Product Range
Photoinitiators & UV Curing

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Lambson’s world renowned SpeedCure range encompasses both single component and specialist formulated photoinitiator products for UV free radical and cationic curing of resins, varnishes, coatings and inks. Lambson’s SpeedCure photoinitiators are valued for their applicability across all key UV curing technologies ranging from protective coatings, adhesives and printing inks to automotive, electronics and food packaging industries.

Lambson’s UviCure range includes cycloaliphatic epoxy resins, which are the key component of epoxy coatings valued for their high adhesion, low shrinkage and chemical resistance. The UviCure range also includes specialist oxetane resins which are used in conjunction with cycloaliphatic epoxy resins and provide benefits like increased speed of cure, hardness and improved adhesion to difficult substrates.

<table>
<thead>
<tr>
<th>TYPE I PHOTOINITIATORS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydroxyacetophenones</td>
<td>4-8</td>
</tr>
<tr>
<td>SpeedCure 73</td>
<td>4</td>
</tr>
<tr>
<td>SpeedCure B4</td>
<td>5</td>
</tr>
<tr>
<td>SpeedCure 2959</td>
<td>6</td>
</tr>
<tr>
<td>Speedcure XF5</td>
<td>7</td>
</tr>
<tr>
<td>SpeedCure XFs01</td>
<td>8</td>
</tr>
<tr>
<td>Acetophenones</td>
<td>9</td>
</tr>
<tr>
<td>Speedcure BKL</td>
<td>10-11</td>
</tr>
<tr>
<td>Aminoacetophenones</td>
<td>10</td>
</tr>
<tr>
<td>SpeedCure 97</td>
<td>11</td>
</tr>
<tr>
<td>SpeedCure BDMB</td>
<td>12-15</td>
</tr>
<tr>
<td>Phosphine Oxides</td>
<td>12</td>
</tr>
<tr>
<td>SpeedCure TPO</td>
<td>13</td>
</tr>
<tr>
<td>SpeedCure TPO-L</td>
<td>14</td>
</tr>
<tr>
<td>SpeedCure BPO</td>
<td>15</td>
</tr>
<tr>
<td>SpeedCure XKm</td>
<td>16-23</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TYPE II PHOTOINITIATORS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzophenones</td>
<td>16-23</td>
</tr>
<tr>
<td>SpeedCure BP</td>
<td>16</td>
</tr>
<tr>
<td>SpeedCure MBP</td>
<td>17</td>
</tr>
<tr>
<td>SpeedCure MBB</td>
<td>18</td>
</tr>
<tr>
<td>SpeedCure SG0</td>
<td>19</td>
</tr>
<tr>
<td>SpeedCure BEM</td>
<td>20</td>
</tr>
<tr>
<td>SpeedCure EMK</td>
<td>21</td>
</tr>
<tr>
<td>SpeedCure BMS</td>
<td>22</td>
</tr>
<tr>
<td>SpeedCure PBZ</td>
<td>23</td>
</tr>
<tr>
<td>Thioxanthenes</td>
<td>24-26</td>
</tr>
<tr>
<td>SpeedCure 2-ITX</td>
<td>24</td>
</tr>
<tr>
<td>SpeedCure CPTX</td>
<td>25</td>
</tr>
<tr>
<td>SpeedCure DETX</td>
<td>26</td>
</tr>
<tr>
<td>Benzoyleformates</td>
<td>27</td>
</tr>
<tr>
<td>SpeedCure MBF</td>
<td>27</td>
</tr>
<tr>
<td>AMINE SYNERGISTS</td>
<td>28-30</td>
</tr>
<tr>
<td>Aminobenzoates</td>
<td>28</td>
</tr>
<tr>
<td>SpeedCure EDB</td>
<td>29</td>
</tr>
<tr>
<td>SpeedCure EHA</td>
<td>30</td>
</tr>
<tr>
<td>Tertiary Amine</td>
<td>31</td>
</tr>
<tr>
<td>SpeedCure DMB</td>
<td>31</td>
</tr>
<tr>
<td>POLYMERIC PHOTOINITIATORS</td>
<td>32-35</td>
</tr>
<tr>
<td>Polymetric Benzophenones</td>
<td>32</td>
</tr>
<tr>
<td>SpeedCure 7005</td>
<td>32</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POLYMERIC PHOTOINITIATORS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polymeric Thioxanthenes</td>
<td>33-35</td>
</tr>
<tr>
<td>SpeedCure 7008</td>
<td>33</td>
</tr>
<tr>
<td>SpeedCure 7010</td>
<td>34</td>
</tr>
<tr>
<td>SpeedCure 7010-L</td>
<td>35</td>
</tr>
<tr>
<td>Polymeric Amine Synergant</td>
<td>36</td>
</tr>
<tr>
<td>SpeedCure 7040</td>
<td>36</td>
</tr>
<tr>
<td>Formulated Polymeric Products</td>
<td>37</td>
</tr>
<tr>
<td>SpeedCure XFLM01</td>
<td>37</td>
</tr>
<tr>
<td>FORMULATED PHOTOINITIATORS</td>
<td>38-44</td>
</tr>
<tr>
<td>PRODUCTS</td>
<td></td>
</tr>
<tr>
<td>SpeedCure XFc</td>
<td>38</td>
</tr>
<tr>
<td>SpeedCure XFd</td>
<td>39</td>
</tr>
<tr>
<td>SpeedCure XFw</td>
<td>40</td>
</tr>
<tr>
<td>SpeedCure XFw</td>
<td>41</td>
</tr>
<tr>
<td>SpeedCure 2022</td>
<td>42</td>
</tr>
<tr>
<td>SpeedCure 2100</td>
<td>43</td>
</tr>
<tr>
<td>SpeedCure 4265</td>
<td>44</td>
</tr>
<tr>
<td>SPECIALITY PHOTOINITIATORS</td>
<td>45-50</td>
</tr>
<tr>
<td>PRODUCTS</td>
<td></td>
</tr>
<tr>
<td>SpeedCure BCIM</td>
<td>45</td>
</tr>
<tr>
<td>SpeedCure VLT</td>
<td>46</td>
</tr>
<tr>
<td>SpeedCure 8001</td>
<td>47</td>
</tr>
<tr>
<td>SpeedCure 8002</td>
<td>48</td>
</tr>
<tr>
<td>SpeedCure PDO</td>
<td>49</td>
</tr>
<tr>
<td>SpeedCure EAQ</td>
<td>50</td>
</tr>
<tr>
<td>CATIONIC PHOTOINITIATORS</td>
<td>51-54</td>
</tr>
<tr>
<td>Iodonium Salts</td>
<td></td>
</tr>
<tr>
<td>SpeedCure 937</td>
<td>51</td>
</tr>
<tr>
<td>SpeedCure 938</td>
<td>52</td>
</tr>
<tr>
<td>SpeedCure 938D</td>
<td>53</td>
</tr>
<tr>
<td>SpeedCure 939</td>
<td>54</td>
</tr>
<tr>
<td>Sulfonium Salts</td>
<td>55-58</td>
</tr>
<tr>
<td>SpeedCure 976</td>
<td>55</td>
</tr>
<tr>
<td>SpeedCure 976s</td>
<td>56</td>
</tr>
<tr>
<td>SpeedCure 976D</td>
<td>57</td>
</tr>
<tr>
<td>SpeedCure 992</td>
<td>58</td>
</tr>
<tr>
<td>CATIONIC RESINS</td>
<td></td>
</tr>
<tr>
<td>Cycloaliphatic Epoxides</td>
<td>59-60</td>
</tr>
<tr>
<td>UviCure S105 &amp; S105E</td>
<td>59</td>
</tr>
<tr>
<td>UviCure S128</td>
<td>60</td>
</tr>
<tr>
<td>Oxetanes</td>
<td>61-65</td>
</tr>
<tr>
<td>UviCure S130</td>
<td>61</td>
</tr>
<tr>
<td>UviCure S140</td>
<td>62</td>
</tr>
<tr>
<td>UviCure S150</td>
<td>63</td>
</tr>
<tr>
<td>UviCure S160</td>
<td>64</td>
</tr>
<tr>
<td>UviCure S170</td>
<td>65</td>
</tr>
</tbody>
</table>
Type I Photoinitiators

Hydroxyacetophenones

Speed Cure 73
Chemical Name: 2-hydroxy-2-methyl-1-phenylpropanone
CAS Number: 7473-98-5
EC Number: 231-272-0
Molecular Weight: 164.2

General Information
Speedcure 73 is a highly efficient, widely used Type I photoinitiator. Radicals are formed by an α-cleavage mechanism and as such Speedcure 73 does not require an amine synergist to promote radical production. The radicals formed can rapidly initiate the photopolymerisation of suitable acrylate oligomers and other monomer formulations.

Suggested levels of use are 0.5–5% w/w Speedcure 73 (dependent on formulations and applications).

UV Spectrum

Physical Properties
Appearance: Clear colourless to yellowish liquid
Assay: 98% min
E₁ at λ 244 nm: 646 (Solvent: methanol)

Applications
• Clear Coatings
• Overprint varnishes
• Wood lacquers
• Adhesives
• Silicone based coatings
• Printing Inks

Hydroxyacetophenones

Speed Cure 84
Chemical Name: 1-hydroxycyclohexyl phenyl ketone
CAS Number: 947-19-3
EC Number: 231-426-9
Molecular Weight: 204.3

General Information
Speedcure 84 is a highly efficient, widely used Type I photoinitiator. Radicals are formed by an α-cleavage mechanism and as such Speedcure 84 does not require an amine synergist to promote radical production. The radicals formed can rapidly initiate the photopolymerisation of suitable acrylate oligomers and other monomer formulations.

