



Innovative sun protection: SPF boosting through engineered zeolite platforms

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Research and Development Lab

SAES Chemicals

Pioneering high-purity, clean chemistry solutions to enhance skin barrier protection and well-being.

In SAES Chemicals S.r.l. we bring cutting-edge science to the worlds of cosmetics and nutraceuticals, developing next-generation functional materials that shape the future of well-being. We deliver what consumers demand: outstanding performance from high-purity products, made with clean chemistry and backed by decades of R&D expertise.

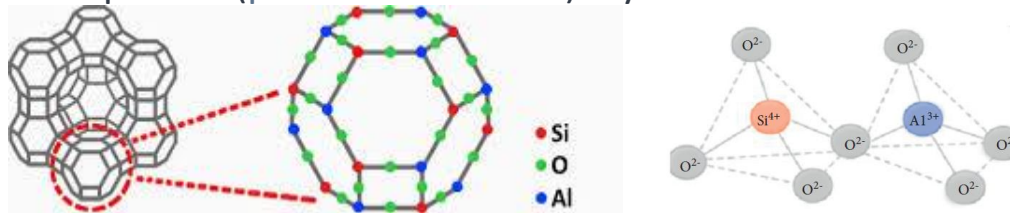
17 Patents Families
claiming engineered
zeolites

Engineered Zeolite | Material class

STRUCTURE

Aluminosilicates with a wide range of silica-to-aluminum ratio (Si/Al)

Microporous (pores sizes < 2 nm) crystalline aluminosilicate

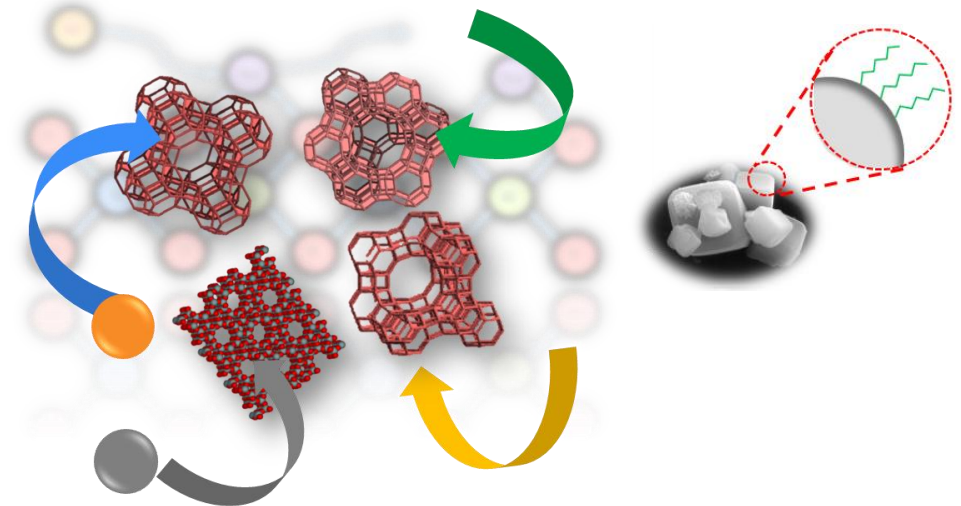


International
Zeolite Association
(IZA) codes

ABW	ACO	AEI	AEL	AEN	AET	AFG	AFI	AFN	AFO	AFR	AFS	AFT	AFV	AFX
AFY	AHT	ANA	ANO	APC	APD	AST	ASV	ATN	ATO	ATS	ATT	ATV	AVE	AVL
AWO	AWW	BCT	BEC	BIK	BOF	BOG	BOZ	BPH	BRE	BSV	CAN	CAS	CDO	CFI
CGF	CGS	CHA	CHI	CLO	CON	CSV	CZP	DAC	DDR	DFO	DFT	DOH	DON	EAB
EDI	EEL	EMT	EON	EOS	EPI	ERI	ERS	ESV	ETL	ETR	ETV	EUO	EWI	EWV
EWS	EWY	EZT	FAR	FAU	FER	FRA	GIS	GIU	GME	GON	GOO	HEI	HEU	HOS
HZF	IFO	IFR	IFT	IFU	IFW	IFY	IHW	IMF	JON	IRN	IRR	JRY	JRY	ISV
ITE	ITG	ITH	ITR	ITT	ITV	ITW	JVY	IWR	IWS	IWV	IWW	JBW	JNT	JOZ
JRY	JSN	JSR	JST	JSW	JSY	JZO	JZT	KFI	KLW	LAU	LEV	LJO	LIT	LOS
LOV	LTA	LTF	LTI	LTL	LTN	MAN	MAR	MAZ	MEI	MEL	MEP	MER	MFI	MFS
MON	MOR	MOZ	MRT	MSE	MSO	MTF	MTN	MIT	MTW	MVY	MWF	MWW	NAB	NAT
NES	NJO	NJW	NON	NPO	NPT	NSI	OBW	OFF	OKO	OSI	OSO	OWE	PAR	PAU
PCR	PHI	PON	POR	POS	PSI	PTF	PTO	PTT	PTY	PUN	PWN	PWO	PWW	RFE
RHO	RON	RRO	RSN	RTE	RTH	RUT	RWR	RWY	SAF	SAO	SAS	SAT	SAV	SBE
SBN	SBS	SBT	SEW	SFE	SFF	SFG	SFH	SFN	SFO	SFS	SFW	SGT	SIV	SOD
SOF	SOR	SOS	SOV	SSF	SSO	SSY	STF	STI	STT	STW	SVR	SVV	SWY	SYT
SZR	TER	THO	TOL	TON	TSC	TUN	UEI	UFI	UOS	UOV	UOZ	USI	UTL	UWY
VET	VFI	VNI	VSV	WEI	WEN	YFI	YUG	ZIN	ZON					

ENGINEERED ZEOLITES

- Variable composition (Si, Al, O, Na, K, Ca, H, N...)
- Selected morphology and surface properties (e.g. surface area, pore size, hydrophilicity)
- Exchanging cations properties
- Surface functionalization with organic molecules
- Gas and liquid adsorption



Engineered Zeolites vs Natural Zeolites

SAES Chemicals uses advanced methods to produce **engineered zeolites**, including the Ionothermal, Solvothermal, and Hydrothermal methods, each with different solvents.

SAES has developed a **proprietary Sol-gel** hydrothermal method for high-performance, specialized zeolites.

Natural zeolites, formed from volcanic activity, are primarily derived from hot springs, lava, and sedimentary deposits. These zeolites occur in various regions around the World, with significant deposits found in many different countries.

	ZeoSAES®	NATURAL
Purity	Extremely high	Low
Crystallinity	High	Medium/low
Thermal stability	Excellent	High
Crystal growth kinetics	Hours to days	Days to decades
Surface properties	Tuneable and addressable	Limited by nature
Particle size distribution	Tuneable by process	Usually broad

Engineered Zeolite | Technological Platform



INCI
Zeolite

HOW
Semi-dry processes without toxic solvents or
hazard chemicals.

