biopsies using both methodologies [4–7].

$$\text{RSF} = \frac{\text{N (free radicals) unprotected}}{\text{N (free radicals) protected}}$$

$$\text{ISPF} = \frac{E_p \text{ [UV dose] supplied to protected skin}}{E_{np} \text{ [UV dose] supplied to unprotected skin}}$$

FIGURE 1: COMPARISON OF THE PROTECTIVE EFFECT (RSF) OF DIFFERENT SUNSCREENS AGAINST THE FORMATION OF FREE RADICALS IN PIG SKIN BIOPSIES

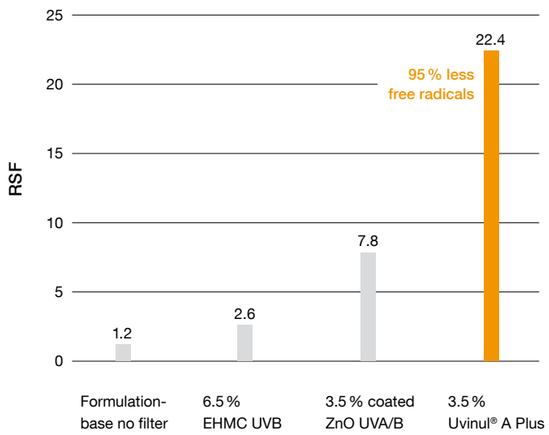
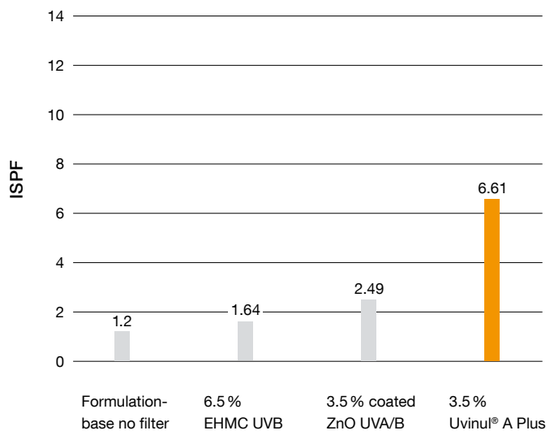


FIGURE 2: COMPARISON OF THE PROTECTIVE EFFECT (ISPF) OF DIFFERENT SUNSCREENS AGAINST THE FORMATION OF FREE RADICALS IN HUMAN SKIN BIOPSIES



In both approaches Uvinul® A Plus (DHHB) shows by far the best performance with highest RSF and ISPF values, respectively. EHMC provided only poor radical protection in both cases, whereas the low but broad absorbing zinc oxide achieved moderate radical prevention values.

The effect of a UV filter is defined by various parameters:

- absorption spectrum
- photostability
- final concentration in the formulation and on the skin
- homogeneous distribution on the skin's surface

Radical protection performance as a function of concentration

Figure 3 shows the increase in radical protection performance (RSF) of Uvinul® A Plus as a function of the concentration (0–10 %).

With Uvinul® A Plus it is easy to define the desired radical protection level by adapting the concentration within the formulation, which is allowed up to max. 10 %.

Photostability is crucial for reliable protection

In Figure 4 the RSF values of the two UVA-I filters Uvinul® A Plus (DHHB) and Butyl Dimethoxydibenzoylmethane (BMDBM), are compared at 5 % in a standard o/w formulation in the presence of a standard UVB filter platorm consisting of 5 % Octocrylene and 5 % Ethylhexyl Methoxycinnamate (EHMC).

It is evident that Uvinul® A Plus is able to prevent UV-induced generation of free radicals significantly better than BMDBM in the same formulation at the same concentration level.

FIGURE 3: PREVENTION OF RADICAL FORMATION – UVINUL® A PLUS ALLOWS FOR EASY CUSTOMIZATION OF DESIRED FREE RADICAL PREVENTION LEVEL

