

# SAFETY DATA SHEET

Date of last issue: 2021-05-10

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## SECTION 1. IDENTIFICATION

Product name : LED UV Curable INK Black  
UH21-BK220U / UH21-BK800U

### Manufacturer or supplier's details

Company name of supplier : MUTOH America Inc  
Address : 4405 East Baseline Road, Suite 120 Phoenix, Arizona 85042  
Contact section : Customer Care  
Telephone : 480-968-7772  
Emergency telephone : 480-968-7772  
During normal opening times

### Recommended use of the chemical and restrictions on use


Recommended use : Digital printing

## SECTION 2. HAZARDS IDENTIFICATION

### GHS Classification in accordance with 29 CFR 1910.1200

Acute toxicity (Oral) : Category 4  
Skin sensitization : Category 1  
Reproductive toxicity : Category 1B

### GHS label elements

Hazard pictograms : 

Signal Word : Danger

Hazard Statements : H302 Harmful if swallowed.  
H317 May cause an allergic skin reaction.  
H360FD May damage fertility. May damage the unborn child.

Precautionary Statements : **Prevention:**  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P261 Avoid breathing mist or vapors.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P272 Contaminated work clothing must not be allowed out of the workplace.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
**Response:**  
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.  
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.  
P308 + P313 IF exposed or concerned: Get medical advice/

attention.  
 P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.  
 P363 Wash contaminated clothing before reuse.

**Storage:**

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Other hazards**

None known.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

**Components**

Chemical name	CAS-No.	Concentration (% w/w)
2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester	86273-46-3	80 - 90
Propoxylated neopentyl glycol diacrylate esters	84170-74-1	< 7
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8	< 7
Propylidynetrimehanol, propoxylated, esters with acrylic acid	53879-54-2	< 5
Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide	162881-26-7	< 5
Carbon black	1333-86-4	< 5
2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	71868-10-5	< 1
Glycerol, propoxylated, esters with acrylic acid	52408-84-1	< 0.5
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid	55818-57-0	< 0.5
2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone	119313-12-1	< 0.3

### SECTION 4. FIRST AID MEASURES

- General advice : In the case of accident or if you feel unwell, seek medical advice immediately.  
 When symptoms persist or in all cases of doubt seek medical advice.
- If inhaled : If inhaled, remove to fresh air.  
 Get medical attention.
- In case of skin contact : In case of contact, immediately flush skin with soap and plenty of water.  
 Remove contaminated clothing and shoes.  
 Get medical attention.  
 Wash clothing before reuse.  
 Thoroughly clean shoes before reuse.
- In case of eye contact : Flush eyes with water as a precaution.  
 Get medical attention if irritation develops and persists.
- If swallowed : If swallowed, DO NOT induce vomiting.  
 Get medical attention.  
 Rinse mouth thoroughly with water.  
 Never give anything by mouth to an unconscious person.
- Most important symptoms and effects, both acute and delayed : Harmful if swallowed.  
 May cause an allergic skin reaction.  
 May damage fertility. May damage the unborn child.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

Notes to physician : Treat symptomatically and supportively.

## SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical

Unsuitable extinguishing media : None known.

Specific hazards during fire fighting : Exposure to combustion products may be a hazard to health.

Hazardous combustion Products : Carbon oxides  
Oxides of phosphorus  
Nitrogen oxides (NO<sub>x</sub>)

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
Use water spray to cool unopened containers.  
Remove undamaged containers from fire area if it is safe to do so.  
Evacuate area.

Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.  
Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

Environmental precautions : Discharge into the environment must be avoided.  
Prevent further leakage or spillage if safe to do so.  
Prevent spreading over a wide area (e.g. by containment or oil barriers).  
Retain and dispose of contaminated wash water.  
Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up : Soak up with inert absorbent material.  
For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container.  
Clean up remaining materials from spill with suitable absorbent.  
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.  
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

## SECTION 7. HANDLING AND STORAGE

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
- Local/Total ventilation : Use only with adequate ventilation.
- Advice on safe handling : Do not get on skin or clothing.  
Do not breathe vapors or spray mist.  
Do not swallow.  
Avoid contact with eyes.  
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment.  
Take care to prevent spills, waste and minimize release to the environment.
- Conditions for safe storage : Keep in properly labeled containers.  
Store locked up.  
Store in accordance with the particular national regulations.
- Materials to avoid : Do not store with the following product types:  
Strong oxidizing agents  
Organic peroxides  
Explosives

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Carbon black	1333-86-4	TWA	3.5 mg/m <sup>3</sup>	NIOSH REL
		TWA	3.5 mg/m <sup>3</sup>	OSHA Z-1
		TWA (Inhalable fraction)	3 mg/m <sup>3</sup>	ACGIH

- Engineering measures** : Ensure adequate ventilation, especially in confined areas.  
Minimize workplace exposure concentrations.

### Personal protective equipment

- Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

- Hand protection  
Material : Chemical-resistant gloves

- Remarks : Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.

- Eye protection : Wear the following personal protective equipment:

Safety glasses

Skin and body protection : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.  
Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).

Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place.  
When using do not eat, drink or smoke.  
Wash contaminated clothing before re-use.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Color : black

Odor : mild

Odor Threshold : No data available

pH : No data available

Melting point/freezing point : -71 °C

Initial boiling point and boiling range : 94 °C

Flash point : 119 °C  
Method: Seta closed cup

Evaporation rate : No data available

Flammability (solid, gas) : Not applicable

Flammability (liquids) : No data available

Upper explosion limit / Upper flammability limit : No data available

Lower explosion limit / Lower flammability limit : No data available

Vapor pressure : No data available

Relative vapor density : > 3

Density : 1.03 - 1.06 g/cm<sup>3</sup>

Solubility(ies)  
Water solubility : 18 g/l

Partition coefficient:  
n-octanol/water : Not applicable

Autoignition temperature : No data available

Decomposition temperature : The substance or mixture is not classified self-reactive.

Viscosity

Viscosity, dynamic	:	2 - 10 mPa.s
Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Particle size	:	Not applicable

## SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Can react with strong oxidizing agents.
Conditions to avoid	:	None known.
Incompatible materials	:	Oxidizing agents
Hazardous decomposition products	:	No hazardous decomposition products are known.

## SECTION 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

Inhalation  
 Skin contact  
 Ingestion  
 Eye contact

### Acute toxicity

Harmful if swallowed.

#### **Product:**

Acute oral toxicity : Acute toxicity estimate: 1,989 mg/kg  
 Method: Calculation method

#### **Components:**

##### **2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Acute oral toxicity : LD50 (Rat): 1,790 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 5.04 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist  
 Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

##### **Propoxylated neopentyl glycol diacrylate esters:**

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 2 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg

Method: OECD Test Guideline 402

Assessment: The substance or mixture has no acute dermal toxicity

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

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The substance or mixture has no acute dermal toxicity

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 423  
Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 401  
Assessment: The substance or mixture has no acute oral toxicity

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The substance or mixture has no acute dermal toxicity

**Carbon black:**

Acute oral toxicity : LD50 (Rat): > 10,000 mg/kg

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Acute oral toxicity : LD50 (Rat): 1,984 mg/kg  
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The substance or mixture has no acute dermal toxicity

**Glycerol, propoxylated, esters with acrylic acid:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 401  
Assessment: The substance or mixture has no acute oral toxicity

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg  
Assessment: The substance or mixture has no acute dermal toxicity

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 401  
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 5 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist  
Method: OECD Test Guideline 403  
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg

Method: OECD Test Guideline 402

Remarks: Based on data from similar materials

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The substance or mixture has no acute dermal toxicity

**Skin corrosion/irritation**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rabbit  
Method: OECD Test Guideline 404  
Result: No skin irritation  
Remarks: May cause skin irritation.  
Based on a Significant New Use Rule regulation

**Propoxylated neopentyl glycol diacrylate esters:**

Species: Rabbit  
Result: No skin irritation

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

Species: Rabbit  
Result: No skin irritation

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Method: OECD Test Guideline 439  
Result: No skin irritation  
Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Species: Rabbit  
Method: OECD Test Guideline 404  
Result: No skin irritation

**Carbon black:**

Species: Rabbit  
Result: No skin irritation

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Species: Rabbit  
Method: OECD Test Guideline 404  
Result: No skin irritation

**Glycerol, propoxylated, esters with acrylic acid:**

Species: Rabbit  
Method: OECD Test Guideline 404  
Result: No skin irritation

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Species: Rabbit  
Method: OECD Test Guideline 404  
Result: No skin irritation

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Species: Rabbit



Method: OECD Test Guideline 404

Result: No skin irritation

**Serious eye damage/eye irritation**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rabbit

Result: No eye irritation

Method: OECD Test Guideline 405

**Propoxylated neopentyl glycol diacrylate esters:**

Species: Rabbit

Result: No eye irritation

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

Species: Rabbit

Result: No eye irritation

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Result: No eye irritation

Method: OECD Test Guideline 437

Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Species: Rabbit

Result: No eye irritation

Method: OECD Test Guideline 405

**Carbon black:**

Species: Rabbit

Result: No eye irritation

Method: OECD Test Guideline 405

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Species: Rabbit

Result: No eye irritation

Method: OECD Test Guideline 405

**Glycerol, propoxylated, esters with acrylic acid:**

Species: Rabbit

Result: Irritation to eyes, reversing within 21 days

Method: OECD Test Guideline 405

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Species: Rabbit

Result: No eye irritation

Method: OECD Test Guideline 405

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Species: Rabbit

Result: No eye irritation

Method: OECD Test Guideline 405

**Respiratory or skin sensitization**

**Skin sensitization**

May cause an allergic skin reaction.

**Respiratory sensitization**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of skin sensitization in humans

**Propoxylated neopentyl glycol diacrylate esters:**

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

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

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

**Propylidynetrimehanol, propoxylated, esters with acrylic acid:**

Test Type: Buehler Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Method: OECD Test Guideline 406  
Result: positive  
Remarks: Based on data from similar materials  
Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Test Type: Maximization Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Method: OECD Test Guideline 406  
Result: positive  
Assessment: Probability or evidence of skin sensitization in humans

**Carbon black:**

Test Type: Buehler Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Method: OECD Test Guideline 406  
Result: negative

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Test Type: Maximization Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Result: negative

**Glycerol, propoxylated, esters with acrylic acid:**

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of skin sensitization in humans

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane,**

**esters with acrylic acid:**

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of skin sensitization in humans

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Test Type: Maximization Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Result: negative

**Germ cell mutagenicity**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Mouse  
Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative

**Propoxylated neopentyl glycol diacrylate esters:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Mouse  
Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative  
Remarks: Based on data from similar materials

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

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

: Test Type: Chromosome aberration test in vitro  
Result: negative

: Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

: Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: negative

: Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

**Carbon black:**

Genotoxicity in vitro

: Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

Test Type: In vitro sister chromatid exchange assay in mam-  
malian cells  
Method: OECD Test Guideline 479  
Result: negative

Test Type: in vitro micronucleus test  
Method: OECD Test Guideline 487  
Result: negative

Genotoxicity in vivo

: Test Type: Sex-linked recessive lethal test in *Drosophila*  
*melanogaster* (in vivo)  
Species: *Drosophila melanogaster* (vinegar fly)  
Application Route: Ingestion  
Method: OECD Test Guideline 477  
Result: negative

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Genotoxicity in vitro

: Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

**Glycerol, propoxylated, esters with acrylic acid:**

Genotoxicity in vitro

: Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Test Type: Chromosome aberration test in vitro  
Result: negative

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Genotoxicity in vitro

: Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Genotoxicity in vivo

: Test Type: Mammalian erythrocyte micronucleus test (in vivo  
cytogenetic assay)  
Species: Mouse  
Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Genotoxicity in vitro

: Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Genotoxicity in vivo

: Test Type: Mammalian erythrocyte micronucleus test (in vivo  
cytogenetic assay)  
Species: Hamster

Application Route: Ingestion  
Result: negative

**Carcinogenicity**

Not classified based on available information.

**Components:**

**Carbon black:**

Species: Rat  
Application Route: Inhalation  
Exposure time: 24 Months  
Result: positive

Species: Rat  
Application Route: Ingestion  
Exposure time: 2 Years  
Result: negative

Carcinogenicity - Assessment: Weight of evidence does not support classification as a carcinogen

**IARC**

Group 2B: Possibly carcinogenic to humans  
Carbon black 1333-86-4

**OSHA**

No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**NTP**

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

**Reproductive toxicity**

May damage fertility. May damage the unborn child.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative  
Remarks: May cause adverse reproductive effects.  
Based on a Significant New Use Rule regulation

Effects on fetal development : Remarks: May cause developmental effects  
Based on a Significant New Use Rule regulation

**Propoxylated neopentyl glycol diacrylate esters:**

Effects on fertility : Test Type: Reproduction/Developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 421  
Result: negative

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rat  
Application Route: Ingestion  
Result: negative  
Remarks: Based on data from similar materials

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

Effects on fertility : Test Type: Fertility  
Species: Rat  
Application Route: Ingestion

Result: positive

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Effects on fetal development : Test Type: Fertility/early embryonic development  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: negative

**Carbon black:**

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: negative

Test Type: Embryo-fetal development  
Species: Mouse  
Application Route: inhalation (dust/mist/fume)  
Result: negative

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Effects on fertility : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Result: positive

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: positive

Reproductive toxicity - Assessment : Clear evidence of adverse effects on development, based on animal experiments., Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

**Glycerol, propoxylated, esters with acrylic acid:**

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rat  
Application Route: Ingestion  
Result: negative

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative

Effects on fetal development : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Effects on fertility : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 415  
Result: negative

Effects on fetal development : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 415  
Result: positive

Reproductive toxicity - Assessment : Clear evidence of adverse effects on development, based on animal experiments.

**STOT-single exposure**

Not classified based on available information.

**STOT-repeated exposure**

Not classified based on available information.

