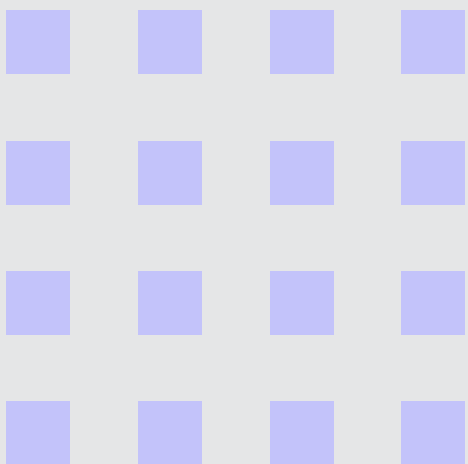


# SINOPCC GROUP



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No.50 Jialingjiang East Street, Nanjing,  
China

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Fax: +86-25-8468-0091  
sales@TinToll.com  
www.TinToll.com

# PHOTOINITIATORS



Sustainable Innovation for a Better Future



# TINTOLL PHOTOINITIATORS

# WHY SELECT TINTOLL?



## FOCUSING ON CUSTOMERS' NEEDS

TINTOLL is dedicated to customer's needs of polymer stabilizing additives and photoinitiators in UV curing coatings, constantly developing new products and offering integrated raw material solutions.

## INNOVATION AND TECHNOLOGIES

Innovation at TINTOLL is defined by our core value of sustainability and builds on our key strengths: superior scientific expertise, state-of-the-art technology, global marketing and sales network, and global regulatory experience.

## COMPREHENSIVE CUSTOMER SUPPORT

TINTOLL supports customers at every stage of the product development process: from the evaluating promising products, to sample testing, to scale production and delivery, together with formulations.

## SUSTAINABLE AND RELIABLE SUPPLY

We want to contribute towards a brighter, sustainable future and therefore maintain our competitive edge by creating economic benefits through proprietary technology, economies of scale, and backward integration.



Sustainable Innovation for a Better Future

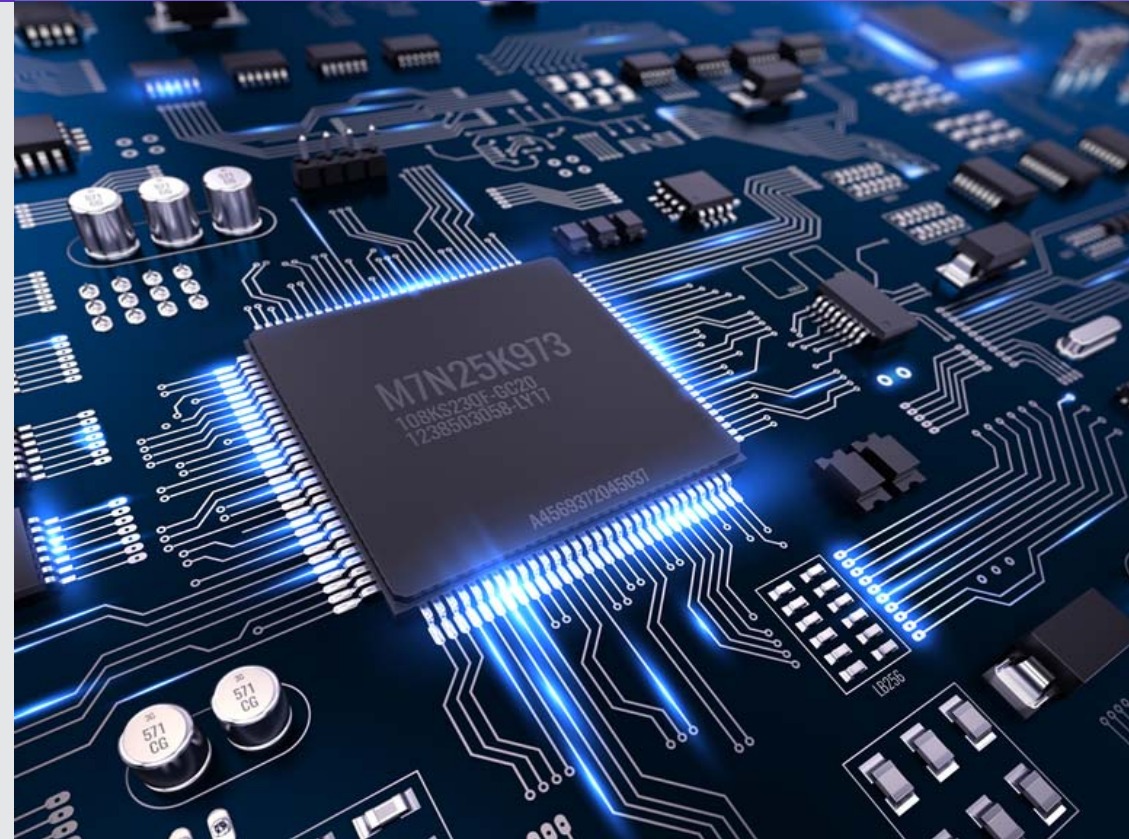
# PHOTOINITIATORS

Curing is a series of chemical and physical processes that a paint must go through after it dries. The coating must attach itself to the substrate either physically (adhesion) or chemically (cohesion), and must adhere to itself. It also requires chemical reactions such as "polymerization" (forming plastic). Applications include industrial coatings and graphic arts coatings.

Ultraviolet curing technology (UV technology) is to add a photoinitiator (or photosensitizer) to a specially formulated system (called a photocuring system) to generate active free radicals or cations after absorbing ultraviolet rays (UV), thereby initiating polymerization, Cross-linking and grafting reactions, making it from liquid to solid technology. UV curing technology is an environmentally friendly and cost-effective option because there is no need to remove water at the end of the printing or coating process, and there is no need to capture or incinerate solvents.

UV curing materials are widely used in optical fiber cables (UV curing optical fiber coating materials), printed circuit boards (UV curing photoresists), home appliances (plastic coatings, metal coatings), automotive parts (transparent varnishes, repair paints, reflector lampshades etc.), printing packaging (UV curing inks), wooden furniture and flooring (UV curing coatings).

Photoinitiators are compounds that generate free radicals upon exposure to ultraviolet light. They then react with monomers and/or oligomers, initiating the polymerization process. Photoinitiators are used extensively with crosslinkable monomers and oligomers in UV-curable inks and coatings, adhesives, and many other products.