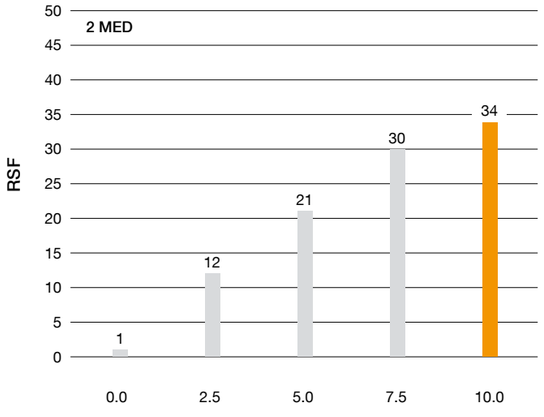
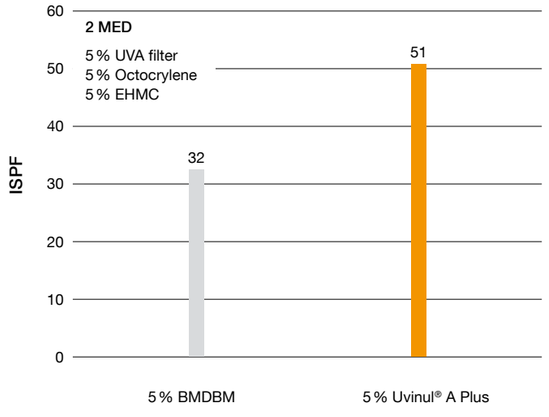


FIGURE 4: FREE RADICAL PROTECTION PERFORMANCE OF THE TWO UVA-I ABSORBERS AVAILABLE ON THE MARKET, TESTED IN A STANDARD O/W FORMULATION IN COMBINATION WITH STANDARD UVB FILTERS



Daily Care Requirements to Prevent Premature Skin Aging

Adequate and reliable skin protection requires a careful balance between erythema and radical protection, as well as good photostability to provide long-lasting protection.

The risk of overexposure to UVB radiation resulting in sunburn in everyday life is fairly low [8], whereas UVA radiation is nearly omnipresent and fairly constant through the year. So, protecting the skin from daily UVA exposure is even more important than excessively high SPFs.

Daily protection should provide at least the same protection level against free radicals (UVA radiation) as against erythema (UVB radiation) in order to efficiently prevent long-term skin damage resulting in photoaging.

Uvinul® A Plus has excellent anti-aging properties for modern daily skin protection thanks to its powerful absorption of the deeply penetrating long-wave UVA rays combined with its excellent photostability.

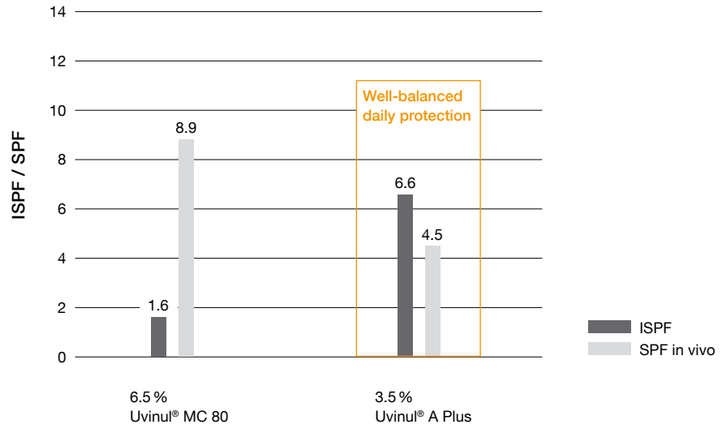
Adequate, well-balanced UV protection for daily skin care requirements can be provided by using 3.5 % Uvinul® A Plus alone (Figure 5, SPF 5 and ISPF 7) [4–7].

For higher protection levels Uvinul® A Plus should be combined with suitable photostable broad-band UV filters such as T-Lite SF, T-Lite SF-S and T-Lite MAX as well as Z-COTE MAX, and/or low amounts of the high-performance UVB filter Uvinul® T 150.

The MAX grades are especially recommended for polyacrylate-based formulations where high cosmetic elegance and superior sensorical properties are required.

Ethylhexyl Methoxycinnamate, which is frequently used as the only sunscreen in daily care formulations, does not represent a serious barrier to the formation of free radicals, although it is effective against sunburn.

FIGURE 5: COMPARISON OF RADICAL PROTECTION (ISPF) AND ERYTHEMA PROTECTION (SPF)



Protection against free radical boost during self-tanning

Consumers expect a “healthy tan” from self-tanning products. Recent studies have shown that the number of free radicals generated in skin increases dramatically if the skin is exposed to natural daylight shortly after the application of self-tanning products. The level of free radicals formed was three times higher in DHA-treated skin than in untreated skin. The addition of even small amounts of Uvinul® A Plus to a self-tanning product not only completely suppressed the free radical boost triggered by the self-tanning reaction, but also reduced the level of free radicals below that of the untreated skin.

The incorporation of the high-performance UV-A filter Uvinul® A Plus in self-tanning products therefore offers the best possible protection against skin damage resulting from free radicals.