**Repeated dose toxicity**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rat  
NOAEL: 160 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days  
Method: OECD Test Guideline 407

**Propoxylated neopentyl glycol diacrylate esters:**

Species: Rat  
NOAEL: 1,000 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days  
Method: OECD Test Guideline 407

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

Species: Rat  
NOAEL: 100 mg/kg  
LOAEL: 300 mg/kg  
Application Route: Ingestion  
Exposure time: 90 Days

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Species: Rat  
NOAEL: 1,000 mg/kg  
Application Route: Ingestion  
Exposure time: 90 Days  
Method: OECD Test Guideline 408

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Species: Rat  
NOAEL: 75 mg/kg  
LOAEL: 220 mg/kg  
Application Route: Ingestion  
Exposure time: 90 Days  
Method: OECD Test Guideline 408

**Glycerol, propoxylated, esters with acrylic acid:**

Species: Rat

NOAEL: 250 mg/kg  
 LOAEL: 750 mg/kg  
 Application Route: Ingestion  
 Exposure time: 28 Days  
 Method: OECD Test Guideline 422  
 Remarks: Based on data from similar materials

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Species: Rat  
 NOAEL: > 900 mg/kg  
 Application Route: Ingestion  
 Exposure time: 5 Weeks  
 Method: OECD Test Guideline 422

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Species: Rat  
 NOAEL: >= 100 mg/kg  
 Application Route: Ingestion  
 Exposure time: 28 Days

**Aspiration toxicity**

Not classified based on available information.

**Further information**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Remarks: May cause internal organ effects  
 Based on a Significant New Use Rule regulation

**SECTION 12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 6.8 mg/l  
 Exposure time: 96 h  
 Method: OECD Test Guideline 203

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 55 mg/l  
 aquatic invertebrates : Exposure time: 48 h  
 Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): 10 mg/l  
 Exposure time: 72 h  
 Method: OECD Test Guideline 201

NOEC (Desmodesmus subspicatus (green algae)): 0.78 mg/l  
 Exposure time: 72 h  
 Method: OECD Test Guideline 201

Toxicity to daphnia and other : NOEC (Daphnia magna (Water flea)): 0.26 mg/l  
 aquatic invertebrates (Chronic : Exposure time: 21 d  
 toxicity) : Method: OECD Test Guideline 211

Toxicity to microorganisms : EC50: 741 mg/l  
 Exposure time: 3 h  
 Method: OECD Test Guideline 209

**Propoxylated neopentyl glycol diacrylate esters:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 2.7 mg/l  
 Exposure time: 96 h



Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 37 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): 11 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 1 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : NOEC: 2 mg/l  
Exposure time: 28 d

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

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 1 - 10 mg/l  
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 3.53 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 2.01 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

EC10 (Pseudokirchneriella subcapitata (green algae)): 1.56 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 1,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 1 - 10 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203  
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 10 - 100 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202  
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): > 10 - 100 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

EC10 (Desmodesmus subspicatus (green algae)): > 1 - 10 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 90 µg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Remarks: No toxicity at the limit of solubility.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1.18 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202  
Remarks: No toxicity at the limit of solubility.

Toxicity to algae/aquatic plants : NOEC (Desmodesmus subspicatus (green algae)): 260 µg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
Remarks: No toxicity at the limit of solubility.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 8.1 µg/l  
Exposure time: 21 d  
Method: OECD Test Guideline 211  
Remarks: No toxicity at the limit of solubility.

Toxicity to microorganisms : EC50: > 100 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**Carbon black:**

Toxicity to fish : LL50 (Danio rerio (zebra fish)): > 1,000 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): > 5,600 mg/l  
Exposure time: 24 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EL10 (Desmodesmus subspicatus (green algae)): > 10,000 mg/l  
Exposure time: 72 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 201

EL50 (Desmodesmus subspicatus (green algae)): > 10,000 mg/l  
Exposure time: 72 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 201

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Toxicity to fish : LC50 (Zebrafish): 9 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 15.3 mg/l  
Exposure time: 24 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 1.6 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

NOEC (Desmodesmus subspicatus (green algae)): 0.39 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : IC50: > 100 mg/l  
Exposure time: 3 h

**Glycerol, propoxylated, esters with acrylic acid:**

- Toxicity to fish : LC50 (Danio rerio (zebra fish)): 5.74 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 91.4 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202
- Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 12.2 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201
- EC10 (Desmodesmus subspicatus (green algae)): 2.06 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201
- Toxicity to microorganisms : EC50: > 1,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

- Toxicity to fish : LL50 (Cyprinus carpio (Carp)): > 100 mg/l  
Exposure time: 96 h  
Test substance: Water Accommodated Fraction  
Method: ISO 7346/1  
Remarks: Based on data from similar materials
- Toxicity to daphnia and other aquatic invertebrates : LL50 (Daphnia magna (Water flea)): > 100 mg/l  
Exposure time: 48 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 202
- Toxicity to algae/aquatic plants : EL50 (Pseudokirchneriella subcapitata (green algae)): 105 mg/l  
Exposure time: 72 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 201
- NOELR (Pseudokirchneriella subcapitata (green algae)): 1.2 mg/l  
Exposure time: 72 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 201
- Toxicity to microorganisms : EC50: > 1,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

- Toxicity to fish : LC50 (Danio rerio (zebra fish)): 0.46 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 0.8 mg/l  
Exposure time: 24 h  
Method: OECD Test Guideline 202
- Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 2 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201
- Toxicity to microorganisms : EC50: > 100 mg/l

Exposure time: 30 min  
Method: OECD Test Guideline 209

**Persistence and degradability**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 84.4 %  
Exposure time: 28 d

**Propoxylated neopentyl glycol diacrylate esters:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 51 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301D

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

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 0 - 10 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 65 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B  
Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 1 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 1 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301E

**Glycerol, propoxylated, esters with acrylic acid:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 72 - 85 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 42 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 3 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

**Bioaccumulative potential**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Partition coefficient: : log Pow: 1.7  
n-octanol/water

**Propoxylated neopentyl glycol diacrylate esters:**

Partition coefficient: : log Pow: 2.41 - 3.87  
n-octanol/water

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

Bioaccumulation : Species: Cyprinus carpio (Carp)  
Bioconcentration factor (BCF): 18 - 72

Partition coefficient: : log Pow: 3.1 - 3.8  
n-octanol/water

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Bioaccumulation : Species: Fish  
Bioconcentration factor (BCF): < 5

Partition coefficient: : log Pow: 5.8  
n-octanol/water

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Bioaccumulation : Bioconcentration factor (BCF): 13

Partition coefficient: : log Pow: 3.09  
n-octanol/water

**Glycerol, propoxylated, esters with acrylic acid:**

Partition coefficient: : log Pow: 2.52  
n-octanol/water

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Partition coefficient: : log Pow: 1.6 - 3.8  
n-octanol/water

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Partition coefficient: : log Pow: 2.91  
n-octanol/water

**Mobility in soil**

No data available

**Other adverse effects**

No data available

## SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal methods**

Waste from residues : Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
If not otherwise specified: Dispose of as unused product.

## SECTION 14. TRANSPORT INFORMATION

**International Regulations**

**UNRTDG**

Not regulated as dangerous goods

**IATA-DGR**

Not regulated as dangerous goods

**IMDG-Code**

Not regulated as dangerous goods

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**Domestic regulation**

**49 CFR**

Not regulated as dangerous goods

**SECTION 15. REGULATORY INFORMATION**

**EPCRA - Emergency Planning and Community Right-to-Know  
CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

This material does not contain any components with a section 302 EHS TPQ.

**SARA 311/312 Hazards** : Acute toxicity (any route of exposure)  
Respiratory or skin sensitization  
Reproductive toxicity

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**US State Regulations**

**Pennsylvania Right To Know**

2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester	86273-46-3
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8
Propoxylated neopentyl glycol diacrylate esters	84170-74-1
Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide	162881-26-7
Carbon black	1333-86-4
Propylidynetrimethanol, propoxylated, esters with acrylic acid	53879-54-2

**California Prop. 65**

WARNING: This product can expose you to chemicals including Carbon black and Benzophenone, which are known to the State of California to cause cancer, and Toluene, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

**California List of Hazardous Substances**

Carbon black	1333-86-4
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**California Permissible Exposure Limits for Chemical Contaminants**

Carbon black	1333-86-4
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**Additional regulatory information**

2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester 86273-46-3  
The United States Environmental Protection Agency (USEPA) has established a Significant New Use Rule (SNUR) for one of the components in this product.  
See 40 CFR § 721.10064

**SECTION 16. OTHER INFORMATION**

## Further information

### Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA Z-1 / TWA	:	8-hour time weighted average

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Revision Date : 2021-05-10

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless

specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.



# SAFETY DATA SHEET

Date of last issue: 2021-05-10

Date of first issue: 2019-12-01

## SECTION 1. IDENTIFICATION

Product name : LED UV Curable INK Cleaner  
UH21-CL220U

### Manufacturer or supplier's details

Company name of supplier : MUTOH America Inc  
Address : 4405 East Baseline Road, Suite 120 Phoenix, Arizona 85042  
Contact section : Customer Care  
Telephone : 480-968-7772  
Emergency telephone : 480-968-7772  
During normal opening times

### Recommended use of the chemical and restrictions on use


Recommended use : Digital printing

## SECTION 2. HAZARDS IDENTIFICATION

### GHS Classification in accordance with 29 CFR 1910.1200

Flammable liquids : Category 4  
Skin irritation : Category 2  
Reproductive toxicity : Category 1B

### GHS label elements

Hazard pictograms : 

Signal Word : Danger

Hazard Statements : H227 Combustible liquid.  
H315 Causes skin irritation.  
H360Df May damage the unborn child. Suspected of damaging fertility.

Precautionary Statements : **Prevention:**  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.  
P264 Wash skin thoroughly after handling.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
**Response:**  
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.  
P308 + P313 IF exposed or concerned: Get medical advice/ attention.  
P332 + P313 If skin irritation occurs: Get medical advice/ attention.

P362 + P364 Take off contaminated clothing and wash it before reuse.

**Storage:**

P403 + P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Other hazards**

Vapors may form explosive mixture with air.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

**Components**

Chemical name	CAS-No.	Concentration (% w/w)
Bis(2-ethoxyethyl) ether	112-36-7	30 - 60
bis(2-(2-methoxyethoxy)ethyl) ether	143-24-8	30 - 60

### SECTION 4. FIRST AID MEASURES

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.  
When symptoms persist or in all cases of doubt seek medical advice.

If inhaled : If inhaled, remove to fresh air.  
Get medical attention.

In case of skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.  
Get medical attention.  
Wash clothing before reuse.  
Thoroughly clean shoes before reuse.

In case of eye contact : Flush eyes with water as a precaution.  
Get medical attention if irritation develops and persists.

If swallowed : If swallowed, DO NOT induce vomiting.  
Get medical attention.  
Rinse mouth thoroughly with water.

Most important symptoms and effects, both acute and delayed : Causes skin irritation.  
May damage the unborn child. Suspected of damaging fertility.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

Notes to physician : Treat symptomatically and supportively.

### SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO2)  
Dry chemical

- Unsuitable extinguishing media : High volume water jet
- Specific hazards during fire fighting : Do not use a solid water stream as it may scatter and spread fire.  
Flash back possible over considerable distance.  
Vapors may form explosive mixtures with air.  
Exposure to combustion products may be a hazard to health.
- Hazardous combustion Products : Carbon oxides
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
Use water spray to cool unopened containers.  
Remove undamaged containers from fire area if it is safe to do so.  
Evacuate area.
- Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Remove all sources of ignition.  
Use personal protective equipment.  
Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).
- Environmental precautions : Discharge into the environment must be avoided.  
Prevent further leakage or spillage if safe to do so.  
Prevent spreading over a wide area (e.g. by containment or oil barriers).  
Retain and dispose of contaminated wash water.  
Local authorities should be advised if significant spillages cannot be contained.
- Methods and materials for containment and cleaning up : Non-sparking tools should be used.  
Soak up with inert absorbent material.  
Suppress (knock down) gases/vapors/mists with a water spray jet.  
For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container.  
Clean up remaining materials from spill with suitable absorbent.  
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.  
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

## SECTION 7. HANDLING AND STORAGE

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
- Local/Total ventilation : If sufficient ventilation is unavailable, use with local exhaust ventilation.
- Advice on safe handling : Do not get on skin or clothing.

Do not breathe vapors or spray mist.  
Do not swallow.  
Avoid contact with eyes.  
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment.  
Keep container tightly closed.  
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
Take precautionary measures against static discharges.  
Take care to prevent spills, waste and minimize release to the environment.

- Conditions for safe storage : Keep in properly labeled containers.  
Store locked up.  
Keep tightly closed.  
Keep in a cool, well-ventilated place.  
Store in accordance with the particular national regulations.  
Keep away from heat and sources of ignition.
- Materials to avoid : Do not store with the following product types:  
Strong oxidizing agents  
Organic peroxides  
Explosives  
Gases

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

- Engineering measures : Ensure adequate ventilation, especially in confined areas.  
Minimize workplace exposure concentrations.

### Personal protective equipment

- Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

- Hand protection  
Material : Chemical-resistant gloves

- Remarks : Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Take note that the product is flammable, which may impact the selection of hand protection. Wash hands before breaks and at the end of workday.

- Eye protection : Wear the following personal protective equipment:  
Safety glasses

- Skin and body protection : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.  
Wear the following personal protective equipment:  
If assessment demonstrates that there is a risk of explosive atmospheres or flash fires, use flame retardant antistatic protective clothing.  
Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).
- Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place.  
When using do not eat, drink or smoke.  
Wash contaminated clothing before re-use.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : liquid
- Color : clear
- Odor : mild
- Odor Threshold : No data available
- pH : No data available
- Melting point/freezing point : No data available
- Initial boiling point and boiling range : > 120 °C  
(1,013 hPa)
- Flash point : 62.78 °C  
Method: Seta closed cup
- Evaporation rate : No data available
- Flammability (solid, gas) : Not applicable
- Flammability (liquids) : No data available
- Upper explosion limit / Upper flammability limit : No data available
- Lower explosion limit / Lower flammability limit : No data available
- Vapor pressure : No data available
- Relative vapor density : > 3  
(Air = 1.0)
- Density : 0.94 - 0.99 g/cm<sup>3</sup> (20 °C)
- Solubility(ies)  
Water solubility : completely miscible
- Partition coefficient:  
n-octanol/water : Not applicable
- Autoignition temperature : No data available

Decomposition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	2 mPa.s
Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Particle size	:	Not applicable

## SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Combustible liquid. Vapors may form explosive mixture with air. Can react with strong oxidizing agents.
Conditions to avoid	:	Heat, flames and sparks.
Incompatible materials	:	Oxidizing agents
Hazardous decomposition products	:	No hazardous decomposition products are known.