# UV CURING APPLICATIONS



Curing is a series of chemical and physical processes that a paint must go through after it dries. The coating must attach itself to the substrate either physically (adhesion) or chemically (cohesion), and must adhere to itself. It also requires chemical reactions such as "polymerization" (forming plastic). Applications include industrial coatings and graphic arts coatings.

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As a protective medium for optical fibers, UV-curable fiber optic cable coating materials have a great influence on the strength, service life and optical properties of optical fibers, and are an important part of communication optical fibers.



# UV CURING APPLICATION

UV-curable photoresist is a key material for manufacturing printed circuit board (PCB) circuit patterns, and photoinitiator is a key component of photoresist.

UV-curable plastic coatings are mainly used on various plastic substrates. Plastic products generally have the disadvantages of poor scratch resistance and poor wear resistance, so the surface decoration and reinforcement of these substrates are particularly important. When traditional solvent-based coatings are painted, not only will the solvent volatilize and pollute the environment, but also require high temperatures during curing, which may cause plastic deformation, but UV-curable plastic coatings can overcome these problems. In addition, UV-curable plastic coatings can impart various decorative effects to the substrate, have excellent scratch resistance, chemical resistance, and abrasion resistance, and can also impart some special functions to the substrate, such as anti-static, anti-reflection, etc. Therefore, UV-curable plastic coatings are widely used in many industries and fields such as automobiles and electronic products.

UV-curable coatings are also used in the manufacture of display and touch screens, solar and fuel cells, flexible electronics, medical devices, aerospace and automotive components, lighting components and more. UV curing materials are used in the chip manufacturing and encapsulation of LEDs. In the field of liquid crystal panels, there are a variety of optical functional films in liquid crystal components, such as polarizers and wide viewing angle films that increase the viewing angle function, anti-glare films and anti-reflection films that improve visual performance, and brightness-enhancing films that increase display brightness. UV curing materials are used in the wet coating of optical functional films.

UV-curable ink undergoes a cross-linking reaction under the irradiation of ultraviolet light of a specific wavelength, and changes from liquid to solid. In terms of high-speed printing, environmental protection and energy saving, UV curable inks are superior to other types of inks, and are also the most potential environmentally friendly inks.

In the medical field, UV-curable composite resin materials can greatly meet the requirements of clinicians and patients for dental restoration, and make up for the lack of hardness and wear resistance of previous resin materials. In the medical device industry, UV medical conductive pressure-sensitive adhesive can be used to prepare medical electrodes, physiotherapy electrodes, disposable ECG electrodes, high-frequency electrosurgical plate electrodes, etc.

TINTOLL is a leading manufacturer and supplier of photoinitiators, which is also one of the cornerstone businesses of TINTOLL. Our product portfolio covers free radical and cationic photoinitiators (photo-acid generators) as well as amine synergists. UV-curable materials are widely used in graphic arts, industrial coatings, adhesives, printed circuit boards, and 3D printing. TINTOLL provides application support, product development and custom solutions, and collaborates with customers to develop next-generation photoinitiators.





# FREE RADICAL PHOTOINITIATORS

Photoinitiators can be divided into two categories: free radical photoinitiators and cationic photoinitiators.

Free radical photoinitiators react differently when exposed to UV light. Depending on their reactivity, they are classified as Norrish Type I or Norrish Type II photoinitiators.

Norish Type I initiators are typically compounds containing a benzoyl group which, when exposed to UV light, cleaves to produce two highly reactive free radicals, at least one of which reacts with the monomer to initiate polymerization. Type I photoinitiators are irreversibly incorporated into the polymer matrix.

Norish Type II photoinitiators require hydrogen donors to react when exposed to UV light, and the most common of these hydrogen donors are amines (amine synergists). Upon UV irradiation, the Type II photoinitiator abstracts a hydrogen atom from the synergist used to form two very reactive alkylamino radicals, which subsequently initiate polymerization. Type II photoinitiators are generally not incorporated during the reaction, but synergists are incorporated.

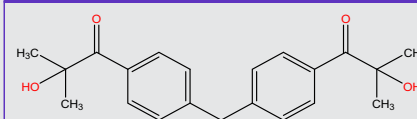
TINTOLL is a leading manufacturer and supplier of photoinitiators, which is also one of the cornerstone businesses of TINTOLL. Our product portfolio covers free radical and cationic photoinitiators (photo-acid generators) as well as amine synergists. UV-curable materials are widely used in graphic arts, industrial coatings, adhesives, printed circuit boards, and 3D printing. TINTOLL provides application support, product development and custom solutions, and collaborates with customers to develop next-generation photoinitiators.

# FREE RADICAL PHOTOINITIATORS TYPE I

## PowerCure™ 127

CAS No.: 474510-57-1

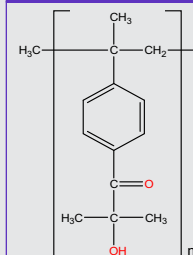
2-hydroxy-1-(4-(4-(2-hydroxy-2-methylpropionyl)benzyl)phenyl)propan-1-one



## PowerCure™ 150

CAS No.: 163702-01-0

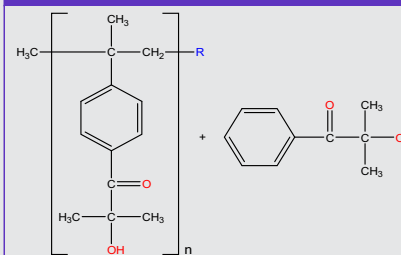
Oligo[2-hydroxy-2-methyl-1-[4-(1-methylvinyl)phenyl]propanone]



## PowerCure™ 151

CAS No.: 163702-01-0 + 7473-98-5

Oligo[2-hydroxy-2-methyl-1-[4-(1-methylvinyl)phenyl]propanone]



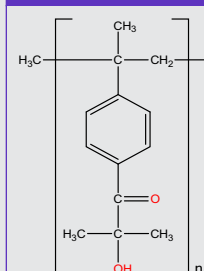
CAS No.: 163702-01-0

CAS No.: 7473-98-5

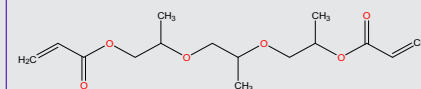
## PowerCure™ 152

CAS No.: 163702-01-0 + 42978-66-5

Oligomeric alpha hydroxy ketone (75% wt) and Tripropylene glycol diacrylate (25% wt)