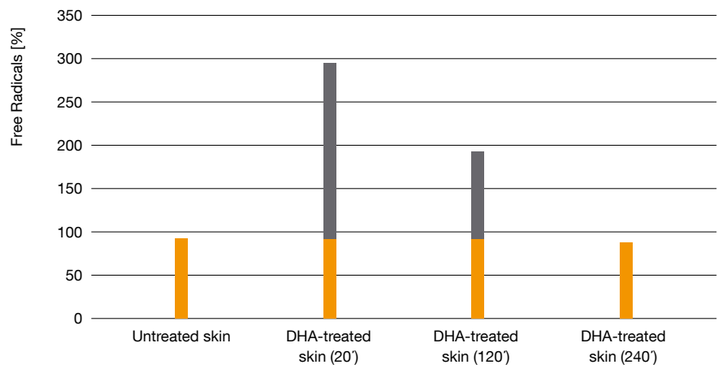
DHA treatment and subsequent UV exposure leads to a dramatic increase in the number of free radicals in the skin.

The risk of skin damage such as premature skin aging increases.

20 minutes after DHA application, the level of UV-induced free radicals in the skin is three times higher than in the untreated skin. After two hours, the level is still twice as high.

Four hours after DHA application, the boosting effect is no longer detectable. The self-tanning reaction is complete.

UV-INDUCED FORMATION OF FREE RADICALS IN DHA-TREATED SKIN COMPARED TO UNTREATED SKIN (2 MED)



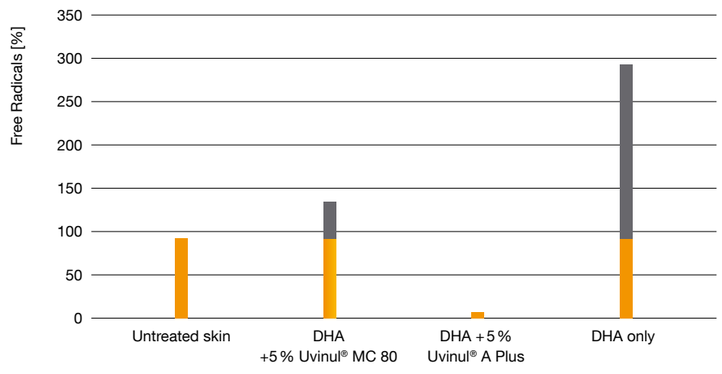
Uvinul® A Plus suppresses the radical boost of DHA under UV exposure.

The addition of 5 % Uvinul® A Plus to DHA reduces the amount of UV-induced free radicals in skin to a level that is 92 % below that of untreated skin, representing a reduction of more than 97 % compared to DHA treated skin.

High protection levels and strong anti-aging activity is achievable with Uvinul® A Plus.

UV-B filters only have a minor effect. With the addition of 5 % Uvinul® MC80, 40 % more free radicals are still detectable after 20 min in DHA-treated skin compared to untreated skin.

UV-INDUCED FORMATION OF FREE RADICALS IN DHA-TREATED SKIN IN THE PRESENCE OF UV FILTERS (2 MED)



Protection of the Skin’s Antioxidative Defense System

The skin has an intrinsic antioxidative defense system to deal with free radicals and reactive oxygen species.
It consists of enzymatic and non-enzymatic antioxidants like superoxide dismutase or catalase, as well as ascorbic acid and tocopherol. Its capacity can be determined by ESR Spectroscopy and described as the Skin’s Antioxidative Protection (SAP). However, oxidative stress like UV irradiation has a negative impact on the capacity of the SAP. Topically applied sunscreens are able to protect this defense system, antioxidants can enhance it. The level of protection can be expressed in percent Retention of the Skin´s Antioxidative Protection (% SAR).

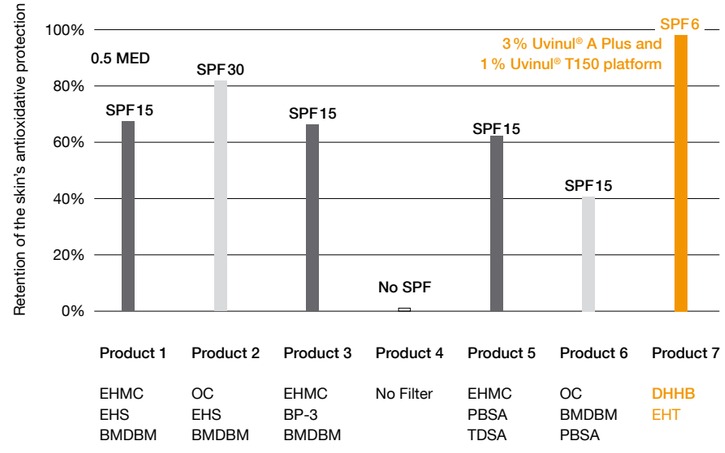
In a recent study six premium anti-aging market products containing antioxidants and one laboratory formulation were tested on pig skin biopsies with a view to their activity against free radicals and ROS (reactive oxygen species).