Suggested levels of use are 0.5–5% w/w Speedcure 84 (dependent on formulations and applications).

UV Spectrum

Physical Properties
Appearance: White crystalline powder
Assay: 99 % min
Melting range: 46-50°C min
Loss on drying: 0.5% w/w max
E₁ at λ 244 nm: 480 (Solvent: methanol)

Applications
• Clear Coatings
• Overprint varnishes
• Wood lacquers
• Adhesives
• Silicone based coatings
• Printing Inks
**Type I Photoinitiators**

### Hydroxyacetophenones

#### SpeedCure 2959

**Chemical Name:** 1-[4-(2-hydroxyethoxy)-phenyl]-2-hydroxy-2-methyl-1-propane-1-one  
**CAS Number:** 106797-53-9  
**EC Number:** 402-670-3  
**Molecular Weight:** 224.3

**General Information**

Speedcure 2959 is a highly reactive Type I photoinitiator which will induce the rapid photopolymerisation of systems comprising unsaturated monomers and prepolymers when exposed to UV light.

Suggested levels of use are 2.0-5.0% w/w Speedcure 2959, based on resin weight.

**UV Spectrum**

![UV Spectrum]

**Physical Properties**

- **Appearance:** White to off white powder  
- **Assay:** 98.0% min  
- **Melting range:** 86-90°C  
- **Loss on drying:** 0.50% w/w max  
- **E\text{t} at λ 219 nm:** 474 (Solvent: methanol)  
- **E\text{t} at λ 275 nm:** 722 (Solvent: methanol)

**Applications**

- UV curing of unsaturated monomers and prepolymers  
- Used in waterborne systems based on acrylate or unsaturated polyester resins  
- Used in non direct contact food packaging where minimum residual odour is required  
- Used on all types of substrates; wood, metal, plastic and paper

#### SpeedCure XFs

**Chemical Name:** Oligo(2-hydroxy-2-methyl-1-[4-(1-methylvinyl)phenyl] propanone) & 2-hydroxy-2-methyl-1-phenyl/propanone  
**CAS Number:** 163702-01-0 & 7473-98-5  
**EC Number:** 402-990-3 & 231-272-0  
**Molecular Weight:** 408.5 & 164.2

**General Information**

Speedcure XFs is a liquid photoinitiator specifically developed for use in clear coatings (varnishes and lacquers) for wood, paper, metals and plastics. It is also used in the formulation of adhesives and printing inks.

It is recommended that Speedcure XFs should be used between 0.5% and 5% w/w dependent on the formulation composition, thickness and required cure speed.

**UV Spectrum**

![UV Spectrum]

**Physical Properties**

- **Appearance:** Transparent pale yellow liquid  
- **E\text{t} at λ 252 nm:** ≥ 450 (Solvent: acetonitrile)  
- **Gardner colour:** 7 maximum (Solvent: 20% w/w in acetone)  
- **Loss on drying:** 0.5% maximum

**Applications**

- Clear lacquers  
- Inks  
- Floor coatings  
- Wood coatings  
- Adhesives  
- Printings inks
**Type I Photoinitiators**

### Hydroxyacetophenones

**SpeedCure XFS01**

**Chemical Name:** Oligo[2-hydroxy-2-methyl-1-[4-(1-methylvinyl) phenyl]propanone]

**CAS Number:** 163702-01-0

**EC Number:** 402-990-3

**Molecular Weight:** 408.5

**General Information**

SpeedCure XFS01 is an oligomeric α-hydroxyketone photoinitiator used specifically for the photocuring of clear coatings (varnishes and lacquers) for wood, paper, metals and plastics. The product exhibits high reactivity, low migration, low odour and low yellowing characteristics. The product is usually used at concentrations between 0.5% to 5.0% (by weight) dependent on the formulation being used. SpeedCure XFS01 can also be effectively formulated as an aqueous emulsion especially suitable for waterborne UV curable systems.

**UV Spectrum**

![UV Spectrum](image)

**Physical Properties**

- **Appearance:** Viscous yellow to orange liquid
- **E₁ at λ 258 nm:** ≥ 600 (Solvent: acetonitrile)
- **Gardner colour:** ≤ 7 (Solvent: 20% w/w in acetone)
- **Loss on drying:** ≤ 0.5 % w/w

**Applications**

- Clear lacquers
- Inks
- Floor coatings
- Wood coatings
- Adhesives
- Printings inks

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### Acetophenones

**SpeedCure BKL**

**Chemical Name:** 2,2-dimethoxy-2-phenylacetophenone.

**CAS Number:** 24650-42-8

**Molecular Weight:** 256.3

**General Information**

SpeedCure BKL is a highly efficient, widely used, Type I photoinitiator. The radicals formed by an α-cleavage mechanism rapidly initiate the photopolymerisation of suitable resin formulations.

SpeedCure BKL can be employed in the UV curing of a variety of mono and multifunctional vinyl and acrylic monomers. Suggested levels of use are 0.5–5% w/w Speedcure BKL (quantities vary depending on individual formulations and applications).

**UV Spectrum**

![UV Spectrum](image)

**Physical Properties**

- **Appearance:** White crystalline powder
- **Assay:** 99% min
- **Melting range:** 64-69°C
- **Loss on drying:** 0.5% max
- **E₁ at λ 253 nm:** 447 (Solvent: methanol)

**Applications**

- Printing inks
- Over print varnishes
- Wood lacquers
- Adhesives
- Putties and fillers for particle board and chip board
- Photoresists
- Solder masks
- Optical fibre coatings
Type I Photoinitiators

Aminoacetophenones

**SpeedCure 97**

- **Chemical Name:** 2-methyl-1-[4-(methylthio)phenyl]2-morpholinopropan-1-one
- **CAS Number:** 71868-10-5
- **EC Number:** 400-600-6
- **Molecular Weight:** 279.4

**General Information**

Speedcure 97 is a Type I photoinitiator used to initiate UV photopolymerisation typically with unsaturated monomers and polymers such as acrylates/methacrylates or vinyl polymers.

Speedcure 97 is particularly suitable for pigmented systems due to its UV absorption at 250-350nm.

**Suggested usage levels are:**
- Offset inks: 4-6%
- Screen inks: 2-4%
- Clear coatings: 0.1-1%
- Photo resists: 3-6%

**UV Spectrum**

- **Wavelength (nm) vs. Absorbance**
- **Concentration**:
  - 0.0025%
  - 0.005%
  - 0.01%

**Physical Properties**

- **Appearance:** White powder
- **Assay:** 99% min
- **Melting range:** 70°C min
- **Volatile:** 0.25% w/w max
- **E<sub>λ</sub> at λ 306 nm:** 643 (Solvent: methanol)

**Applications**

- Clear Coatings
- Overprint varnishes
- Wood lacquers
- Adhesives
- Silicone based coatings
- Printing inks

**Aminoacetophenones**

**SpeedCure BDMB**

- **Chemical Name:** 2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone
- **CAS Number:** 119313-12-1
- **EC Number:** 404-360-3
- **Molecular Weight:** 366.5

**General Information**

Speedcure BDMB is a highly reactive Type I photoinitiator and will induce rapid photopolymerisation when exposed to UV light.

Suggested levels of use are 0.5-5% w/w Speedcure BDMB. The product can also be used in conjunction with other coinitiators such as Speedcure 84 or Speedcure BK1L dependent on the system that is being cured.

**UV Spectrum**

- **Wavelength (nm) vs. Absorbance**
- **Concentration**:
  - 0.0002%
  - 0.0005%
  - 0.005%

**Physical Properties**

- **Appearance:** Pale yellow powder
- **Assay:** 99.0% min
- **Melting range:** 110-119°C
- **Loss on drying:** 0.3 % w/w max
- **E<sub>λ</sub> at λ 321 nm:** 679 (Solvent: methanol)

**Applications**

- UV curable screen printing inks
- Varnishes for paper metal and plastics
- Photoresists and solder masks
- UV curable offset printing inks
- Printing plates
- Adhesives
- Electronics
Type I Photoinitiators

Phosphine Oxides

SpeedCure TPO
Chemical Name: 2,4,6-trimethylbenzoyldiphenylphosphine oxide
CAS Number: 75980-60-8
EC Number: 278-355-8
Molecular Weight: 348.38

General Information
Speedcure TPO is an extremely efficient Type I photoinitiator, which absorbs UV light at longer wavelengths, thus making it particularly suitable for curing pigmented formulations. Speedcure TPO undergoes photobleaching during cure, allowing the effective curing of thick films, clears and whites.

UV Spectrum

Physical Properties
Appearance: Pale yellow crystalline powder
Assay: 97% min
Acidity: 4.0 mg KOH/g max (typical 0.3 mg KOH/g)
Melting range: 87-94°C
Loss on drying: 0.2% w/w max
Ash: 0.1% w/w max
Eₙ at λ 267 nm: 64 (Solvent: methanol)
Eₙ at λ 298 nm: 55 (Solvent: methanol)

Applications
• Wood coatings and filler
• Glass fibre reinforced polyester laminates
• Manufacture of printing plates
• Pigmented printing inks

Phosphine Oxides

SpeedCure TPO-L
Chemical Name: Ethyl (2,4,6-trimethylbenzoyl) phenyl phosphinate
CAS Number: 84434-11-7
EC Number: 282-810-6
Molecular Weight: 316.33

General Information
Speedcure TPO-L is a liquid Type I photoinitiator absorbing at 380 nm. Photofragmentation produces benzoyl and phosphinyl radicals that can initiate the polymerisation of formulations containing acrylates, unsaturated polyesters and styrene.