## SECTION 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

Inhalation  
Skin contact  
Ingestion  
Eye contact

### Acute toxicity

Not classified based on available information.

#### **Product:**

Acute oral toxicity : Acute toxicity estimate: 3,616 mg/kg  
Method: Calculation method

#### **Components:**

##### **Bis(2-ethoxyethyl) ether:**

Acute oral toxicity : LD50 (Rat): 4,970 mg/kg

##### **bis(2-(2-methoxyethoxy)ethyl) ether:**

Acute oral toxicity : LD50 (Rat): 3,850 mg/kg

Acute dermal toxicity : LD50 (Rat): > 6,900 mg/kg  
Remarks: Based on data from similar materials

### Skin corrosion/irritation

Causes skin irritation.

#### **Components:**

##### **Bis(2-ethoxyethyl) ether:**

Result: Skin irritation

Remarks: Based on data from similar materials

##### **bis(2-(2-methoxyethoxy)ethyl) ether:**

Species: Rabbit  
 Method: OECD Test Guideline 404  
 Result: No skin irritation

**Serious eye damage/eye irritation**

Not classified based on available information.

**Components:**

**Bis(2-ethoxyethyl) ether:**

Species: Rabbit  
 Result: No eye irritation  
 Method: OECD Test Guideline 405

**bis(2-(2-methoxyethoxy)ethyl) ether:**

Species: Rabbit  
 Result: No eye irritation  
 Method: OECD Test Guideline 405

**Respiratory or skin sensitization**

**Skin sensitization**

Not classified based on available information.

**Respiratory sensitization**

Not classified based on available information.

**Components:**

**Bis(2-ethoxyethyl) ether:**

Test Type: Local lymph node assay (LLNA)  
 Routes of exposure: Skin contact  
 Species: Mouse  
 Method: OECD Test Guideline 429  
 Result: negative  
 Remarks: Based on data from similar materials

**bis(2-(2-methoxyethoxy)ethyl) ether:**

Test Type: Local lymph node assay (LLNA)  
 Routes of exposure: Skin contact  
 Species: Mouse  
 Method: OECD Test Guideline 429  
 Result: negative  
 Remarks: Based on data from similar materials

**Germ cell mutagenicity**

Not classified based on available information.

**Components:**

**Bis(2-ethoxyethyl) ether:**

- Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
 Result: negative  
 Remarks: Based on data from similar materials
- : Test Type: In vitro mammalian cell gene mutation test  
 Result: negative  
 Remarks: Based on data from similar materials
- : Test Type: Chromosome aberration test in vitro  
 Result: negative  
 Remarks: Based on data from similar materials
- Genotoxicity in vivo : Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)  
 Species: Mouse  
 Application Route: Ingestion  
 Result: negative  
 Remarks: Based on data from similar materials

**bis(2-(2-methoxyethoxy)ethyl) ether:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

Genotoxicity in vivo : Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)  
Species: Rat  
Application Route: Inhalation (vapor)  
Result: negative  
Remarks: Based on data from similar materials

**Carcinogenicity**

Not classified based on available information.

**IARC**

No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**OSHA**

No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**NTP**

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

**Reproductive toxicity**

May damage the unborn child. Suspected of damaging fertility.

**Components:**

**Bis(2-ethoxyethyl) ether:**

Effects on fertility : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Result: negative  
Remarks: Based on data from similar materials

Effects on fetal development : Test Type: Embryo-foetal development  
Species: Rabbit  
Application Route: Ingestion  
Result: negative

**bis(2-(2-methoxyethoxy)ethyl) ether:**

Effects on fertility : Test Type: Reproduction/Developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 421  
Result: positive

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rabbit  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: positive

Reproductive toxicity - Assessment : Clear evidence of adverse effects on development, based on animal experiments., Some evidence of adverse effects on sexual function and fertility, based on animal experiments.

**STOT-single exposure**

Not classified based on available information.

**STOT-repeated exposure**

Not classified based on available information.



## Repeated dose toxicity

### Components:

#### **Bis(2-ethoxyethyl) ether:**

Species: Rat  
 NOAEL: 2.49 mg/l  
 Application Route: inhalation (dust/mist/fume)  
 Exposure time: 4 w  
 Method: OECD Test Guideline 412

#### **bis(2-(2-methoxyethoxy)ethyl) ether:**

Species: Rat  
 NOAEL: 250 mg/kg  
 Application Route: Ingestion  
 Exposure time: 28 d  
 Method: OECD Test Guideline 407  
 Remarks: Based on data from similar materials

## Aspiration toxicity

Not classified based on available information.

## SECTION 12. ECOLOGICAL INFORMATION

### Ecotoxicity

#### Components:

#### **Bis(2-ethoxyethyl) ether:**

Toxicity to fish : LC50: > 10,000 mg/l  
 Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : LC50: 6,600 mg/l  
 Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EC10 (Ceriodaphnia dubia (water flea)): > 1 mg/l  
 Exposure time: 7 d  
 Remarks: Based on data from similar materials

Toxicity to microorganisms : NOEC: > 1,000 mg/l  
 Exposure time: 3 h  
 Method: OECD Test Guideline 209

#### **bis(2-(2-methoxyethoxy)ethyl) ether:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 5,000 mg/l  
 Exposure time: 96 h  
 Method: OECD Test Guideline 203  
 Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 7,467 mg/l  
 Exposure time: 48 h  
 Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): 2,814 mg/l  
 Exposure time: 72 h  
 Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 625 mg/l  
 Exposure time: 72 h  
 Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 320 mg/l  
 Exposure time: 21 d  
 Method: OECD Test Guideline 211

Toxicity to microorganisms : EC10:  $\geq$  5,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209  
Remarks: Based on data from similar materials

## Persistence and degradability

### Components:

#### **Bis(2-ethoxyethyl) ether:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 0 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F

#### **bis(2-(2-methoxyethoxy)ethyl) ether:**

Biodegradability : Result: Inherently biodegradable.  
Biodegradation:  $>$  70 %  
Exposure time: 28 d  
Method: OECD Test Guideline 302B  
Remarks: Based on data from similar materials

## Bioaccumulative potential

### Components:

#### **Bis(2-ethoxyethyl) ether:**

Partition coefficient: : log Pow: 0.39  
n-octanol/water

#### **bis(2-(2-methoxyethoxy)ethyl) ether:**

Partition coefficient: : log Pow: -0.84  
n-octanol/water

### **Mobility in soil**

No data available

### **Other adverse effects**

No data available

## SECTION 13. DISPOSAL CONSIDERATIONS

### **Disposal methods**

Waste from residues : Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
Empty containers retain residue and can be dangerous.  
Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury and/or death.  
If not otherwise specified: Dispose of as unused product.

## SECTION 14. TRANSPORT INFORMATION

### **International Regulations**

#### **UNRTDG**

Not regulated as dangerous goods

#### **IATA-DGR**

Not regulated as dangerous goods

#### **IMDG-Code**

Not regulated as dangerous goods

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**SECTION 15. REGULATORY INFORMATION**

**EPCRA - Emergency Planning and Community Right-to-Know  
CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

This material does not contain any components with a section 302 EHS TPQ.

**SARA 311/312 Hazards** : Fire Hazard  
Acute Health Hazard  
Chronic Health Hazard

**SARA 313** : The following components are subject to reporting levels established by SARA Title III, Section 313:



Bis(2-ethoxyethyl) ether 112-36-7 60%

**US State Regulations**



**Pennsylvania Right To Know**

Bis(2-ethoxyethyl) ether 112-36-7  
bis(2-(2-methoxyethoxy)ethyl) ether 143-24-8

**California Prop. 65**

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

**Additional regulatory information**

Diethylene Glycol Diethyl Ether 112-36-7

The United States Environmental Protection Agency (USEPA) has established a Significant New Use Rule (SNUR) for one of the components in this product.  
See 40 CFR § 721.10229

**SECTION 16. OTHER INFORMATION**

**Further information**

**Full text of other abbreviations**

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test

population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Revision Date : 2021-05-10

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

# SAFETY DATA SHEET

Date of last issue: 2023-11-30

Date of first issue: 2019-12-01

## SECTION 1. IDENTIFICATION

Product name : LED UV Curable INK Cyan  
UH21-CY220U / UH21-CY800U

### Manufacturer or supplier's details

Company name of supplier : MUTOH America Inc  
Address : 4405 East Baseline Road, Suite 120 Phoenix, Arizona 85042  
Contact section : Customer Care  
Telephone : 480-968-7772  
Emergency telephone : 480-968-7772  
During normal opening times

### Recommended use of the chemical and restrictions on use

Recommended use : Digital printing

## SECTION 2. HAZARDS IDENTIFICATION

### GHS Classification in accordance with 29 CFR 1910.1200

Acute toxicity (Oral) : Category 4

Skin sensitization : Category 1

Reproductive toxicity : Category 1B

### GHS label elements

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H302 Harmful if swallowed.  
H317 May cause an allergic skin reaction.  
H360FD May damage fertility. May damage the unborn child.

Precautionary Statements : **Prevention:**  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P261 Avoid breathing mist or vapors.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P272 Contaminated work clothing must not be allowed out of the workplace.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
**Response:**  
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.  
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.  
P308 + P313 IF exposed or concerned: Get medical advice/

attention.  
 P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.

P363 Wash contaminated clothing before reuse.

**Storage:**

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Other hazards**

None known.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substance / Mixture : Mixture

**Components**

Chemical name	CAS-No.	Concentration (% w/w)
2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester	86273-46-3	≥ 50 - ≤ 100
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8	≥ 2.5 - ≤ 10
Propylidynetrimethanol, propoxylated, esters with acrylic acid	53879-54-2	≥ 2.5 - < 10
Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide	162881-26-7	≥ 2.5 - ≤ 10
2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	71868-10-5	≥ 0 - < 2.5
2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone	119313-12-1	≥ 0 - < 2.5

**SECTION 4. FIRST AID MEASURES**

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.  
 When symptoms persist or in all cases of doubt seek medical advice.

If inhaled : If inhaled, remove to fresh air.  
 Get medical attention.

In case of skin contact : In case of contact, immediately flush skin with soap and plenty of water.  
 Remove contaminated clothing and shoes.  
 Get medical attention.  
 Wash clothing before reuse.  
 Thoroughly clean shoes before reuse.

In case of eye contact : Flush eyes with water as a precaution.  
 Get medical attention if irritation develops and persists.

If swallowed : If swallowed, DO NOT induce vomiting.  
 Get medical attention.  
 Rinse mouth thoroughly with water.  
 Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed : Harmful if swallowed.  
 May cause an allergic skin reaction.  
 May damage fertility. May damage the unborn child.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

Notes to physician : Treat symptomatically and supportively.

## SECTION 5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical
- Unsuitable extinguishing media : None known.
- Specific hazards during fire fighting : Exposure to combustion products may be a hazard to health.
- Hazardous combustion Products : Carbon oxides  
Oxides of phosphorus  
Nitrogen oxides (NO<sub>x</sub>)  
Metal oxides
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
Use water spray to cool unopened containers.  
Remove undamaged containers from fire area if it is safe to do so.  
Evacuate area.
- Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.  
**Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).**
- Environmental precautions : Discharge into the environment must be avoided.  
Prevent further leakage or spillage if safe to do so.  
Prevent spreading over a wide area (e.g. by containment or oil barriers).  
Retain and dispose of contaminated wash water.  
Local authorities should be advised if significant spillages cannot be contained.
- Methods and materials for containment and cleaning up : Soak up with inert absorbent material.  
For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container.  
Clean up remaining materials from spill with suitable absorbent.  
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.  
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

## SECTION 7. HANDLING AND STORAGE

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
- Local/Total ventilation : **Use only with adequate ventilation.**

- Advice on safe handling : Do not get on skin or clothing.  
Do not breathe vapors or spray mist.  
Do not swallow.  
Avoid contact with eyes.  
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment.  
**Take care to prevent** spills, waste and minimize release to the environment.
- Conditions for safe storage : Keep in properly labeled containers.  
Store locked up.  
**Store in accordance** with the particular national regulations.
- Materials to avoid : Do not store with the following product types:  
Strong oxidizing agents  
Organic peroxides  
Explosives

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

- Engineering measures** : Ensure adequate ventilation, especially in confined areas.  
Minimize workplace exposure concentrations.

### Personal protective equipment

- Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

### Hand protection

- Material : Chemical-resistant gloves

- Remarks : Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.

- Eye protection : Wear the following personal protective equipment:  
Safety glasses

- Skin and body protection : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.  
Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).

- Hygiene measures : If exposure to chemical is likely during typical use, provide eye



flushing systems and safety showers close to the working place.  
 When using do not eat, drink or smoke.  
 Wash contaminated clothing before re-use.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Color	:	cyan
Odor	:	mild
Odor Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	-71 °C
Initial boiling point and boiling range	:	94 °C
Flash point	:	119 °C Method: Seta closed cup
Evaporation rate	:	No data available
Flammability (solid, gas)	:	Not applicable
Flammability (liquids)	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	> 3
Density	:	1.03 - 1.06 g/cm <sup>3</sup>
Solubility(ies)		
Water solubility	:	18 g/l
Partition coefficient: n-octanol/water	:	Not applicable
Autoignition temperature	:	No data available
Decomposition temperature	:	The substance or mixture is not classified self-reactive.
Viscosity		
Viscosity, dynamic	:	2 - 10 mPa.s
Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Particle size	:	Not applicable

## SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Not classified as a reactivity hazard.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Can react with strong oxidizing agents.
Conditions to avoid	: None known.
Incompatible materials	: Oxidizing agents
Hazardous decomposition products	: No hazardous decomposition products are known.

## SECTION 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

Inhalation  
 Skin contact  
 Ingestion  
 Eye contact

### Acute toxicity

Harmful if swallowed.