CAS No.: 163702-01-0



CAS No.: 42978-66-5



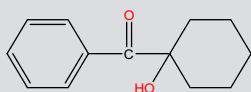
# FREE RADICAL PHOTOINITIATORS TYPE I

# FREE RADICAL PHOTOINITIATORS TYPE I

## PowerCure™ 184

CAS No.: 947-19-3

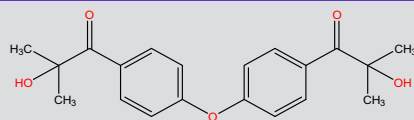
1-Hydroxy-cyclohexyl-phenyl-ketone



## PowerCure™ 160

CAS No.: 71868-15-0

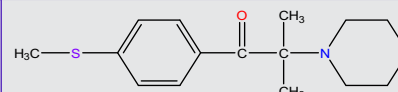
2-Hydroxy-1-[4-[4-(2-hydroxy-2-methylpropionyl)phenoxy]phenyl]-2-methylpropanone



## PowerCure™ 907

CAS No.: 71868-10-5

2-Methyl-1-[4-(methylthio)phenyl]-2-(4-morpholinyl)-1-propanone



## PowerCure™ 1000

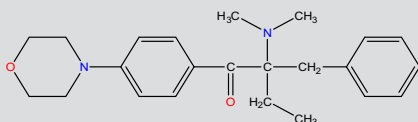
CAS No.: 947-19-3 + 7473-98-5

Blend of 20% PowerCure 184 and 80% PowerCure 1173

## PowerCure™ 369

CAS No.: 119313-12-1

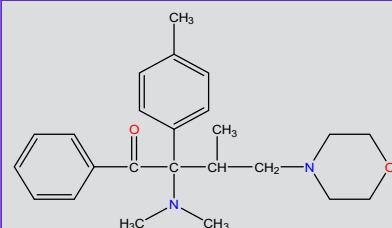
2-Benzyl-2-(dimethylamino)-1-[4-(4-morpholinyl)phenyl]-1-butanone



## PowerCure™ 379

CAS No.: 119344-86-4

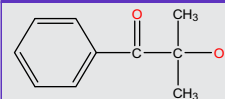
2-Dimethylamino-2-(4-methyl-benzyl)-1-(4-morpholin-4-yl-phenyl)-butan-1-one



## PowerCure™ 1173

CAS No.: 7473-98-5

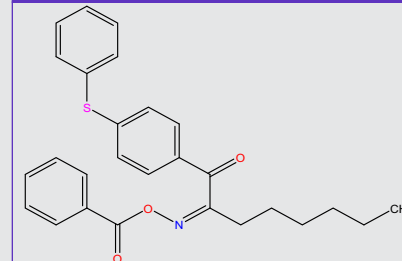
2-Hydroxy-2-methyl-1-phenyl-1-propanone



## PowerCure™ 1314

CAS No.: 253585-83-0

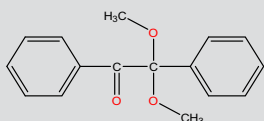
1-[4-(Phenylthio)phenyl]-1,2-octanedione 2-(O-benzoyloxime)



## PowerCure™ 651 (BDK)

CAS No.: 24650-42-8

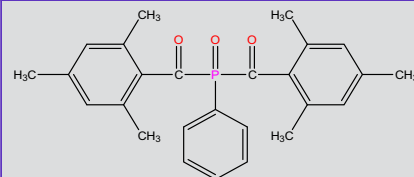
2,2-Dimethoxy-1,2-diphenyl-ethanone



## PowerCure™ 819

CAS No.: 162881-26-7

Bis(2,4,6-trimethylbenzoyl)phenyl phosphine oxide



## PowerCure™ 2022

CAS No.: 7473-98-5 + 84434-11-7 + 162881-26-7

Blend of PowerCure 1173, PowerCure TPO-L, PowerCure 819

## PowerCure™ 2100

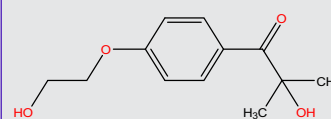
CAS No.: 162881-26-7 + 84434-11-7

Blend of PowerCure 819 + PowerCure TPO-L

## PowerCure™ 2959

CAS No.: 106797-53-9

2-Hydroxy-1-[4-(2-hydroxyethoxy)phenyl]-2-methyl-1-propanone



## PowerCure™ 4265

CAS No.: 75980-60-8 + 7473-98-5

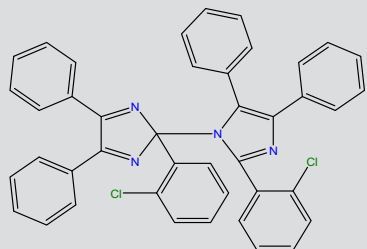
Blend of 50% PowerCure TPO and 50% PowerCure 1173

## FREE RADICAL PHOTOINITIATORS TYPE I

### PowerCure™ BCIM

CAS No.: 7189-82-4

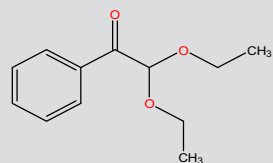
2,2'-Bis(2-chlorophenyl)-4,4',5,5'-tetraphenyl-1,2'-biimidazole



### PowerCure™ DEAP

CAS No.: 6175-45-7

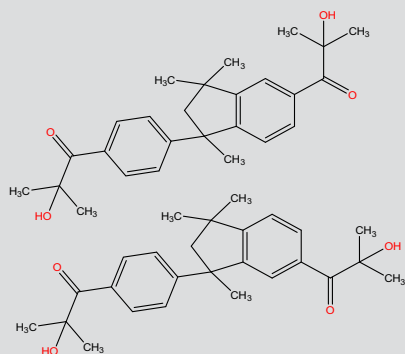
2,2-Diethoxy-1-phenylethanone



### PowerCure™ ONE

CAS No.: 163702-01-0

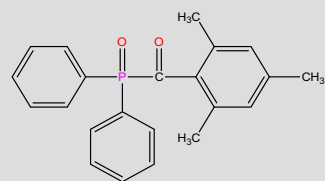
Difunctional alpha-hydroxy ketone photoinitiator