DEFINITION
Engineered Zeolite

COMPATIBILITY
High compatible with most cosmetic ingredients.

CHARACTERISTICS
Fine powder Non-Nano
according to European Commission
Recommendation (2022/C 229/01) - 10 June
2022

REPRODUCIBILITY
Verified through a fine control of particle size and
shape, loss on drying, surface charge, color
stability, crystallinity, surface area.

CERTIFICATIONS & REGISTRATIONS



Cruelty-free suitable
Halal certifiable
ISO 14001
ISO 9001

OK Sephora list
OK Credo list
Heavy metal tested
Ni, Cr < 10 ppm, other metals < 1
ppm

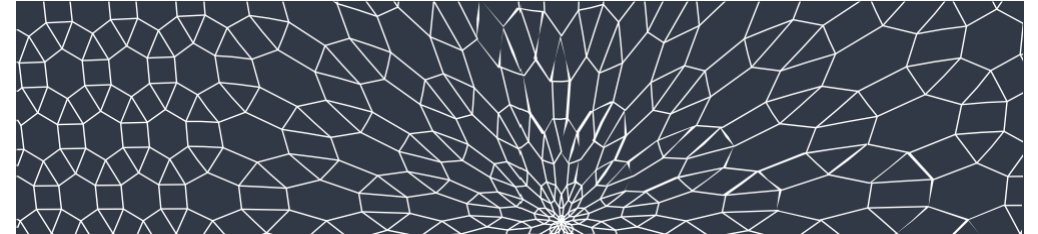
OK EU / US / China / Japan /
South Korea / Mercosur
Cosmetic regulation
Patent Pending

Product Categories



ZeoSAES® Fillers

TEXTURE AND EXPERIENCE MODIFIER INGREDIENTS



ZeoSAES® UV Booster

UV BOOSTING INGREDIENTS



ZeoSAES® Actives

ACTIVE INGREDIENTS



ZeoSAES® Adsorbents

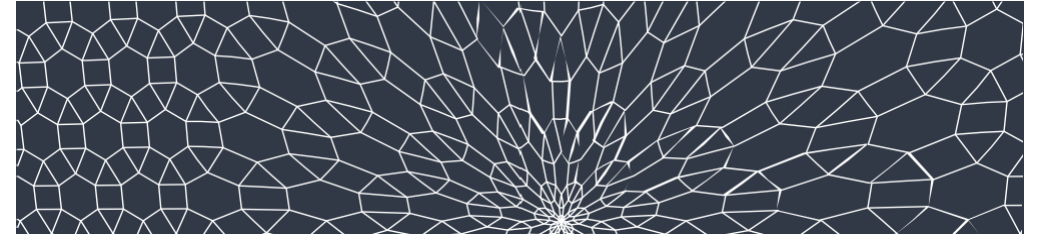
ADSORBENT INGREDIENTS

Product Categories



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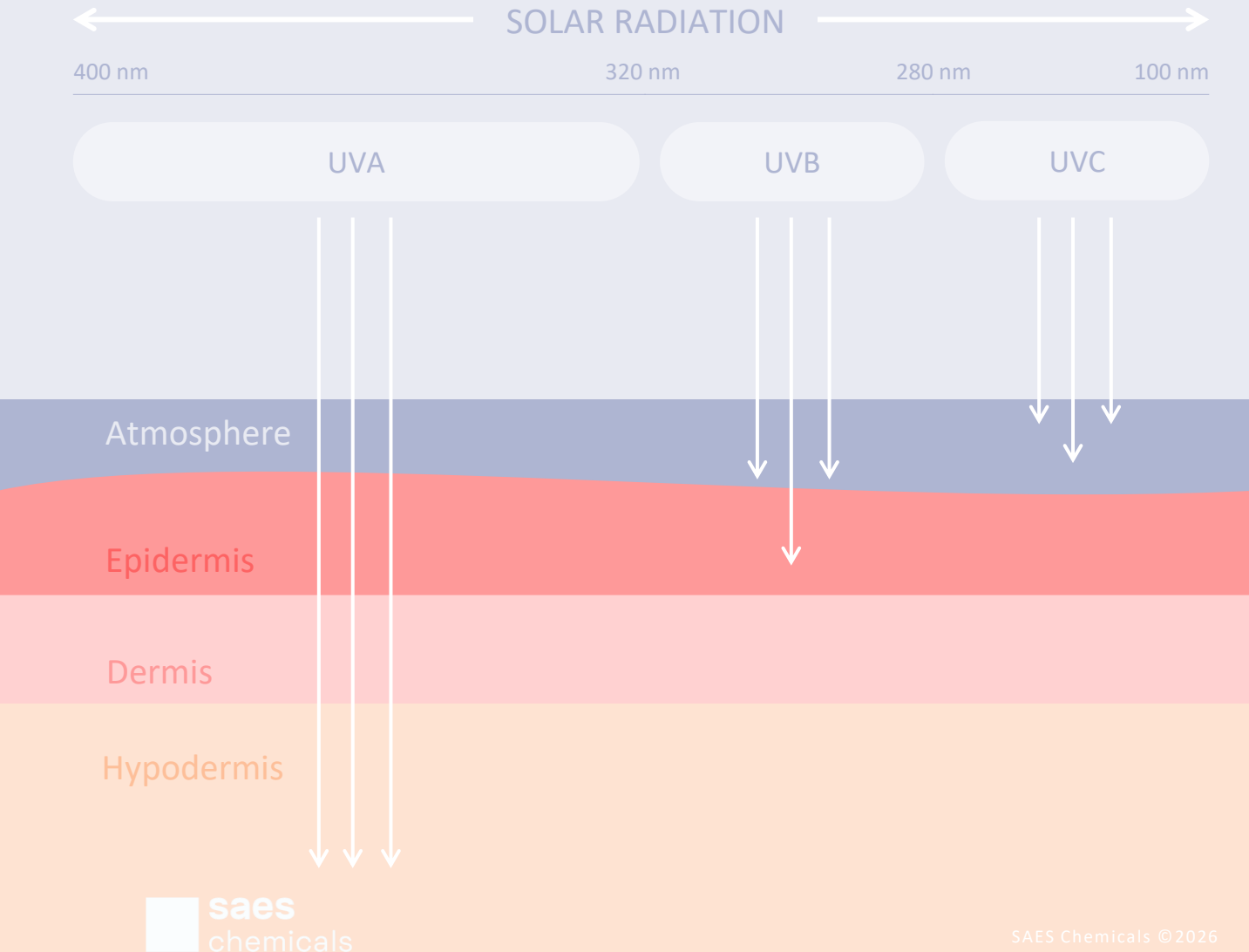
ZeoSAES® UV Booster

The first specialty zeolite UV Boosting ingredients. All-in-one ingredient, high UV rays scattering and great sensorial properties.

ZeoSAES® UV Booster 5X6015

ZeoSAES® UV Booster Evolution 5X6027

SPF introduction



UVC

Short-wavelength is the most damaging type of UV radiation, but it is completely filtered by the atmosphere.

