

TECHNICAL DATA SHEET

Product Name: Octocrylene

INCI Name: Octocrylene

CAS: 6197-30-4

Chemical Category: Organic aromatic ester (cyanoacrylate derivative)

Functional Categories: UV filter; UV filter photostabilizer

IUPAC Name: 2-ethylhexyl 2-cyano-3,3-diphenylacrylate

Description: Octocrylene is a lipophilic organic UV filter used in cosmetic formulations to protect the skin from UVB radiation, with partial absorption in the short-wave UVA spectrum. Chemically, it is a stable aromatic ester with a cyanoacrylate structure, which provides good resistance to photodegradation and makes it a key component of modern sun protection systems. Its ability to absorb UV energy and convert it into heat occurs without significant molecular breakdown, thereby maintaining product efficacy during sun exposure. In formulations, it plays a pronounced role as a photostabilizer, particularly in combination with UV filters that are more prone to degradation, such as avobenzone. The presence of octocrylene helps extend their protective function and improves the overall stability of the UV system. Due to its lipophilic nature, it is easily incorporated into the oil phase of emulsions, oil gels, and anhydrous products, while also contributing to the sensory profile by providing smoothness and improved spreadability. Octocrylene is particularly valued in formulations intended for daily skin protection, sports products, and water-resistant formulations, as it demonstrates good resistance to wash-off and remains in the upper layers of the skin. It does not function as a classical emollient, but contributes to a smooth skin feel without leaving a greasy residue. At properly balanced concentrations, it shows good tolerability, although in formulations intended for sensitive areas, such as the area around the eyes, it is used cautiously and at lower concentrations due to potential irritation in highly reactive skin. In cosmetic development, octocrylene is regarded as a functionally stable and technologically reliable raw material, especially in complex SPF formulations where long-lasting protection, UV filter stability, and consistent performance are required.

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Physicochemical Properties: Octocrylene, in its pure form, is a clear to slightly yellowish viscous liquid, a property important for formulators as it enables easy dosing and uniform distribution in the oil phase of cosmetic products. The substance is lipophilic and practically insoluble in water, while exhibiting good solubility in oils, ester emollients, and other organic solvents commonly used in SPF formulations. This property directly influences emulsion stability and compatibility with other lipophilic UV filters. The relative density of octocrylene at 25°C falls within a narrow range, indicating consistent quality across batches and suppliers. The refractive index is relatively high, which is characteristic of aromatic esters and serves as a useful parameter for identification and quality control in laboratory conditions. The molecular weight is 361.48 g/mol, and its chemical structure provides strong resistance to UV radiation without rapid chemical degradation. Octocrylene exhibits very good photostability, meaning it retains its chemical structure and UV absorption capacity during sun exposure. This property makes it suitable for long-lasting sun protection products. The UV absorption maximum lies in the UVB region, with partial overlap into the short-wave UVA spectrum, which is used as one of the criteria for its identification and purity confirmation. Chromatographic purity is high, with strictly controlled levels of individual and total impurities, which is important from both safety and regulatory perspectives. From a chemical standpoint, octocrylene is stable over a wide pH range typical for cosmetic formulations and does not show a tendency toward hydrolysis under normal storage and usage conditions. Acidity is low and tightly defined by specifications, contributing to compatibility with other active and auxiliary ingredients. Due to its stability, physicochemical profile, and predictable behavior in formulations, octocrylene is considered a technologically reliable raw material, particularly for customers seeking consistent quality, good product stability, and extended shelf life of SPF products.

Benefits:

- Absorbs UVB radiation and effectively reduces the risk of sunburn
- Contributes to partial protection against short-wave UVA radiation
- Enhances photostability of other UV filters, especially avobenzone
- Maintains stability during sun exposure without significant degradation
- Improves water resistance of formulations and maintains protection after water contact
- Easily incorporated into the oil phase, facilitating stable SPF formulations
- Provides a smooth, non-greasy skin feel and improved spreadability

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Method of Use: Octocrylene is incorporated exclusively into the oil phase in cosmetic formulations due to its lipophilic nature and water insolubility. During emulsion preparation, it is added together with oils, emollients, and other lipophilic UV filters, typically in the heating phase, where it dissolves easily and distributes uniformly. In anhydrous systems, such as oil-based products or balms, it is added directly to the base with mild heating and mixing until complete homogenization. It is stable within the typical cosmetic pH range and compatible with most emulsifiers and auxiliary ingredients used in SPF formulations. In sunscreens and lotions, it is typically used at concentrations of 5–10%, depending on the target SPF and combination with other UV filters. In daily skincare products with SPF, such as day creams and fluids, typical concentrations range from 2–7%, where it functions both as a UVB filter and a system photostabilizer. In decorative cosmetics with SPF (foundations, BB/CC creams, lip products), it is used at lower concentrations, typically 1–5%, to provide additional UV protection without overloading the formulation. In water-resistant and sports formulations, higher concentrations within regulatory limits are often used to enhance film stability on the skin. In products intended for sensitive areas, such as the area around the eyes, it is used cautiously and at lower concentrations, typically up to 3%, with careful balancing of the overall UV system to improve tolerability.

Combinations with Other UV Filters: Octocrylene is rarely used alone in practice, but rather as part of a balanced UV system due to its high compatibility with most organic UV filters and its contribution to formulation stability. It is most commonly combined with avobenzene, where it plays a key role as a photostabilizer by slowing its degradation under UV exposure and enabling reliable UVA protection over time. This combination is one of the most widely used in modern broad-spectrum SPF formulations. It is also frequently used with Ethylhexyl Triazone and Bis-Ethylhexyloxyphenol Methoxyphenyl Triazine, where octocrylene contributes to UVB absorption and system stability, while these filters extend protection into the UVA range. Such combinations allow achieving high SPF values with relatively lower individual filter concentrations, improving product tolerability. In formulations with Homosalate, Ethylhexyl Salicylate, or Octyl Methoxycinnamate, octocrylene acts synergistically in the UVB range, enhancing overall protection efficiency and contributing to a more uniform protection profile. It also plays a technological stabilizing role by reducing the risk of degradation and performance loss during storage and use. In advanced formulations that include inorganic UV filters such as coated titanium dioxide or zinc oxide, octocrylene is used as a complementary component of the organic UV system. In such systems, it improves sensory

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properties and reduces whitening, while mineral filters provide physical reflection and scattering of UV radiation. Overall, octocrylene is considered a “linking” UV filter in formulations, as it connects UVB and UVA protection, enhances the stability of other active filters, and provides formulators with greater flexibility in designing effective and regulatory-compliant SPF products.

Animal Testing: In accordance with current European regulations (Regulation (EC) No. 1223/2009 on cosmetic products), the substance has not been tested on animals. Safety assessment is based on available toxicological data, scientific literature, and validated alternative testing methods (in vitro and in silico). “In silico” refers to testing and evaluation methods performed using computer models and simulations, rather than on living organisms (in vivo) or cell cultures (in vitro). This statement confirms compliance with the ban on animal testing and is provided for informational purposes regarding further use of the ingredient in cosmetic formulations.

GMO: Non-GMO

Vegan: Does not contain ingredients of animal origin