UV Spectrum

Physical Properties
Appearance: Yellow liquid
Assay: 94.5% min
Volatiles: 1% w/w max
Acidity: 1 mg KOH/g max
Eₙ at λ 290 nm: 63 (Solvent: methanol)
Eₙ at λ 274 nm: 74 (Solvent: methanol)
Eₙ at λ 268 nm: 72 (Solvent: methanol)

Applications
• UV offset and flexo inks
• UV photo resists
• White pigmented UV lacquers
• Stereolithography
• UV screen inks
• UV overprint varnishes
Type I Photoinitiators

**Phosphine Oxides**

**SpeedCure BPO**

- **Chemical Name:** Phenyl bis(2,4,6-trimethylbenzoyl)-phosphine oxide
- **CAS Number:** 162881-26-7
- **EC Number:** 423-340-5
- **Molecular Weight:** 418.5

**General Information**

Speedcure BPO is a highly reactive Type I photoinitiator and will induce rapid photopolymerisation when exposed to UV light. It is particularly suitable for white pigmented formulations due to its photobleaching properties.

Suggested levels of use are 0.5–1.0 % w/w Speedcure BPO. The product can also be used in conjunction with other coinitiators dependent on the system that is being cured.

**UV Spectrum**

**Physical Properties**

- **Appearance:** White to yellowish powder
- **Assay:** 98.0 % min
- **Loss on drying:** 0.2 % w/w max
- **Melting point range:** 127–135°C
- **E₁ at λ 281 nm:** 260 (Solvent: methanol)

**Applications**

- White pigmented formulations
- Clear coats for outside use in combination with light stabilizers
- Suitable for thick sections
- Curing of glass fibre reinforced polyester/styrene systems
- Can be used with UV absorbers

**SpeedCure XKm**

- **Chemical Name:** Ethyl[3-benzoyl-2,4,6-trimethylbenzoyl] (phenyl) phosphinate
- **CAS Number:** 1539267-56-5
- **Molecular Weight:** 420

**General Information**

Speedcure XKm combines both Norrish Type I and Type II radical generating mechanisms. In clear and white systems it must be formulated together with an acrylated amine coinitiator. In pigmented formulations, Speedcure XKm should be formulated in combination with an amine synergist (or acrylated amine) and a thioxanthone sensitizer in order to improve cure speed and surface cure.

The product is activated when irradiated with standard LED sources emitting at 365 and 395nm as well as standard mercury, gallium and HUV lamps.

**UV Spectrum**

**Physical Properties**

- **Appearance:** White to off white powder
- **Assay:** 97.0 % min
- **Volatiles:** 0.5 % w/w max
- **Melting point:** 85–92°C
- **E₁ at λ 281 nm:** 6 (Solvent: acetonitrile)

**Applications**

- UV/LED offset and flexo inks
- UV/LED photo resists
- White pigmented UV lacquers
- Stereolithography
- UV screen inks
- UV overprint varnishes
- Printing plates
**Type II Photoinitiators**

### Benzophenones

**SpeedCure BP**
- **Chemical Name:** Benzophenone
- **CAS Number:** 119-61-9
- **EC Number:** 204-337-6
- **Molecular Weight:** 182.2

**General Information**
Speedcure BP is a Type II photoinitiator and when used in conjunction with tertiary amine synergists, initiates the rapid photopolymerisation of suitable resin formulations.

Suggested levels of use are 0.5-1.5% w/w Speedcure BP together with 2-5% w/w amine synergist.

**UV Spectrum**

![UV Spectrum Graph]

**Physical Properties**
- **Appearance:** White flakes
- **Assay:** 99% min
- **Melting point:** 47-51°C
- **Volatiles:** 0.5% max
- **E_1 at λ 252 nm:** 982 (Solvent: methanol)

**Applications**
- Printing inks
- Clear over print varnishes
- Wood varnishes
- Decorative coatings
- Adhesives
- Fibre optics
- Photoresists
- Solder masks

**SpeedCure MBP**
- **Chemical Name:** 4-methylbenzophenone
- **CAS Number:** 134-84-9
- **EC Number:** 205-159-1
- **Molecular Weight:** 196.25

**General Information**
Speedcure MBP is a cost effective photoinitiator suitable for use when benzophenone free formulations are required. It is a free flowing, easy to handle, low dusting, small flaked material.

**UV Spectrum**

![UV Spectrum Graph]

**Physical Properties**
- **Appearance:** White crystalline flakes
- **Assay:** 98% min
- **Loss on drying:** 0.25% w/w max
- **Melting point:** 55-58°C
- **E_1 at λ 259 nm:** 929 (Solvent: methanol)

**Applications**
- Printing inks
- Wood lacquers
- Over print varnishes
- Putties and fillers for particle board and chip board
- Adhesives
- Solder masks
- Optical fibre coatings
- Photoresist films
**Type II Photoinitiators**

**Benzophenones**

**SpeedCure MBB**
- **Chemical Name:** Methyl-2-benzoylbenzoate
- **CAS Number:** 606-28-0
- **EC Number:** 210-112-3
- **Molecular Weight:** 240.3

**General Information**

Speedcure MBB is a low odour photoinitiator which, when used with tertiary amine synergists, initiates the rapid polymerisation of suitable resin formulations.

Suggested levels of use are 0.5 – 5% w/w Speedcure MBB together with 2 – 5% w/w amine synergist (quantities vary depending on individual formulations and applications).

**UV Spectrum**

**Physical Properties**
- **Appearance:** White to off white crystalline powder
- **Assay:** 99% min
- **Loss on drying (60°C):** 0.5 % w/w max
- **Melting point range:** 48 - 54°C
- **E_λ_246 nm:** 650 (Solvent: methanol)

**Applications**
- Printing inks
- Decorative coatings
- Clear over print varnishes
- Food packaging
- Wood varnishes (particularly for indoor uses)

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**Benzophenones**

**SpeedCure 500**
- **Chemical Name:** A mixture of 1-hydroxycyclohexyl phenyl ketone and benzophenone
- **CAS Number:** 947-19-3 & 119-61-9
- **EC Number:** 213-426-9 & 204-337-6

**General Information**

Speedcure 500 is a eutectic liquid mixture of a Type I and a Type II photoinitiators. It is used to initiate the photopolymerisation of unsaturated prepolymers, e.g. acrylates in combination with mono and multifunctional monomers.

**UV Spectrum**

**Physical Properties**
- **Speedcure 84 content:** 45.0–55.0 %
- **Speedcure BP content:** 45.0–55.0 %
- **ε_λ_249 nm:** 733 (Solvent: methanol)

**Applications**
- Clear coatings
- Wood lacquers
- Printing inks
Type II Photoinitiators

Benzophenones

SpeedCure BEM

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS Number</th>
<th>EC Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzophenone</td>
<td>119-61-9</td>
<td>204-337-6</td>
</tr>
<tr>
<td>2-methylbenzophenone</td>
<td>131-58-8</td>
<td>205-032-0</td>
</tr>
<tr>
<td>4-methylbenzophenone</td>
<td>134-84-9</td>
<td>205-159-1</td>
</tr>
</tbody>
</table>

General Information

Speedcure BEM is a highly efficient, liquid, non yellowing photoinitiator blend, which in conjunction with tertiary amine synergists initiates rapid polymerisation of suitable resin formulations.

Suggested levels of use are 0.5–5% w/w Speedcure BEM together with 2–5% amine synergist (dependent on formulations and applications).

UV Spectrum

Physical Properties

Appearance: Clear light yellow liquid

Composition by area % GC:

Benzophenone: 45.0–55.0%
2-methylbenzophenone: 40.0–50.0%
4-methylbenzophenone: 3.0–10.0%

Melting point: 5–10°C
Eν at λ 254 nm: 928 (Solvent: methanol)

Applications

• Printing inks
• Clear overprint varnishes
• Wood varnishes
• Decorative coatings
• Adhesives
• Photoresists
• Solder masks
• Fibre optics

SpeedCure EMK

Chemical Name: 4,4'-bis(diethylenimino)benzophenone

<table>
<thead>
<tr>
<th>General Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speedcure EMK is an efficient UV photoinitiator or hydrogen donor absorbing at 377 nm. It is used primarily in the electronics sector but also has uses in LED curing.</td>
</tr>
</tbody>
</table>

UV Spectrum

Physical Properties

Appearance: Pale yellow solid
Assay: 98% min
Melting point: 92°C min
Moisture content: 0.5 % w/w max
Eν at λ 250 nm: 548 (Solvent: methanol)
Eν at λ 378 nm: 1288 (Solvent: methanol)

Applications

• UV cured resists
• Printing inks
• LED curing
### Type II Photoinitiators

#### Benzophenones

**SpeedCure BMS**

- **Chemical Name:** 4-benzyol-4’-methyldiphenyl sulphide
- **CAS Number:** 83846-85-9
- **EC Number:** 281-064-9
- **Molecular Weight:** 304.4

**General Information**

Speedcure BMS is a highly reactive Type II photoinitiator and will induce rapid photopolymerisation when formulated with a suitable tertiary amine synergist.

Suggested levels of use are 0.2–5% w/w Speedcure BMS together with 2–5% w/w amine synergist when formulated with a suitable tertiary amine synergist.