UVC does not reach the earth's surface.

UVB

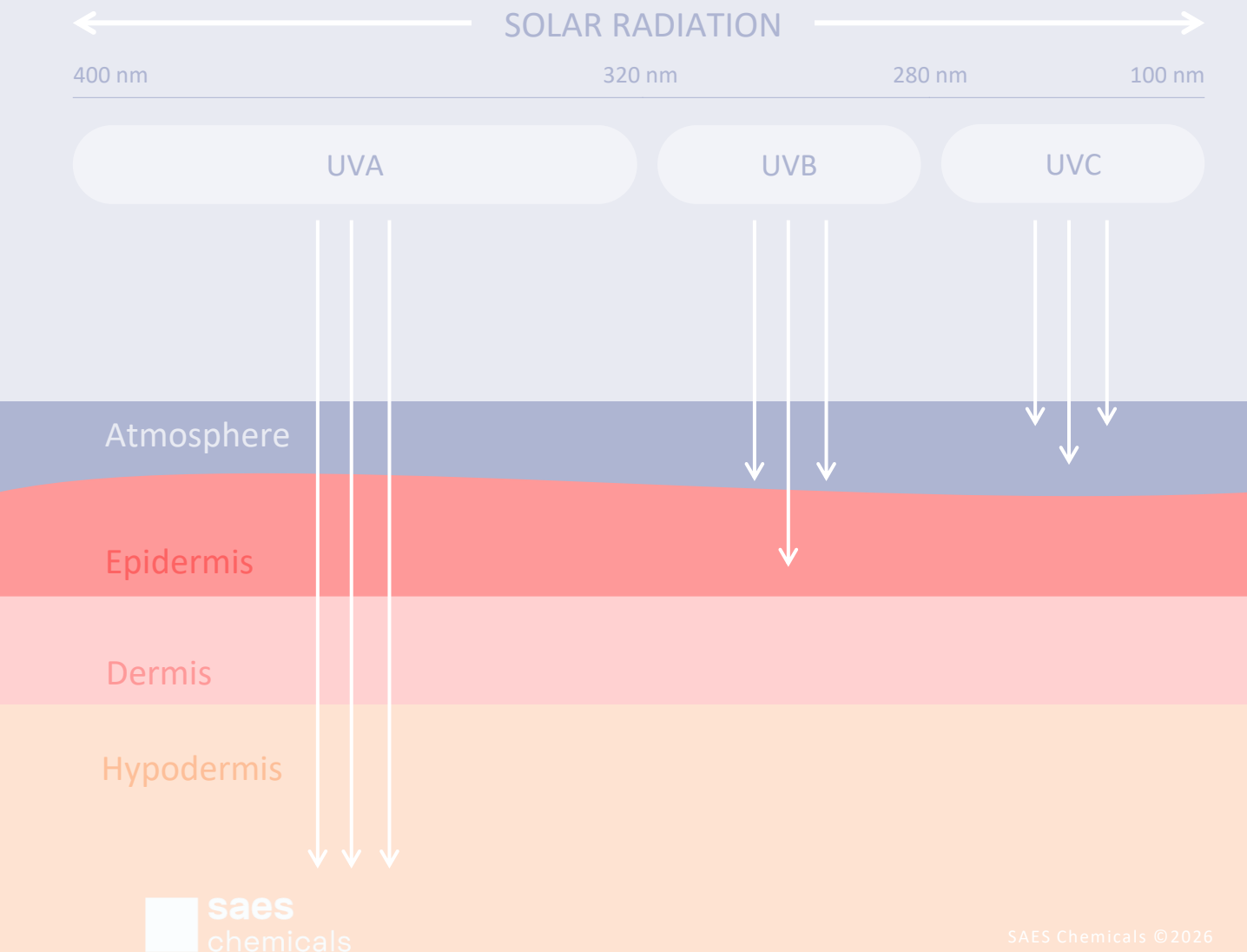
Medium-wavelength is very biologically active but cannot penetrate beyond the superficial skin layers. It is responsible for delayed tanning and burning; UVB enhances skin ageing and significantly promotes the development of skin cancer.

Most solar UVB is filtered by the atmosphere.

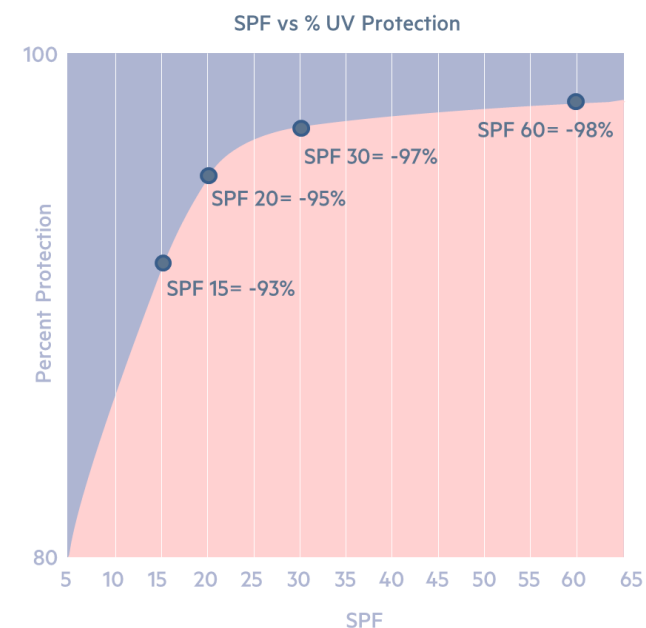
UVA

Long-wavelength UVA accounts for approximately 95% of the UV radiation reaching the Earth's surface. It can penetrate into the deeper layers of the skin and is responsible for the immediate tanning effect. UVA contributes to skin ageing and wrinkling and it may also enhance the development of skin cancers