#### **Product:**

Acute oral toxicity : Acute toxicity estimate: 1,989 mg/kg  
 Method: Calculation method

#### **Components:**

##### **2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Acute oral toxicity : LD50 (Rat): 1,790 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 5.04 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist  
 Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

##### **Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide:**

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
 Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

##### **Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 423  
 Remarks: Based on data from similar materials

##### **Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 401

Assessment: The substance or mixture has no acute oral toxicity

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Acute oral toxicity : LD50 (Rat): 1,984 mg/kg  
 Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
 Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

**Skin corrosion/irritation**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenoxy)ethoxy]ethyl ester:**

Species: Rabbit  
 Method: OECD Test Guideline 404  
 Result: No skin irritation  
 Remarks: May cause skin irritation.  
 Based on a Significant New Use Rule regulation

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

Species: Rabbit  
 Result: No skin irritation

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Method: OECD Test Guideline 439  
 Result: No skin irritation  
 Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Species: Rabbit  
 Method: OECD Test Guideline 404  
 Result: No skin irritation

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Species: Rabbit  
 Method: OECD Test Guideline 404  
 Result: No skin irritation

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Species: Rabbit  
 Method: OECD Test Guideline 404  
 Result: No skin irritation

**Serious eye damage/eye irritation**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rabbit  
 Result: No eye irritation  
 Method: OECD Test Guideline 405

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

Species: Rabbit  
 Result: No eye irritation

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Result: No eye irritation  
 Method: OECD Test Guideline 437  
 Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Species: Rabbit  
 Result: No eye irritation  
 Method: OECD Test Guideline 405

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Species: Rabbit  
 Result: No eye irritation  
 Method: OECD Test Guideline 405

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Species: Rabbit  
 Result: No eye irritation  
 Method: OECD Test Guideline 405

**Respiratory or skin sensitization**

**Skin sensitization**

May cause an allergic skin reaction.

**Respiratory sensitization**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Test Type: Local lymph node assay (LLNA)  
 Routes of exposure: Skin contact  
 Species: Mouse  
 Method: OECD Test Guideline 429  
 Result: positive  
 Assessment: Probability or evidence of skin sensitization in humans

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

Test Type: Local lymph node assay (LLNA)  
 Routes of exposure: Skin contact  
 Species: Mouse  
 Method: OECD Test Guideline 429  
 Result: positive  
 Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Test Type: Buehler Test  
 Routes of exposure: Skin contact  
 Species: Guinea pig  
 Method: OECD Test Guideline 406  
 Result: positive  
 Remarks: Based on data from similar materials  
 Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Test Type: Maximization Test

Routes of exposure: Skin contact  
 Species: Guinea pig  
 Method: OECD Test Guideline 406  
 Result: positive  
 Assessment: Probability or evidence of skin sensitization in humans

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Test Type: Maximization Test  
 Routes of exposure: Skin contact  
 Species: Guinea pig  
 Result: negative

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Test Type: Maximization Test  
 Routes of exposure: Skin contact  
 Species: Guinea pig  
 Result: negative

**Germ cell mutagenicity**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test  
 Method: OECD Test Guideline 476  
 Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo  
 cytogenetic assay)  
 Species: Mouse  
 Application Route: Ingestion  
 Method: OECD Test Guideline 474  
 Result: negative

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

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
 Result: negative

: Test Type: Chromosome aberration test in vitro  
 Result: negative

: Test Type: In vitro mammalian cell gene mutation test  
 Method: OECD Test Guideline 476  
 Result: negative

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
 Method: OECD Test Guideline 471  
 Result: negative

: Test Type: Chromosome aberration test in vitro  
 Method: OECD Test Guideline 473  
 Result: negative

: Test Type: In vitro mammalian cell gene mutation test  
 Method: OECD Test Guideline 476  
 Result: negative

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
 Result: negative

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Hamster  
Application Route: Ingestion  
Result: negative

### Carcinogenicity

Not classified based on available information.

**IARC** Not classifiable.

**OSHA** No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**NTP** No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

### Reproductive toxicity

May damage fertility. May damage the unborn child.

#### Components:

#### **2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative  
Remarks: May cause adverse reproductive effects.  
Based on a Significant New Use Rule regulation

Effects on fetal development : Remarks: May cause developmental effects  
Based on a Significant New Use Rule regulation

#### **Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide:**

Effects on fertility : Test Type: Fertility  
Species: Rat  
Application Route: Ingestion  
Result: positive

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

#### **Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Effects on fetal development : Test Type: Fertility/early embryonic development  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: negative

#### **2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Effects on fertility : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Result: positive

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rat

Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: positive

Reproductive toxicity - Assessment : Clear evidence of adverse effects on development, based on animal experiments., Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Effects on fertility : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 415  
Result: negative

Effects on fetal development : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 415  
Result: positive

Reproductive toxicity - Assessment : Clear evidence of adverse effects on development, based on animal experiments.

**STOT-single exposure**

Not classified based on available information.

**STOT-repeated exposure**

Not classified based on available information.

**Repeated dose toxicity**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rat  
NOAEL: 160 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days  
Method: OECD Test Guideline 407

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

Species: Rat  
NOAEL: 100 mg/kg  
LOAEL: 300 mg/kg  
Application Route: Ingestion  
Exposure time: 90 Days

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Species: Rat  
NOAEL: 1,000 mg/kg  
Application Route: Ingestion  
Exposure time: 90 Days  
Method: OECD Test Guideline 408

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Species: Rat  
NOAEL: 75 mg/kg  
LOAEL: 220 mg/kg  
Application Route: Ingestion  
Exposure time: 90 Days  
Method: OECD Test Guideline 408

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Species: Rat  
NOAEL:  $\geq$  100 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days

### Aspiration toxicity

Not classified based on available information.

### Further information

#### Components:

#### **2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Remarks: May cause internal organ effects  
Based on a Significant New Use Rule regulation

## SECTION 12. ECOLOGICAL INFORMATION

### Ecotoxicity

#### Components:

#### **2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

- |  |   |   |
|--|---|---|
| Toxicity to fish   | : | LC50 (Danio rerio (zebra fish)): 6.8 mg/l<br>Exposure time: 96 h<br>Method: OECD Test Guideline 203   |
| Toxicity to daphnia and other aquatic invertebrates                    | : | EC50 (Daphnia magna (Water flea)): 55 mg/l<br>Exposure time: 48 h<br>Method: OECD Test Guideline 202  |
| Toxicity to algae/aquatic plants                                       | : | EC50 (Desmodesmus subspicatus (green algae)): 10 mg/l<br>Exposure time: 72 h<br>Method: OECD Test Guideline 201<br><br>NOEC (Desmodesmus subspicatus (green algae)): 0.78 mg/l<br>Exposure time: 72 h<br>Method: OECD Test Guideline 201              |
| Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) | : | NOEC (Daphnia magna (Water flea)): 0.26 mg/l<br>Exposure time: 21 d<br>Method: OECD Test Guideline 211  |
| Toxicity to microorganisms   | : | EC50: 741 mg/l<br>Exposure time: 3 h<br>Method: OECD Test Guideline 209   |
| <br>   |   |   |
| <b>Propylidynetrimethanol, propoxylated, esters with acrylic acid:</b> |   |   |
| Toxicity to fish   | : | LC50 (Danio rerio (zebra fish)): > 1 - 10 mg/l<br>Exposure time: 96 h<br>Method: OECD Test Guideline 203<br>Remarks: Based on data from similar materials   |
| Toxicity to daphnia and other aquatic invertebrates                    | : | EC50 (Daphnia magna (Water flea)): > 10 - 100 mg/l<br>Exposure time: 48 h<br>Method: OECD Test Guideline 202<br>Remarks: Based on data from similar materials   |
| Toxicity to algae/aquatic plants                                       | : | ErC50 (Desmodesmus subspicatus (green algae)): > 10 - 100 mg/l<br>Exposure time: 72 h<br>Method: OECD Test Guideline 201<br><br>EC10 (Desmodesmus subspicatus (green algae)): > 1 - 10 mg/l<br>Exposure time: 72 h<br>Method: OECD Test Guideline 201 |



**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

- Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 90 µg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203  
Remarks: No toxicity at the limit of solubility.
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1.18 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202  
Remarks: No toxicity at the limit of solubility.
- Toxicity to algae/aquatic plants : NOEC (Desmodesmus subspicatus (green algae)): 260 µg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
Remarks: No toxicity at the limit of solubility.
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 8.1 µg/l  
Exposure time: 21 d  
Method: OECD Test Guideline 211  
Remarks: No toxicity at the limit of solubility.
- Toxicity to microorganisms : EC50: > 100 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

- Toxicity to fish : LC50 (Zebrafish): 9 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 15.3 mg/l  
Exposure time: 24 h  
Method: OECD Test Guideline 202
- Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 1.6 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201
- NOEC (Desmodesmus subspicatus (green algae)): 0.39 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201
- Toxicity to microorganisms : IC50: > 100 mg/l  
Exposure time: 3 h

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

- Toxicity to fish : LC50 (Danio rerio (zebra fish)): 0.46 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 0.8 mg/l  
Exposure time: 24 h  
Method: OECD Test Guideline 202
- Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 2 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201
- Toxicity to microorganisms : EC50: > 100 mg/l  
Exposure time: 30 min  
Method: OECD Test Guideline 209

**Persistence and degradability**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 84.4 %  
Exposure time: 28 d

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

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 0 - 10 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 65 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B  
Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 1 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 1 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301E

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 3 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

**Bioaccumulative potential**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Partition coefficient: : log Pow: 1.7  
n-octanol/water

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

Bioaccumulation : Species: Cyprinus carpio (Carp)  
Bioconcentration factor (BCF): 18 - 72

Partition coefficient: : log Pow: 3.1 - 3.8  
n-octanol/water

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Bioaccumulation : Species: Fish  
Bioconcentration factor (BCF): < 5

Partition coefficient: : log Pow: 5.8  
n-octanol/water

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Bioaccumulation : Bioconcentration factor (BCF): 13

Partition coefficient: : log Pow: 3.09  
n-octanol/water

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**  
Partition coefficient: : log Pow: 2.91  
n-octanol/water

**Mobility in soil**  
No data available

**Other adverse effects**  
No data available

### SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal methods**  
Waste from residues : Dispose of in accordance with local regulations.  
  
Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
If not otherwise specified: Dispose of as unused product.

### SECTION 14. TRANSPORT INFORMATION

**International Regulations**

**UNRTDG**

Not regulated as dangerous goods

**IATA-DGR**

Not regulated as dangerous goods

**IMDG-Code**

Not regulated as dangerous goods

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**Domestic regulation**

**49 CFR**

Not regulated as dangerous goods

### SECTION 15. REGULATORY INFORMATION

**EPCRA - Emergency Planning and Community Right-to-Know**

**CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

This material does not contain any components with a section 302 EHS TPQ.

**SARA 311/312 Hazards** : Acute toxicity (any route of exposure)  
Respiratory or skin sensitization  
Reproductive toxicity

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**US State Regulations**

## Pennsylvania Right To Know

2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester	86273-46-3
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8
Propoxylated neopentyl glycol diacrylate esters	84170-74-1
Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide	162881-26-7
Propylidynetrimethanol, propoxylated, esters with acrylic acid	53879-54-2

## California Prop. 65

WARNING: This product can expose you to chemicals including Benzophenone, 2,2-bis(acryloyloxymethyl)butyl acrylate, Ethylbenzene and N,N-diethylacetamide, which are known to the State of California to cause cancer, and N,N-Dimethylacetamide and Methanol, which are known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

## Additional regulatory information

2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester 86273-46-3  
 The United States Environmental Protection Agency (USEPA) has established a Significant New Use Rule (SNUR) for one of the components in this product.  
 See 40 CFR § 721.10064

## SECTION 16. OTHER INFORMATION

### Further information

### Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency,

Data Sheet <http://echa.europa.eu/>

Revision Date : 2023-11-30

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

# SAFETY DATA SHEET

Date of last issue: 2021-05-10  
Date of first issue: 2019-12-01

## SECTION 1. IDENTIFICATION

Product name : LED UV Curable INK Magenta  
UH21-MA220U / UH21-MA800U

### Manufacturer or supplier's details

Company name of supplier : MUTOH America Inc  
Address : 4405 East Baseline Road, Suite 120 Phoenix, Arizona 85042  
Contact section : Customer Care  
Telephone : 480-968-7772  
Emergency telephone : 480-968-7772  
During normal opening times

### Recommended use of the chemical and restrictions on use


Recommended use : Digital printing

## SECTION 2. HAZARDS IDENTIFICATION

### GHS Classification in accordance with 29 CFR 1910.1200

Acute toxicity (Oral) : Category 4  
Skin sensitization : Category 1  
Reproductive toxicity : Category 1B

### GHS label elements

Hazard pictograms : 

Signal Word : Danger

Hazard Statements : H302 Harmful if swallowed.  
H317 May cause an allergic skin reaction.  
H360FD May damage fertility. May damage the unborn child.

Precautionary Statements : **Prevention:**  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P261 Avoid breathing mist or vapors.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P272 Contaminated work clothing must not be allowed out of the workplace.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
**Response:**  
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.  
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.  
P308 + P313 IF exposed or concerned: Get medical advice/

attention.  
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.  
 P363 Wash contaminated clothing before reuse.

**Storage:**  
 P405 Store locked up.

**Disposal:**  
 P501 Dispose of contents/ container to an approved waste disposal plant.

**Other hazards**

None known.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substance / Mixture : Mixture

**Components**

Chemical name	CAS-No.	Concentration (% w/w)
2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester	86273-46-3	80 - 90
Propoxylated neopentyl glycol diacrylate esters	84170-74-1	< 7
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8	< 7
Propylidynetrimethanol, propoxylated, esters with acrylic acid	53879-54-2	< 5
Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide	162881-26-7	< 5
2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	71868-10-5	< 1
Glycerol, propoxylated, esters with acrylic acid	52408-84-1	< 0.5
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid	55818-57-0	< 0.5
2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone	119313-12-1	< 0.3

**SECTION 4. FIRST AID MEASURES**

- General advice : In the case of accident or if you feel unwell, seek medical advice immediately.  
 When symptoms persist or in all cases of doubt seek medical advice.
- If inhaled : If inhaled, remove to fresh air.  
 Get medical attention.
- In case of skin contact : In case of contact, immediately flush skin with soap and plenty of water.  
 Remove contaminated clothing and shoes.  
 Get medical attention.  
 Wash clothing before reuse.  
 Thoroughly clean shoes before reuse.
- In case of eye contact : Flush eyes with water as a precaution.  
 Get medical attention if irritation develops and persists.
- If swallowed : If swallowed, DO NOT induce vomiting.  
 Get medical attention.  
 Rinse mouth thoroughly with water.  
 Never give anything by mouth to an unconscious person.
- Most important symptoms and effects, both acute and delayed : Harmful if swallowed.  
 May cause an allergic skin reaction.  
 May damage fertility. May damage the unborn child.
- Protection of first-aiders : First Aid responders should pay attention to self-protection, and

use the recommended personal protective equipment when the potential for exposure exists (see section 8).