### PowerCure™ TPO

CAS No.: 75980-60-8

Diphenyl (2,4,6-trimethylbenzoyl)-phosphine oxide

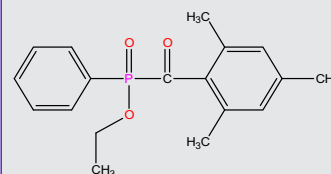


## FREE RADICAL PHOTOINITIATORS TYPE I

### PowerCure™ TPO-L

CAS No.: 84434-11-7

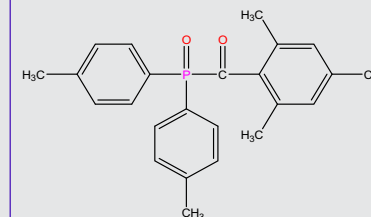
Ethyl (2,4,6-trimethylbenzoyl) phenylphosphinate



### PowerCure™ TMO

CAS No.: 270586-78-2

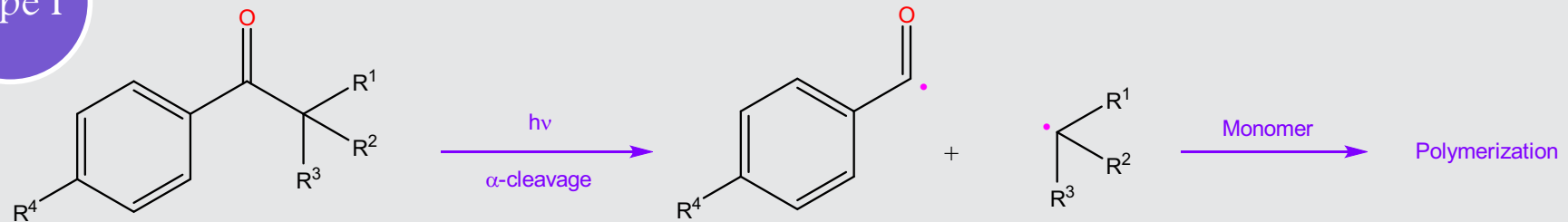
(2,4,6-Trimethylbenzoyl)-bis(4-methylphenyl)phosphinyl oxide





### NORRISH TYPE I PHOTOINITIATOR MECHANISMS

Type I

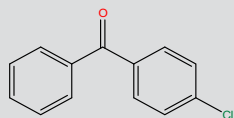


## FREE RADICAL PHOTOINITIATORS TYPE II

## FREE RADICAL PHOTOINITIATORS TYPE II

### PowerCure™ 64

CAS No.: 134-85-0  
4-Chlorobenzophenone



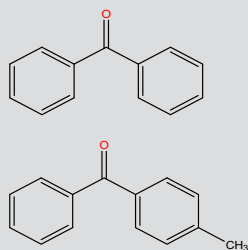
### PowerCure™ 500

CAS No.: 947-19-3 + 119-61-9

50% PowerCure 184 and 50 % PowerCure BP

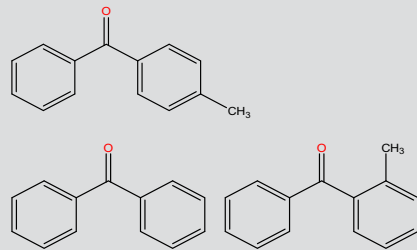
### PowerCure™ 501

CAS No.: 119-61-9 + 134-84-9  
Mixture of PowerCure BP (50%) and PowerCure 4MPB (50%)



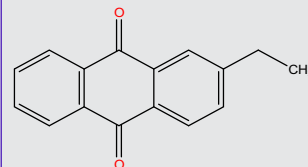
### PowerCure™ 502

CAS No.: 134-84-9 + 119-61-9 + 131-58-8  
Blend of PowerCure 4MPB and PowerCure BP and 2MBP



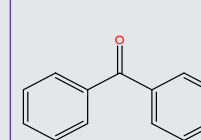
### PowerCure™ 2EAQ

CAS No.: 84-51-5  
2-Ethyl anthraquinone



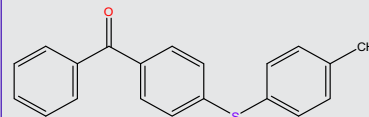
### PowerCure™ BP

CAS No.: 119-61-9  
Benzophenone



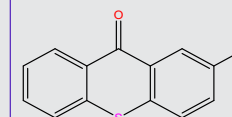
### PowerCure™ BMS

CAS No.: 83846-85-9  
4-Benzoyl-4'-methyl diphenyl sulphide



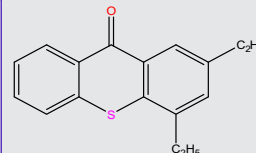
### PowerCure™ CTX

CAS No.: 86-39-5  
2-Chlorothioxanthone



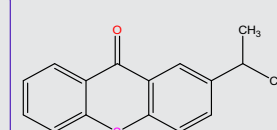
### PowerCure™ DETX

CAS No.: 82799-44-8  
2,4-Diethylthioxanthone



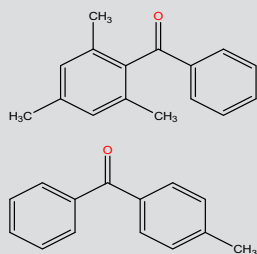
### PowerCure™ ITX

CAS No.: 5495-84-1  
2-isopropyl thioxanthone



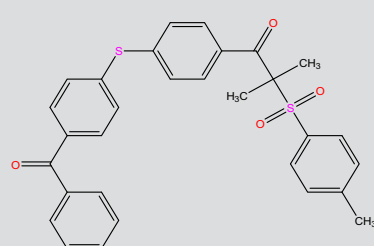
### PowerCure™ 503

CAS No.: 954-16-5 + 134-84-9  
Liquid mixture of PowerCure TMBP and PowerCure 4MBP



### PowerCure™ 1001M

CAS No.: 272460-97-6  
1-[4-(4-Benzoylphenylthio)phenyl]-2-tosyl-2-methyl-1-propanone