**UV Spectrum**

![UV Spectrum](image)

**Physical Properties**

- **Appearance:** White powder
- **Assay:** 98% min
- **Loss on drying:** 0.5% max
- **Melting point range:** 75-85°C
- **Ash:** 0.1% max
- **E; at λ 246 nm:** 529 (Solvent: methanol)
- **E; at λ 315 nm:** 606 (Solvent: methanol)

**Applications**

- Printing inks
- Clear over print varnishes
- Adhesives
- Fibre optics
- Decorative coatings

---

**SpeedCure PBZ**

- **Chemical Name:** 4-phenylbenzophenone
- **CAS Number:** 2128-93-0
- **EC Number:** 218-345-2
- **Molecular Weight:** 258.3

**General Information**

Speedcure PBZ is a photoinitiator, which is normally used together with a tertiary amine synergist in the formulation of UV curable coatings.

Suggested levels of use are 0.5–3% w/w Speedcure PBZ together with 2–5% w/w Speedcure EDB or DMB (quantities vary depending on individual formulations and applications).

**UV Spectrum**

![UV Spectrum](image)

**Physical Properties**

- **Appearance:** Off white powder
- **Assay:** 99% min
- **Melting point range:** 99-103°C
- **Ash:** 0.1% max
- **E; at λ 290 nm:** 940 (Solvent: methanol)

**Applications**

- Printing inks
- Wood varnishes
- Over print varnishes
- Decorative coatings
- Adhesives
- Pressure transfer sheets
- Metal primers
- Photoresists
### Type II Photoinitiators

#### Thioxanthenes

**SpeedCure 2-ITX**  
Chemical Name: 2-Isopropylthioxanthone  
CAS Number: 5495-84-1  
EC Number: 226-827-9  
Molecular Weight: 254.3

**General Information**  
SpeedCure 2-ITX is a highly efficient photoinitiator which, when used in conjunction with tertiary amine synergists, induces the rapid photopolymerisation of suitable resin formulations.

Suggested concentrations are 0.25-3% w/w Speedcure 2-ITX together with 2-5% w/w amine synergist such as Speedcure EDB or DMB (quantities vary depending on individual formulations and applications).

**UV Spectrum**

**Physical Properties**  
Appearance: Cream to pale yellow powder  
Assay: 98% min  
Loss on drying: 0.5% w/w max  
E\text{1} at λ 250 nm: 1890 (Solvent: methanol)  
E\text{1} at λ 383 nm: 248 (Solvent: methanol)

**Applications**  
- Printing inks  
- Wood varnishes  
- Decorative coatings  
- Pressure transfer sheets  
- Photoresists

---

**SpeedCure CPTX**  
Chemical Name: 1-chloro-4-propoxymethoxythioxanthone  
CAS Number: 142770-42-1  
EC Number: 415-890-1  
Molecular Weight: 304.79

**General Information**  
Speedcure CPTX is a highly efficient thioxanthone photoinitiator which, when used in conjunction with tertiary amine synergists, induces the rapid photopolymerisation of suitable resin formulations and can also be used in combination with Speedcure 73 to sensitise iodonium salts in cationic cure.

Suggested levels of use are 0.2-3.0% w/w Speedcure CPTX together with 2-5% w/w amine synergist, such as Speedcure EDB or BEDB (quantities may vary depending on individual formulations and applications).

**UV Spectrum**

**Physical Properties**  
Appearance: Yellow crystalline powder  
Assay: 97% min  
Loss on drying: 0.5% w/w max  
Melting point: 99-104°C  
Gardner colour: 11 max (5% w/v in toluene)  
E\text{1} at λ 257 nm: 1281 (Solvent: methanol)  
E\text{1} at λ 314 nm: 318 (Solvent: methanol)  
E\text{1} at λ 389 nm: 205 (Solvent: methanol)

**Applications**  
- Printing inks  
- Wood varnishes  
- Adhesives  
- Decorative coatings  
- Photoresists  
- Sensitisation of iodonium salts  
- Pressure transfer sheets
Type II Photoinitiators

Thioxanthones

SpeedCure DETX

- Chemical Name: 2,4-Diethylthioxanthone
- CAS Number: 82799-44-8
- EC Number: 280-041-0
- Molecular Weight: 268.3

General Information

Speedcure DETX is a highly efficient photoinitiator which, when used in conjunction with tertiary amine synergists, induces the rapid photopolymerisation of suitable resin formulations.

Suggested levels of use are 0.25-3% w/w Speedcure DETX together with 2-5% w/w amine synergist such as Speedcure EDB or DMB (quantities vary depending on individual formulations and applications).

UV Spectrum

Physical Properties

- Appearance: Yellow powder
- Assay (GC): 99% min
- Melting point range: 68-75°C
- Loss on drying: 0.25% w/w max
- Ash: 0.1% w/w max
- E\text{\textsubscript{1}} at λ 222 nm: 535 (Solvent: methanol)
- E\text{\textsubscript{1}} at λ 261 nm: 1751 (Solvent: methanol)
- E\text{\textsubscript{1}} at λ 291 nm: 224 (Solvent: methanol)
- E\text{\textsubscript{1}} at λ 386 nm: 238 (Solvent: methanol)

Applications

- Printing inks
- Wood varnishes
- Decorative coatings
- Adhesives
- Pressure transfer sheets
- Photoresists

Benzoylformates

SpeedCure MBF

- Chemical Name: Methylbenzoylformate
- CAS Number: 15206-55-0
- EC Number: 239-263-3
- Molecular Weight: 164.16

General Information

Speedcure MBF is a highly efficient Type II photoinitiator which does not require an amine synergist. It is ideal for overprint varnish and wood coating applications where excellent surface cure response and non yellowing are the desired properties.

Recommended levels of use are 3-5% w/w clear coatings.

UV Spectrum

Physical Properties

- Appearance: Clear, pale yellow liquid
- Assay: 99% min
- Boiling point (range): 246-250°C
- Density: 1.15-1.17 g/ml
- E\text{\textsubscript{1}} at λ 244 nm: 453 (Solvent: methanol)

Applications

- Wood coatings
- Inks
- High performance over print varnishes
- Industrial coatings
- Adhesives
Amine Synergists

Aminobenzoates

Speed Cure EDB
Chemical Name: Ethyl-4-(dimethylamino)benzoate
CAS Number: 10287-53-3
EC Number: 233-634-3
Molecular Weight: 193.2

General Information
Speed Cure EDB is a highly efficient amine synergist which, when used in conjunction with Type II photoinitiators, generates free radicals that initiate photopolymerisation of suitable resin formulations.

Suggested levels of use are 2–5% w/w Speed Cure EDB together with 0.25–3% w/w photoinitiator such as Speed Cure ITX or DETX (quantities vary depending on individual formulations and applications).

UV Spectrum

Physical Properties
Appearance: White to off white powder
Assay: 98% min
Moisture: 0.2% w/w max
Melting point range: 62–68°C
\( E_1 \) at \( \lambda \) 228 nm: 368 (Solvent: methanol)
\( E_1 \) at \( \lambda \) 310 nm: 1492 (Solvent: methanol)

Applications
• Wood varnishes
• Printing inks
• Over printing varnishes
• Pressure transfer sheets
• Decorative coatings
• Adhesives
• Sealant
• Metal primers
• Photoresists

Aminobenzoates

Speed Cure EHA
Chemical Name: 2-ethylhexyl-4-(dimethylamino)benzoate
CAS Number: 21245-02-3
EC Number: 244-289-3
Molecular Weight: 277.4

General Information
Speed Cure EHA is an efficient amine synergist which, when used in conjunction with Type II photoinitiators, generates free radicals that initiate the photopolymerisation of suitable resin formulations.

Suggested levels of use are 2–5% w/w Speed Cure EHA together with 0.2–3% w/w Speed Cure ITX or BMS (quantities vary depending on individual formulations and applications).

UV Spectrum

Physical Properties
Appearance: Pale yellow liquid
Assay: 98 % min
Gardner colour: 2 max
\( E_1 \) at \( \lambda \) 310 nm: 1084 (Solvent: methanol)
\( E_1 \) at \( \lambda \) 227 nm: 267 (Solvent: methanol)

Applications
• Wood varnishes
• Printing inks
• Pressure transfer sheets
• Decorative coatings
• Adhesives
• Metal primers
• Photoresists
Amine Synergists

Aminobenzoates

SpeedCure BEDB
Chemical Name: 2-butoxyethyl-4-(dimethylamino)benzoate
CAS Number: 67362-76-9
EC Number: 266-668-2
Molecular Weight: 265.4

General Information
Speedcure BEDB is a liquid amine synergist which, when used in conjunction with Type II photoinitiators, generates free radicals capable of initiating the rapid photopolymerisation of suitable resin formulations. Thioxanthone photoinitiators are highly soluble in Speedcure BEDB, affording a single liquid additive.

Suggested levels of use are 2–5% w/w Speedcure BEDB together with 0.25–3% w/w photoinitiator (quantities vary depending on individual formulations and applications).