Notes to physician : Treat symptomatically and supportively.

## SECTION 5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical
- Unsuitable extinguishing media : None known.
- Specific hazards during fire fighting : Exposure to combustion products may be a hazard to health.
- Hazardous combustion Products : Carbon oxides  
Oxides of phosphorus  
Nitrogen oxides (NO<sub>x</sub>)
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
Use water spray to cool unopened containers.  
Remove undamaged containers from fire area if it is safe to do so.  
Evacuate area.
- Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.  
Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).
- Environmental precautions : Discharge into the environment must be avoided.  
Prevent further leakage or spillage if safe to do so.  
Prevent spreading over a wide area (e.g. by containment or oil barriers).  
Retain and dispose of contaminated wash water.  
Local authorities should be advised if significant spillages cannot be contained.
- Methods and materials for containment and cleaning up : Soak up with inert absorbent material.  
For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container.  
Clean up remaining materials from spill with suitable absorbent.  
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.  
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

## SECTION 7. HANDLING AND STORAGE

Technical measures : See Engineering measures under EXPOSURE



CONTROLS/PERSONAL PROTECTION section.

- Local/Total ventilation : Use only with adequate ventilation.
- Advice on safe handling : Do not get on skin or clothing.  
Do not breathe vapors or spray mist.  
Do not swallow.  
Avoid contact with eyes.  
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment.  
Take care to prevent spills, waste and minimize release to the environment.
- Conditions for safe storage : Keep in properly labeled containers.  
Store locked up.  
Store in accordance with the particular national regulations.
- Materials to avoid : Do not store with the following product types:  
Strong oxidizing agents  
Organic peroxides  
Explosives

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

- Engineering measures** : Ensure adequate ventilation, especially in confined areas.  
Minimize workplace exposure concentrations.

### Personal protective equipment

- Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

### Hand protection

- Material : Chemical-resistant gloves

- Remarks : Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.

- Eye protection : Wear the following personal protective equipment:  
Safety glasses

- Skin and body protection : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.  
Skin contact must be avoided by using impervious protective

clothing (gloves, aprons, boots, etc).



Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Color	:	magenta
Odor	:	mild
Odor Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	-71 °C
Initial boiling point and boiling range	:	94 °C
Flash point	:	119 °C Method: Seta closed cup
Evaporation rate	:	No data available
Flammability (solid, gas)	:	Not applicable
Flammability (liquids)	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	> 3
Density	:	1.03 - 1.06 g/cm <sup>3</sup>
Solubility(ies)		
Water solubility	:	18 g/l
Partition coefficient: n-octanol/water	:	Not applicable
Autoignition temperature	:	No data available
Decomposition temperature	:	The substance or mixture is not classified self-reactive.
Viscosity		
Viscosity, dynamic	:	2 - 10 mPa.s
Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive

- Oxidizing properties : The substance or mixture is not classified as oxidizing.
- Particle size : Not applicable

## SECTION 10. STABILITY AND REACTIVITY

- Reactivity : Not classified as a reactivity hazard.
- Chemical stability : Stable under normal conditions.
- Possibility of hazardous reactions : Can react with strong oxidizing agents.
- Conditions to avoid : None known.
- Incompatible materials : Oxidizing agents
- Hazardous decomposition products : No hazardous decomposition products are known.

## SECTION 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

Inhalation  
 Skin contact  
 Ingestion  
 Eye contact

### Acute toxicity

Harmful if swallowed.

#### **Product:**

- Acute oral toxicity : Acute toxicity estimate: 1,989 mg/kg  
 Method: Calculation method

#### **Components:**

##### **2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

- Acute oral toxicity : LD50 (Rat): 1,790 mg/kg
- Acute inhalation toxicity : LC50 (Rat): > 5.04 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist  
 Method: OECD Test Guideline 403
- Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

##### **Propoxylated neopentyl glycol diacrylate esters:**

- Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg
- Acute inhalation toxicity : LC50 (Rat): > 2 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist
- Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

##### **Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide:**

- Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 423  
 Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 401  
 Assessment: The substance or mixture has no acute oral toxicity

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Acute oral toxicity : LD50 (Rat): 1,984 mg/kg  
 Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

**Glycerol, propoxylated, esters with acrylic acid:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 401  
 Assessment: The substance or mixture has no acute oral toxicity

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg  
 Assessment: The substance or mixture has no acute dermal toxicity

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 401  
 Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 5 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist  
 Method: OECD Test Guideline 403  
 Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Remarks: Based on data from similar materials

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
 Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402

Assessment: The substance or mixture has no acute dermal toxicity

**Skin corrosion/irritation**

Not classified based on available information.

**Components:****2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

Remarks: May cause skin irritation.

Based on a Significant New Use Rule regulation

**Propoxylated neopentyl glycol diacrylate esters:**

Species: Rabbit

Result: No skin irritation

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

Species: Rabbit

Result: No skin irritation

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Method: OECD Test Guideline 439

Result: No skin irritation

Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

**Glycerol, propoxylated, esters with acrylic acid:**

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

**Serious eye damage/eye irritation**

Not classified based on available information.

**Components:****2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rabbit

Result: No eye irritation

Method: OECD Test Guideline 405

**Propoxylated neopentyl glycol diacrylate esters:**

Species: Rabbit

Result: No eye irritation

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

Species: Rabbit

Result: No eye irritation

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Result: No eye irritation

Method: OECD Test Guideline 437

Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Species: Rabbit

Result: No eye irritation

Method: OECD Test Guideline 405

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Species: Rabbit

Result: No eye irritation

Method: OECD Test Guideline 405

**Glycerol, propoxylated, esters with acrylic acid:**

Species: Rabbit

Result: Irritation to eyes, reversing within 21 days

Method: OECD Test Guideline 405

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Species: Rabbit

Result: No eye irritation

Method: OECD Test Guideline 405

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Species: Rabbit

Result: No eye irritation

Method: OECD Test Guideline 405

**Respiratory or skin sensitization**

**Skin sensitization**

May cause an allergic skin reaction.

**Respiratory sensitization**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Test Type: Local lymph node assay (LLNA)

Routes of exposure: Skin contact

Species: Mouse

Method: OECD Test Guideline 429

Result: positive

Assessment: Probability or evidence of skin sensitization in humans

**Propoxylated neopentyl glycol diacrylate esters:**

Test Type: Local lymph node assay (LLNA)

Routes of exposure: Skin contact

Species: Mouse

Method: OECD Test Guideline 429

Result: positive

Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

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

Test Type: Local lymph node assay (LLNA)

Routes of exposure: Skin contact

Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Test Type: Buehler Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Method: OECD Test Guideline 406  
Result: positive  
Remarks: Based on data from similar materials  
Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Test Type: Maximization Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Method: OECD Test Guideline 406  
Result: positive  
Assessment: Probability or evidence of skin sensitization in humans

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Test Type: Maximization Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Result: negative

**Glycerol, propoxylated, esters with acrylic acid:**

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of skin sensitization in humans

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of skin sensitization in humans

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Test Type: Maximization Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Result: negative

**Germ cell mutagenicity**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Mouse

Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative

**Propoxylated neopentyl glycol diacrylate esters:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Mouse  
Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative  
Remarks: Based on data from similar materials

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

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

: Test Type: Chromosome aberration test in vitro  
Result: negative

: Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

: Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: negative

: Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

**Glycerol, propoxylated, esters with acrylic acid:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Test Type: Chromosome aberration test in vitro  
Result: negative

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Mouse



Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Hamster  
Application Route: Ingestion  
Result: negative

**Carcinogenicity**

Not classified based on available information.

**IARC** Not classifiable.

**OSHA** No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**NTP** No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

**Reproductive toxicity**

May damage fertility. May damage the unborn child.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative  
Remarks: May cause adverse reproductive effects.  
Based on a Significant New Use Rule regulation

Effects on fetal development : Remarks: May cause developmental effects  
Based on a Significant New Use Rule regulation

**Propoxylated neopentyl glycol diacrylate esters:**

Effects on fertility : Test Type: Reproduction/Developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 421  
Result: negative

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rat  
Application Route: Ingestion  
Result: negative  
Remarks: Based on data from similar materials

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

Effects on fertility : Test Type: Fertility  
Species: Rat  
Application Route: Ingestion  
Result: positive

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Effects on fetal development : Test Type: Fertility/early embryonic development  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: negative

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Effects on fertility : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Result: positive

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: positive

Reproductive toxicity - Assessment : Clear evidence of adverse effects on development, based on animal experiments., Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

**Glycerol, propoxylated, esters with acrylic acid:**

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rat  
Application Route: Ingestion  
Result: negative

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative

Effects on fetal development : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Effects on fertility : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 415  
Result: negative

Effects on fetal development : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 415  
Result: positive

Reproductive toxicity - Assessment : Clear evidence of adverse effects on development, based on

Assessment animal experiments.

**STOT-single exposure**

Not classified based on available information.

**STOT-repeated exposure**

Not classified based on available information.

**Repeated dose toxicity**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rat  
NOAEL: 160 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days  
Method: OECD Test Guideline 407

**Propoxylated neopentyl glycol diacrylate esters:**

Species: Rat  
NOAEL: 1,000 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days  
Method: OECD Test Guideline 407

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

Species: Rat  
NOAEL: 100 mg/kg  
LOAEL: 300 mg/kg  
Application Route: Ingestion  
Exposure time: 90 Days

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Species: Rat  
NOAEL: 1,000 mg/kg  
Application Route: Ingestion  
Exposure time: 90 Days  
Method: OECD Test Guideline 408

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Species: Rat  
NOAEL: 75 mg/kg  
LOAEL: 220 mg/kg  
Application Route: Ingestion  
Exposure time: 90 Days  
Method: OECD Test Guideline 408

**Glycerol, propoxylated, esters with acrylic acid:**

Species: Rat  
NOAEL: 250 mg/kg  
LOAEL: 750 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days  
Method: OECD Test Guideline 422  
Remarks: Based on data from similar materials

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Species: Rat  
NOAEL: > 900 mg/kg  
Application Route: Ingestion  
Exposure time: 5 Weeks  
Method: OECD Test Guideline 422

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Species: Rat  
NOAEL: >= 100 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days

**Aspiration toxicity**

Not classified based on available information.

**Further information**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Remarks: May cause internal organ effects  
Based on a Significant New Use Rule regulation

**SECTION 12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

- |  |   |  |
|--|---|--|
| Toxicity to fish   | : | LC50 (Danio rerio (zebra fish)): 6.8 mg/l<br>Exposure time: 96 h<br>Method: OECD Test Guideline 203  |
| Toxicity to daphnia and other aquatic invertebrates                    | : | EC50 (Daphnia magna (Water flea)): 55 mg/l<br>Exposure time: 48 h<br>Method: OECD Test Guideline 202   |
| Toxicity to algae/aquatic plants                                       | : | EC50 (Desmodesmus subspicatus (green algae)): 10 mg/l<br>Exposure time: 72 h<br>Method: OECD Test Guideline 201<br><br>NOEC (Desmodesmus subspicatus (green algae)): 0.78 mg/l<br>Exposure time: 72 h<br>Method: OECD Test Guideline 201 |
| Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) | : | NOEC (Daphnia magna (Water flea)): 0.26 mg/l<br>Exposure time: 21 d<br>Method: OECD Test Guideline 211   |
| Toxicity to microorganisms   | : | EC50: 741 mg/l<br>Exposure time: 3 h<br>Method: OECD Test Guideline 209  |

**Propoxylated neopentyl glycol diacrylate esters:**

- |   |   |   |
|---|---|---|
| Toxicity to fish                                    | : | LC50 (Danio rerio (zebra fish)): 2.7 mg/l<br>Exposure time: 96 h<br>Method: OECD Test Guideline 203   |
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): 37 mg/l<br>Exposure time: 48 h<br>Method: OECD Test Guideline 202  |
| Toxicity to algae/aquatic plants                    | : | EC50 (Pseudokirchneriella subcapitata (green algae)): 11 mg/l<br>Exposure time: 72 h<br>Method: OECD Test Guideline 201<br><br>NOEC (Pseudokirchneriella subcapitata (green algae)): 1 mg/l<br>Exposure time: 72 h<br>Method: OECD Test Guideline 201 |

Toxicity to microorganisms : NOEC: 2 mg/l  
Exposure time: 28 d

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

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 1 - 10 mg/l  
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 3.53 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 2.01 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

EC10 (Pseudokirchneriella subcapitata (green algae)): 1.56 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 1,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**Propylidynetrimehanol, propoxylated, esters with acrylic acid:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 1 - 10 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203  
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 10 - 100 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202  
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): > 10 - 100 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

EC10 (Desmodesmus subspicatus (green algae)): > 1 - 10 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 90 µg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203  
Remarks: No toxicity at the limit of solubility.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1.18 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202  
Remarks: No toxicity at the limit of solubility.

Toxicity to algae/aquatic plants : NOEC (Desmodesmus subspicatus (green algae)): 260 µg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
Remarks: No toxicity at the limit of solubility.

Toxicity to daphnia and other aquatic invertebrates (Chronic) : NOEC (Daphnia magna (Water flea)): 8.1 µg/l  
Exposure time: 21 d

toxicity) Method: OECD Test Guideline 211  
Remarks: No toxicity at the limit of solubility.