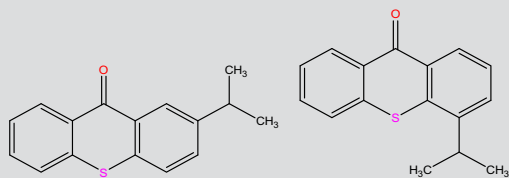


Sustainable Innovation for a Better Future

## FREE RADICAL PHOTOINITIATORS TYPE II

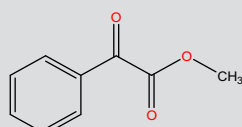
### PowerCure™ ITX24

CAS No.: 75081-21-9 [5495-84-1 (2-isomer) + 83846-86-0 (4-isomer)]  
Mixture of 2-isopropyl thioxanthone and 4-isopropyl thioxanthone



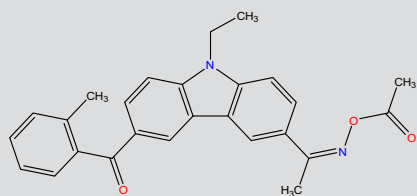
### PowerCure™ MBF

CAS No.: 15206-55-0  
Methylbenzoylformate



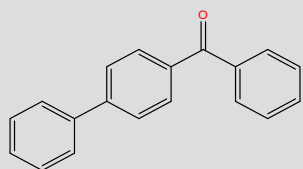
### PowerCure™ OXE02

CAS No.: 478556-66-0  
[1-[9-ethyl-6-(2-methylbenzoyl)carbazol-3-yl]ethylideneamino] acetate



### PowerCure™ PBZ

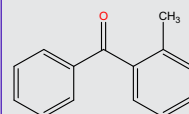
CAS No.: 2128-93-0  
4-Phenyl benzophenone



## FREE RADICAL PHOTOINITIATORS TYPE II

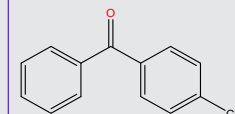
### PowerCure™ 2MBP

CAS No.: 131-58-8  
2-Methyl benzophenone



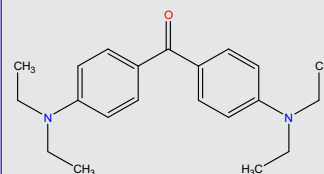
### PowerCure™ 4MBP

CAS No.: 134-84-9  
4-Methyl benzophenone



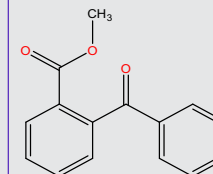
### PowerCure™ MEK

CAS No.: 90-93-7  
4,4'-Bis(diethylamino) benzophenone



### PowerCure™ OMBB

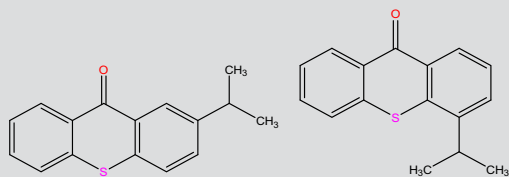
CAS No.: 606-28-0  
Methyl-o-benzoylbenzoate



## FREE RADICAL PHOTOINITIATORS TYPE II

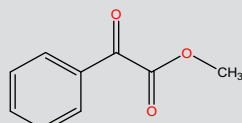
### PowerCure™ ITX24

CAS No.: 75081-21-9 [5495-84-1 (2-isomer) + 83846-86-0 (4-isomer)]  
Mixture of 2-isopropyl thioxanthone and 4-isopropyl thioxanthone



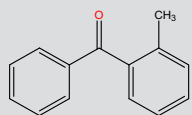
### PowerCure™ MBF

CAS No.: 15206-55-0  
Methylbenzoylformate



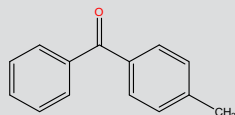
### PowerCure™ 2MBP

CAS No.: 131-58-8  
2-Methyl benzophenone



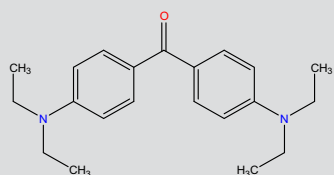
### PowerCure™ 4MBP

CAS No.: 134-84-9  
4-Methyl benzophenone



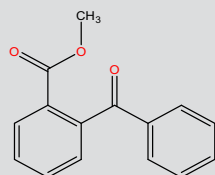
### PowerCure™ MEK

CAS No.: 90-93-7  
4,4'-Bis(diethylamino) benzophenone



### PowerCure™ OMBB

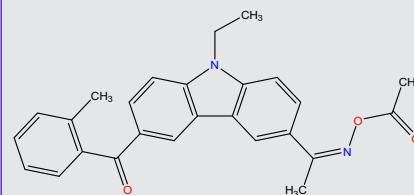
CAS No.: 606-28-0  
Methyl-o-benzoylbenzoate



## FREE RADICAL PHOTOINITIATORS TYPE II

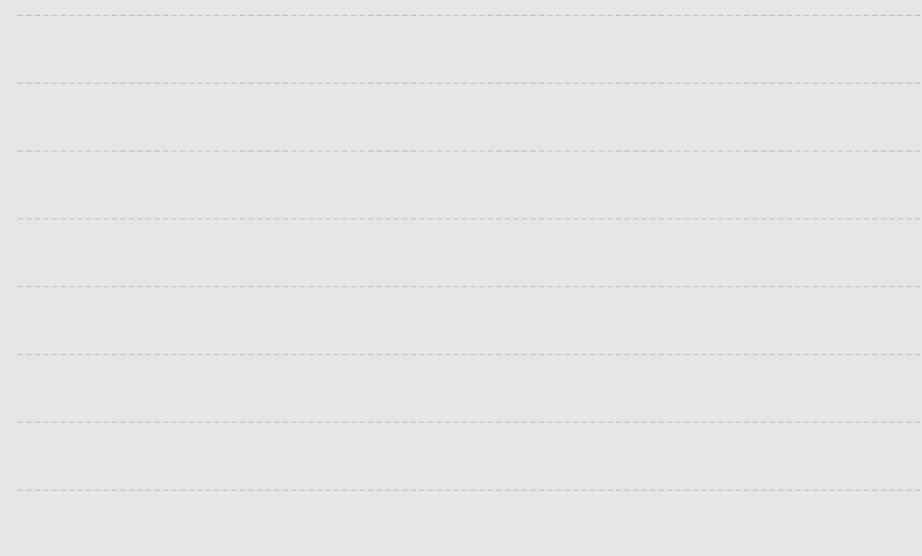
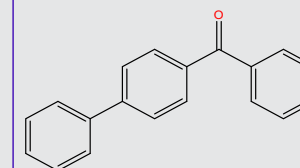
### PowerCure™ OXE02

