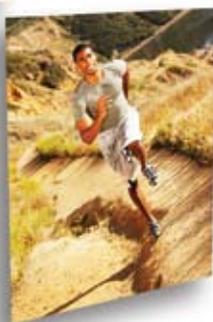


Escalol® S UV Absorber

Your formulation 'keystone' for broad-spectrum protection, long-lasting protection



More than ever, consumers and regulatory agencies are focused on the potential damage of UVA radiation to skin and to overall health. The major trend in sun protection is toward **broad spectrum protection** – from both UVA and UVB radiation. Escalol S, based on HydroxyPhenyl Triazine chemistry, represents a highly efficient technology that acts as the 'keystone' for the broad range of ingredients that make up an effective sun care formulation.

Escalol S offers protection in both the UVA and UVB ranges of the light spectrum in a single ingredient. In particular, it provides photostable, effective, and long-lasting protection against UVA radiation. Escalol S can boost the performance and the stability of commonly used UV filters. Its synergies with other filters can offer higher sun protection factor (SPF) ratings for UVB radiation, or photostability for longer-lasting UVA protection.

Cosmetically elegant, easy to formulate, and highly efficient, Escalol S is an ideal ingredient upon which to base your UV protection packages.

Applications

- Long-lasting sunscreens
- Aerosol, spray and gel applications
- Anti-aging/firming creams and day creams
- Multipurpose products, such as bronzing agents and insect repellants
- Decorative cosmetics with UV claims
- Light oil/water (O/W) formulations



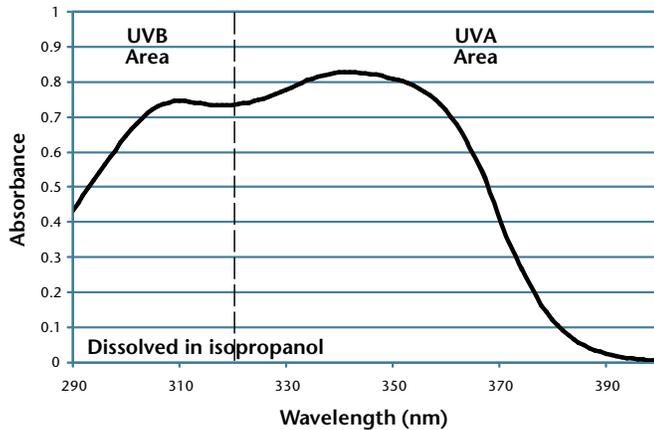
Features and Benefits

- Provides broad-spectrum UVB/UVA absorption
- Highly photostable for long-lasting protection
- Boosts SPF
- Oil soluble for highly water-resistant formulations
- Ease of formulation
- Excellent compatibility with cosmetic ingredients
- Highly efficient, cost-effective in use
- Safe for daily use in cosmetic applications

Reaching across the UV spectrum

Although UVB waves can burn the epidermis. Less visibly damaging UVA waves penetrate the dermis and hypodermis, accumulate over time, and have been shown to accelerate skin aging, suppress the immune response, and increase the risk of developing skin cancer.

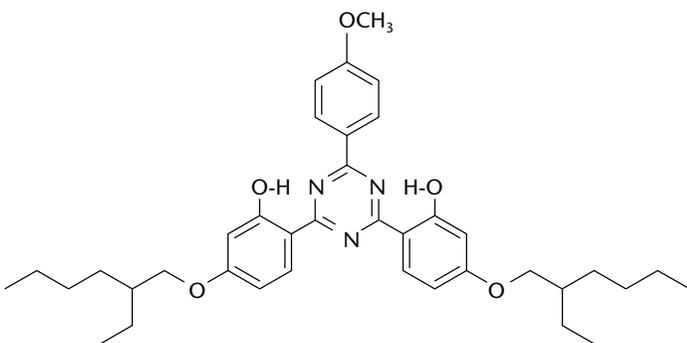
Absorbs short - and long - wave radiation



Twin absorption peaks provide broad-spectrum protection.

