Uvinul® light stabilizers

<table>
<thead>
<tr>
<th>range</th>
<th>Uvinul® 3008</th>
<th>benzophenone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uvinul® 3026</td>
<td>benzotriazole</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 3027</td>
<td>benzotriazole</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 3028</td>
<td>benzotriazole</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 3029</td>
<td>benzotriazole</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 3030</td>
<td>cyanoacrylate</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 3033 P</td>
<td>benzotriazole</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 3034</td>
<td>benzotriazole</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 3035</td>
<td>cyanoacrylate</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 3039</td>
<td>cyanoacrylate</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 3434 C</td>
<td>UV absorber, HALS, antioxidant (blend)</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 4050 H</td>
<td>sterically hindered amine, monomeric</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 4077 H</td>
<td>sterically hindered amine, monomeric</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 4092 H</td>
<td>sterically hindered amine, monomeric</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 5050 H</td>
<td>sterically hindered amine, oligomeric</td>
</tr>
<tr>
<td></td>
<td>Uvinul® 5062 H</td>
<td>sterically hindered amine, oligomeric</td>
</tr>
</tbody>
</table>
**Uvinul® 3008**

**chemical class**
benzophenone

**chemical name**
2-hydroxy-4-octyloxybenzophenone

**CAS number**
1843-05-6

**molecular structure**

![Molecular Structure](image)

**molecular mass**
326 g/mol

**physical form**
yellowish powder

**melting point**
48–49 °C (118–120 °F)

**density (20 °C [68 °F])**
1.16 g/cm³

**absorbance spectrum**
(0.2 g/l in acetonitrile, d = 1 mm)

![Absorbance Spectrum](image)

**solubility**
(20 °C [68 °F], % m/m)

<table>
<thead>
<tr>
<th>Solvent</th>
<th>Absorbance</th>
</tr>
</thead>
<tbody>
<tr>
<td>acetone</td>
<td>43</td>
</tr>
<tr>
<td>chloroform</td>
<td>61</td>
</tr>
<tr>
<td>ethanol</td>
<td>4</td>
</tr>
<tr>
<td>ethyl acetate</td>
<td>44</td>
</tr>
<tr>
<td>n-hexane</td>
<td>12</td>
</tr>
<tr>
<td>methanol</td>
<td>2</td>
</tr>
<tr>
<td>methylene chloride</td>
<td>67</td>
</tr>
<tr>
<td>toluene</td>
<td>&gt; 50</td>
</tr>
<tr>
<td>water</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

**application**
The main applications are LLDPE und LDPE/EVA-films as well as PVC and HDPE applications. In polyolefins it is recommended to combine Uvinul® 3008 with a HALS.
Uvinul® 3026

chemical class  
benzotriazole

chemical name  
6-tert-butyl-2-(5-chloro-2H-benzotriazole-2-yl)-4-methylphenol

CAS number  
3896-11-5

molecular structure

![Molecular Structure](image)

molecular mass  
316 g/mol

physical form  
yellowish powder

melting point  
138–141 °C (280–286 °F)

density (20 °C [68 °F])  
1.32 g/cm³

absorbance spectrum  
(0.2 g/l in acetonitrile, d = 1 mm)

![Absorbance Spectrum](image)

solubility  
(20 °C [68 °F], % m/m)

<table>
<thead>
<tr>
<th>Solvent</th>
<th>% m/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>acetone</td>
<td>1</td>
</tr>
<tr>
<td>chloroform</td>
<td>11</td>
</tr>
<tr>
<td>ethyl acetate</td>
<td>2</td>
</tr>
<tr>
<td>n-hexane</td>
<td>1</td>
</tr>
<tr>
<td>methylene chloride</td>
<td>9</td>
</tr>
<tr>
<td>methanol</td>
<td>0.1</td>
</tr>
</tbody>
</table>

application  
It is recommended to combine Uvinul® 3026 with a HALS when used in polyolefins. It can also be used in polyester, PMMA and RIM-PU.
**Uvinul® 3027**

**chemical class**
benzotriazole

**chemical name**
2,4-di-tert-butyl-6-(5-chloro-2H-benzotriazole-2-yl)-phenol

**CAS number**
3864-99-1

**molecular structure**

![Molecular Structure](image)