Toxicity to microorganisms : EC50: > 100 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Toxicity to fish : LC50 (Zebrafish): 9 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 15.3 mg/l  
aquatic invertebrates Exposure time: 24 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 1.6 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

NOEC (Desmodesmus subspicatus (green algae)): 0.39 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : IC50: > 100 mg/l  
Exposure time: 3 h

**Glycerol, propoxylated, esters with acrylic acid:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 5.74 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 91.4 mg/l  
aquatic invertebrates Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 12.2 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

EC10 (Desmodesmus subspicatus (green algae)): 2.06 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 1,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Toxicity to fish : LL50 (Cyprinus carpio (Carp)): > 100 mg/l  
Exposure time: 96 h  
Test substance: Water Accommodated Fraction  
Method: ISO 7346/1  
Remarks: Based on data from similar materials

Toxicity to daphnia and other : LL50 (Daphnia magna (Water flea)): > 100 mg/l  
aquatic invertebrates Exposure time: 48 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EL50 (Pseudokirchneriella subcapitata (green algae)): 105 mg/l

Exposure time: 72 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 201

NOELR (Pseudokirchneriella subcapitata (green algae)): 1.2 mg/l

Exposure time: 72 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 1,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 0.46 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 0.8 mg/l  
Exposure time: 24 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 2 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 100 mg/l  
Exposure time: 30 min  
Method: OECD Test Guideline 209

**Persistence and degradability**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 84.4 %  
Exposure time: 28 d

**Propoxylated neopentyl glycol diacrylate esters:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 51 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301D

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

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 0 - 10 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 65 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B  
Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 1 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 1 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301E

**Glycerol, propoxylated, esters with acrylic acid:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 72 - 85 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 42 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 3 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

**Bioaccumulative potential**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Partition coefficient: : log Pow: 1.7  
n-octanol/water

**Propoxylated neopentyl glycol diacrylate esters:**

Partition coefficient: : log Pow: 2.41 - 3.87  
n-octanol/water

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

Bioaccumulation : Species: Cyprinus carpio (Carp)  
Bioconcentration factor (BCF): 18 - 72

Partition coefficient: : log Pow: 3.1 - 3.8  
n-octanol/water

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Bioaccumulation : Species: Fish  
Bioconcentration factor (BCF): < 5

Partition coefficient: : log Pow: 5.8  
n-octanol/water

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Bioaccumulation : Bioconcentration factor (BCF): 13

Partition coefficient: : log Pow: 3.09  
n-octanol/water

**Glycerol, propoxylated, esters with acrylic acid:**

Partition coefficient: : log Pow: 2.52  
n-octanol/water

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**



Partition coefficient: : log Pow: 1.6 - 3.8  
n-octanol/water

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**  
Partition coefficient: : log Pow: 2.91  
n-octanol/water

**Mobility in soil**  
No data available

**Other adverse effects**  
No data available

## SECTION 13. DISPOSAL CONSIDERATIONS

**Disposal methods**  
Waste from residues : Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
If not otherwise specified: Dispose of as unused product.

## SECTION 14. TRANSPORT INFORMATION

**International Regulations**  
**UNRTDG**  
Not regulated as dangerous goods

**IATA-DGR**  
Not regulated as dangerous goods

**IMDG-Code**  
Not regulated as dangerous goods

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**  
Not applicable for product as supplied.

**Domestic regulation**  
**49 CFR**  
Not regulated as dangerous goods

## SECTION 15. REGULATORY INFORMATION

**EPCRA - Emergency Planning and Community Right-to-Know**  
**CERCLA Reportable Quantity**  
This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**  
This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**  
This material does not contain any components with a section 302 EHS TPQ.

**SARA 311/312 Hazards** : Acute toxicity (any route of exposure)  
Respiratory or skin sensitization  
Reproductive toxicity

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**US State Regulations**

## Pennsylvania Right To Know

2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester	86273-46-3
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8
Propoxylated neopentyl glycol diacrylate esters	84170-74-1
Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide	162881-26-7
Propylidynetrimethanol, propoxylated, esters with acrylic acid	53879-54-2

## California Prop. 65

WARNING: This product can expose you to chemicals including Benzophenone, which is known to the State of California to cause cancer, and Toluene, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

## Additional regulatory information

2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester 86273-46-3  
The United States Environmental Protection Agency (USEPA) has established a Significant New Use Rule (SNUR) for one of the components in this product.  
See 40 CFR § 721.10064

## SECTION 16. OTHER INFORMATION

### Further information

### Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Revision Date : 2021-05-10

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

# SAFETY DATA SHEET

Date of last issue: 2023-11-30

Date of first issue: 2019-12-01

## SECTION 1. IDENTIFICATION

Product name : LED UV Curable INK Varnish  
UH21-VA220U / UH21-VA800U

### Manufacturer or supplier's details

Company name of supplier : MUTOH America Inc  
Address : 4405 East Baseline Road, Suite 120 Phoenix, Arizona 85042  
Contact section : Customer Care  
Telephone : 480-968-7772  
Emergency telephone : 480-968-7772  
During normal opening times

### Recommended use of the chemical and restrictions on use

Recommended use : Digital printing

## SECTION 2. HAZARDS IDENTIFICATION

### GHS Classification in accordance with 29 CFR 1910.1200

Acute toxicity (Oral) : Category 4  
Skin sensitization : Category 1  
Reproductive toxicity : Category 1B

### GHS label elements

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H302 Harmful if swallowed.  
H317 May cause an allergic skin reaction.  
H360FD May damage fertility. May damage the unborn child.

Precautionary Statements : **Prevention:**  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P261 Avoid breathing mist or vapors.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P272 Contaminated work clothing must not be allowed out of the workplace.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
**Response:**  
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.  
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.  
P308 + P313 IF exposed or concerned: Get medical advice/

attention.  
 P333 + P313 If skin irritation or rash occurs: Get medical advice/  
 attention.

P363 Wash contaminated clothing before reuse.

**Storage:**

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Other hazards**

None known.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

**Components**

Chemical name	CAS-No.	Concentration (% w/w)
2-Propenoic acid, 2-[2-(ethenoxy)ethoxy]ethyl ester	86273-46-3	≥ 50 - ≤ 100
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8	≥ 2.5 - ≤ 10
Poly(oxy-1,2-ethanediyl),.alpha.-hydro-.omega.-[(1-oxo-2-propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol	28961-43-5	> 2.5 - ≤ 10

### SECTION 4. FIRST AID MEASURES

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.  
 When symptoms persist or in all cases of doubt seek medical advice.

If inhaled : If inhaled, remove to fresh air.  
 Get medical attention.

In case of skin contact : In case of contact, immediately flush skin with soap and plenty of water.  
 Remove contaminated clothing and shoes.  
 Get medical attention.  
 Wash clothing before reuse.  
 Thoroughly clean shoes before reuse.

In case of eye contact : Flush eyes with water as a precaution.  
 Get medical attention if irritation develops and persists.

If swallowed : If swallowed, DO NOT induce vomiting.  
 Get medical attention.  
 Rinse mouth thoroughly with water.  
 Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed : Harmful if swallowed.  
 May cause an allergic skin reaction.  
 May damage fertility. May damage the unborn child.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

Notes to physician : Treat symptomatically and supportively.

## SECTION 5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical
- Unsuitable extinguishing media : None known.
- Specific hazards during fire fighting : Exposure to combustion products may be a hazard to health.
- Hazardous combustion Products : Carbon oxides  
Oxides of phosphorus  
Nitrogen oxides (NO<sub>x</sub>)
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
Use water spray to cool unopened containers.  
Remove undamaged containers from fire area if it is safe to do so.  
Evacuate area.
- Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.  
**Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).**
- Environmental precautions : Discharge into the environment must be avoided.  
Prevent further leakage or spillage if safe to do so.  
Prevent spreading over a wide area (e.g. by containment or oil barriers).  
Retain and dispose of contaminated wash water.  
Local authorities should be advised if significant spillages cannot be contained.
- Methods and materials for containment and cleaning up : Soak up with inert absorbent material.  
For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container.  
Clean up remaining materials from spill with suitable absorbent.  
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.  
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

## SECTION 7. HANDLING AND STORAGE

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
- Local/Total ventilation : **Use only with adequate ventilation.**

- Advice on safe handling : Do not get on skin or clothing.  
Do not breathe vapors or spray mist.  
Do not swallow.  
Avoid contact with eyes.  
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment.  
**Take care to prevent** spills, waste and minimize release to the environment.
- Conditions for safe storage : Keep in properly labeled containers.  
Store locked up.  
**Store in accordance** with the particular national regulations.
- Materials to avoid : Do not store with the following product types:  
Strong oxidizing agents  
Organic peroxides  
Explosives

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

- Engineering measures** : **Ensure adequate ventilation, especially in confined areas.**  
**Minimize workplace exposure concentrations.**

### Personal protective equipment

- Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

### Hand protection

- Material : Chemical-resistant gloves

- Remarks : Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.

### Eye protection

- : Wear the following personal protective equipment:  
Safety glasses

### Skin and body protection

- : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.  
Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).

### Hygiene measures

- : **If exposure to chemical is likely during typical use, provide eye**

flushing systems and safety showers close to the working place.  
 When using do not eat, drink or smoke.  
 Wash contaminated clothing before re-use.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Color	:	clear
Odor	:	mild
Odor Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	-71 °C
Initial boiling point and boiling range	:	94 °C
Flash point	:	119 °C Method: Seta closed cup
Evaporation rate	:	No data available
Flammability (solid, gas)	:	Not applicable
Flammability (liquids)	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	> 3
Density	:	1.03 - 1.06 g/cm <sup>3</sup>
Solubility(ies)		
Water solubility	:	18 g/l
Partition coefficient: n-octanol/water	:	Not applicable
Autoignition temperature	:	No data available
Decomposition temperature	:	The substance or mixture is not classified self-reactive.
Viscosity		
Viscosity, dynamic	:	2 - 10 mPa.s
Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Particle size	:	Not applicable



**SECTION 10. STABILITY AND REACTIVITY**

Reactivity	: Not classified as a reactivity hazard.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Can react with strong oxidizing agents.
Conditions to avoid	: None known.
Incompatible materials	: Oxidizing agents
Hazardous decomposition products	: No hazardous decomposition products are known.

**SECTION 11. TOXICOLOGICAL INFORMATION**

**Information on likely routes of exposure**

Inhalation  
 Skin contact  
 Ingestion  
 Eye contact

**Acute toxicity**

Harmful if swallowed.

**Product:**

Acute oral toxicity : Acute toxicity estimate: 1,989 mg/kg  
 Method: Calculation method

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Acute oral toxicity : LD50 (Rat): 1,790 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 5.04 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist  
 Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

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

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
 Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

**Poly(oxy-1,2-ethanediyl),.alpha.-hydro-.omega.-[(1-oxo-2- propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 423  
 Remarks: Based on data from similar materials

**Skin corrosion/irritation**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rabbit  
 Method: OECD Test Guideline 404  
 Result: No skin irritation  
 Remarks: May cause skin irritation.  
 Based on a Significant New Use Rule regulation

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

Species: Rabbit  
 Result: No skin irritation

**Poly(oxy-1,2-ethanediyl),.alpha.-hydro-.omega.-[(1-oxo-2- propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Method: OECD Test Guideline 439  
 Result: No skin irritation  
 Remarks: Based on data from similar materials

**Respiratory or skin sensitization**

**Skin sensitization**

May cause an allergic skin reaction.

**Respiratory sensitization**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Test Type: Local lymph node assay (LLNA)  
 Routes of exposure: Skin contact  
 Species: Mouse  
 Method: OECD Test Guideline 429  
 Result: positive  
 Assessment: Probability or evidence of skin sensitization in humans

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

Test Type: Local lymph node assay (LLNA)  
 Routes of exposure: Skin contact  
 Species: Mouse  
 Method: OECD Test Guideline 429  
 Result: positive  
 Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

**Poly(oxy-1,2-ethanediyl),.alpha.-hydro-.omega.-[(1-oxo-2- propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Test Type: Buehler Test  
 Routes of exposure: Skin contact  
 Species: Guinea pig  
 Method: OECD Test Guideline 406  
 Result: positive  
 Remarks: Based on data from similar materials  
 Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

**Germ cell mutagenicity**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test  
 Method: OECD Test Guideline 476  
 Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
 Species: Mouse  
 Application Route: Ingestion

Method: OECD Test Guideline 474

Result: negative

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

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

: Test Type: Chromosome aberration test in vitro  
Result: negative

: Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

**Carcinogenicity**

Not classified based on available information.

**IARC** Not classifiable.

**OSHA** No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**NTP** No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

**Reproductive toxicity**

May damage fertility. May damage the unborn child.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative  
Remarks: May cause adverse reproductive effects.  
Based on a Significant New Use Rule regulation

Effects on fetal development : Remarks: May cause developmental effects  
Based on a Significant New Use Rule regulation

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

Effects on fertility : Test Type: Fertility  
Species: Rat  
Application Route: Ingestion  
Result: positive

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

Reproductive toxicity - Assessment : Clear evidence of adverse effects on development, based on animal experiments.

**STOT-single exposure**

Not classified based on available information.

**STOT-repeated exposure**

Not classified based on available information.

**Repeated dose toxicity**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rat  
 NOAEL: 160 mg/kg  
 Application Route: Ingestion  
 Exposure time: 28 Days  
 Method: OECD Test Guideline 407

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

Species: Rat  
 NOAEL: 100 mg/kg  
 LOAEL: 300 mg/kg  
 Application Route: Ingestion  
 Exposure time: 90 Days

**Aspiration toxicity**

Not classified based on available information.

**Further information**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Remarks: May cause internal organ effects  
 Based on a Significant New Use Rule regulation

**SECTION 12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

- Toxicity to fish : LC50 (Danio rerio (zebra fish)): 6.8 mg/l  
 Exposure time: 96 h  
 Method: OECD Test Guideline 203
  
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 55 mg/l  
 Exposure time: 48 h  
 Method: OECD Test Guideline 202
  
- Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): 10 mg/l  
 Exposure time: 72 h  
 Method: OECD Test Guideline 201
  
- NOEC (Desmodesmus subspicatus (green algae)): 0.78 mg/l  
 Exposure time: 72 h  
 Method: OECD Test Guideline 201
  
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.26 mg/l  
 Exposure time: 21 d  
 Method: OECD Test Guideline 211
  
- Toxicity to microorganisms : EC50: 741 mg/l  
 Exposure time: 3 h  
 Method: OECD Test Guideline 209

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

- Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 1 - 10 mg/l  
 Exposure time: 96 h
  
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 3.53 mg/l  
 Exposure time: 48 h  
 Method: OECD Test Guideline 202
  
- Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 2.01 mg/l  
 Exposure time: 72 h  
 Method: OECD Test Guideline 201

EC10 (Pseudokirchneriella subcapitata (green algae)): 1.56 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 1,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**Poly(oxy-1,2-ethanediyl),.alpha.-hydro-.omega.-[(1-oxo-2- propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 1 - 10 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203  
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 10 - 100 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202  
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): > 10 - 100 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

EC10 (Desmodesmus subspicatus (green algae)): > 1 - 10 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

**Persistence and degradability**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 84.4 %  
Exposure time: 28 d

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

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 0 - 10 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F

**Poly(oxy-1,2-ethanediyl),.alpha.-hydro-.omega.-[(1-oxo-2- propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 65 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B  
Remarks: Based on data from similar materials

**Bioaccumulative potential**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Partition coefficient: : log Pow: 1.7  
n-octanol/water

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

Bioaccumulation : Species: Cyprinus carpio (Carp)  
Bioconcentration factor (BCF): 18 - 72

Partition coefficient: : log Pow: 3.1 - 3.8

n-octanol/water

**Mobility in soil**

No data available

**Other adverse effects**

No data available

**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**

Waste from residues : Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
If not otherwise specified: Dispose of as unused product.