CAS No.: 478556-66-0  
[1-[9-ethyl-6-(2-methylbenzoyl)carbazol-3-yl]ethylideneamino] acetate

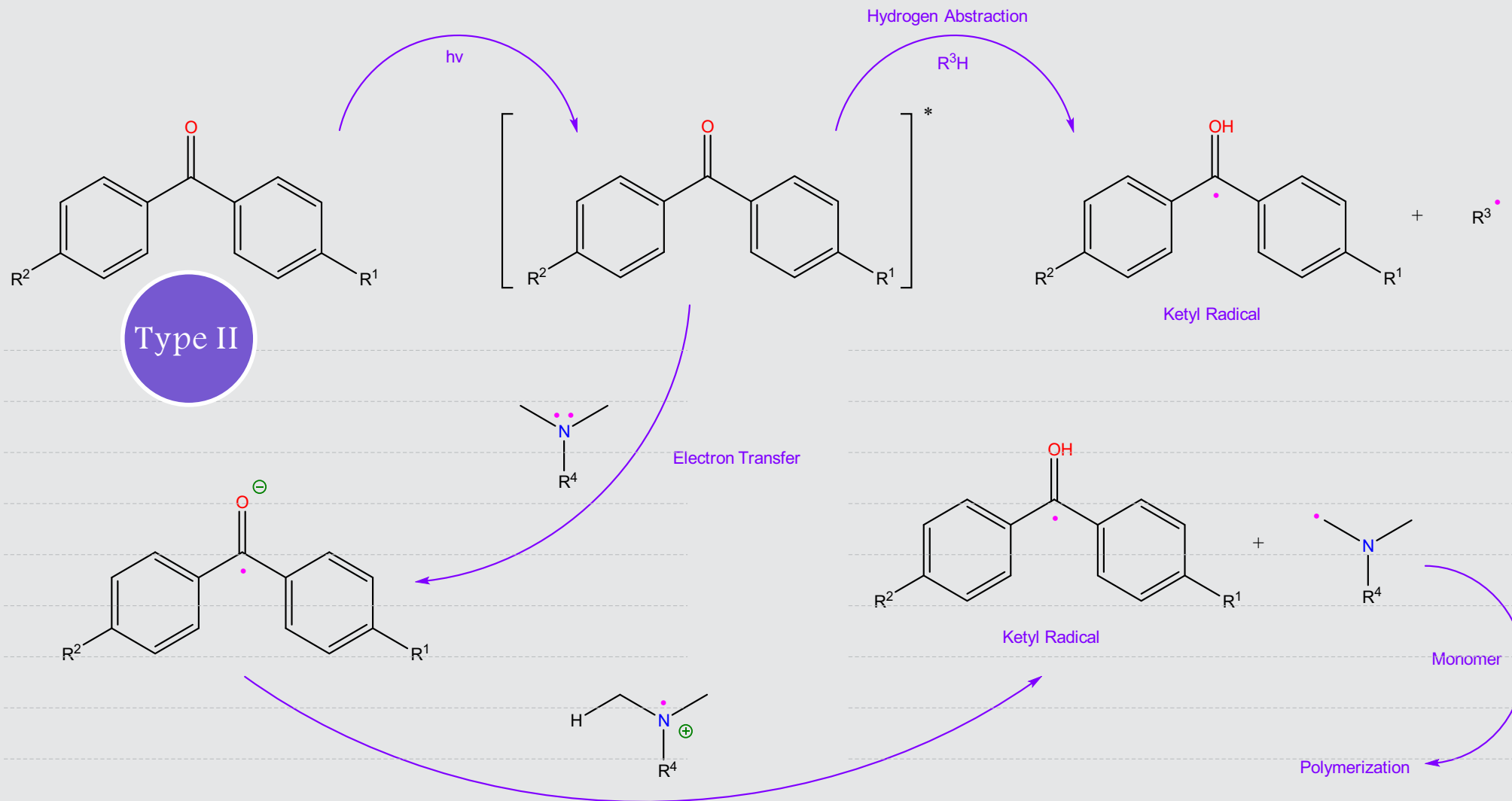


### PowerCure™ PBZ

CAS No.: 2128-93-0  
4-Phenyl benzophenone



# NORRISH TYPE II PHOTOINITIATOR MECHANISMS





# SPECIALTY PHOTOINITIATORS

PowerCure™ 784 is a highly reactive orange solid photoinitiator for free radical polymerization of unsaturated resins under visible light (sunlight) or ultraviolet light, and the best performance can be obtained in the absence of oxygen.

PowerCure™ 784 is a fluorinated diaryl biscyclopentadienyl titanium complex. No primary radicals are formed, and titanocenes are neither type I nor type II molecules. The excited state of the titanocene forms a complex with the acrylate monomer to produce a monomer radical that initiates polymerization.

Its unique light-absorbing properties and its excellent reactivity make it particularly suitable for use in photopolymers such as resists, printing plates and other information storage devices such as optical layers, holograms, laser direct imaging, stereolithography. PowerCure™ 784 has photobleaching properties and can be used in clear and pigmented systems.

TINTOLL is a leading manufacturer and supplier of photoinitiators, which is also one of the cornerstone businesses of TINTOLL. Our product portfolio covers free radical and cationic photoinitiators (photo-acid generators) as well as amine synergists. UV-curable materials are widely used in graphic arts, industrial coatings, adhesives, printed circuit boards, and 3D printing. TINTOLL provides application support, product development and custom solutions, and collaborates with customers to develop next-generation photoinitiators.