**molecular mass**
358 g/mol

**physical form**
yellowish powder

**melting point**
154–157 °C (309–315 °F)

**density (20 °C [68 °F])**
1.26 g/cm³

**absorbance spectrum**
(0.2 g/l in acetonitrile, d = 1 mm)

![Absorbance Spectrum](image)

**solubility**
(20 °C [68 °F], % m/m)

<table>
<thead>
<tr>
<th>Solvent</th>
<th>% m/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>acetone</td>
<td>1</td>
</tr>
<tr>
<td>benzene</td>
<td>16</td>
</tr>
<tr>
<td>chloroform</td>
<td>19</td>
</tr>
<tr>
<td>ethyl acetate</td>
<td>5</td>
</tr>
<tr>
<td>n-hexane</td>
<td>4</td>
</tr>
<tr>
<td>methanol</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>methylene chloride</td>
<td>17</td>
</tr>
<tr>
<td>water</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

**application**
Uvinul® 3027 is used in polyolefins, polystyrenes, ABS, PMMA, RIM-PU and polyesters. It can also be used in optical applications requiring radiation of greater wavelength to be absorbed.
**Uvinul® 3028**

**chemical class**
benzotriazole

**chemical name**
2-(2H-benzotriazole-2-yl)-4,6-di-tert-pentylphenol

**CAS number**
25973-55-1

**molecular structure**

![Molecular structure of Uvinul® 3028]

**molecular mass**
352 g/mol

**physical form**
yellowish powder

**melting point**
80–88 °C (176–190 °F)

**density (20 °C [68 °F])**
1.17 g/cm³

**absorbance spectrum**
(0.2 g/l in acetonitrile, d = 1 mm)

![Absorbance spectrum of Uvinul® 3028]

**solubility**
(20 °C [68 °F], % m/m)

<table>
<thead>
<tr>
<th>Solvent</th>
<th>% m/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetone</td>
<td>6</td>
</tr>
<tr>
<td>Benzene</td>
<td>39</td>
</tr>
<tr>
<td>Chloroform</td>
<td>44</td>
</tr>
<tr>
<td>Cyclohexane</td>
<td>15</td>
</tr>
<tr>
<td>Ethyl acetate</td>
<td>16</td>
</tr>
<tr>
<td>n-Hexane</td>
<td>16</td>
</tr>
<tr>
<td>Methanol</td>
<td>0.4</td>
</tr>
<tr>
<td>Water</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

**application**
Uvinul® 3028 is used in polyolefins, PS, ABS, POM, PMMA, PA and PUR.
**Uvinul® 3029**

**chemical class**
benzotriazole

**chemical name**
2-(2H-benzotriazole-2-yl)-4-(1,1,3,3-tetramethylbutyl)-phenol

**CAS number**
3147-75-9

**molecular structure**

![Molecular Structure](image)

**molecular mass**
323 g/mol

**physical form**
yellowish powder

**melting point**
103–105 °C (217–221 °F)

**density**
(20 °C [68 °F])
1.18 g/cm³

**absorbance spectrum**
(0.2 g/l in acetonitrile, d = 1 mm)

![Absorbance Spectrum](image)

**solubility**
(20 °C [68 °F], % m/m)

<table>
<thead>
<tr>
<th>Solvent</th>
<th>Solubility</th>
</tr>
</thead>
<tbody>
<tr>
<td>acetone</td>
<td>9</td>
</tr>
<tr>
<td>benzene</td>
<td>32</td>
</tr>
<tr>
<td>chloroform</td>
<td>37</td>
</tr>
<tr>
<td>ethyl acetate</td>
<td>15</td>
</tr>
<tr>
<td>n-hexane</td>
<td>6</td>
</tr>
<tr>
<td>methanol</td>
<td>0.6</td>
</tr>
<tr>
<td>methylene chloride</td>
<td>38</td>
</tr>
<tr>
<td>water</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

**application**
Uvinul® 3029 is particularly suitable for the protection of polycarbonates.
Uvinul® 3030

**chemical class**
cyanoacrylate

**chemical name**
1,3-bis-[2’-cyano-3’,3’-diphenylacryloyloxy]-2,2-bis-[[2’-cyano-3’,3’-diphenylacryloyloxy]methyl]-propane

**CAS number**
178671-58-4

**molecular structure**

![Molecular Structure](image)

**molecular mass**
1,061 g/mol

**physical form**
white crystalline powder

**melting point**
175–178 °C (347–352 °F)

**density (20 °C [68 °F])**
1.2 g/cm³

**absorbance spectrum**
(0.2 g/l in acetonitrile, d = 1 mm)

![Absorbance Spectrum](image)