UV Spectrum

Physical Properties
Appearance: Pale yellow liquid
Assay (Area % GC): 97 % min
E: at λ 311 nm: 1102 (Solvent: methanol)
Volatile: 1% max
Water Content: 0.25% max
EDB content: 0.5% max
2-Butoxy ethanol content: 0.5% max

Applications
• Wood varnishes
• Printing inks
• Overprint varnishes
• Decorative coatings
• Pressure transfer sheets
• Adhesives
• Sealants
• Metal primers
• Photoresists

Tertiary Amine

SpeedCure DMB
Chemical Name: 2-(dimethylamino)ethylbenzoate
CAS Number: 2208-05-1
EC Number: 218-630-1
Molecular Weight: 193.2

General Information
Speedcure DMB is an efficient amine synergist which, when used in conjunction with Type II photoinitiators, generates free radicals that initiate photopolymerisation of suitable resin formulations.

Suggested levels of use are 2–5% w/w Speedcure DMB together with 0.25–3% w/w photoinitiator (quantities vary depending on individual formulations and applications).

UV Spectrum

Physical Properties
Appearance: Pale yellow liquid
Assay: 95% min
Moisture: 0.5% max
Gardner Colour: 2 max
E: at λ 273 nm: 66 (Solvent: methanol)
E: at λ 229 nm: 687 (Solvent: methanol)

Applications
• Printing inks
• Wood varnishes
• Decorative coatings
• Adhesives
• Pressure transfer sheets
• Metal primers
• Photoresists
Polymeric Photoinitiators

Polymeric Benzophenones

SpeedCure 7005
Chemical Name: A mixture of polymeric benzophenones
CAS Numbers: 1003567-82-5 & 1003557-16-1
Molecular Mass: ~1,200 g mol⁻¹.

General Information
Speedcure 7005 is a polymeric photoinitiator suitable for use when benzophenone free formulations are required. It will induce rapid photopolymerisation when formulated with a suitable polymeric tertiary amine synergist, such as Speedcure 7040. Although the product has been developed for low migration systems, the amount of migrating species should be checked by the customer in their final formulations as there are many factors that can affect photoinitiator migration.

UV Spectrum

Physical Properties
Appearance: Off white to pale yellow liquid
Assay: 97.0% min
Loss on drying: 0.5% w/w max (60°C for 3 hours under vacuum)
E₁ at λ 309 nm: 54 (Solvent: methanol)
E₁ at λ 245 nm: 354 (Solvent: methanol)

Applications
• Printing inks
• Wood lacquers
• Over print varnishes
• Putties and fillers for particle board and chip board
• Adhesives
• Solder masks
• Optical fibre coatings
• Photoresist films

Polymeric Thioxanthenes

SpeedCure 7008
Chemical Name: A mixture of polymeric thioxanthenes
CAS Number: 1258512-68-3
Molecular Mass: ~800 g mol⁻¹.

General Information
Speedcure 7008 is a highly efficient polymeric thioxanthone photoinitiator which when used in conjunction with a polymeric tertiary amine synergist such as Speedcure 7040 or an acrylated amine will induce rapid photo polymerisation.

Speedcure 7008 products can also be used to sensitize photoinitiators such as Speedcure BDMB and Speedcure 97 in pigmented systems or iodonium salt photoinitiators in cationic resin systems.

UV Spectrum

Physical Properties
Appearance: Pale yellow powder
Assay: 95% min
Loss on drying: 0.5% w/w max
E₁ at λ 385 nm: 157 (methanol)
E₁ at λ 305 nm: 163 (methanol)
E₁ at λ 259 nm: 763 (methanol)

Applications
• Printing Inks: pigmented and white systems, non direct food contact systems
• Wood Coatings: Varnishes and other clear coatings
• Decorative Coatings: Metal cans and food cartons
• LED Technologies: Long wave absorption between 340 to 410 nm
Polymeric Photoinitiators

Polymeric Thioxanthenes

SpeedCure 7010
Chemical Name: A mixture of polymeric thioxanthenes
CAS Number: 1003567-83-6
Molecular Weight: ~1,830 g mol⁻¹.

General Information
Speedcure 7010 is an efficient low migration polymeric thioxanthone type photoinitiator which when used in conjunction with a polymeric amine synergist such as Speedcure 7040 or an acrylated amine, induces the rapid photopolymerisation of suitable resin formulations. Although the product has been developed for low migration systems, the amount of migrating species should be checked by the customer in their final formulations as there are many factors that can affect photoinitiator migration.

Speedcure 7010 products can also be used to sensitize photoinitiators such as Speedcure BDBM and Speedcure 97 in pigmented systems or iodonium salt photoinitiators in cationic resin systems.

UV Spectrum

Physical Properties
Appearance: Pale yellow free flowing powder
Assay: 97.75% min
Loss on drying: 0.5 % w/w max (60°C for 3 hours under vacuum)
Gardner Colour: 7 max (10% w/v in toluene)
E₁ at λ 384 nm: 127 (Solvent: acetonitrile)
E₁ at λ 312 nm: 201 (Solvent: acetonitrile)
E₁ at λ 257 nm: 793 (Solvent: acetonitrile)

Applications
• Printing Inks: pigmented and white systems, non direct food contact systems
• Wood Coatings: Varnishes and other clear coatings
• Decorative Coatings: Metal cans and food cartons
• LED Technologies: Long wave absorption between 340 to 410 nm

Polymeric Thioxanthenes

SpeedCure 7010-L
Chemical Name: A mixture of polymeric thioxanthenes in trimethylolpropane ethoxylate triacrylate (EO-TMPTA)
CAS Number: 1003567-83-6 and 28961-43-5
Molecular Weight: ~1,800 g mol⁻¹ (polymeric thioxanthone component)

General Information
Speedcure 7010-L is a liquid version of Speedcure 7010 (Speedcure 7010 in EO-TMPTA), designed for ease of formulating.

UV Spectrum

Physical Properties
Appearance: Pale yellow liquid
Strength: ~40% active initiator
E₁ at λ 383 nm: 51 (Solvent: acetonitrile)
E₁ at λ 312 nm: 80 (Solvent: acetonitrile)
E₁ at λ 257 nm: 308 (Solvent: acetonitrile)

Applications
• Printing Inks: pigmented and white systems, non direct food contact systems
• Wood Coatings: Varnishes and other clear coatings
• Decorative Coatings: Metal cans and food cartons
• LED Technologies: Long wave absorption between 340 to 410 nm
Polymeric Photoinitiators

Polymeric Amine Synergist

SpeedCure 7040
Chemical Name: A mixture of polymeric aminobenzoates
CAS Number: 1003567-84-7 & 1003557-17-2
Molecular Weight: 1,040 g mol⁻¹

General Information
Speedcure 7040 is a highly efficient amine synergist which, when used in conjunction with Type II polymeric photoinitiators, generates free radicals that initiate photopolymerisation of suitable resin formulations. Although the product has been developed for low migration systems, the amount of migrating species should be checked by the customer in their final formulations as there are many factors that can affect photoinitiator migration.

UV Spectrum

Physical Properties
Appearance: Pale amber liquid
Assay: 94.5% min (% w/w by difference)
Loss on drying: 0.5% w/w max (105°C for 3 hours under vacuum)
Eₐ: at λ 228 nm: 187 (Solvent: methanol)
Eₐ: at λ 310 nm: 698 (Solvent: methanol)

Applications
- Wood varnishes
- Printing inks
- Over print varnishes
- Pressure transfer sheets
- Decorative coatings for metal cans and food cartons
- Adhesives
- Sealants
- Metal primers
- Photoresists

Formulated Polymeric Products

Speedcure XFLM01
Chemical Name: A mixture of polymeric thioxanthones, polymeric benzophenones and polymeric amine synergists.
CAS Number: 1003567-82-5, 1003557-16-1, 1003567-83-6, 1003567-84-7 & 1003557-17-2

General Information
Speedcure XFLM01 is a low migration formulated photoinitiator product that has been developed by Lambson Limited to benefit food packaging related applications of UV Flexographic, Offset and Screen Printing inks where low migration as a main characteristic is mandatory. Although the product has been developed for low migration systems, the amount of migrating species should be checked by the customer in their final formulations as there are many factors that can affect photoinitiator migration.

It is recommended that Speedcure XFLM01 should be used between 12 and 15% w/w in UV Flexo ink formulations.

UV Spectrum

Physical Properties
Appearance: Transparent yellow to amber liquid
Loss on drying: < 0.75% w/w max (60°C for 3 hours under vacuum)
Eₐ: at λ 255 nm: ~ 200 (Solvent: acetonitrile)
Eₐ: at λ 310 nm: ~ 390 (Solvent: acetonitrile)
Viscosity @ 25°C: ~ 1,850 mPa.s

Applications
Complete curing package for low migration/low odour applications in:
- Printing inks: pigmented and white systems, non direct food contact systems
- Wood Coatings: Varnishes and other clear coatings
- Decorative Coatings: Metal cans and food cartons
- LED Technologies: Long wave absorption between 340 to 410 nm
Formulated Photoinitiators Products

SpeedCure XFc

General Information
SpeedCure XFc is a liquid photoinitiator specifically developed for use in clear coatings such as UV overprint varnishes and lacquers where fast curing and low yellowing are a prerequisite.

The product is completely miscible in all common acrylate and acrylated amine resins including for example TPGDA, DPGDA, TMPTA, EO-Bisphenol A dimethacrylate and HDDA.

It is recommended that Speedcure XFc should be used between 5 and 10% w/w for UV clear systems such as overprint varnishes and lacquers.