**SECTION 14. TRANSPORT INFORMATION****International Regulations****UNRTDG**

Not regulated as dangerous goods

**IATA-DGR**

Not regulated as dangerous goods

**IMDG-Code**

Not regulated as dangerous goods

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**Domestic regulation****49 CFR**

Not regulated as dangerous goods

**SECTION 15. REGULATORY INFORMATION****EPCRA - Emergency Planning and Community Right-to-Know****CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

This material does not contain any components with a section 302 EHS TPQ.

**SARA 311/312 Hazards** : Acute toxicity (any route of exposure)  
Respiratory or skin sensitization  
Reproductive toxicity

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**US State Regulations****Pennsylvania Right To Know**

2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester  
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide

86273-46-3  
75980-60-8

**California Prop. 65**

WARNING: This product can expose you to chemicals including Ethylbenzene and N,N-diethylacetamide, which are known to the State of California to cause cancer, and N,N-Dimethylacetamide, Methanol and Toluene, which are known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

**Additional regulatory information**

2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester 86273-46-3  
The United States Environmental Protection Agency (USEPA) has established a Significant New Use Rule (SNUR) for one of the components in this product.  
See 40 CFR § 721.10064

**SECTION 16. OTHER INFORMATION****Further information****Full text of other abbreviations**

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECl - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Revision Date : 2023-11-30

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided

relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.



# SAFETY DATA SHEET

Date of last issue: 2021-05-10

Date of first issue: 2019-12-01

## SECTION 1. IDENTIFICATION

Product name : LED UV Curable INK White  
UH21-WH220U / UH21-WH500U

### Manufacturer or supplier's details

Company name of supplier : MUTOH America Inc  
Address : 4405 East Baseline Road, Suite 120 Phoenix, Arizona 85042  
Contact section : Customer Care  
Telephone : 480-968-7772  
Emergency telephone : 480-968-7772  
During normal opening times

### Recommended use of the chemical and restrictions on use

Recommended use : Digital printing

## SECTION 2. HAZARDS IDENTIFICATION

### GHS Classification in accordance with 29 CFR 1910.1200

Acute toxicity (Oral) : Category 4

Skin sensitization : Category 1

Reproductive toxicity : Category 2

### GHS label elements

Hazard pictograms :



Signal Word : Warning

Hazard Statements : H302 Harmful if swallowed.  
H317 May cause an allergic skin reaction.  
H361 Suspected of damaging fertility or the unborn child.

Precautionary Statements : **Prevention:**  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P261 Avoid breathing mist or vapors.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P272 Contaminated work clothing must not be allowed out of the workplace.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
**Response:**  
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.  
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.  
P308 + P313 IF exposed or concerned: Get medical advice/

attention.  
 P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.

P363 Wash contaminated clothing before reuse.

**Storage:**

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Other hazards**

None known.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

**Components**

Chemical name	CAS-No.	Concentration (% w/w)
2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester	86273-46-3	50 - 100
Titanium dioxide	13463-67-7	2.5 - < 25
Propoxylated neopentyl glycol diacrylate esters	84170-74-1	2.5 - < 10
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8	3 - < 10
Poly(oxy-1,2-ethanediyl), .alpha.-hydro-.omega.-[(1-oxo-2-propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol	28961-43-5	0.1 - < 1

### SECTION 4. FIRST AID MEASURES

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.  
 When symptoms persist or in all cases of doubt seek medical advice.

If inhaled : If inhaled, remove to fresh air.  
 Get medical attention.

In case of skin contact : In case of contact, immediately flush skin with soap and plenty of water.  
 Remove contaminated clothing and shoes.  
 Get medical attention.  
 Wash clothing before reuse.  
 Thoroughly clean shoes before reuse.

In case of eye contact : Flush eyes with water as a precaution.  
 Get medical attention if irritation develops and persists.

If swallowed : If swallowed, DO NOT induce vomiting.  
 Get medical attention.  
 Rinse mouth thoroughly with water.  
 Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed : Harmful if swallowed.  
 May cause an allergic skin reaction.  
 Suspected of damaging fertility or the unborn child.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

Notes to physician : Treat symptomatically and supportively.

## SECTION 5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO2)  
Dry chemical
- Unsuitable extinguishing media : None known.
- Specific hazards during fire fighting : Exposure to combustion products may be a hazard to health.
- Hazardous combustion Products : Carbon oxides  
Metal oxides  
Oxides of phosphorus
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
Use water spray to cool unopened containers.  
Remove undamaged containers from fire area if it is safe to do so.  
Evacuate area.
- Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.  
Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).
- Environmental precautions : Discharge into the environment must be avoided.  
Prevent further leakage or spillage if safe to do so.  
Prevent spreading over a wide area (e.g. by containment or oil barriers).  
Retain and dispose of contaminated wash water.  
Local authorities should be advised if significant spillages cannot be contained.
- Methods and materials for containment and cleaning up : Soak up with inert absorbent material.  
For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container.  
Clean up remaining materials from spill with suitable absorbent.  
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.  
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

## SECTION 7. HANDLING AND STORAGE

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
- Local/Total ventilation : Use only with adequate ventilation.

- Advice on safe handling : Do not get on skin or clothing.  
Avoid inhalation of vapor or mist.  
Do not swallow.  
Avoid contact with eyes.  
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment.  
Take care to prevent spills, waste and minimize release to the environment.
- Conditions for safe storage : Keep in properly labeled containers.  
Store locked up.  
Store in accordance with the particular national regulations.
- Materials to avoid : Do not store with the following product types:  
Strong oxidizing agents  
Organic peroxides  
Explosives

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Titanium dioxide	13463-67-7	TWA (total dust)	15 mg/m <sup>3</sup>	OSHA Z-1
		TWA	10 mg/m <sup>3</sup> (Titanium dioxide)	ACGIH

- Engineering measures** : Ensure adequate ventilation, especially in confined areas.  
Minimize workplace exposure concentrations.
- Personal protective equipment**
- Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.
- Hand protection
- Material : Chemical-resistant gloves
- Remarks : Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.
- Eye protection : Wear the following personal protective equipment:  
Safety glasses
- Skin and body protection : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.  
Skin contact must be avoided by using impervious protective

clothing (gloves, aprons, boots, etc).

Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Color : white

Odor : characteristic

Odor Threshold : No data available

pH : No data available

Melting point/freezing point : No data available

Initial boiling point and boiling range : No data available

Flash point : 118.6 °C

Evaporation rate : No data available

Flammability (solid, gas) : Not applicable

Flammability (liquids) : No data available

Upper explosion limit / Upper flammability limit : No data available

Lower explosion limit / Lower flammability limit : No data available

Vapor pressure : No data available

Relative vapor density : No data available

Relative density : No data available

Solubility(ies)  
Water solubility : immiscible

Partition coefficient:  
n-octanol/water : Not applicable

Autoignition temperature : No data available

Decomposition temperature : The substance or mixture is not classified self-reactive.

Viscosity  
Viscosity, kinematic : No data available

Explosive properties : Not explosive

Oxidizing properties : The substance or mixture is not classified as oxidizing.

Particle size : Not applicable

## SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Not classified as a reactivity hazard.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Can react with strong oxidizing agents.
Conditions to avoid	: None known.
Incompatible materials	: Oxidizing agents
Hazardous decomposition products	: No hazardous decomposition products are known.

## SECTION 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

Inhalation  
 Skin contact  
 Ingestion  
 Eye contact

### Acute toxicity

Harmful if swallowed.

#### **Product:**

Acute oral toxicity : Acute toxicity estimate: 1,791 mg/kg  
 Method: Calculation method

#### **Components:**

##### **2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Acute oral toxicity : LD50 (Rat): 1,790 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 5.04 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist  
 Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

#### **Titanium dioxide:**

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 6.82 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist  
 Assessment: The substance or mixture has no acute inhalation toxicity

#### **Propoxylated neopentyl glycol diacrylate esters:**

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 2 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg

Method: OECD Test Guideline 402

Assessment: The substance or mixture has no acute dermal toxicity

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

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The substance or mixture has no acute dermal toxicity

**Poly(oxy-1,2-ethanediyl), .alpha.-hydro.-omega.-[(1-oxo-2-propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 401  
Assessment: The substance or mixture has no acute oral toxicity

Acute dermal toxicity : LD50 (Rabbit): > 13,200 mg/kg

**Skin corrosion/irritation**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rabbit  
Method: OECD Test Guideline 404  
Result: No skin irritation  
Remarks: May cause skin irritation.  
Based on a Significant New Use Rule regulation

**Titanium dioxide:**

Species: Rabbit  
Result: No skin irritation

**Propoxylated neopentyl glycol diacrylate esters:**

Species: Rabbit  
Result: No skin irritation

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

Species: Rabbit  
Result: No skin irritation

**Poly(oxy-1,2-ethanediyl), .alpha.-hydro.-omega.-[(1-oxo-2-propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Species: Rabbit  
Method: OECD Test Guideline 404  
Result: No skin irritation

**Serious eye damage/eye irritation**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rabbit  
Result: No eye irritation  
Method: OECD Test Guideline 405

**Titanium dioxide:**

Species: Rabbit  
Result: No eye irritation

**Propoxylated neopentyl glycol diacrylate esters:**

Species: Rabbit  
Result: No eye irritation

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

Species: Rabbit  
Result: No eye irritation

**Poly(oxy-1,2-ethanediyl), .alpha.-hydro-.omega.-[(1-oxo-2-propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Species: Rabbit  
Result: Irritation to eyes, reversing within 21 days  
Method: OECD Test Guideline 405

**Respiratory or skin sensitization**

**Skin sensitization**

May cause an allergic skin reaction.

**Respiratory sensitization**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of skin sensitization in humans

**Titanium dioxide:**

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Result: negative

**Propoxylated neopentyl glycol diacrylate esters:**

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

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

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

**Poly(oxy-1,2-ethanediyl), .alpha.-hydro-.omega.-[(1-oxo-2-propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Test Type: Buehler Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Method: OECD Test Guideline 406  
Result: positive  
Assessment: Probability or evidence of skin sensitization in humans

**Germ cell mutagenicity**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**



Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Mouse  
Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative

**Titanium dioxide:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

Genotoxicity in vivo : Test Type: In vivo micronucleus test  
Species: Mouse  
Result: negative

**Propoxylated neopentyl glycol diacrylate esters:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Mouse  
Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative  
Remarks: Based on data from similar materials

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

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

: Test Type: Chromosome aberration test in vitro  
Result: negative

: Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

**Poly(oxy-1,2-ethanediyl), .alpha.-hydro.-omega.-[(1-oxo-2-propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: positive

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Mouse  
Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative

**Carcinogenicity**

Not classified based on available information.

**Components:**

**Titanium dioxide:**

Species: Rat

Application Route: inhalation (dust/mist/fume)

Exposure time: 2 Years  
 Method: OECD Test Guideline 453  
 Result: positive  
 Remarks: The mechanism or mode of action may not be relevant in humans.  
 Carcinogenicity - Assessment : Limited evidence of carcinogenicity in inhalation studies with animals.

**IARC** Group 2B: Possibly carcinogenic to humans  
 Titanium dioxide 13463-67-7

**OSHA** No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**NTP** No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

### Reproductive toxicity

Suspected of damaging fertility or the unborn child.

#### Components:

#### **2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
 Species: Rat  
 Application Route: Ingestion  
 Method: OECD Test Guideline 422  
 Result: negative  
 Remarks: May cause adverse reproductive effects.  
 Based on a Significant New Use Rule regulation

Effects on fetal development : Remarks: May cause developmental effects  
 Based on a Significant New Use Rule regulation

#### **Propoxylated neopentyl glycol diacrylate esters:**

Effects on fertility : Test Type: Reproduction/Developmental toxicity screening test  
 Species: Rat  
 Application Route: Ingestion  
 Method: OECD Test Guideline 421  
 Result: negative

Effects on fetal development : Test Type: Embryo-fetal development  
 Species: Rat  
 Application Route: Ingestion  
 Result: negative  
 Remarks: Based on data from similar materials

#### **Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide:**

Effects on fertility : Test Type: Fertility  
 Species: Rat  
 Application Route: Ingestion  
 Result: positive

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

#### **Poly(oxy-1,2-ethanediyl), .alpha.-hydro.-omega.-[(1-oxo-2-propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Effects on fetal development : Test Type: Embryo-fetal development  
 Species: Rat  
 Application Route: Ingestion  
 Result: negative

**STOT-single exposure**

Not classified based on available information.

**STOT-repeated exposure**

Not classified based on available information.

**Repeated dose toxicity**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rat  
NOAEL: 160 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days  
Method: OECD Test Guideline 407

**Titanium dioxide:**

Species: Rat  
NOAEL: 24,000 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days

Species: Rat  
NOAEL: 10 mg/m<sup>3</sup>  
Application Route: inhalation (dust/mist/fume)  
Exposure time: 2 y

**Propoxylated neopentyl glycol diacrylate esters:**

Species: Rat  
NOAEL: 1,000 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days  
Method: OECD Test Guideline 407

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

Species: Rat  
NOAEL: 100 mg/kg  
LOAEL: 300 mg/kg  
Application Route: Ingestion  
Exposure time: 90 Days

**Poly(oxy-1,2-ethanediyl), .alpha.-hydro-.omega.-[(1-oxo-2-propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Species: Rat  
NOAEL: >= 200 mg/kg  
Application Route: Skin contact  
Exposure time: 16 Days  
Remarks: Based on data from similar materials

**Aspiration toxicity**

Not classified based on available information.