**solubility**
(20 °C [68 °F], % m/m)

<table>
<thead>
<tr>
<th>Solvent</th>
<th>% m/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>butanone</td>
<td>0.2</td>
</tr>
<tr>
<td>methanol</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>methyl ethyl ketone</td>
<td>7</td>
</tr>
<tr>
<td>toluene</td>
<td>0.8</td>
</tr>
<tr>
<td>water</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

**application**
Uvinul® 3030 is a UV absorber having maximal thermal stability and minimal volatility. Therefore, it can be used to stabilize polymers with high extrusion temperatures. Besides PA and PET, Uvinul® 3030 is especially suitable for stabilizing polycarbonates due to the good compatibility with the production process and excellent stabilizing effect.
Uvinul® 3033 P

chemical class
benzotriazole

chemical name
2-(2H-benzotriazole-2-yl)-4-methylphenol

CAS number
2440-22-4

molecular structure
![Molecular Structure](image_url)

molecular mass
225 g/mol

physical form
yellowish powder

melting point
128–132 °C (262–270 °F)

density (20 °C [68 °F])
1.38 g/cm³

absorbance spectrum
(0.2 g/l in acetonitrile, d = 1 mm)

<table>
<thead>
<tr>
<th>Solubility</th>
<th>Acetone</th>
<th>Benzene</th>
<th>Chloroform</th>
<th>Cyclohexane</th>
<th>Ethyl Acetate</th>
<th>n-Hexane</th>
<th>Methanol</th>
<th>Methylene Chloride</th>
<th>Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>% m/m (20 °C [68 °F])</td>
<td>3</td>
<td>7</td>
<td>13</td>
<td>1</td>
<td>3.5</td>
<td>0.8</td>
<td>0.2</td>
<td>16</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

application
Uvinul® 3033 P can be used in various polymers, e.g., in PVC, PS, SAN, ASA, ABS, PET, PMMA and PUR.
**Uvinul® 3034**

**chemical class**
benzotriazole

**chemical name**
2-(2H-benzotriazole-2-yl)-4,6-bis(1-methyl-1-phenylethyl)phenol

**CAS number**
70321-86-7

**molecular structure**

![Molecular Structure](image)

**molecular mass**
448 g/mol

**physical form**
yellowish powder

**melting point**
137–141 °C (279–286 °F)

**density** (20 °C [68 °F])
1.22 g/cm³

**absorbance spectrum**
(0.2 g/l in acetonitrile, d = 1 mm)

![Absorbance Spectrum](image)

**solubility**
(20 °C [68 °F], % m/m)

<table>
<thead>
<tr>
<th>Solvent</th>
<th>Solubility</th>
</tr>
</thead>
<tbody>
<tr>
<td>acetone</td>
<td>2</td>
</tr>
<tr>
<td>chloroform</td>
<td>35</td>
</tr>
<tr>
<td>cyclohexane</td>
<td>5</td>
</tr>
<tr>
<td>ethanol</td>
<td>0.3</td>
</tr>
<tr>
<td>ethyl acetate</td>
<td>4</td>
</tr>
<tr>
<td>n-hexane</td>
<td>0.6</td>
</tr>
<tr>
<td>methanol</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>methylene chloride</td>
<td>34</td>
</tr>
<tr>
<td>toluene</td>
<td>20</td>
</tr>
<tr>
<td>water</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

**application**
Uvinul® 3034 suitable for application in PET, PA, PC, PMMA, TPU as well as PP films.
**Uvinul® 3035**

**chemical class**
cyanoacrylate

**chemical name**
ethyl-2-cyano-3,3-diphenylacrylate

**CAS number**
5232-99-5

**molecular structure**

![Molecular structure of Uvinul® 3035]

**molecular mass**
277 g/mol

**physical form**
white crystalline powder

**melting point**
95–100 °C (203–212 °F)

**density (20 °C [68 °F])**
1.16 g/cm³

**absorbance spectrum**
(0.2 g/l in acetonitrile, d = 1 mm)

![Absorbance spectrum of Uvinul® 3035]

**solubility**
(20 °C [68 °F], % m/m)
- ethyl acetate: 35
- methanol: 7
- methyl ethyl ketone: 27
- toluene: 31
- water: < 0.01