# SPECIALTY PHOTOINITIATORS

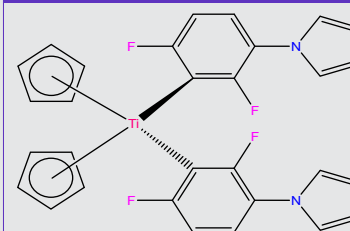


SPECIALTY  
PHOTOINITIATORS

## PowerCure™ 784

CAS No.: 125051-32-3

Bis (cyclopentadienyl) bis [2,6-difluoro-3-(1-pyrryl)phenyl] titanium



FREE RADICAL  
PHOTOINITIATORS

CATIONIC  
PHOTOINITIATORS

AMINE  
SYNERGIST

# CATIONIC PHOTOINITIATORS

Cationic photoinitiators react differently from free radical photoinitiators. Ionium and sulfonium salts are the most widely used cationic photoinitiators because of their excellent photosensitivity and the fact that their solubility and other physical properties can be tailored for various applications. When these salts are irradiated with UV light, they undergo homolytic bond cleavage like Type I photoinitiators, and the free radicals formed react with proton donors to form super-strong protonic acids (also called Bronsted or Lewis acids), and the resulting acid initiates polymerization.

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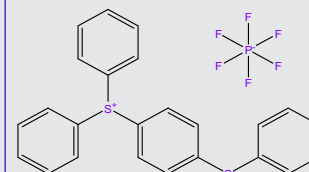
Sustainable Innovation for a Better Future

# CATIONIC PHOTOINITIATORS

## PowerCure™ PAG100

CAS No.: 75482-18-7

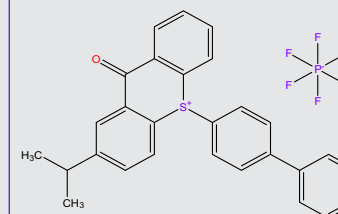
Diphenyl(4-phenylthio)phenylsulfonium Hexafluorophosphate



## PowerCure™ PAG110

CAS No.: 591773-92-1

10-[1,1'-Biphenyl]1-4-yl-2-(1-methylethyl)-9-oxo-9H-thioxanthenium hexafluorophosphate



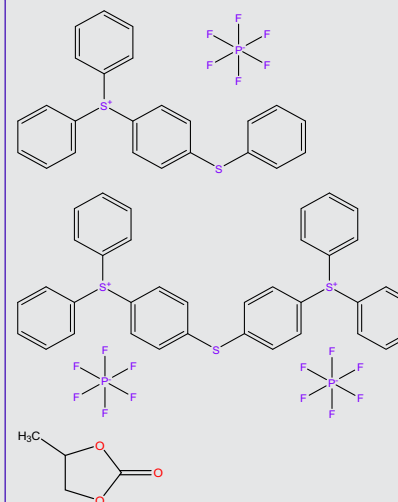
## PowerCure™ PAG101

CAS No.: 68156-13-8 + 74227-35-3 + 108-32-7

Diphenyl(4-phenylthio)phenylsulfonium Hexafluorophosphate

Bis(4-(diphenylsulfonio)phenyl)sulfide bis(hexafluorophosphate)

Propylene carbonate

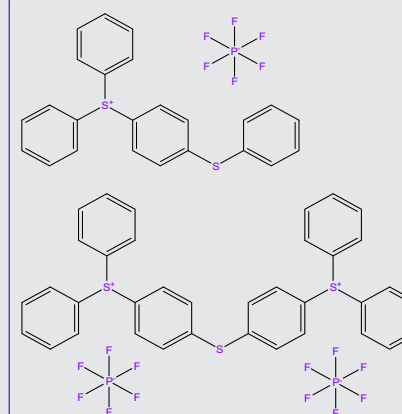


## PowerCure™ PAG102

CAS No.: 68156-13-8 + 74227-35-3

Diphenyl(4-phenylthio)phenylsulfonium Hexafluorophosphate

Bis(4-(diphenylsulfonio)phenyl)sulfide bis(hexafluorophosphate)

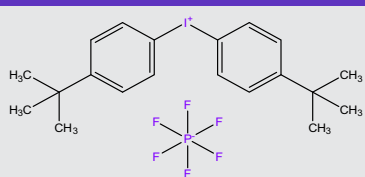


# CATIONIC PHOTOINITIATORS

# CATIONIC PHOTOINITIATORS

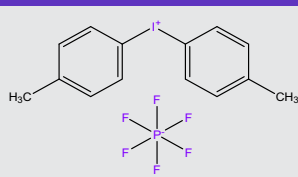
## PowerCure™ PAG120

CAS No.: 61358-25-6  
Bis(4-tert-butylphenyl)iodonium hexafluorophosphate



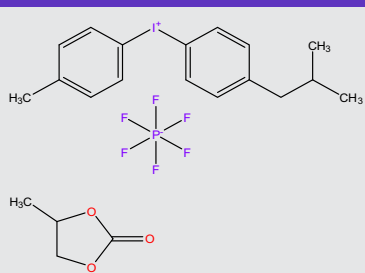
## PowerCure™ PAG121

CAS No.: 60565-88-0  
Bis(4-methylphenyl)iodonium hexafluorophosphate



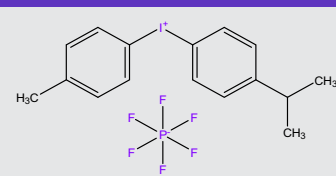
## PowerCure™ PAG122

CAS No.: 344562-80-7+ 108-32-7  
4-isobutylphenyl-4'-methylphenyliodoniumhexafluorophosphate  
Propylene carbonate



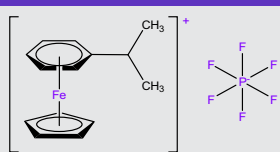
## PowerCure™ PAG123

CAS No.: 184477-29-0  
[4-(1-Methylethyl)phenyl](4- methylphenyl)iodonium,  
hexafluorophosphate