The quality of the protection is crucial

It could be confirmed that UV protection is the most efficient line of defense against free radicals, the major source of photoaging.

Figure 6 demonstrates that a high SPF does not necessarily protect the skin‘s antioxidative defense system efficiently. A UVA-focused skin care formulation with 3 % Uvinul® A Plus and 1 % Uvinul® T150 (SPF 6 only) provided almost 100 % retention of the skin’s own antioxidative protection – significantly higher than the tested market products with SPFs up to 30 [4].

FIGURE 6: PROTECTIVE PERFORMANCE OF PREMIUM ANTI-AGING MARKET PRODUCTS ON THE SKIN’S OWN DEFENSE SYSTEM – THE QUALITY OF UV FILTERING SYSTEMS IS CRUCIAL



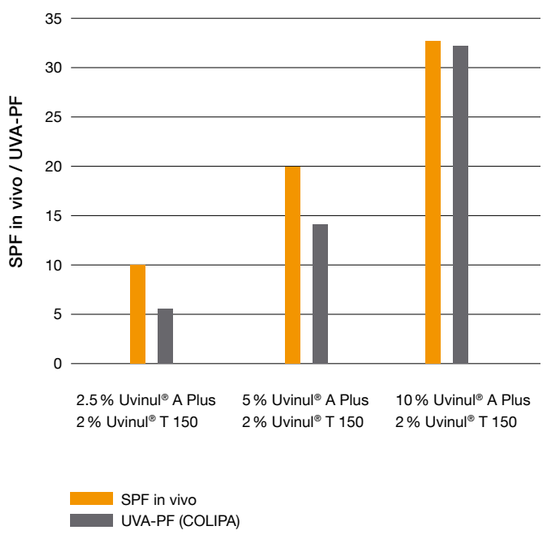
DHHB Diethylamino Hydroxybenzoyl Hexyl Benzoate, **EHT** Ethylhexyl Triazone,
OC Octocrylene, **EHS** Ethylhexyl Salicylate, **BP3** Benzophenone-3
EHMC Ethylhexyl Methoxycinnamate, **BMDBM** Butyl Methoxydibenzoylmethane,
PBSA Phenylbenzimidazole, **TDSA** Terephthalydene Dicamphor Sulfonic Acid

Effective SPF Boosting

Uvinul® A Plus is the ultimate UVA sunscreen for your suncare formulations.

Uvinul® A Plus helps not only to fulfill the requirements of adequate UVA protection, but also to significantly boost the SPF – especially at higher percentages – while keeping UVB filter concentrations as low as possible. No additional stabilization is needed. This provides both enhanced UVB protection and a superior stable UVA protection with low amounts of sunscreen.
Figure 7 shows the outstanding boosting performance of Uvinul® A Plus: increasing the percentage of Uvinul® A Plus from 2.5 % to 10 % results in a threefold higher SPF (in vivo) and a sixfold increase in UVA-PF, without enhancing the UVB filter concentration.

FIGURE 7: SPF BOOSTING PERFORMANCE OF UVINUL® A PLUS (BASF PATENT PENDING)



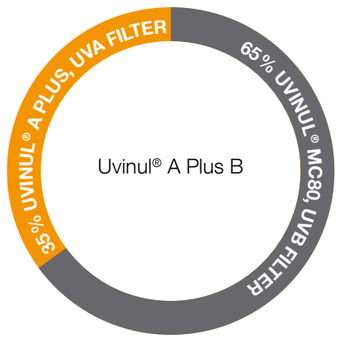
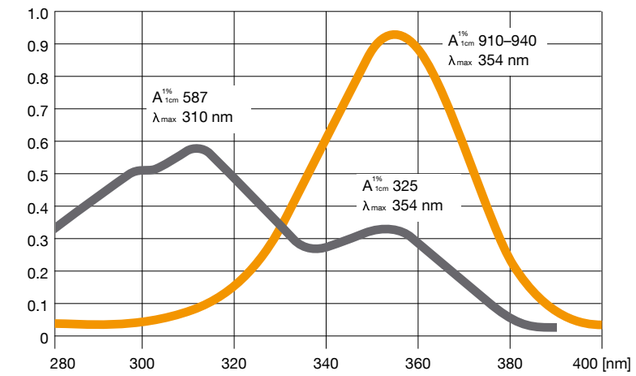


FIGURE 8: ABSORPTION SPECTRA OF UVINUL® A PLUS AND UVINUL® A PLUS B



Product Characteristics

	UVINUL® A PLUS / UVINUL® A PLUS GRANULAR	UVINUL® A PLUS B
Chemical Name	2-(4-Diethylamino-2-hydroxybenzoyl)-benzoic acid hexylester	2-(4-Diethylamino-2-hydroxybenzoyl)-benzoic acid hexylester and ethylhexyl methoxycinnamate
INCI	Diethylamino Hydroxybenzoyl Hexyl Benzoate	Ethylhexyl Methoxycinnamate (and) Diethylamino Hydroxybenzoyl Hexyl Benzoate
UV Protection	Long-wave UVA (UVA-I)	UVA-I and UVB
Appearance	**Uvinul® A Plus Granular:** White to light-salmon colored granules **Uvinul® A Plus:** Yellow **melt** that crystallizes upon storage*	Yellow liquid** that crystallizes
Purity	Min. 98 %	Min. 35 % – max. 37 % Uvinul® A Plus in Uvinul® MC 80 (Ethylhexyl Methoxycinnamate)
Viscosity		1,600 mPa·s
Solubility	Soluble in a wide range of cosmetic oils and solvents	Miscible in a wide range of cosmetic oils and solvents

Feel free to contact us for advice on specific formulations and technical queries.

* Recommended melting procedure: Place the whole drum in the oven at a temperature not to exceed 70° C for about 12 hours. No stirring is necessary.
** Storage at 22° C recommended.

Regulatory Status

COUNTRY	CHEMICAL LEGISLATION	AUTHORIZATION FOR USE IN SUNSCREEN PRODUCTS
EU	ELINCS-No. 443-860-6	Approved up to max 10 %
Switzerland	Listed (10 t/year)	Approved up to max 10 %
USA	Exempt for cosmetic use (TSCA)	Not approved
Canada	Listed Notification No. EAU-174	Not approved
Mexico	No chemical inventories in place	Approved up to max 10 %
South America	No chemical inventories in place	Approved up to max 10 %
Australia	Covered by TGA approval	Approved up to max 10 %
New Zealand		Approved up to max 10 % (follows EU regulation)
Japan	Listed. ISHL No. 7-(4)-1080 Exempt from CSCL (ENCS) when used as cosmetic ingredient.	Approved up to max 10 %
India		Approved up to max 10 % (follows EU regulation)
Korea	Exempt for cosmetic use	Approved up to max 10 %
Taiwan	Exempt for cosmetic use	Approved up to max 10 %
China		Approved up to max 10 %
Asean		Approved up to max 10 %
South Africa	No chemical inventories in place	Approved up to max 10 %

For up-to-date regulatory information, please visit our homepage: www.beautycare.basf.com

EU Commission Recommendation (2006/647/EC)

on the efficacy of sunscreen products and the claims made relating thereto (September, 22 2006)

For sunscreen products minimum UVA protection is required. It should be closely related to the level of UVB protection. More precisely, the level of the UVA protection factor, measured in the persistent pigment darkening test (PPD in vivo or an adequate alternative in vitro test, e.g. as recently proposed by COLIPA) should be at least 1/3 of the labeled SPF in vivo value. Consumer magazines have already taken this requirement as a minimum level of UVA protection (min. 1/3 SPF) for the evaluation of skin care products too.

Furthermore, only 8 defined SPF values are allowed (6, 10, 15, 20, 25, 30, 50, 50+). They have to be accompanied by the respective protection category: low (SPF 6, 10), medium (SPF 15, 20, 25), high (SPF 30, 50), very high (SPF 50+). As an additional parameter, a minimum critical wavelength of 370 nm is proposed.
Source: Official Journal of the European Union (L. 265/39) [9]

Uvinul® A Plus is the filter of choice to fulfill those new requirements

- Uvinul® A Plus is photostable without the need for stabilization, reliably keeping the level of UVA protection – independent from irradiation
- Uvinul® A Plus is highly efficient in combination with Uvinul® T 150
- Uvinul® A Plus is authorized up to 10 %
- Uvinul® A Plus is easy to use up to 10 % due to its good solubility

Uvinul® A Plus is indispensable for high-level protection

No Bioaccumulation of Uvinul® A Plus/ Uvinul® T150

From time to time concerns are raised regarding the bioaccumulation of UV filters in aquatic organisms, especially in fish. Therefore BASF decided to investigate this in the cases of Uvinul A Plus and Uvinul T150. The state of the art method to find out whether or not a substance is bioaccumulative is to perform the bioaccumulation study according to OECD 305.

For both UV filters (Uvinul A Plus, Uvinul T 150) the study results demonstrate that the filters are not bioaccumulative in the sense of PBT/vPvB (REACH) [10,11].

High Formulation Flexibility

UVINUL® A PLUS – READILY SOLUBLE IN A WIDE RANGE OF COSMETIC OILS AND SOLVENTS.		SOLUBILITY UVINUL® A PLUS	
Trade Name	**INCI Name**	**max. %**	**at °C**
Spectrasolv DMDA	N,N-Dimethyldecanamide	44	20
Lexfeel® Shine	Propylene Glycol Dibenzoate	38	20
Uvinul® N539T	Octocrylene	34	22
Cetiol® B	Dibutyl Adipate	31	21
Neoheliopan® OS	Ethylhexylsalicylate	30	21
Eusolex® HMS	Homosalate	29	21
Uvinul® MC 80	Ethylhexyl Methoxycinamate	24	20
Finsolv® TN	C 12-15 Alkyl Benzoate	18	21
Hallbrite® BHB	Butyloctyl Salicylate	17	20
Dermofeel® BCG	Butylene Glycol Dicaprylate/Dicaprate	16	21
Dermofeel® TC-7	Triheptanoin	14	21
Vitamin E Acetate	Vitamin E Acetate	14	21
Cetiol® CC	Dicaprylyl Carbonate	13	21
Silsoft 305	PEG/PPG-5/3 Trisiloxane	12	21
Miglyol® 812	Caprylic/Capric Triglyceride	12	21
EtOH 99.8 %	Alcohol	11	21
Myritol® 331	Cocoglycerides	10	21
Witconol APM PPG-3	PPG-3-Myristylether	8	21
Cosmacol® EMI	Di-C12-13 Alkyl Malate	8	21
Isopropyl Palmitate	Isopropyl Palmitate	8	21
EtOH 96 %	Alcohol	8	21
Cosmacol® ETI	Tridecyl Salicylate	8	21
Cosmacol® EOI	C12-13 Alkyl Octanoate	6	21

Formulations* DAILY CARE

50/00196 EU V001 LIGHT TEINTED DAILY CARE CREAM "THREE LINES OF DEFENSE"

UVA

	Ingredient	INCI	%
A	Dem. water	Dem. aqua	57.65
	Glycerin 87 %	Glycerin	5.00
	D-Panthenol 50 P	Panthenol, Propylene Glycol	4.00
	Reflecks™ Dimensions Shimmering Red	Calcium Sodium Borosilicate (and) Titanium Dioxide	2.00
	FD&C Red No.4 (1 % aqueous solution)	CI 14700	q.s.
	BHT	BHT	0.05
B	Uvinul® A Plus	Diethylamino Hydroxybenzoyl Hexyl Benzoate	3.00
	Luvitol® Lite	Hydrogenated Polyisobutene	7.00
	Lanette® O	Cetearyl Alcohol	1.50
	Cutina GMS	Glyceryl Stearate	1.50
	Cetiol® SB 45	Butyrospermum Parkii (Shea Butter)	7.00
	Olive Oil	Olive (Olea Europaea) Oil	7.00
	Eumulgin B 2	Ceteareth-20	1.00
	Cetiol® OE	Dicaprylyl Ether	1.00
C	Cosmedia SP	Sodium Polyacrylate	0.75
D	Euxyl® PE 9010	Phenoxyethanol, Ethylhexylglycerin	1.00
	Bisabolol rac.	Bisabolol	0.25
	Vitamin E Acetate	Tocopheryl Acetate	1.00
	Sodium Ascorbyl Phosphate	Sodium Ascorbyl Phosphate	0.20
	Perfume		0.10

Manufacturing:
Heat phase A to 80 °C. Heat phase B to about 80 °C and stir it into phase A whilst homogenizing. Stir phase C into phase A+B and homogenize. Cool to about 40 °C whilst stirring, add phase D and homogenize again. Cool to room temperature whilst stirring

53/00480 EU LIGHT DAILY CARE CREAM WITH UVINUL® A PLUS AND UVINUL® T 150 BALANCED DAILY CARE

UVA

	Ingredient	INCI	%
A	Uvinul® T 150	Ethylhexyl Triazone	2.00
	Uvinul® A Plus	Diethylamino Hydroxybenzoyl Hexyl Benzoate	5.50
	Axol® C 62	Glyceryl Stearate Citrate	1.50
	Lanette® O	Cetearyl Alcohol	1.50
	Cosmacol® EOI	C12-13 Alkyl Ethylhexanoate	4.00
	Cetiol® B	Dibutyl Adipate	6.00
	Eutanol® G	Octyldodecanol	1.50
	Abil® 350	Dimethicone	3.00
	Finsolv® TN	C12-15 Alkyl Benzoate	4.00
	Carbopol® Ultrez 10 Polymer	Carbomer	0.30
B	Dem. water	Dem. aqua	62.55
	D-Panthenol 50 P	Panthenol, Propylene Glycol	2.00
	Sodium Hydroxide 10 % aqueous w/w	Sodium Hydroxide	0.90

(Table continued on next page.)

* No warranties are made that the formulation examples may be used without infringing the intellectual property rights of third parties. In any case, it lies within the responsibility of the user to examine the respective patent situation.

53/00480 EU LIGHT DAILY CARE CREAM WITH UVINUL® A PLUS AND UVINUL® T 150 BALANCED DAILY CARE

	Ingredient	INCI	%
C	Bisabolol F	Bisabolol	0.25
	Ethanol	Alcohol	3.50
	Vitamin E Acetate	Tocopheryl Acetate	1.00
	Euxyl® PE 9010	Phenoxyethanol, Ethylhexylglycerin	0.50

Manufacturing:
Melt phase A at about 80 °C. Heat phase B to about 80 °C and stir it into phase A whilst homogenizing. Cool down to about 40 °C whilst stirring. Add phase C and homogenize again. Cool to room temperature whilst stirring.

Measurement values:
Viscosity: 6,300 mPa·s (Brookfield RVD VII+)
pH value: 6.0
SPF: 15 (International SPF Test Method, 2006)
UVA-PF**: 9.5
λ_{crit}: ≧ 370 nm

Formulations* SUN PROTECTION

53/00373 EU SUN PROTECTION LOTION SPF 30 WITH UVINUL® A PLUS AND UVINUL® T150 HIGH PROTECTION

UVA

	Ingredient	INCI	%
A	Uvinul® T 150	Ethylhexyl Triazone	2.50
	Uvinul® A Plus	Diethylamino Hydroxybenzoyl Hexyl Benzoate	7.50
	Eumulgin® VL 75	Lauryl Glucoside, Polyglyceryl-2 Dipolyhydroxystearate, Glycerin	4.00
	Cetiol® B	Dibutyl Adipate	8.00
	Finsolv® TN	C12-15 Alkyl Benzoate	8.00
	Myritol® 313	Cocoglycerides	12.00
	Lanette® E	Sodium Cetearyl Sulfate	1.00
	Lanette® O	Cetearyl Alcohol	2.00
B	Dem. water	Dem. aqua	48.45
	Veegum® Ultra	Magnesium Aluminum Silicate	1.50
	Keltrol®	Xanthan Gum	0.30
	Allantoin	Allantoin	0.20
	Edeta® BD	Disodium EDTA	0.05
	Glycerin 87 %	Glycerin	3.00
C	Euxyl® PE 9010	Phenoxyethanol, Methylparabene, Ethylparabene, Butylparabene, Propylparabene, Isobutylparabene	0.50
	Vitamin E Acetate	Tocopheryl Acetate	1.00

Manufacturing:
Heat phase A to about 80 °C. Heat phase B at about 80 °C and stir into phase A whilst homogenizing. Cool to about 40 °C, add phase C and homogenize again. Cool to room temperature whilst stirring.

Measurement values:
Viscosity: 4,000 mPa·s (Brookfield RVD VII+)
pH value: 6.2
SPF: 36 (International SPF Test Method, 2006)
SPF / % filter: 3.6
UVA-PF**: 23
λ_{crit}: ≧ 370 nm

* No warranties are made that the formulation examples may be used without infringing the intellectual property rights of third parties. In any case, it lies within the responsibility of the user to examine the respective patent situation.
** Method for the in vitro determination of UVA protection provided by sunscreen products (COLIPA Guideline 2007)

53/00446 EU SUN CARE MILK SPF 50+ WITH UVINUL® A PLUS, UVINUL® T 150 AND T-LITE SF-S, VERY HIGH PROTECTION

UVA

	Ingredient	INCI	%
A	Uvinul® T 150	Ethylhexyl Triazone	3.00
	Uvinul® A Plus	Diethylamino Hydroxybenzoyl Hexyl Benzoate	10.00
	Tinosorb® S	Bis-Ethylhexyloxphenol Methoxyphenyl Triazine	2.00
	Cutina® GMS	Glyceryl Stearate	1.00
	Axol® C 62	Glyceryl Stearate Citrate	2.00
	Finsolv® TN	C12-15 Alkyl Benzoate	6.00
	Cetiol® B	Dibutyl Adipate	4.00
	Cosmacol® ETI	Di-C12-13 Alkyl Tartrate	4.00
	Lanette® O	Cetearyl Alcohol	1.00
	Unimer U-6	Triacontanyl PVP	2.00
	Luvitol® Lite	Hydrogenated Polyisobutene	3.00
B	T-Lite SF-S	Titanium Dioxide, Hydrated Silica, Dimethicone/Methicone Copolymer, Aluminum Hydroxide	6.00
C	Glycerin 87 %	Glycerin	3.00
	D-Panthenol	Panthenol, Propylene Glycol	2.00
	Edeta® BD	Disodium EDTA	0.20
	Keltrol®	Xanthan Gum	0.15
	Polysurf® Modified Hydroxyethylcellulose	Cetyl Hydroxyethylcellulose	0.15
	Dem. water	Dem. aqua	49.00
D	Vitamin E Acetate	Tocopheryl Acetate	0.50
	Euxyl® PE 9010	Phenoxyethanol Ethylhexylglycerin	1.00

Manufacturing:
Heat phase A at about 80 °C. Add the components of phase B to phase A and homogenize. Heat phase C to about 80 °C and stir it into phases A+B whilst homogenizing. Cool to about 40 °C whilst stirring, add phase D and homogenize again. Cool to room temperature whilst stirring.

Measurement values:
Viscosity: 12,400 mPa·s (Brookfield RVD VII+)
pH value: 5.7
SPF: 67 (International SPF Test Method, 2006)
SPF / % filter: 3.2
UVA-PF**: 24.4
λ_{crit}: ≧ 370 nm

Formulations* SELF TANNING

RH 08/041-1 PROTECTED TANNING CREAM

	Ingredient	INCI	%
A	Uvinul® MC 80	Ethylhexyl Methoxycinnamate	3.50
	Uvinul® A Plus Granular	Diethylamino Hydroxybenzoyl Hexyl Benzoate	2.50
	Tego Care 450	Polyglyceryl-3 Methylglucose Distearate	2.50
	Lanette® O	Cetearyl Alcohol	1.50
	Cetiol® MM	Myristyl Myristate	1.50
	Finsolv® TN	C12-C15 Alkyl Benzoate	2.50
	Cetiol® CC	Dicaprylyl Carbonate	2.50
	Cosmacol® EOI	C12-C13 Alkyl Octanoate	2.50
	Abil® 350	Dimethicone	2.00
B	Dem. water	Dem. aqua	63.45
	Glycerin	Glycerin	3.00
	1,2 Propylene Glycol Care	Propylene Glycol	2.00
	Natrosol Plus 330 CS	Cetyl Hydroxyethylcellulose	0.30
	Edeta® BD	Disodium EDTA	0.05
	Citric acid (10 % in water)	Citric Acid	0.20
C	Vitamin E Acetate	Tocopheryl Acetate	1.00
	Euxyl® PE 9010	Phenoxyethanol Ethylhexylglycerin	1.00
D	DHA	Dihydroxyacetone	2.00
	Dem. water	Dem. aqua	6.00

Manufacturing:
Heat phase A to 80 °C. Heat phase B to about 80 °C. Stir phase A into phase B whilst homogenizing. Cool to about 40 C whilst stirring, add phases C and D and homogenize again. Cool to room temperature whilst stirring.

Measurement values:
Viscosity: 25,000 mPa·s (Brookfield RVD VII+)
pH value: 4.89

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** Method for the in vitro determination of UVA protection provided by sunscreen products (COLIPA Guideline 2007)

Summary

Increased awareness of the hazards of UVA exposure has led to augmented requirements for adequate skin protection. In Uvinul® A Plus, BASF offers an excellent UVA-I sunscreen that provides all you need to meet current and future requirements for outstanding, reliable UVA protection and to combat premature skin aging:

- Excellent long-wave UVA protection – against deeply penetrating UV rays
- Powerful action against free radicals generation – for preventing premature skin aging
- Effective SPF boosting – for effective UV protection
- Reliable photostability – for long-lasting performance

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Beauty Care Ingredients

Designed for the customers' needs, BASF offers one of the most comprehensive portfolios in the personal care industry, including products for hair, oral, skin and sun care, and color cosmetics. The high quality range includes actives, polymers, effect pigments, UV filters and surfactants. Along with this broad and diverse range of products, BASF constantly strives to create innovative and sophisticated raw materials. Anticipating and supporting the requirements of the personal care market is the particular strength of Beauty Care by BASF.

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EMV 080303E-01

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