**application**
Uvinul® 3035 is particularly suitable for the stabilization of PVC, PA and ABS. It can also be used in PS, polyesters and PUR.
**Uvinul® 3039**

- **Chemical Class**: cyanoacrylate
- **Chemical Name**: (2-ethylhexyl)-2-cyano-3,3-diphenylacrylate
- **CAS Number**: 6197-30-4

**Molecular Structure**

![Molecular Structure of Uvinul® 3039](image)

- **Molecular Mass**: 361 g/mol
- **Physical Form**: slightly yellowish clear liquid
- **Melting Point**: –8 °C (18 °F)
- **Density (20 °C [68 °F])**: 1.05 g/cm³

**Absorbance Spectrum**

(0.2 g/l in acetonitrile, d = 1 mm)

![Absorbance Spectrum](image)

**Miscibility**

(20 °C [68 °F], % m/m)

<table>
<thead>
<tr>
<th>Miscible</th>
<th>Not Miscible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl acetate</td>
<td>Miscible</td>
</tr>
<tr>
<td>Methanol</td>
<td>Miscible</td>
</tr>
<tr>
<td>Methyl ethyl ketone</td>
<td>Miscible</td>
</tr>
<tr>
<td>Toluene</td>
<td>Miscible</td>
</tr>
<tr>
<td>Water</td>
<td>Not Miscible</td>
</tr>
</tbody>
</table>

Uvinul® 3039 is compatible with all common plasticizers.

**Application**

Due to its good compatibility with plasticizers, Uvinul® 3039 is particularly suitable for the stabilization of PVC-p and PVC plastisols. It can also be used in PUR, polyesters and PMMA.
Uvinul® 3434 C

**chemical class**
liquid blend consisting of UV absorber, HALS and antioxidant

**physical form**
light yellowish liquid

**boiling point**
> 150 °C (302 °F)

**density (20 °C [68 °F])**
1.00 g/cm³

**miscibility (20 °C [68 °F], % m/m)**
- ethyl acetate: miscible
- methanol: miscible
- methyl ethyl ketone: miscible
- toluene: miscible
- water: not miscible

**application**
Uvinul® 3434 C is a blend developed in particular for application in PUR where it exhibits an excellent stabilizing effect. Being liquid it is easily incorporated into PUR systems.
**Uvinul® 4050 H**

**chemical class**  
sterically hindered amine, monomeric

**chemical name**  
N,N'-bisformyl-N,N'-bis-(2,2,6,6-tetramethyl-4-piperidinyl)-hexamethylenediamine

**CAS number**  
124172-53-8

**molecular structure**

![Molecular structure of Uvinul® 4050 H](image)

**molecular mass**  
450 g/mol

**physical form**  
white crystalline powder

**melting point**  
155–160 °C (311–320 °F)

**density (20 °C [68 °F])**  
1.08 g/cm³

**solubility (20 °C [68 °F], % m/m)**

<table>
<thead>
<tr>
<th>Solvent</th>
<th>% m/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>acetone</td>
<td>0.3</td>
</tr>
<tr>
<td>chloroform</td>
<td>6</td>
</tr>
<tr>
<td>ethyl acetate</td>
<td>0.3</td>
</tr>
<tr>
<td>n-hexane</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>methanol</td>
<td>11</td>
</tr>
<tr>
<td>methyl ethyl ketone</td>
<td>6</td>
</tr>
<tr>
<td>water</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**application**  
Uvinul® 4050 H is suitable for the stabilization of polyolefins, particularly in thick-walled PP molding and PP fibers, as well as ABS, PA and polyesters. Combined with UV absorbers it is also used in PS, ABS and PA.
Uvinul® 4077 H

chemical class  
sterically hindered amine, monomeric

chemical name  
bis-(2,2,6,6-tetramethyl-4-piperidyl)-sebacate

CAS number  
52829-07-9

molecular structure

![Molecular Structure](attachment://molecular_structure.png)

molecular mass  
481 g/mol

physical form  
white crystalline powder

melting point  
81–85 °C (178–185 °F)

density (20 °C [68 °F])  
1.05 g/cm³

solubility  
(20 °C [68 °F], % m/m)
<table>
<thead>
<tr>
<th>Solvent</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>acetone</td>
<td>19</td>
</tr>
<tr>
<td>chloroform</td>
<td>45</td>
</tr>
<tr>
<td>ethyl acetate</td>
<td>24</td>
</tr>
<tr>
<td>n-hexane</td>
<td>5</td>
</tr>
<tr>
<td>methanol</td>
<td>38</td>
</tr>
<tr>
<td>methylene chloride</td>
<td>56</td>
</tr>
<tr>
<td>water</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

application  
Uvinul® 4077 H is suitable for the stabilization of polyolefins, particularly in PP molding. Combined with UV absorbers it is also used in PA, SAN and PS.
**Uvinul® 4092 H**

