The most important products available for countering the harmful effects of the sun’s rays, preventing the signs of premature aging, wrinkles and skin damage as well as loss of hair colour, are UV-absorbing filters or sunscreens. Vivimed offers some of the most widely used and effective UV filters for the Personal Care market to help reduce the damaging effects of the sun and provide colour-fade protection for dyed hair, as well as in-bottle stability against photo-oxidation of formulations, to help prolong shelf life. Our range of UV-filters provides the performance needed to meet the exacting demands of the personal care market.

### On skin:
Exposure to damaging ultraviolet light from the sun’s rays accounts for 90% of the symptoms of premature skin ageing such as wrinkles and skin cancers. UV-A radiation is linked with the loss of skin elasticity, wrinkling and the signs of premature ageing, whilst the more powerful UV-B radiation is linked to sunburn, cell damage and cancer risk. Vivimed active UV-filters in an effective skin care formulation will minimise damage caused by harsh sun. For this reason many of today’s anti-aging creams contain UV-absorbers as a first line of defence.

### On hair:
UV radiation plays a major role in the photo-damage of hair. Shorter wavelength, more powerful UV-B radiation penetrates the hair cuticle, resulting in a loss of natural hair colour and tensile strength. Exposure to UV-A radiation can cause a significant reduction in the vibrancy and depth of colour of dyed hair. Vivimed active UV-filters will minimise damage caused by harsh sun.

### In-product protection:
UV-filters help to prevent personal care products from photo-oxidation. This preserves colour, appearance, formulation stability and prolongs product shelf life, particularly for highly coloured products in clear packaging.

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**Vivimed UV-filters**

<table>
<thead>
<tr>
<th>UV Filter</th>
<th>Name</th>
<th>CAS No.</th>
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<tbody>
<tr>
<td>Avis</td>
<td>Avobenzone</td>
<td>CAS 70356-09-1</td>
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<tr>
<td>Ben-3</td>
<td>Benzophenone-3</td>
<td>CAS 131-57-7</td>
</tr>
<tr>
<td>Ben-4</td>
<td>Benzophenone-4</td>
<td>CAS 4065-45-6</td>
</tr>
<tr>
<td>Etone</td>
<td>Ethylhexyl triazone</td>
<td>CAS 88122-99-0</td>
</tr>
<tr>
<td>Octyne-b</td>
<td>Octocrylene</td>
<td>CAS 88122-99-0</td>
</tr>
<tr>
<td>Vivsonic</td>
<td>PBSA</td>
<td>CAS 27503-81-7</td>
</tr>
</tbody>
</table>

![Fig.1: UV-absorption spectra](attachment:fig1.png)
Ben-3
- Broad-spectrum UV-A and UV-B filter
- Oil-soluble for hair and skincare products.
- Used in sun care skin creams for decorative cosmetics with sun protection factor (SPF)
- Preservative (UV-filter) for UV-sensitive preparations.

Ben-4
- Water-soluble UV-A and UV-B filter for hair and skincare products.
- For formulating high SPF suncreams.
- Acts as stabiliser in polyacrylic acid gel formulations to protect against degradation.
- Helps protect the colour and integrity of water-based personal care formulations, particularly those in clear packaging.

Guide formulation:
**Water-resistant sunscreen with SPF-30**

<table>
<thead>
<tr>
<th>SPF-30 Sunscreen</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.M. Water</td>
<td>70</td>
</tr>
<tr>
<td>Carborner (TR1 + ELT-10)</td>
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</tr>
<tr>
<td>Triethanolamine</td>
<td>q.s.</td>
</tr>
<tr>
<td>Glycerol Monostearate</td>
<td>2.0</td>
</tr>
<tr>
<td>Emulsifying wax</td>
<td>1.0</td>
</tr>
<tr>
<td>Alkyl benzoate C12-14</td>
<td>5.0</td>
</tr>
<tr>
<td>Cetyl Alcohol</td>
<td>2.0</td>
</tr>
<tr>
<td>Ben-3 Benzophenone-3</td>
<td>3.0</td>
</tr>
<tr>
<td>Avis Butyl methoxydibenzoylmethane</td>
<td>4.0</td>
</tr>
<tr>
<td>Etone Ethylhexyl triazone</td>
<td>1.0</td>
</tr>
<tr>
<td>Ethylhexyl methoxycinnamate (GMC)</td>
<td>7.5</td>
</tr>
<tr>
<td>Cosvat Chlorophenesin</td>
<td>0.3</td>
</tr>
<tr>
<td>Propylene glycol</td>
<td>2.0</td>
</tr>
<tr>
<td>Dimethicone</td>
<td>1.0</td>
</tr>
<tr>
<td>Allantoin</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Fig.2: absorption range guide

**Etone**
- Highly effective UV-B filter for skincare formulations.
- Sun creams, oils, lotions, lipsticks, etc.
- Enables Formulating of high SPF products.
- Excellent wash-off resistance for sun creams.
- Very high stability to intense UV-exposure.
- Approved for use in Japan and the EU.

**Avis**
- Broad spectrum UV-A & UV-B filter, oil soluble
- General skincare formulations;
  - Suncreams, make-up creams, hand and face lotions, medicated and moisturising creams.
- Protects skin from damaging UV radiation.
- Protective hair care preparations.
- Photo-oxidation preventative.
- Most effective when used with secondary photostabiliser.

**Octyne-b**
- General skincare formulations;
  - Suncreams, hand and face lotions, anti-aging creams.
- Absorbs in the UV-B and short UV-A range
- Oil-soluble, water-resistant
- Acts as UV-stabiliser for other sunscreen actives to boost performance

**Viv sonic**
- Efficient UV-B absorber for general suncreams, daily skin care and anti-aging formulations
- Water-soluble for light non-greasy feel
- Use in combination with UV-A filter for high SPF suncreams

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