UV Spectrum

Physical Properties
- Appearance: Transparent pale yellow liquid
- Viscosity @ 25°C: ~ 2,000 cPs
- Ei at λ 248 nm: ~ 530 (Solvent: acetonitrile)
- Gardner colour: 6 max (Solvent: 20% w/w in acetone)

Applications
- UV overprint varnishes
- Lacquers
- Clearcoats

SpeedCure XFd

General Information
Speedcure XFd is a liquid photoinitiator specifically developed to be highly reactive in dark pigmented systems. The product induces rapid photopolymerisation of suitable resin formulations containing acrylates, unsaturated polyesters and styrene.

The product is completely miscible in all common acrylate and acrylated amine resins including for example TPGDA, DPGDA, TMPTA, EO-Bisphenol A dimethacrylate and HDDA.

It is recommended that Speedcure XFd should be used between 5 and 10% w/w in dark pigmented systems.

UV Spectrum

Physical Properties
- Appearance: Transparent pale yellow liquid
- Viscosity @ 25°C: ~ 3,000 cPs
- Ei at λ 259 nm: ~ 650 (Solvent: acetonitrile)
- Ei at λ 304 nm: ~ 330 (Solvent: acetonitrile)
- Ei at λ 385 nm: ~ 50 (Solvent: acetonitrile)
- GARDNER colour: 6 max (Solvent: 20% w/w in acetone)

Applications
- Highly pigmented systems
SpeedCure XFe

General Information

SpeedCure XFe is a liquid photoinitiator specifically developed for the rapid radiation curing of thick layers typically used in photoresists and printing inks; it is used primarily in the electronics industry.

The product is completely miscible in all common acrylate and acrylated amine resins including for example TPGDA, DPGDA, TMPTA, EO-Bisphenol A dimethacrylate and HDDA.

It is recommended that Speedcure XFe should be used between 5 and 10% w/w for most systems, though this may have to be adjusted in accordance with more specialised requirements.

UV Spectrum

Physical Properties

Appearance: Transparent pale yellow liquid
Viscosity @ 25°C: ~ 3,500 cPs
\( \varepsilon \) at \( \lambda \) 256 nm: ~ 550 (Solvent: acetonitrile)
GARDNER colour: 6 max (Solvent: 20% w/w in acetone)

Applications

• Photo resists
• Printing inks
• Electronics
• Thick layers

SpeedCure XFW

General Information

SpeedCure XFW is a product specifically developed for use in white inks and coatings. It is a liquid Type I photoinitiator which when exposed to UV irradiation will produce free radicals that will initiate the polymerisation of formulations containing acrylates, unsaturated polyesters and styrene.

The product is completely miscible in all common acrylate and acrylated amine resins including for example TPGDA, DPGDA, TMPTA, EO-Bisphenol A dimethacrylate and HDDA.

It is recommended that Speedcure XFW should be used between 5 and 10% w/w for white pigmented UV systems.

UV Spectrum

Physical Properties

Appearance: Transparent pale yellow liquid
Viscosity @ 25°C: ~ 4,500 cPs
\( \varepsilon \) at \( \lambda \) 247 nm: ~ 375 (Solvent: acetonitrile)
GARDNER colour: 6 max (Solvent: 20% w/w in acetone)

Applications

• White pigmented systems
• Inks
• Coatings
Formulated Photoinitiators Products

SpeedCure 2022

General Information
SpeedCure 2022 is an efficient liquid 100% active UV curing formulation based on a mixture of alphahydroxy ketone and acylphosphine oxide free radical photoinitiators.

The product is compatible with most organic solvents and monomer systems.

It is recommended that Speedcure 2022 should be used in concentrations between 1 and 4% w/w for the curing of UV clear and pigmented systems including highly opaque furniture coatings and screen inks containing rutile titanium dioxide pigments.

For optimum product performance it is recommended that Speedcure 2022 should be trialled over a concentration range by the customer in their specific formulation.

UV Spectrum

Physical Properties
Appearance: Transparent yellow liquid
Water Content: 0.5% w/w max (Karl Fischer)
ε at λ 243 nm: 552 (Solvent: methanol)
Gardner Colour: ≤ 8
Viscosity: 50 mPa.s
Density: 1.09 g cm⁻³ (20 °C)

Applications
• Balanced surface and depth cure
• Clear systems
• White pigmented systems
• Low yellowing applications

SpeedCure 2100

General Information
SpeedCure 2100 is an efficient 100% active liquid photoinitiator formulation based on a mixture of acylphosphine oxide photoinitiators. This liquid product will provide all of the processing benefits associated with liquid photoinitiators with good compatibility with most organic solvents and resin systems.

Speedcure 2100 can be used alone or formulated with surface cure photoinitiators such as, α-hydroxy ketones for optimal cure. For optimum product performance, it is recommended that Speedcure 2100 should be trialled over a concentration range of 1-5%.

UV Spectrum

Physical Properties
Appearance: Clear viscous yellow liquid
Water Content: 0.5% w/w max (Karl Fischer)
ε at λ 243 nm: 82
Gardner Colour: ≤ 7
Density: ~1.10 g cm⁻³
Viscosity: 1800 mPa.s

Applications
• UV cured systems
• Clear systems
• Pigmented systems
• White pigmented systems
• Low yellowing applications
• Wood coatings
• Varnishes
Formulated Photoinitiators Products

**SpeedCure 4265**

**General Information**
SpeedCure 4265 is an efficient liquid 100% active UV curing formulation based on a mixture of alphahydroxy ketone and acylphosphine oxide free radical photoinitiators. The product is completely miscible in all common acrylate and acrylated amine resins including TPGDA, DPGDA, TMPTA, EO-Bisphenol A dimethacrylate and HDDA.

It is recommended that Speedcure 4265 should be used in concentrations between 2 and 5% w/w for UV clear systems such as overprint varnishes, lacquers and white pigmented ink systems. For optimum product performance it is recommended that Speedcure 4265 should be trialled over a concentration range by the customer in their specific formulation.

**UV Spectrum**

**Physical Properties**
- **Appearance:** Transparent yellow liquid
- **Water Content:** 0.50 % w/w max (Karl Fischer)
- **E at λ 243 nm:** 485 (Solvent: acetonitrile)
- **Gardner Colour:** ≤ 6
- **Viscosity:** 255 mPa.s at 25 °C
- **Density:** 1.11 g cm⁻³ at 20 °C

**Applications**
- Overprint varnishes
- Laquers
- White pigmented systems
- Low yellowing applications

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Speciality Photoinitiators

**SpeedCure BCIM**

**Chemical Name:** 2-(2-chlorophenyl)-1-[2-(2-chlorophenyl)-4,5-diphenyl-2H-imidazol-2-yl]-4,5-diphenyl-1H-imidazole

**CAS Number:** 7189-82-4
**EC Number:** 230-555-6
**Molecular Weight:** 659.6

**General Information**
Speedcure BCIM is a long wavelength absorption photoinitiator often used with leuco dyes for direct write laser imaging. It is insensitive to oxygen and forms stable free radicals which react readily with LCV creating extremely reactive LCV radicals. It can also be formulated with H-donor coinitiators such as thiols to initiate acrylate systems.

**UV Spectrum**

**Physical Properties**
- **Appearance:** Yellow powder
- **Melting range:** > 200°C
- **Assay:** 99% min
- **Loss on drying:** 0.3 % max
- **E at λ 264 nm:** 484 (Solvent: methanol)

**Applications**
- Photoimaging
- Colour forming processes
- Production of resists
Speciality Photoinitiators

**SpeedCure VLT**

**Chemical Name:** Bis(5-cyclopentadienyl)-bis(2,6-difluoro-3-\[(1-pyrrol-1-y1)-phenyl]titanium

**CAS Number:** 125051-32-3

**EC Number:** 412-000-1

**Molecular Weight:** 534.4

**General Information**

Speedcure VLT is a highly reactive photoinitiator based on fluorinated diaryl-cyclopentadienyl titanium complex for radical polymerization of unsaturated resins upon exposure to visible light (daylight) or UV light. It is especially suited for the curing of photopolymers for imaging, specialty adhesive and information storage applications.

Speedcure VLT also acts as an effective sensitizer for diarylidionium type cationic photoinitiators and can therefore be used to promote cure of cationic formulations with visible light.

**UV Spectrum**

<table>
<thead>
<tr>
<th>Wavelength (nm)</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>280</td>
<td>2.5</td>
</tr>
<tr>
<td>330</td>
<td>2.0</td>
</tr>
<tr>
<td>380</td>
<td>1.5</td>
</tr>
<tr>
<td>430</td>
<td>1.0</td>
</tr>
<tr>
<td>480</td>
<td>0.5</td>
</tr>
<tr>
<td>530</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Physical Properties**

**Appearance:** Orange powder

**Assay:** 98% min (HPLC area %)

**Loss on drying:** 0.5 % w/w max (%w/w 105°C for 3 hours under vacuum)

**Melting range:** 160-170°C

**E: at λ 391 nm:** 24 (Solvent: acetonitrile)

**E: at λ 462 nm:** 17 (Solvent: acetonitrile)

**Applications**

- Visible light curing
- Laser cure: Laser direct imaging Argon (488nm) or FD-Nd/YAG (532nm) lasers
- High thickness coatings
- Pressure sensitive adhesives
- Polyimide formulations

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**SpeedCure 8001**

**Chemical Name:** 1-[4-(phenylthio)phenyl]-3-cyclopentylpropane-1,2-dione-2-(O-benzoyloxime)

**CAS Number:** 1206525-75-8

**Molecular Weight:** 443.6

**General Information**

Speedcure 8001 is an oxime ester photoinitiator that has been developed to meet the specific requirements desired for colour filter resists, which are used to produce colour filters.