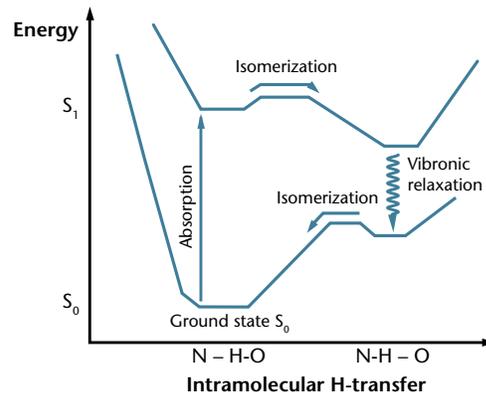
Escalol S filters ultraviolet radiation across a broad spectrum – both short-wave UVB radiation (290-320 nm) and long-wave UVA radiation (320-400 nm). The innovative asymmetrical molecular design enables this dual absorption through two absorption peaks.

Designed for performance



Asymmetry of the Escalol S molecule enables twin absorption peaks.

The cycle of photostability



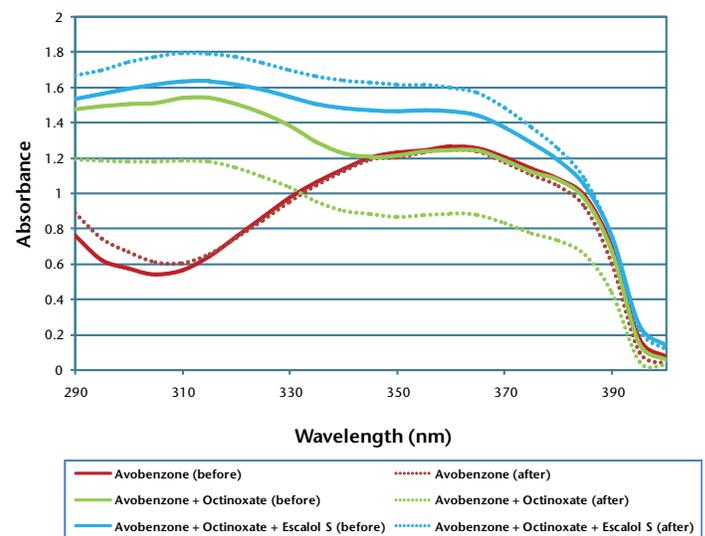
Escalol S achieves photostability by absorbing harmful UVB and UVA radiation through ongoing cycles of internal conversion followed by vibronic relaxation; isomerization occurs via intramolecular H transfer.

Synergies

Photostabilizes the UVA absorber Avobenzene

Escalol S stabilizes the highly effective but highly unstable UVA absorber Avobenzene (BMBM,) resulting in better photostability. Escalol S proves particularly significant as a formulation keystone when Avobenzene (BMBM) is combined with the UVB absorber EMHC.

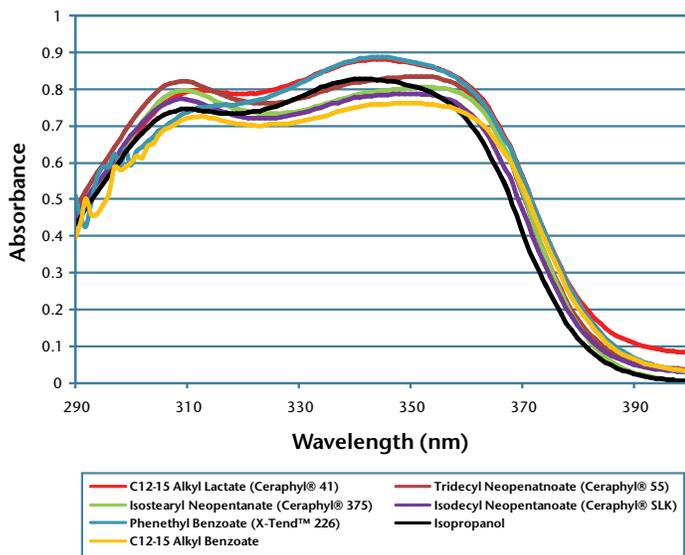
Effect of Escalol S on the photostability of Avobenzene in Phenethyl Benzoate after 10 MEDs



The levels of sunscreen filters were as follows (w/w): 3% Avobenzene, 7.5% Octinoxate, and 5% Escalol S

When Escalol S is combined with Avobenzene and EMHC, as shown, it provides broad spectrum protection, boosts UVA absorption, and provides improved photostability.