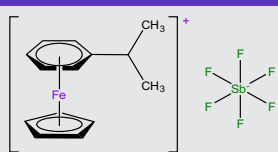
## PowerCure™ PAG130

CAS No.: 32760-80-8  
Cyclopentadienyliron(ii) hexa-fluorophosphate



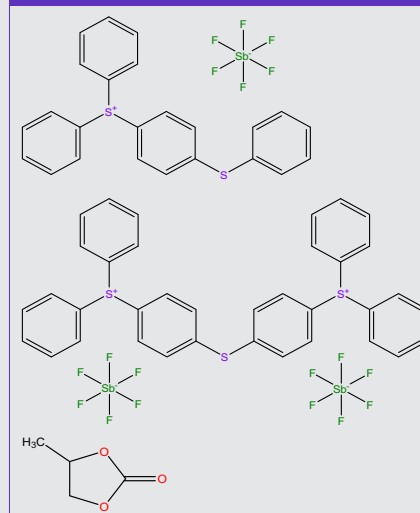
## PowerCure™ PAG230

CAS No.: 100011 -37-8  
Cyclopentadienyliron(ii) hexa-fluoroantimonate



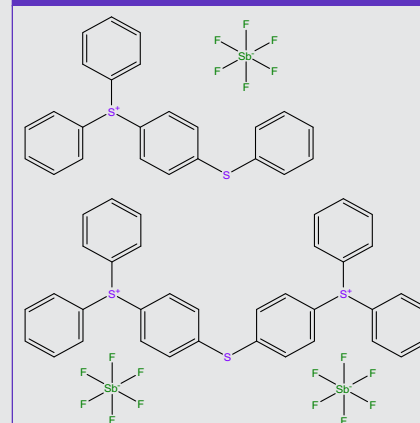
## PowerCure™ PAG201

CAS No.: 71449-78-0 + 89452-37-9 + 108-32-7  
Diphenyl(4-phenylthio)phenylsulfonium Hexafluoroantimonate  
Bis(4-(diphenylsulfonio)phenyl)sulfide bis(hexafluoroantimonate)  
Propylene carbonate



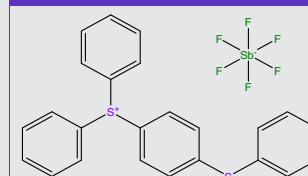
## PowerCure™ PAG202

CAS No.: 71449-78-0 + 89452-37-9  
Diphenyl(4-phenylthio)phenylsulfonium Hexafluoroantimonate  
Bis(4-(diphenylsulfonio)phenyl)sulfide bis(hexafluoroantimonate)



## PowerCure™ PAG200

CAS No.: 71449-78-0  
Diphenyl(4-phenylthio)phenylsulfonium Hexafluoroantimonate



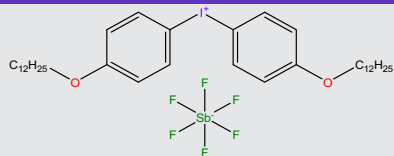
CATIONIC  
PHOTOINITIATORS

# CATIONIC PHOTOINITIATORS

## PowerCure™ PAG225

CAS No.: 71786-70-4

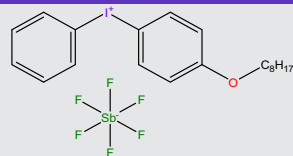
Bis(4-dodecylphenyl)iodonium hexafluoroantimonate



## PowerCure™ PAG226

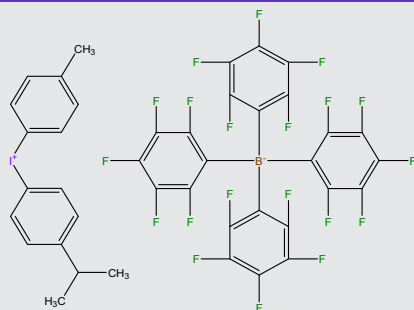
CAS No.: 121239-75-6

(4-Octyloxyphenyl)phenyliodoniumhexafluoroantimonate



## PowerCure™ PAG300

CAS No.: 178233-72-2



PowerCure™ PAG300:

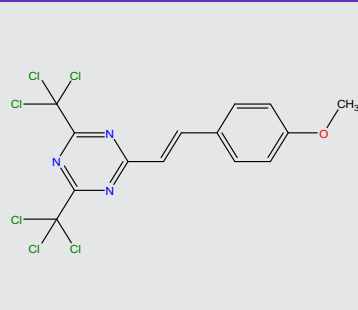
(4-isopropylphenyl)(p-tolyl)iodonium-tetrakis(pentafluorophenyl)borate

PowerCure™ PAG400:

2-[2-(4-Methoxyphenyl-2-yl)vinyl]-4,6-bis(trichloromethyl)1,3,5-triazine

## PowerCure™ PAG400

CAS No.: 42573-57-9



# POWERCURE PHOTOINITIATORS



## AMINE SYNERGIST (PHOTOSENSITIZER)

Amine synergists are also called photosensitizers. Photosensitizers are molecules that do not absorb radiation or initiate polymerization reactions but can increase the effective rate of photoinitiator activity. They are usually amine compounds. The role of photosensitizer is to increase the photosensitivity of photoinitiator and accelerate the curing of the system.

The amine synergist acts as an active hydrogen donor to excite the photoinitiator. Abstraction of hydrogen generates very reactive alkylamino radicals, which subsequently initiate polymerization.

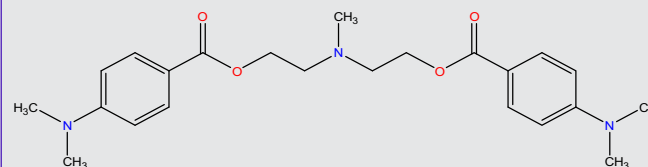
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## AMINE SYNERGIST (PHOTOSENSITIZER)

### PowerCure™ 198

CAS No.: 925246-00-0

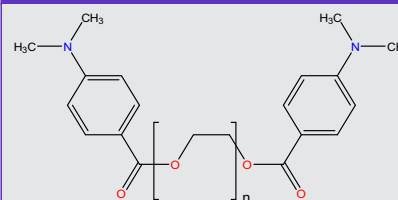
1,1'-[(Methylimino)di-2,1-ethanediy] bis[4-(dimethylamino)benzoate]



### PowerCure™ ASA

CAS No.: 71512-90-8

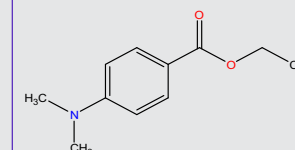
Poly(ethylene glycol) bis(p-dimethylaminobenzoate)



### PowerCure™ EDB

CAS No.: 10287-53-3

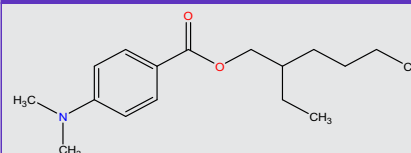
Ethyl-4-(dimethylamino) benzoate



### PowerCure™ EHA

CAS No.: 21245-02-3

2-Ethylhexyl-4-dimethylamino benzoate



### PowerCure™ NPG

CAS No.: 103-01-5

Phenylacetic acid