SPF introduction



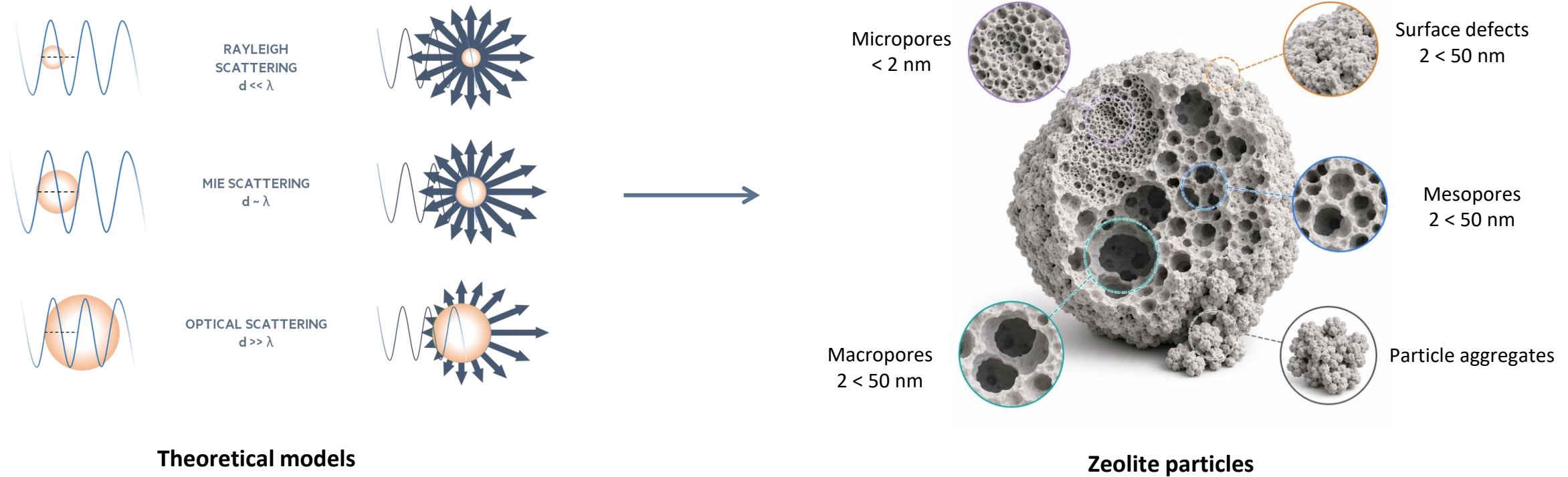
SUN PROTECTION FACTOR (SPF) is a measure of how much solar energy (UV radiation) is required to produce sunburn on protected skin relative to the amount of solar energy required to produce sunburn on unprotected skin



These SPF values are obtained by using UV filters and functional ingredients able to **ABSORB or SCATTER UV RADIATION**

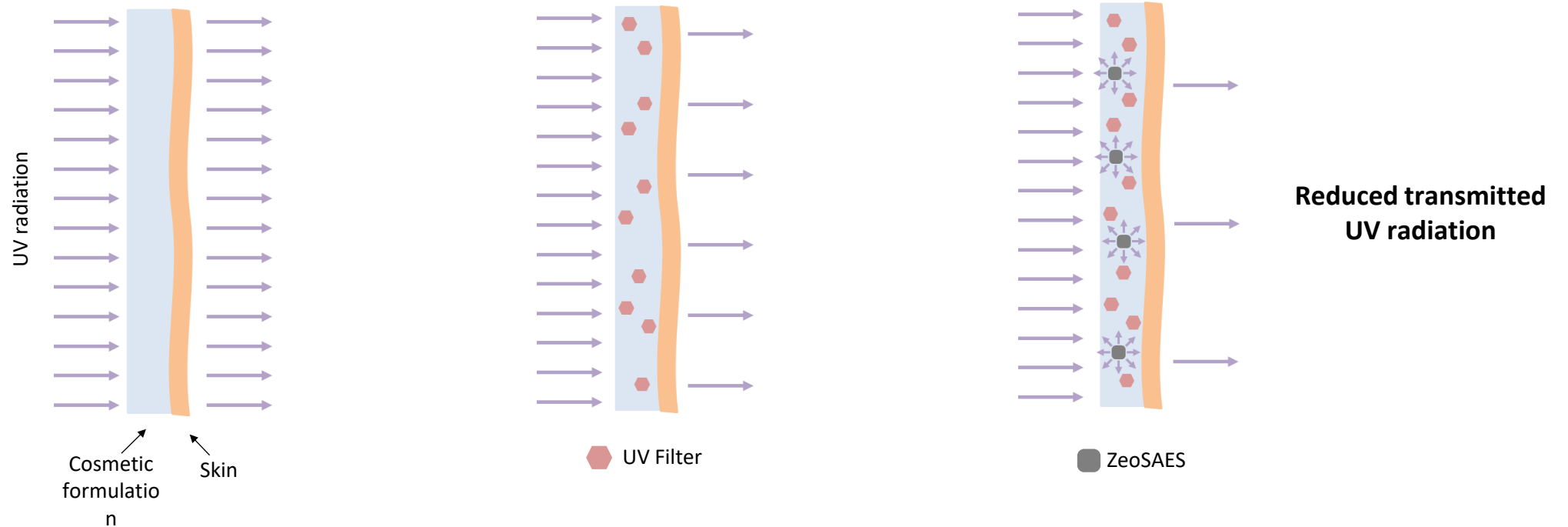
SPF introduction

Light scattering by solid particles occurs when incident light is redirected by particles due to **differences in refractive index between the solid and the surrounding medium**. The scattering intensity and angular distribution depend mainly on **particle size, shape, concentration, wavelength, and optical properties**.



SPF introduction

The interaction between UV light and particles redirects the radiation, **enlarging the path** it travels within the formulation. This increase the **chance to be absorbed** by UV filters (chemical and/or physical), maximizing their efficiency.



Engineered zeolites are effective for exploiting this SPF boosting mechanism

ZeoSAES® UV Booster I 5X6015

Safe and effective SPF booster

INCI
Zeolite

Definition
Engineered Zeolite

The first inorganic UV booster derived from engineered zeolites. It provides excellent UV-boosting performance by scattering UVA and UVB rays, allowing:

- reduction in the amount of UV filters needed in the formulation
- enhanced UV light absorption by UV filters.

It also delivers a pleasant sensorial feel on the skin thanks to its texturizing properties



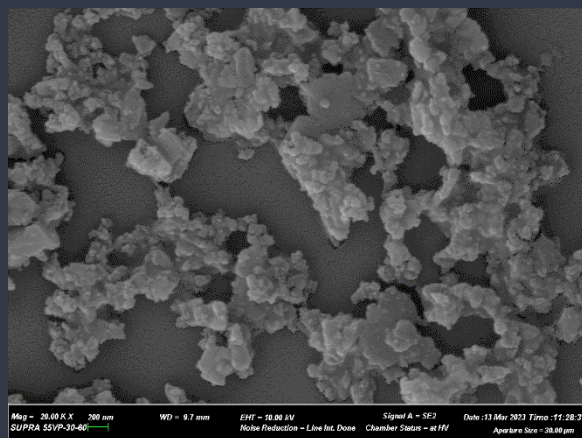
BENEFITS



RICH
TEXTURE



DRY
TOUCH



PRODUCT FEATURES

- Water and oil dispersable
- Highly compatible with all SPF range
- Strong rheology modifier, increasing body and improving density
- Increased sebum control
- Increased oil and sweat absorption
- Compatible with chemical and physical UV filters

UV BOOSTING INGREDIENTS

Up to
> 350 **100**

Surface area (m²/g) Oil sorption (mL/100 g)

1,40-1,45 **1-10**

Refractive index Particle size (µm)