**chemical class**
sterically hindered amine, monomeric

**chemical name**
bis-(1,2,2,6,6-pentamethyl-4-piperidyl)-sebacate + methyl-(1,2,2,6,6-pentamethyl-4-piperidyl)-sebacate

**CAS number**
41556-26-7 + 82919-37-7

**molecular structure**

![Molecular structure of Uvinul® 4092 H](image)

**molecular mass**
509 g/mol + 370 g/mol

**physical form**
slightly yellowish clear liquid

**density (20 °C [68 °F])**
0.99 g/cm³

**solubility (20 °C [68 °F], % m/m)**
- acetone: > 50
- chloroform: > 50
- cyclohexane: > 50
- ethanol: > 50
- ethyl acetate: > 50
- n-hexane: > 50
- methanol: > 50
- methylene chloride: > 50
- toluene: > 50
- water: < 0.01

**application**
Uvinul® 4092 H is a liquid light stabilizer used in PVC-p, PUR and styrenics as well as in liquid colors.
Uvinul® 5050 H

**chemical class**
sterically hindered amine, oligomeric

**CAS number**
152261-33-1

**molecular structure**

![Molecular Structure](image)

**molecular mass**
3,000–4,000 g/mol

**physical form**
yellowish pellets

**drop point**
> 110 °C (230 °F)

**density (20 °C [68 °F])**
0.99 g/cm³ ± 5 %

**solubility (20 °C [68 °F], % m/m)**
- tetrahydrofuran: > 40
- toluene: > 40
- water: < 0.01

**application**
Uvinul® 5050 H can be used in all polyolefins. It is particularly suitable for water-cooled tape production, films containing PPA and TiO₂, and agricultural applications. It can also be used in PVC, PA and TPU as well as in ABS and PET.

**processing**
Uvinul® 5050 H is supplied in pellet form. In order to achieve a homogenous distribution it is necessary to follow this temperature program in batch production:

<table>
<thead>
<tr>
<th></th>
<th>PP</th>
<th>PE (HD and LD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>feeding zone</td>
<td>&lt; 50 °C (122 °F)</td>
<td>&lt; 50 °C (122 °F)</td>
</tr>
<tr>
<td>heating zone 1</td>
<td>80 °C (176 °F)</td>
<td>80 °C (176 °F)</td>
</tr>
<tr>
<td>kneading zone</td>
<td>200–240 °C (392–464 °F)</td>
<td>180–220 °C (356–428 °F)</td>
</tr>
</tbody>
</table>

This temperature program yields best homogenization at high throughput.
**Uvinul® 5062 H**

**chemical class**  
sterically hindered amine, oligomeric

**CAS number**  
65447-77-0

**molecular structure**

![Molecular structure of Uvinul® 5062 H](image)

**molecular mass**  
3,100–4,000 g/mol

**physical form**  
white crystalline powder

**melting point**  
50–70 °C (68–158 °F)

**density**  
(20 °C [68 °F]) 1.22 g/cm³

**solubility**  
(20 °C [68 °F], % m/m)

<table>
<thead>
<tr>
<th>Solvent</th>
<th>% m/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>acetone</td>
<td>4</td>
</tr>
<tr>
<td>chloroform</td>
<td>&gt; 40</td>
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<tr>
<td>ethanol</td>
<td>0.08</td>
</tr>
<tr>
<td>ethyl acetate</td>
<td>3</td>
</tr>
<tr>
<td>n-hexane</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>methanol</td>
<td>0.05</td>
</tr>
<tr>
<td>methylene chloride</td>
<td>&gt; 40</td>
</tr>
<tr>
<td>toluene</td>
<td>15</td>
</tr>
<tr>
<td>water</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

**application**  
Uvinul® 5062 H can be used as a stabilizer for polyolefins and PA.
Safety

When handling these products, advice and information given in the safety data sheet must be complied with. Further, protective and workplace hygiene measures adequate for handling chemicals must be observed.

Note

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights, etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed.