# UV Filters

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**Eastern Petroleum Private Limited**

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# UV Filters

OMC, Octyl Salicylate, Homosalate, Avobenzone, Benzophenone 3, Benzophenone 4, Ethylhexyl Triazone, Octocrylene

**Introduction:**

UV lters are used to manufacture personal care products to protect our skin from detrimental ultraviolet radiation. It has the ability to prevent skin defacement caused by exposure to UVA & UVB lights by absorbing or reecting UV Rays. UV lters are used in cosmetics, sunscreens and moisturizers that work as a shield against sunburns, premature ageing and skin cancer. To ensure safety and eectiveness in consumer products, it is regulated in many countries.

**Application:**

- **Facial Creams & Moisturizers:** These products contain lower SPF ratings but still provide considerable protection from daily exposure to sunlight and photoaging caused by UVA rays.
- **Sunscreens and Sunblocks:** These products consist of UVA and UVB lters which oer comprehensive protection against the full range of ultraviolet radiations.
- **Foundations Beauty Balms / Color Correctors Creams and Lip Care Products :** UV lters are also added to cosmetic products like Beauty Balms and Color Correctors creams or foundations and extensively safeguard sensitive skin from damage.
- **Hair Care Products:** Consumption of UV Filters in the hair care segment like conditioners, shampoos and hair sprays have been growing steadily to prevent sun-related damages like fading colour, loss of shine in hair and deterioration in the quality of hair proteins.

**Typical Characterisitcs:**

- **Absorption of UV Radiation:** UV lters acts as a shield by blocking UV radiation from entering into the skin either by reecting, absorbing or scattering the UV radiation. They provide a shield against UVA and UVB radiation which contributes to premature skin ageing and sunburns.
- **Wide-Range protection:** Our Avobenzone and Octocrylene have the ability to provide complete protection by blocking UVA & UVB radiation respectively.
- **Photostability:** This is the property that determines the stability of UV Filters when exposed to direct sunlight. Example: Avobenzone can deteriorate under direct sunrays unless it is stabilised by other ingredients such as Octocrylene.
- **Safety and Compatibility:** UV Filters should not cause any adverse eects for continuous skin exposure. There should not be any irritation or allergic reaction and they should have the tendency not to block the pores. Example: Benzophenone is considered to be safe for all skin types. Various UV Filters can be used in diverse formulations to impart all-around stability and skin-friendly performance.

**Packing:**

Material can be packed in 25 kg drums, 200 kg / 220 kg / 235 kg HDPE drums as per customer requirement.

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# PRODUCTS AND ITS FEATURES

| Sr. No. | Product Name | CAS Number | Features | Recommended usage for Cosmectis & OTC Formulations |
|---|---|---|---|---|
| 1 | Octylmethoxy Cinnamate (OMC) | 5466-77-3 | Octylmethoxy Cinnamate (OMC), commonly referred to as Octinoxate, eectively absorbs UVB rays within the range of 280-320 nm. This ingredient is generally stable when exposed to sunlight, though it may undergo degradation over time, particularly at elevated concen-trations. Its stability makes OMC a popular choice in sunscreen formulations, as it helps provide reliable protection against sun damage. | Between 2 - 10% |
| 2 | Octyl Salicylate | 118-60-5 | Octyl Salicylate is a derivative formed from salicylic acid and 2-ethylhexanol. This compound eectively absorbs UVB rays (280–320 nm), thus helping to shield the skin from sunburn and various forms of UV-induced damage. Its inclusion in sunscreen formulations aids in providing a protective barrier against harmful radiation. By ltering out UVB light, it plays a crucial role in skincare products aimed at preventing sun-related skin issues. | Between 5 - 10% |
| 3 | Homosalate | 118-56-9 | Homosalate mainly absorbs UVB radiation (280–320 nm), which is linked to sunburns and certain forms of skin cancer. It provides a protective barrier against harmful UVB rays, but it oers minimal defense against UVA radiation. | Not more than 10% |
| 4 | Avobenzone | 0356-09-01 | Avobenzone, a potent UVA lter, is susceptible to degradation when exposed to sunlight. To improve its stability it's often combined with other stabilizers like Octocrylene. This makes Avobenzone a preferred option in formulations thereby replacing inorganic sunscreens like zinc oxide and titanium dioxide. | Between 3 - 5% |
| 5 | Benzophenone 3 | 131-57-7 | Benzophenone-3, also referred to as Oxybenzone, is an organic compound that oers protection against sun damage by absorbing UVB rays (280–320 nm) and a portion of UVA rays (320–400 nm). This helps prevent skin issues such as sunburn and DNA damage caused by excessive sun exposure. | Between 6 - 10% |
| 6 | Benzophenone 4 | 4065-45-6 | Benzophenone-4 serves as a UV lter that safeguards the skin from both UVA and UVB radiation damage. This dual role enhances the eectiveness and longevity of products that contain this ingredient, making it a valuable component in sun protection products and other cosmetics. | Between 6 - 10% |
| 7 | Ethyl Hexyl Triazone | 88122-99-0 | Ethyl Hexyl Triazone is a synthetic organic compound used as a UV lter in sunscreens and other cosmetic formulations. It primarily absorbs UVB radiation, making it eective for protecting the skin from sunburn and other harmful eects associated with UV exposure. One of its notable characteristics is its excellent photostability, which allows it to maintain its protective properties even when exposed to sunlight. This stability enhances the overall ecacy of sun-screen products. | Not more than 0.5% |
| 8 | Octocrylene | 6197-30-4 | Octocrylene is primarily responsible for absorbing UVB rays in the range of 280-320 nm, while also demonstrating some capability to absorb UVA radiation from 320-400 nm. This characteristic makes it a valuable component for achieving broad-spectrum sun protection. By incorporating Octocrylene into sunscreen formulations, users can benet from enhanced defence against both types of ultraviolet rays. Its dual absorption properties contribute to a more comprehensive shield against sun damage. | Between 2 - 10% |