Speedcure 8001 exhibits high photosensitivity together with no discoloration in the resist formulations, which can provide a significant advantage, especially in the blue colour.

Speedcure 8001 also shows high solubility in typical colour filter resist solvents such as propylene glycol monomethyl ether acetate (PGMEA) and cyclohexanone.
Speciality Photoinitiators

### SpeedCure 8002

**Chemical Name:** 1-[9-(Ethyl-6-(2-methylbenzoyl)-9H-carbazol-3-yl)-3-cyclopentylpropanone-1-(O-acetyloxime)

**CAS Number:** 1227375-90-7

**EC Number:** n/a

**Molecular Weight:** 494.6

#### General Information

Speedcure 8002 is an oxime ester photoinitiator that has been developed to meet the specific requirements desired for colour filter resists, which are used to produce colour filters.

Speedcure 8002 provides extremely high sensitivity and outstanding photocuring performance. Speedcure 8002 can affect photocuring of highly pigmented colour filter resist formulations and high optical density black matrices where photocuring is traditionally very challenging.

#### UV Spectrum

![UV Spectrum Graph]

- **Wavelength (nm):** 210, 260, 310, 360, 410
- **Concentration:**
  - 0.001%
  - 0.002%
  - 0.005%

#### Physical Properties

- **Appearance:** White to off-white powder
- **Assay (HPLC):** 98% min
- **Melting point (range):** 109.0-114.0°C
- **TGA (N2 at 10 °C/min):** 5% weight loss at 250°C
- **Loss on drying:** <0.5 wt%
- **E; at λ 340 nm:** 417 (Solvent: methanol)
- **Solubility in PGMEA:** 12.1 wt% (20°C)
- **Solubility in Cyclohexanone:** 25 wt% (20°C)

#### Applications

- Colour filter resists
- Offset, screen and flexo inks
- Solder resist and etch resists in PCB industry
- Photobase activated systems

### SpeedCure PDO

**Chemical Name:** 1-phenyl-1,2-propanedione-2-(O-ethoxycarbonyl) oxime

**CAS Number:** 65894-76-0

**EC Number:** 265-967-5

**Molecular Weight:** 235.3

#### General Information

Speedcure PDO is a highly reactive Type I photoinitiator absorbing at 259 nm. The excited triplet state undergoes fast fragmentation of the N-O bond to form a highly reactive radical, which is the prime initiator of the polymerisation.

High purity Speedcure PDO is recommended for use in the electronics industry especially where low levels of chloride and metals are required.

#### UV Spectrum

![UV Spectrum Graph]

- **Wavelength (nm):** 210, 260, 310, 360, 410
- **Concentration:**
  - 0.001%
  - 0.002%
  - 0.005%

#### Physical Properties

- **Appearance:** White to pale cream powder
- **Melting point (range):** 58-61°C
- **Assay:** 96% min
- **Moisture:** 0.5% max
- **Sulphated ash:** 0.2% max
- **Chloride:** 5 ppm max
- **Sodium:** 5 ppm max
- **Potassium:** 1 ppm max
- **Iron:** 1 ppm max
- **Copper:** 1 ppm max
- **Calcium:** 1 ppm max
- **E; at λ 259 nm:** 535 (Solvent: methanol)

#### Applications

- Electronics
- Clear coats
- Adhesives
Speciality Photoinitiators

**SpeedCure EAQ**
- **Chemical Name:** 2-Ethyl anthraquinone
- **CAS Number:** 84-51-5
- **EC Number:** 201-535-4
- **Molecular Weight:** 236.27

**General Information**
SpeedCure EAQ is a Type II photoinitiator absorbing at 330 nm. SpeedCure EAQ abstracts hydrogens from the resin backbone of esters and urethanes and does not require an amine synergist. It is widely used in electronics for acid resists where amines cannot be tolerated.

**UV Spectrum**

![UV Spectrum](image)

**Physical Properties**
- **Appearance:** Pale yellow powder
- **Melting point:** ≥ 107-111°C
- **Assay:** ≥ 99.0 %
- **E<sub>c</sub> at λ 256 nm:** 208% (Solvent: methanol)
- **E<sub>c</sub> at λ 327 nm:** 227 (Solvent: methanol)

**Applications**
- Electronics
- Acid etch resists
- Printing inks

Cationic Photoinitiators

**Iodonium Salts**

**SpeedCure 937**
- **Chemical Name:** Bis(4-dodecylphenyl)iodonium hexafluoroantimonate
- **CAS Number:** 71786-70-4
- **EC Number:** 404-420-9

**General Information**
SpeedCure 937 is an iodonium hexafluoroantimonate salt dissolved in a glycidyl ether reactive diluent. The product has been primarily developed for use with epoxy silicone polymers and is useful in UV cure release coating applications. The product can also be used in other cationic photocatalysed curing reactions including cycloaliphatic epoxy resins, vinyl ethers, oxetanes and glycidyl ethers.

Depending on the application and substrate used the product can be used in conjunction with a sensitizer, such as Speedcure CPTX or polymeric Speedcure 7010, in order to speed up the rate of curing.

**UV Spectrum**

![UV Spectrum](image)

**Physical Properties**
- **Appearance:** Amber liquid
- **Active Content:** 50 % min (100% Epoxide Equivalent)
- **Moisture:** 1.0 % w/w max (Karl Fischer)
- **E<sub>c</sub> at λ 230 nm:** 120 (Solvent: acetonitrile)

**Applications**
- Used in cationic curing of:
  - Cycloaliphatic epoxies
  - Vinyl Ethers
  - Glycidyl ethers
  - Oxetanes
Iodonium Salts

SpeedCure 938

Chemical Name: Bis-(4-t-butylphenyl)-iodonium hexafluorophosphate
CAS Number: 61358-25-6
EC Number: 620-341-4

General Information

Speedcure 938 is an iodonium cationic photoinitiator, intended for use in non silicone applications such as the cationic UV curing of inks.

Depending on the application and substrate used the product can be used in conjunction with a sensitisier, such as Speedcure 2-ITX, in order to increase the rate of curing or allow LED curing.

UV Spectrum

![UV Spectrum Graph]

Physical Properties

Appearance: Pale yellow/cream crystalline powder
Assay: 98 % min
Melting Range: 140 to 180°C
Volatiles: 1% w/w max
E₁ at λ 241 nm: 389 (Solvent: acetonitrile)

Applications

Used in cationic curing of:
• Cycloaliphatic epoxies
• Vinyl Ethers
• Glycidyl ethers
• Oxetanes

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Iodonium Salts

SpeedCure 938D

Chemical Name: Bis-(4-t-butylphenyl)-iodonium hexafluorophosphate in a reactive solvent.
CAS Number: 61358-25-6 & 2425-79-8
EC Number: 620-341-4 & 219-371-7

General Information

Speedcure 938D is a liquid iodonium cationic photoinitiator dissolved in a reactive diluent. It is intended for use in nonsilicone applications such as the cationic UV curing of inks.

Depending on the application and substrate used the product can be used in conjunction with a sensitisier, such as Speedcure ITX, in order to increase the rate of curing or allow LED curing.

UV Spectrum

![UV Spectrum Graph]

Physical Properties

Appearance: Pale yellow transparent liquid
Solids Content: 40 % w/w
Water (KF): 1% w/w
E₁ at λ 241 nm: 177 (Solvent: acetonitrile)

Applications

Used in cationic curing of:
• Cycloaliphatic epoxies
• Vinyl Ethers
• Glycidyl ethers
• Oxetanes

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Cationic Photoinitiators

Iodonium Salts

SpeedCure 939
Chemical Name: 4-Isopropyl-4'-methylidiphenyliodonium Tetrakis(pentafluorophenyl)borate
CAS Number: 178233-72-2
EC Number: 422-960-3
Molecular Weight: 1015.7

General Information
SpeedCure 939 is an iodonium tetrakis(pentafluorophenyl)borate salt supplied as a solid powder. This product has been developed with the low nucleophilicity borate anion to give the highest rates of cure. Speedcure 939 will induce the rapid photopolymerisation of cationic coating formulations containing cycloaliphatic epoxide resins, vinyl esters, oxetanes and glycidyl ethers. It is recommended that this photoinitiator is used in concentrations of less than 1%. Speedcure 939 can be combined with a thioxanthone photosensitiser in order to increase the rate of photopolymerisation or to achieve curing by LED light.

UV Spectrum

Physical Properties
Appearance: White Powder
Melting point: 120-133°C
E; at λ 258 nm: 155.7 (Solvent: acetonitrile)

Applications
Used in cationic curing of:
• Inks
• Pigmented Coatings
• Varnishes
• Electronics
• Photoresists
• Graphic Arts
• Printing Plates
• Composites
• Fibre optic coatings

Sulfonium Salts

SpeedCure 976
Chemical Name: (sulfanediyldibenzene-4,1-diyl) bis(diphenylsulfonium) bis(hexafluoroantimonate) in propylene carbonate.
CAS Number: 89452-37-9 & 108-32-7

General Information
SpeedCure 976 is a cationic photoinitiator, which is a mixture of triarylsulfonium hexafluoroantimonate salts in propylene carbonate.

It is recommended the Speedcure 976 is used at 1.5-3.0%.