3%

Ingredient in
formulation

2

physical filters

Titanium Dioxide

Zinc Oxide

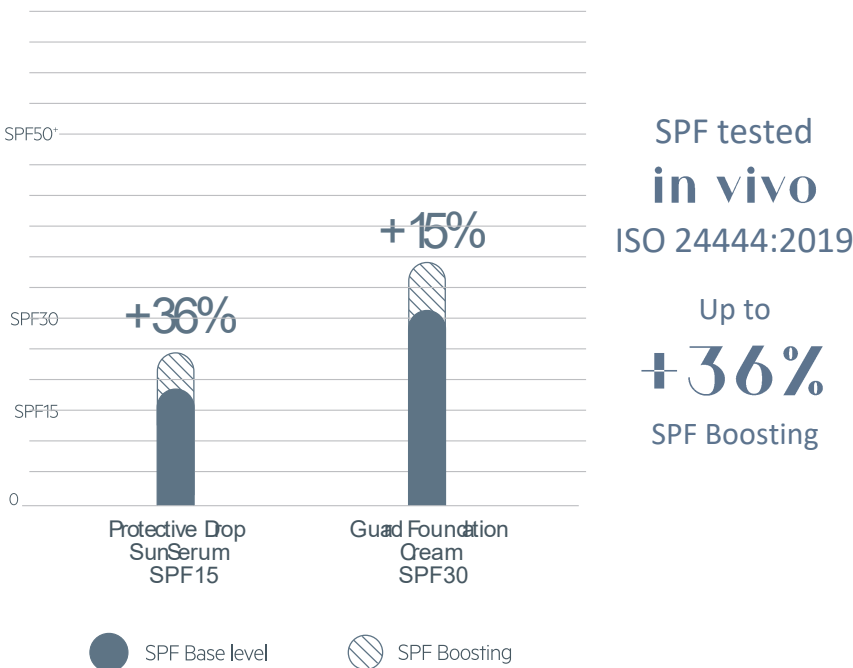
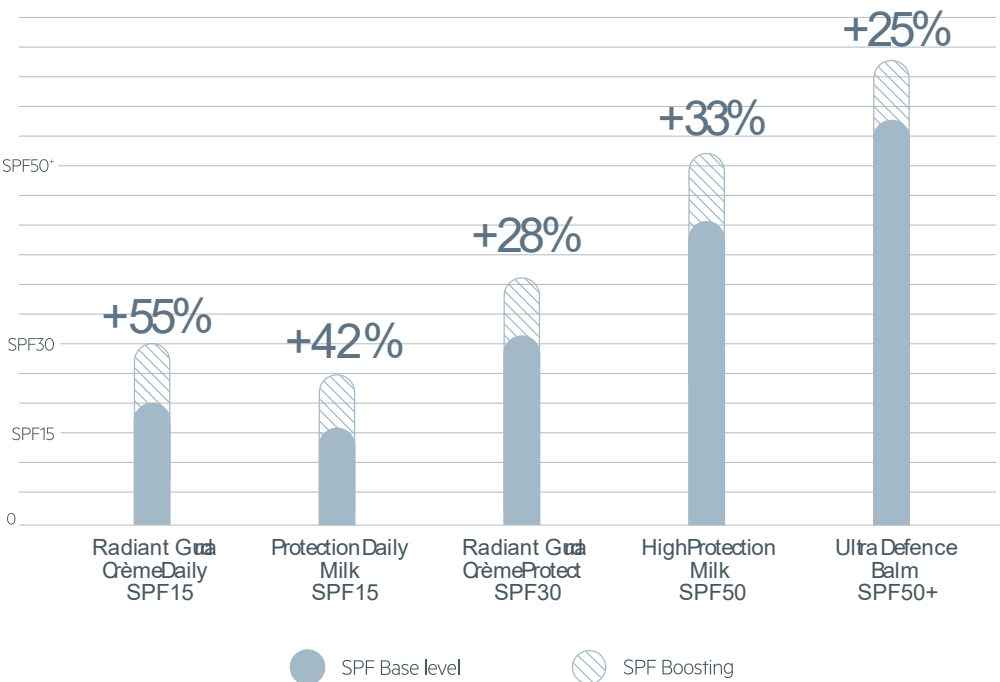
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chemical filters

ZeoSAES® UV Booster | SPF testing

UV BOOSTING INGREDIENTS

ISO 23675 and ISO 24444 deliver basically the same SPF results because the former is designed as a true laboratory translation of the latter, using more standardized tools and ethically neutral procedures, but without changing the UV measurement structure or spectral interpretation.



ZeoSAES® UV Booster I SPF testing

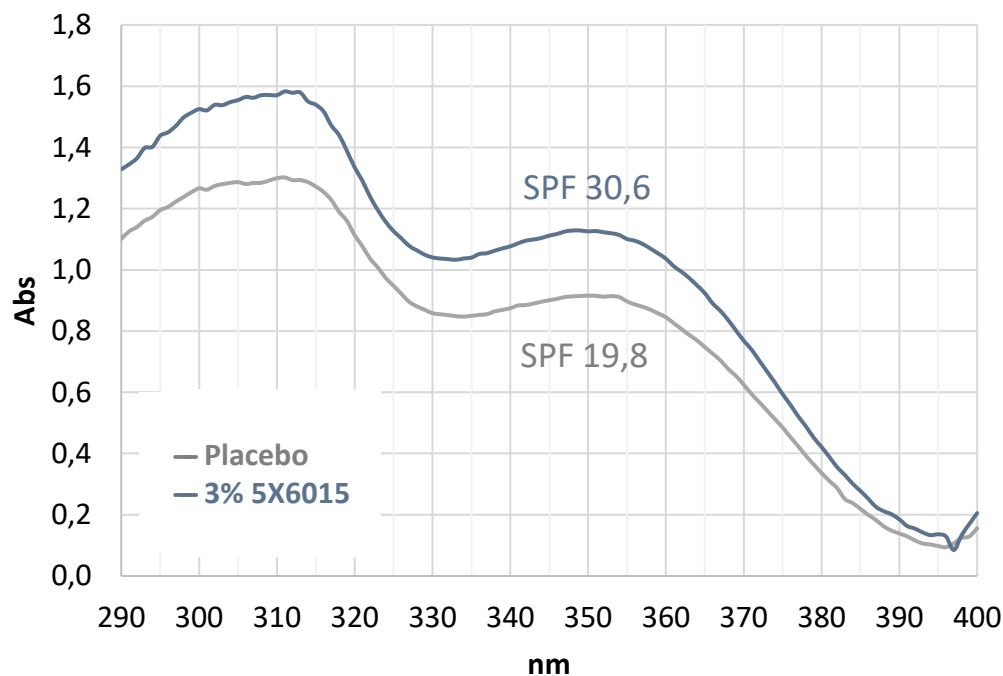
UV BOOSTING INGREDIENTS

Formulation example: Radiant Guard Crème Daily SPF15 + 3% ZeoSAES UV Booster

in-vitro SPF with ISO 23675:2025

INCI

Aqua
Pentylene glycol
Xanthan gum
Polyglyceryl-2 stearate, glyceryl stearate, stearyl alcohol
Cetyl alcohol
C12-C15 alkyl benzoate
Dicaprylyl ether
Coco-caprylate
Dimethicone
Pentaerythrityl tetra-di-t-butyl hydroxyhydrocinnamate
Phenoxyethanol, Ethylhexylglycerin
Lactic acid
Ethylhexyl methoxycinnamate
Bis-ethylhexyloxyphenol methoxyphenyl triazine
Diethylamino hydroxybenzoyl hexyl benzoate
Ethylhexyl triazone



Up to
+55%
SPF Boosting

- With just 3% wt. addition of ZeoSAES UV Booster it is possible to obtain a final SPF above 30
- A greater exploitation of UV filters is observed in the whole wavelength range

ZeoSAES® UV Booster Evolution | 5X6027

Next-gen versatility & robustness

INCI

Zeolite

Definition

Engineered
Zeolite

Formulation freedom unlocked: delivering reliable, reproducible SPF boosting across today's most complex systems.

It also combines sensorial application on skin thanks to its texturizing properties.



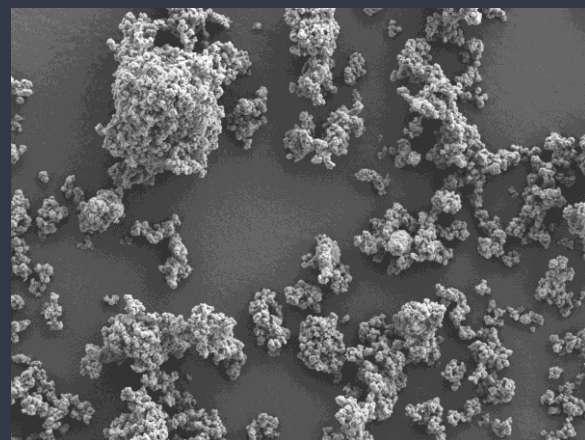
BENEFITS



**RICH
TEXTURE**



**DRY
TOUCH**



PRODUCT FEATURES

- **Outstanding formulation compatibility**, works seamlessly with both lipids and polymers.
- Reliable and reproducible SPF boosting
- Designed for modern systems, including high-water, polymer-rich, and hybrid textures.
- Versatility for next-generation skincare. Ideal for SPF skincare, hybrids, and clean beauty formulations.
- Minimizes instability issues such as phase separation or rheological collapse, accelerating development.

UV BOOSTING INGREDIENTS

> 300	Up to 100
Surface area (m ² /g)	Oil sorption (mL/100 g)
1,40-1,45	4-9
Refractive index	Particle size (µm)

3%

Ingredient in
formulation

2

physical filters
Titanium Dioxide
Zinc Oxide

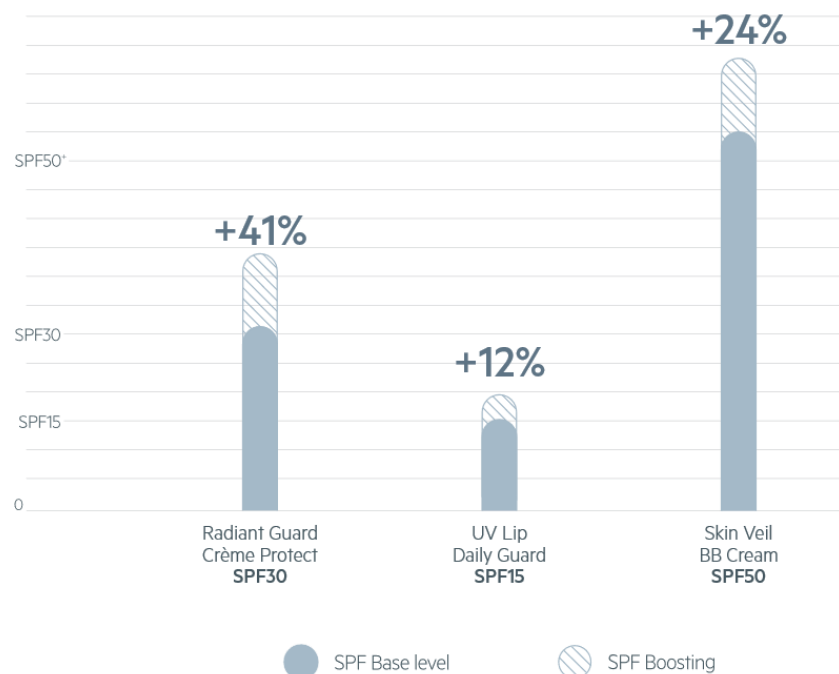
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chemical filters

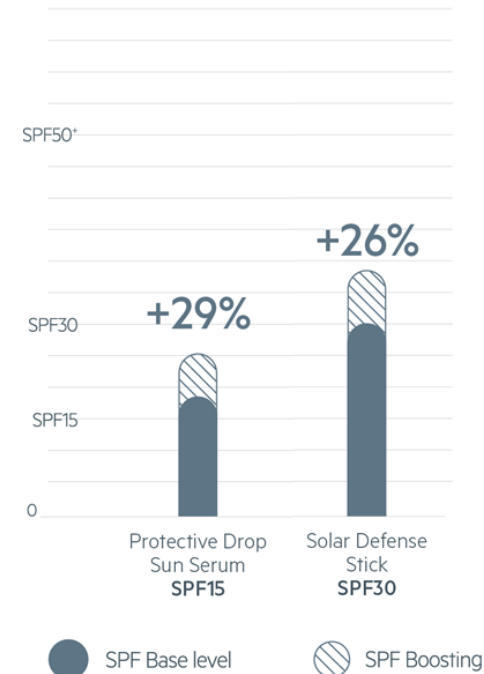
ZeoSAES® UV Booster Evolution | SPF testing

UV BOOSTING INGREDIENTS

ISO 23675 and ISO 24444 deliver basically the same SPF results because the former is designed as a true laboratory translation of the latter, using more standardized tools and ethically neutral procedures, but without changing the UV measurement structure or spectral interpretation.