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# UV Filters & it's Specifications

## OMC

| Test | Specifications |
|---|---|
| Appearance | Colourless to light yellow clear liquid. |
| Specific Gravity D25/25 | 1.005 – 1.013 |
| Refractive Index nD20 | 1.542 – 1.548 |
| Acid value | Max 1.0 mg KOH/gm |
| Saponification value | Min 189 mg KOH/gm |
| Assay by GC | 95.0 – 105% |
| Purity by GC | Min 98.0% |
| Related substances by GC | a) Any individual impurity : Max 0.5%<br>b) Total impurities : Max 2.0% |

## Octyl Salicylate

| Test | Specifications |
|---|---|
| Appearance | Clear Colorless pale yellow liquid |
| Odor | Mild, characteristic odor |
| Acid Value, mg KOH/gm | Not more than 1 |
| Purity by GC, % | Min. 99 |
| 2-Ethyl hexanol content, ppm | Max. 100 |
| Specific Gravity at 25°C | 1.011-1.016 |
| Refractive Index at 20°C | 1.500-1.503 |

## Homosalate

| Test | Specifications |
|---|---|
| Appearance | Colorless to pale yellow liquid |
| Identification by GC (Assay) | The retention time of main peak of test sample should be match with that of standard, as obtained in the Assay |
| Specific Gravity D25/25 | 1.049 – 1.053 |
| Refractive Index nD20 | 1.516 – 1.519 |
| Assay by GC | Min 90 – 110% |
| Purity by GC | Min 99.0% (sum of isomers) |

## Avobenzone

| Test | Specifications |
|---|---|
| Appearance | White to pale yellow crystalline powder |
| Identification by GC (Assay) | The retention time of main peak of test sample should be match with that of standard, as obtained in the Assay |
| Loss on drying | Max 0.5 % |
| Assay By GC | 95.0 – 105.0 % (on dried basis) |
| Related substances by GC | a) Any individual impurity :Max 3.0%<br>b) Total impurities :Max 4.5% |

## Benzophenone 3

| Test | Specifications |
|---|---|
| Appearance | Paly Yellow Powder |
| Solubility | Freely Soluble in Alcohol and Toluene Practically insoluble in water |
| Congealing Temp | NLT 62°C |
| Losson drying | Dry a Sample in vacuum at 40°C 2 hr – NMT 2.0% |
| Assay (BYHPLC) | Not less than 97.0% and NMT 10.30% calculated on dried basis |

## Benzophenone 4

| Test | Specifications |
|---|---|
| Appearance | Very Pale Yellow, Fine Free Flowing powder, free of foreign impurities |
| Absorptivity (Water) | 46Min@286nm |
| Solubility | Clear Solution (5gm in 100 ml water) |
| Purity (ByHPLC Dry Base Tested) | 99 % (Min) |
| Moisture content | Less than 3% |

## Ethyl Hexyl Triazone

| Test | Specifications |
|---|---|
| Appearance | White to light yellow powder |
| Odors | Light Characteristic |
| Melting Point (°C) | 123 – 132 °C |
| Moisture content by KF% w/w | Not more than 0.5% |
| Colour (Gardner) (10gin/100 irl Acetone) | Max. 3.0 |
| Clromatographic purity by HPLC | NLT 98.0 % |

## Octocrylene

| Test | Specifications |
|---|---|
| Appearance | Yellow color viscous liquid |
| Specific gravity at 25°C | Between 1.045 to 1.055 |
| Refractive index at 20°C | Between 1.561 to 1.571 |
| Chromatographic Purity<br>a. Single Max impurity<br>b. Total impurities | <br>Not more than 0.5%<br>Not more than 2.0% |
| Specific Absorption (303nm, 1cm, 1% Methanol) | Between 340 & 370 |
| Assay | Between 95 to 105 % |
| Benzophenone Content | Less than 500 ppm |

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