Solvent effects on Escalol S



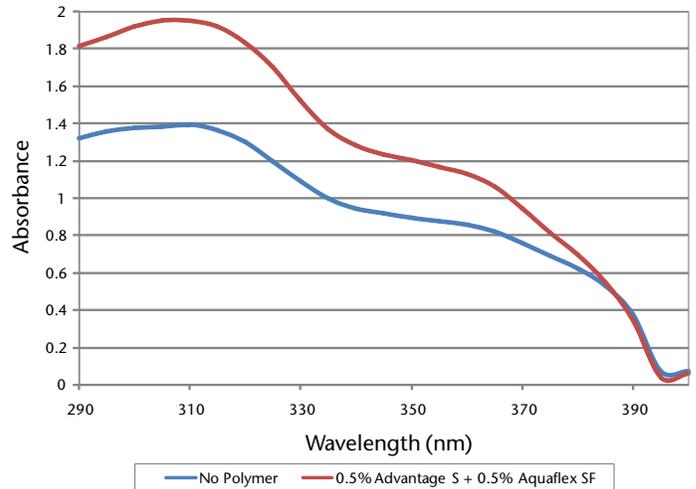
| TRADE NAME | INCI NAME | 1ST PEAK | | 2ND PEAK | | λ_c | SOL. @ 25° C |
|---------------|--------------------------|-----------------|------------------------|-----------------|------------------------|-------------|--------------|
| | | λ_{MAX} | EXT. COEFF. E (1%/1CM) | λ_{MAX} | EXT. COEFF. E (1%/1CM) | | |
| X-Tend™ 226 | Phenethyl Benzoate | 345 | 798 | 299 | 573 | 368 | 34% |
| Isopropanol | Isopropanol | 342 | 780 | 310 | 702 | 365 | |
| Finsolv TN | C12-15 Alkyl Benzoate | 348 | 765 | 313 | 731 | 368 | 13% |
| Ceraphyl® SLK | Isodecyl Neopentanoate | 351 | 761 | 309 | 746 | 366 | 5% |
| Ceraphyl® 41 | C12-15 Alkyl Lactate | 344 | 757 | 313 | 684 | 369 | 6% |
| Ceraphyl® 55 | Tridecyl Neopentanoate | 350 | 734 | 309 | 722 | 367 | 4% |
| Ceraphyl® 375 | Isostearyl Neopentanoate | 353 | 731 | 310 | 723 | 366 | |

When solubilized in a range of commonly used sunscreen solvents, Escalol S retains its twin-peak UV absorption capability, as shown above. A number of popular solvents further boost the performance of Escalol S at various wavelengths across the UV spectrum.

Formulating with Escalol S

Escalol S is fully conjugated and highly stable. With two ethylhexyl substituents, the Escalol S molecule dissolves readily in cosmetic oils. It is particularly suited to light O/W formulations, including popular aerosols and sprays.

In combination with the Advantage® S and ISP Aquaflex® SF-40 polymers, Escalol S actually performs better, particularly in the UVB range of the spectrum, as shown.



In anhydrous spray formulations, the inclusion of film-forming polymers can boost the UV absorption performance of Escalol S.

As a keystone UV filter, Escalol S is highly absorbent, high-performing, and safe. It is suited to a range of daily use cosmetics, such as sunscreens, day creams, and multipurpose products.

Escalol S has been approved in most countries (except for the pending US approval) for use as a sunscreen active in a concentration of up to 10%. Common use concentrations in cosmetic products range from 1 to 3%. Solubilize Escalol S by adding it directly into the oil phase and heating to 80°C.



Escalol® S UV Absorber

Technology for optimal performance

Overview

| | |
|-------------------|--|
| Chemical name | 2,2'-[6-(4-methoxyphenyl)-1,3,5-triazine-2,4-diyl]bis(5-[(2-ethylhexyl)oxy]phenol) |
| INCI name | Bis-Ethylhexyloxyphenol Methoxyphenyl Triazine |
| USAN name | Bemotrizinol |
| CAS number | 187393-00-6 |
| Molecular formula | C ₃₈ H ₄₉ N ₃ O ₅ |
| Molecular weight | 627.80 g/mol |

Physical properties

| | |
|-----------------------|----------------------|
| Appearance | Light yellow powder |
| Odor | Trace characteristic |
| Assay | 98% min. |
| Absorption (1%, 1 cm) | 790 min. |

Handling/Safety

Please refer to the MSDS

Guidelines for use

- Approved in most countries (except for the pending US approval) for use as a sunscreen active in a concentration of up to 10%.
- Common use concentration in cosmetic products is 1 to 3%
- Soluble in polar cosmetic oils
- Solubilize Escalol S by adding it directly into the oil phase and heating to 80°C

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