SPF tested
in vitro
ISO
23675:2025
Up to
+41%
SPF Boosting



SPF tested
in vivo
ISO 24444:2019
Up to
+29%
SPF Boosting

ZeoSAES® UV Booster Evolution I SPF testing

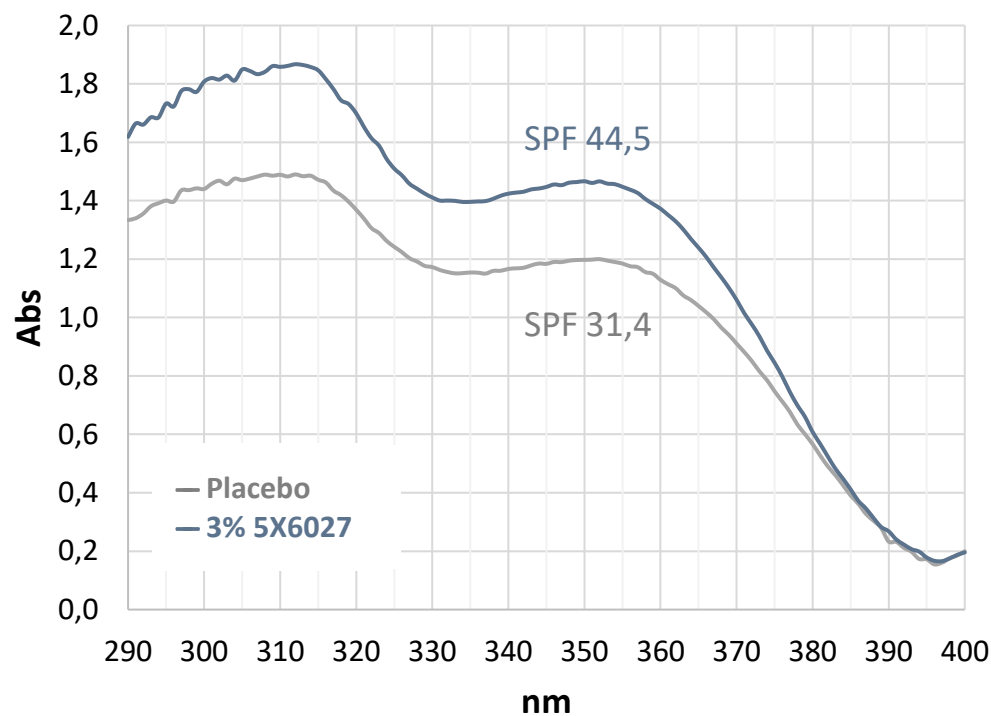
UV BOOSTING INGREDIENTS

Formulation example: Radiant Guard Crème Protect SPF30 + 3% ZeoSAES UV Booster Evolution

in-vitro SPF with ISO 23675:2025

INCI

Aqua
Pentylene glycol
Xanthan gum
Polyglyceryl-2 stearate, glyceryl stearate, stearyl alcohol
Cetyl alcohol
C12-C15 alkyl benzoate
Dicaprylyl ether
Coco-caprylate
Dimethicone
Pentaerythrityl tetra-di-t-butyl hydroxyhydrocinnamate
Phenoxyethanol, Ethylhexylglycerin
Lactic acid
Ethylhexyl methoxycinnamate
Bis-ethylhexyloxyphenol methoxyphenyl triazine
Diethylamino hydroxybenzoyl hexyl benzoate
Ethylhexyl triazone



Up to
+41%
SPF Boosting

- With just 3% wt. addition of ZeoSAES UV Booster Evolution it is possible to significantly increase the SPF value of the formulation without the addition of extra filters
- A greater exploitation of UV filters is observed in the whole wavelength range

Product Categories



ZeoSAES® Fillers

TEXTURE AND EXPERIENCE MODIFIER INGREDIENTS



ZeoSAES® UV Booster

UV BOOSTING INGREDIENTS



ZeoSAES® Actives

ACTIVE INGREDIENTS



ZeoSAES® Adsorbents

ADSORBENT INGREDIENTS

Exposome-driven aging

Protecting the skin from the exposome is the new pro-age approach.

ZeoSAES Active Antiox A 5X6200

ZeoSAES Active Antiox C 5X6201

ZeoSAES Active Energy C 5X6203

ZeoSAES Active Fusion Complex 5X6204

ZeoSAES® Actives

in-cosmetics®
korea



ZeoSAES® Active Antiox A
5X6200

Vitamin C + Vitamin B3



ZeoSAES® Active Antiox C
5X6201

Vitamin C



ZeoSAES® Active Energy C
5X6203

Caffeine



ZeoSAES® Active Fusion Complex
5X6204

Vitamin C + Vitamin B3
+ Caffeine

ZeoSAES® Active Antiox A | 5X6200

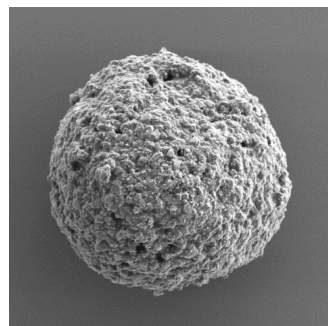
Antioxidant-loaded zeolite for active texture & protection

Multifunctional ingredient, texturizing and active, delivering the many sensorial benefits of zeolite while providing all the advantages of Vitamins C and B3.

Thanks to the innovative delivery system, hydrophilic vitamins act more effectively due to *enhanced stability*. It can be used in both anhydrous and water-based formulations thanks to its intrinsic versatility.

INCI: Zeolite, Ascorbyl Glucoside, Niacinamide

Active loading: 40%



BENEFITS



SCAVENGER FOR
WELL-AGING



CUSHION
EFFECT



BLURRING
EFFECT

WHY IT STANDS OUT

- Multifunctional ingredient, texturizing and antioxidant boosting.
- Delivery of hydrophilic Vitamins C and B3 in both lipophilic and hydrophilic systems.
- Cushion effect and dry touch.
- Protection against free radicals from the exposome.
- Supported claims: sebum control, skin balance, wrinkle reduction, microbiome balancing, whitening effect, and more.
- Tested in vivo on both Caucasian and Asian skin at 2.5%.
- Perfect for emulsions and anhydrous formulations

SUSTAINED
ACTIVE RELEASE
PATTERN

–58%
SKIN ROUGHNESS
ΔRa vs. vitamins

+28%
ANTIOXIDANT DEFENSE
Catalase activity vs. placebo

–55%
TRANSEPIDERMAL WATER LOSS
ΔTEWL vs. vitamins

–18%
MELASMA REDUCTION
Area reduction vs. placebo

–50%
REDNESS
Δa-value vs. vitamins

*In-vivo clinical results after 48 h (2,5%
wt.)*

ZeoSAES® Active Antiox A | Anti-Inflammaging Sun Care – in-vitro results

An advanced antioxidant platform that not only helps protect skin from UV-induced oxidative stress but also enhances the performance of UV filters.

By combining antioxidant activity with SPF-boosting benefits, it provides a dual-action approach to sun protection, helping preserve skin health and reduce the visible effects of photoaging and inflammaging.

+25%

SPF BOOSTING
In a SPF50 formulation

+33%

SPF BOOSTING
In a SPF30 formulation

5%

in formula
Process method 80° C

TESTING METHOD

In-vitro ISO23675

Compatibility and efficacy tested with

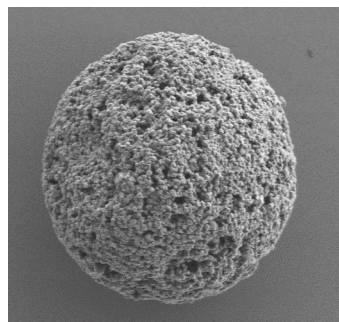
**Physical & Chemical
filters**

ZeoSAES® Active Antiox C | 5X6201

Photo-resilient antioxidant system.

An advanced antioxidant system combining stabilized Vitamin C and zeolite to deliver continuous protection against oxidative stress (ROS) in real outdoor conditions. Engineered to perform under daily environmental aggressors such as pollution and UV exposure, it helps maintain skin integrity while visibly improving skin appearance.