UV Spectrum

Physical Properties
Appearance: Yellow liquid
Active Content: 50 % min
Water (KF): 1.0% max
Gardner Colour: 4 max
E; at λ 291 nm: 101 (Solvent: acetonitrile)
E; at λ 279 nm: 96 (Solvent: acetonitrile)

Applications
Used in cationic curing of:
• Cycloaliphatic epoxies
• Vinyl Ethers
• Glycidyl ethers
• Oxetanes
Cationic Photoinitiators

Sulfonium Salts

**SpeedCure 976s**

**Chemical Name:** (sulfanediyldibenzene-4,1-diyl) bis(diphenylsulfonium) bis(hexafluoroantimonate)

**CAS Number:** 89452-37-9

**General Information**

SpeedCure 976s is a cationic photoinitiator, which is a mixture of triarylsulfonium hexafluoroantimonate salts in 100 % active solid form.

**UV Spectrum**

**Physical Properties**

- **Appearance:** White to off white powder
- **Active Content:** 99 % min
- **Solvents:** 1.0% max
- **Gardner Colour:** 4 max (50 % solution in propylene carbonate)
- **E**: at λ 292 nm: 206 (Solvent: acetonitrile)
- **E**: at λ 278 nm: 195 (Solvent: acetonitrile)

**Applications**

- Used in cationic curing of:
  - Cycloaliphatic epoxies
  - Vinyl Ethers
  - Glycidyl ethers
  - Oxetanes

---

Sulfonium Salts

**SpeedCure 976D**

**Chemical Name:** (sulfanediyldibenzene-4,1-diyl) bis(diphenylsulfonium) bis(hexafluoroantimonate) in a reactive solvent.

**CAS Number:** 89452-37-9 & 2425-79-8

**General Information**

SpeedCure 976D is a cationic photoinitiator, a mixture of triarylsulfonium hexafluoroantimonate salts in a reactive solvent.

**UV Spectrum**

**Physical Properties**

- **Appearance:** Pale yellow transparent liquid
- **Solids Content:** 35 % min
- **Water (KF):** 1% w/w max
- **E**: at λ 291 nm: 71 (Solvent: acetonitrile)
- **E**: at λ 278 nm: 67 (Solvent: acetonitrile)

**Applications**

- Used in cationic curing of:
  - Cycloaliphatic epoxies
  - Vinyl Ethers
  - Glycidyl ethers
  - Oxetanes
Cationic Photoinitiators

Sulfonium Salts

SpeedCure 992
Chemical Name: (4-{[(4-(diphenylsulfanyl)phenyl)phenyl]sulfonyl}phenyl)diphenylsulfonium bis(hexafluorophosphate) in propylene carbonate
CAS Number: 74227-35-3 & 108-32-7

General Information
Speedcure 992 is a cationic photoinitiator, a mixture of triarylsulfonium hexafluorophosphate salts in propylene carbonate.

UV Spectrum

- Concentration: 0.001%, 0.005%, 0.01%
- Absorbance
- Wavelength (nm)

Physical Properties
- Appearance: Clear, yellow to amber liquid
- Active Content: 40% max
- Water % w/w: 1% max
- Gardner Colour: 4 max
- pH: 5.5-7.0
- E1 at λ 300 nm: 131 (Solvent: acetonitrile)
- E1 at λ 231 nm: 202 (Solvent: acetonitrile)

Applications
- Used in cationic curing of:
  - Cyclic aliphatic epoxides
  - Vinyl Ethers
  - Glycidyl ethers
  - Oxetanes

Cycloaliphatic Epoxides

UviCure S105 & S105E
Chemical Name: 7-oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate
CAS Number: 2386-87-0
EC Number: 219-207-4
Molecular Weight: 252.3

General Information
UviCure S105 is a cycloaliphatic epoxy resin which, when cured with cationic photoinitiators such as Speedcure 992 or Speedcure 976, yields clear, hard, glossy coatings. Properties of the cured resin can be modified by the use of other additives and diluents such as UviCure S130.

UviCure S105 is also available in electronics grade S105E.

Formulations based on UviCure products have the benefits of:-
- Low shrinkage
- Excellent adhesion
- No oxygen inhibition
- Good combinations of flexibility and hardness

Physical Properties
- Appearance: S105: Pale yellow to colourless transparent liquid
- S105E: Pale yellow to colourless transparent liquid
- Epoxide equivalent weight: 126 to 135 g/mol
- Viscosity @ 25°C: 200 - 350 mPa.s
- Water content: ≤ 0.05% w/w
- Colour (APHA): S105: ≤ 50
  - S105E: ≤ 100 ppm
- Total Chlorine: ≤ 100 ppm

Applications
- Metal decoration coatings
- Overprint varnishes
- White base coats
- Flexo inks
- Screen inks
- Ink jet inks
- Stereolithography
- DVD adhesives
- Electrical coatings and sealants
Cationic Resins

Cycloaliphatic Epoxides

UviCure S128
Chemical Name: Bis((3,4-epoxycyclohexyl)methyl) adipate
CAS Number: 3130-19-6
EC Number: 221-518-5
Molecular Weight: 366.45

General Information
UviCure S128 is an adipate based cycloaliphatic epoxy resin which, when cured with cationic photoinitiators such as Speedcure 992 or Speedcure 976, yields clear, flexible, glossy coatings. Properties of the cured resin can be modified by the use of other additives and diluents such as UviCure S105 and UviCure S130 to improve hardness and scratch resistance.

Formulations based on UviCure products have the benefits of:-
• Low shrinkage
• Excellent adhesion
• No oxygen inhibition

Physical Properties
Appearance: Pale yellow liquid
Epoxide equivalent weight: 190-210 g/mol
Viscosity @ 25°C: 500-650 mPa.s
Specific Gravity @25°C: 1.140-1.158
Water content: 0.15 % w/w max
Colour (APHA): 150 max

Applications
• Metal decoration coatings
• Overprint varnishes
• White base coats
• Flexo inks
• Screen inks
• Ink jet inks
• Stereolithography
• DVD adhesives
• Electrical coatings and sealants

Oxetanes

UviCure S130
Chemical Name: 3-Ethylxetane-3-methanol
CAS Number: 3047-32-3
EC Number: 221-254-0
Molecular Weight: 116.16

General Information
UviCure S130 is an alcohol functional oxetane. It is used as a reactive diluent in many different applications, in particular for use in cationic UV curing applications. It is fully compatible with other products within the UviCure range, which can be used to produce formulations with various properties.

Physical Properties
Appearance: Clear liquid
Assay: 98.0% Minimum
Hydroxyl Number: 450-500 mg KOH/g
Water content: 0.50% w/w max

Applications
• Reactive diluent for use in cationic UV curing
• Helps to improve adhesion to various substrates
• Helps to improve hardness of various coatings

60
**Cationic Resins**

**Oxetanes**

**UviCure S140**
- **Chemical Name:** 3-Ethyl-3-[(phenylmethoxy)methyl]-oxetane
- **CAS Number:** 18933-99-8
- **Molecular Weight:** 206
- **Molecular Formula:** C13H18O2

**General Information**
UviCure S140 is a mono functional, low viscosity oxetane resin suitable for cationic thermal and UV initiated cure. It can be used to reduce the viscosity of resin formulations and add flexibility to cured coatings.

**Physical Properties**
- **Appearance:** Colorless to pale yellow transparent liquid
- **Water content:** ≤0.1% w/w
- **Purity:** ≥95%
- **Viscosity:** 1-100 mPa.s (25°C)

**Applications**
- Adhesives
- Coatings
- Resists

**UviCure S150**
- **Chemical Name:** 1,4-Bis[(3-ethyl-3-oxetanylmethoxy)methyl]benzene
- **CAS Number:** 142627-97-2
- **Molecular Weight:** 334, n = 1
- **Molecular Formula:** C20H30O4, n=1

**General Information**
UviCure S150 is a bifunctional oxetane resin suitable for cationic thermal and UV initiated cure. UviCure S150 is an aromatic oxetane which will give increased chemical and thermal stability to cured coatings.

**Physical Properties**
- **Appearance:** Colorless to pale yellow transparent liquid
- **Water content:** ≤0.05% w/w
- **Purity:** ≥90%
- **Viscosity:** 150-220 mPa.s (25°C)

**Applications**
- Adhesives
- Coatings
- Resists
**Oxetanes**

**UviCure S160**

**Chemical Name:** 4,4-Bis(3-ethyl-3-oxetanylmethoxymethyl)biphenyl
**CAS Number:** 358365-48-7
**Molecular Weight:** 410
**Molecular Formula:** C_{26}H_{34}O_{4}

**General Information**

UviCure S160 is a liquid bifunctional oxetane resin suitable for cationic thermal and UV initiated cure. UviCure S160 is a biphenyl oxetane which will give increased chemical and thermal stability to cured coatings.

**Physical Properties**

Appearance: Colorless to pale yellow transparent liquid
Water content: ≤0.1% w/w
Purity: ≥90%
Viscosity: 240-300 mPa.s (50°C)

**Applications**

- Adhesives
- Coatings
- Resists

**Oxetanes**

**UviCure S170**

**Chemical Name:** 3-Ethyl-3-(Methacryloyloxy)Methyloxetane
**CAS Number:** 37674-57-0
**Molecular Weight:** 184
**Molecular Formula:** C_{10}H_{16}O_{3}

**General Information**

UviCure S170 is a low viscosity oxetane-methacrylate hybrid-cure resin suitable both for cationic and free radical curing systems.

**Physical Properties**

Appearance: Colorless to pale yellow transparent liquid
Water content: ≤0.15% w/w
Purity: ≥98%
Viscosity: 1-10 mPa.s (25°C)

**Applications**

- Adhesives
- Coatings
- Resists