INCI: Zeolite, Sodium ascorbyl glucoside, ascorbyl glucoside
Active loading: 40%



BENEFITS



ENVIRONMENTAL
DEFENSE



SKIN CLARITY &
BALANCE



SMART ACTIVE
DELIVERY

WHY IT STANDS OUT

- Proven efficacy against pollution-induced oxidative stress
- Effective under combined pollution and UV exposure
- Photo-resilient antioxidant performance: Stabilized system ensures consistent antioxidant activity, even under light exposure.
- High skin compatibility: Gentle on the skin, suitable for daily use and sensitive skin types.
- No cytotoxicity detected: Scientifically validated safety profile.
- Enhanced stability: Optimized formulation ensures long-lasting efficacy and reliability over time.
- Perfect for emulsions, serums and loose powders formulations

REAL OUTDOOR STRESS (U.D.)

–56%

ROS

Compared to the untreated
area

URBAN POLLUTION (U.D. + UV)

–46%

ROS

Compared to the untreated
area

In-vitro results (2,5% wt.)

ZeoSAES® Active Antiox C | Anti-Inflammaging Sun Care – in-vitro results

By incorporating the ingredient into sunscreen systems, the results showed enhanced antioxidant protection while supporting overall photoprotection performance.

ZeoSAES® Active Antiox C can complement sunscreen formulations by helping neutralize UV-induced oxidative stress and reinforce skin defense under sun exposure, enhancing overall photoprotection.

Up to
+65%
SPF BOOSTING
In a SPF50 formulation

Up to
+79%
SPF BOOSTING
In a SPF30 formulation

Up to
+25%
SPF BOOSTING
In a SPF15 formulation

5%
in formula
Process method 80° C

TESTING METHOD
In-vitro ISO23675

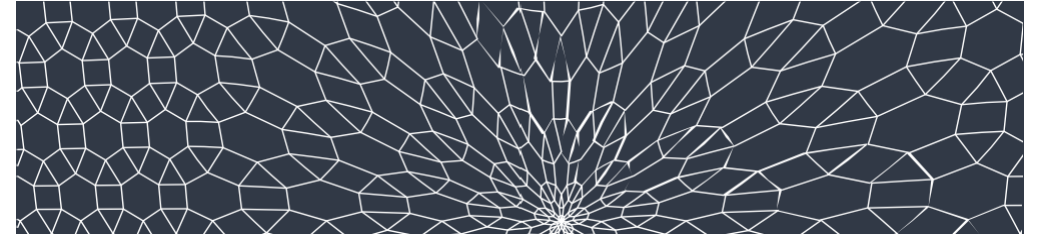
Compatibility and efficacy tested with
**Physical & Chemical
filters**

Product Categories



ZeoSAES® Fillers

TEXTURE AND EXPERIENCE MODIFIER INGREDIENTS



ZeoSAES® UV Booster

UV BOOSTING INGREDIENTS



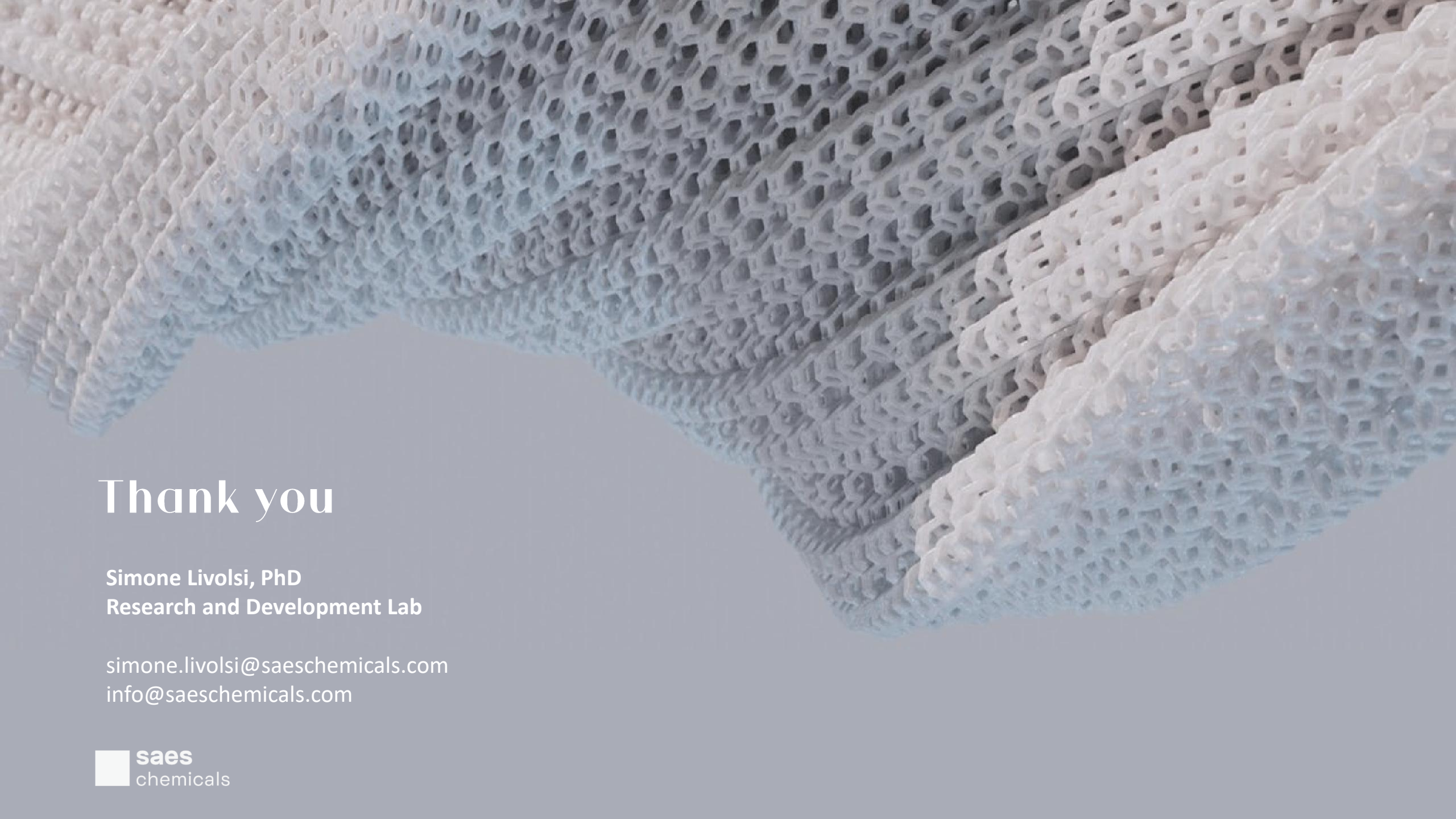
ZeoSAES® Actives

ACTIVE INGREDIENTS



ZeoSAES® Adsorbents

ADSORBENT INGREDIENTS



Thank you

Simone Livolsi, PhD
Research and Development Lab

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