**Further information**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Remarks: May cause internal organ effects  
Based on a Significant New Use Rule regulation

**SECTION 12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 6.8 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 55 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): 10 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

NOEC (Desmodesmus subspicatus (green algae)): 0.78 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.26 mg/l  
Exposure time: 21 d  
Method: OECD Test Guideline 211

Toxicity to microorganisms : EC50: 741 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**Titanium dioxide:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l  
Exposure time: 48 h

Toxicity to algae/aquatic plants : EC50 (Skeletonema costatum (marine diatom)): > 10,000 mg/l  
Exposure time: 72 h

Toxicity to microorganisms : EC50: > 1,000 mg/l  
Exposure time: 3h  
Method: OECD Test Guideline 209

**Propoxylated neopentyl glycol diacrylate esters:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 2.7 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 37 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): 11 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 1 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : NOEC: 2 mg/l  
Exposure time: 28 d

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

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 1 - 10 mg/l  
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 3.53 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 2.01 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

EC10 (Pseudokirchneriella subcapitata (green algae)): 1.56 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 1,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**Poly(oxy-1,2-ethanediyl), .alpha.-hydro.-omega.-[(1-oxo-2-propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 1.95 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 70.7 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 2.2 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 1,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**Persistence and degradability**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 84.4 %  
Exposure time: 28 d

**Propoxylated neopentyl glycol diacrylate esters:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 51 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301D

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

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 0 - 10 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F

**Poly(oxy-1,2-ethanediyl), .alpha.-hydro.-omega.-[(1-oxo-2-propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 60 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

## Bioaccumulative potential

### Components:

#### 2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:

Partition coefficient: : log Pow: 1.7  
n-octanol/water

#### Propoxylated neopentyl glycol diacrylate esters:

Partition coefficient: : log Pow: 2.41 - 3.87  
n-octanol/water

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

Bioaccumulation : Species: Cyprinus carpio (Carp)  
Bioconcentration factor (BCF): 18 - 72

Partition coefficient: : log Pow: 3.1 - 3.8  
n-octanol/water

#### Poly(oxy-1,2-ethanediyl), .alpha.-hydro.-omega.-[(1-oxo-2-propenyl)oxy]-, ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol:

Partition coefficient: : log Pow: 2.89  
n-octanol/water

### Mobility in soil

No data available

### Other adverse effects

No data available

## SECTION 13. DISPOSAL CONSIDERATIONS

### Disposal methods

Waste from residues : Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
If not otherwise specified: Dispose of as unused product.

## SECTION 14. TRANSPORT INFORMATION

### International Regulations

#### UNRTDG

Not regulated as dangerous goods

#### IATA-DGR

Not regulated as dangerous goods

#### IMDG-Code

Not regulated as dangerous goods

### Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

### Domestic regulation

#### 49 CFR

Not regulated as dangerous goods

## SECTION 15. REGULATORY INFORMATION

### EPCRA - Emergency Planning and Community Right-to-Know

#### CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

### SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

### SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

**SARA 311/312 Hazards** : Acute toxicity (any route of exposure)  
Respiratory or skin sensitization  
Reproductive toxicity

**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

### US State Regulations

#### Pennsylvania Right To Know

2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester	86273-46-3
Titanium dioxide	13463-67-7
Diphenyl-2,4,6-trimethylbenzoyl phosphine oxide	75980-60-8
Propoxylated neopentyl glycol diacrylate esters	84170-74-1

#### California Prop. 65

WARNING: This product can expose you to chemicals including Titanium dioxide, which is known to the State of California to cause cancer, and N,N-Dimethylacetamide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

#### California Permissible Exposure Limits for Chemical Contaminants

Titanium dioxide	13463-67-7
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#### Additional regulatory information

2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester	86273-46-3
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The United States Environmental Protection Agency (USEPA) has established a Significant New Use Rule (SNUR) for one of the components in this product.  
See 40 CFR § 721.10064

## SECTION 16. OTHER INFORMATION

### Further information

#### Full text of other abbreviations

ACGIH	: USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	: USA. NIOSH Recommended Exposure Limits
OSHA Z-1	: USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	: 8-hour, time-weighted average
NIOSH REL / TWA	: Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA Z-1 / TWA	: 8-hour time weighted average

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International



Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Cooperation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety Data Sheet : Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, <http://echa.europa.eu/>

Revision Date : 2021-05-10

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.



# SAFETY DATA SHEET

Date of last issue: 2021-05-10

Date of first issue: 2019-12-01

## SECTION 1. IDENTIFICATION

Product name : LED UV Curable INK Yellow  
UH21-YE220U / UH21-YE800U

### Manufacturer or supplier's details

Company name of supplier : MUTOH America Inc  
Address : 4405 East Baseline Road, Suite 120 Phoenix, Arizona 85042  
Contact section : Customer Care  
Telephone : 480-968-7772  
Emergency telephone : 480-968-7772  
During normal opening times

### Recommended use of the chemical and restrictions on use

Recommended use : Digital printing

## SECTION 2. HAZARDS IDENTIFICATION

### GHS Classification in accordance with 29 CFR 1910.1200

Acute toxicity (Oral) : Category 4

Skin sensitization : Category 1

Reproductive toxicity : Category 1B

### GHS label elements

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H302 Harmful if swallowed.  
H317 May cause an allergic skin reaction.  
H360FD May damage fertility. May damage the unborn child.

Precautionary Statements : **Prevention:**  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P261 Avoid breathing mist or vapors.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P272 Contaminated work clothing must not be allowed out of the workplace.  
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
**Response:**  
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.  
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.  
P308 + P313 IF exposed or concerned: Get medical advice/

attention.  
 P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.

P363 Wash contaminated clothing before reuse.

**Storage:**

P405 Store locked up.

**Disposal:**

P501 Dispose of contents/ container to an approved waste disposal plant.

**Other hazards**

None known.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

**Components**

Chemical name	CAS-No.	Concentration (% w/w)
2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester	86273-46-3	80 - 90
Propoxylated neopentyl glycol diacrylate esters	84170-74-1	< 7
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8	< 7
Propylidynetrimethanol, propoxylated, esters with acrylic acid	53879-54-2	< 5
Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide	162881-26-7	< 5
2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	71868-10-5	< 1
Glycerol, propoxylated, esters with acrylic acid	52408-84-1	< 0.5
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid	55818-57-0	< 0.5
2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone	119313-12-1	< 0.3

### SECTION 4. FIRST AID MEASURES

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.  
 When symptoms persist or in all cases of doubt seek medical advice.

If inhaled : If inhaled, remove to fresh air.  
 Get medical attention.

In case of skin contact : In case of contact, immediately flush skin with soap and plenty of water.  
 Remove contaminated clothing and shoes.  
 Get medical attention.  
 Wash clothing before reuse.  
 Thoroughly clean shoes before reuse.

In case of eye contact : Flush eyes with water as a precaution.  
 Get medical attention if irritation develops and persists.

If swallowed : If swallowed, DO NOT induce vomiting.  
 Get medical attention.  
 Rinse mouth thoroughly with water.  
 Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed : Harmful if swallowed.  
 May cause an allergic skin reaction.  
 May damage fertility. May damage the unborn child.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and

use the recommended personal protective equipment when the potential for exposure exists (see section 8).

Notes to physician : Treat symptomatically and supportively.

## SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Water spray  
Alcohol-resistant foam  
Carbon dioxide (CO<sub>2</sub>)  
Dry chemical

Unsuitable extinguishing media : None known.

Specific hazards during fire fighting : Exposure to combustion products may be a hazard to health.

Hazardous combustion Products : Carbon oxides  
Oxides of phosphorus  
Nitrogen oxides (NO<sub>x</sub>)  
Metal oxides

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
Use water spray to cool unopened containers.  
Remove undamaged containers from fire area if it is safe to do so.  
Evacuate area.

Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.  
Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

Environmental precautions : Discharge into the environment must be avoided.  
Prevent further leakage or spillage if safe to do so.  
Prevent spreading over a wide area (e.g. by containment or oil barriers).  
Retain and dispose of contaminated wash water.  
Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up : Soak up with inert absorbent material.  
For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container.  
Clean up remaining materials from spill with suitable absorbent.  
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.  
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

## SECTION 7. HANDLING AND STORAGE

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
- Local/Total ventilation : Use only with adequate ventilation.
- Advice on safe handling : Do not get on skin or clothing.  
Do not breathe vapors or spray mist.  
Do not swallow.  
Avoid contact with eyes.  
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment.  
Take care to prevent spills, waste and minimize release to the environment.
- Conditions for safe storage : Keep in properly labeled containers.  
Store locked up.  
Store in accordance with the particular national regulations.
- Materials to avoid : Do not store with the following product types:  
Strong oxidizing agents  
Organic peroxides  
Explosives

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

- Engineering measures** : Ensure adequate ventilation, especially in confined areas.  
Minimize workplace exposure concentrations.

### Personal protective equipment

- Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.
- Hand protection
  - Material : Chemical-resistant gloves
  - Remarks : Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.
- Eye protection : Wear the following personal protective equipment:  
Safety glasses
- Skin and body protection : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.

Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).



Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Color	:	yellow
Odor	:	mild
Odor Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	-71 °C
Initial boiling point and boiling range	:	94 °C
Flash point	:	119 °C Method: Seta closed cup
Evaporation rate	:	No data available
Flammability (solid, gas)	:	Not applicable
Flammability (liquids)	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	> 3
Density	:	1.03 - 1.06 g/cm <sup>3</sup>
Solubility(ies)		
Water solubility	:	18 g/l
Partition coefficient: n-octanol/water	:	Not applicable
Autoignition temperature	:	No data available
Decomposition temperature	:	The substance or mixture is not classified self-reactive.
Viscosity		
Viscosity, dynamic	:	2 - 10 mPa.s
Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive

- Oxidizing properties : The substance or mixture is not classified as oxidizing.
- Particle size : Not applicable

**SECTION 10. STABILITY AND REACTIVITY**

- Reactivity : Not classified as a reactivity hazard.
- Chemical stability : Stable under normal conditions.
- Possibility of hazardous reactions : Can react with strong oxidizing agents.
- Conditions to avoid : None known.
- Incompatible materials : Oxidizing agents
- Hazardous decomposition products : No hazardous decomposition products are known.

**SECTION 11. TOXICOLOGICAL INFORMATION**

**Information on likely routes of exposure**

Inhalation  
 Skin contact  
 Ingestion  
 Eye contact

**Acute toxicity**

Harmful if swallowed.

**Product:**

- Acute oral toxicity : Acute toxicity estimate: 1,989 mg/kg  
 Method: Calculation method

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

- Acute oral toxicity : LD50 (Rat): 1,790 mg/kg
- Acute inhalation toxicity : LC50 (Rat): > 5.04 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist  
 Method: OECD Test Guideline 403
- Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

**Propoxylated neopentyl glycol diacrylate esters:**

- Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg
- Acute inhalation toxicity : LC50 (Rat): > 2 mg/l  
 Exposure time: 4 h  
 Test atmosphere: dust/mist
- Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
 Method: OECD Test Guideline 402  
 Assessment: The substance or mixture has no acute dermal toxicity

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

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The substance or mixture has no acute dermal toxicity

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 423  
Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 401  
Assessment: The substance or mixture has no acute oral toxicity

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The substance or mixture has no acute dermal toxicity

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Acute oral toxicity : LD50 (Rat): 1,984 mg/kg  
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The substance or mixture has no acute dermal toxicity

**Glycerol, propoxylated, esters with acrylic acid:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 401  
Assessment: The substance or mixture has no acute oral toxicity

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg  
Assessment: The substance or mixture has no acute dermal toxicity

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 401  
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 5 mg/l  
Exposure time: 4 h  
Test atmosphere: dust/mist  
Method: OECD Test Guideline 403  
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
Remarks: Based on data from similar materials

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg  
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg

Method: OECD Test Guideline 402

Assessment: The substance or mixture has no acute dermal toxicity

**Skin corrosion/irritation**

Not classified based on available information.

**Components:****2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

Remarks: May cause skin irritation.

Based on a Significant New Use Rule regulation

**Propoxylated neopentyl glycol diacrylate esters:**

Species: Rabbit

Result: No skin irritation

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

Species: Rabbit

Result: No skin irritation

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Method: OECD Test Guideline 439

Result: No skin irritation

Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

**Glycerol, propoxylated, esters with acrylic acid:**

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

**Serious eye damage/eye irritation**

Not classified based on available information.

**Components:****2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rabbit

Result: No eye irritation

Method: OECD Test Guideline 405

**Propoxylated neopentyl glycol diacrylate esters:**



Species: Rabbit  
Result: No eye irritation

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

Species: Rabbit  
Result: No eye irritation

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Result: No eye irritation  
Method: OECD Test Guideline 437  
Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Species: Rabbit  
Result: No eye irritation  
Method: OECD Test Guideline 405

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Species: Rabbit  
Result: No eye irritation  
Method: OECD Test Guideline 405

**Glycerol, propoxylated, esters with acrylic acid:**

Species: Rabbit  
Result: Irritation to eyes, reversing within 21 days  
Method: OECD Test Guideline 405

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Species: Rabbit  
Result: No eye irritation  
Method: OECD Test Guideline 405

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Species: Rabbit  
Result: No eye irritation  
Method: OECD Test Guideline 405

**Respiratory or skin sensitization**

**Skin sensitization**

May cause an allergic skin reaction.

**Respiratory sensitization**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of skin sensitization in humans

**Propoxylated neopentyl glycol diacrylate esters:**

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

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

Test Type: Local lymph node assay (LLNA)

Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Test Type: Buehler Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Method: OECD Test Guideline 406  
Result: positive  
Remarks: Based on data from similar materials  
Assessment: Probability or evidence of low to moderate skin sensitization rate in humans

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Test Type: Maximization Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Method: OECD Test Guideline 406  
Result: positive  
Assessment: Probability or evidence of skin sensitization in humans

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Test Type: Maximization Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Result: negative

**Glycerol, propoxylated, esters with acrylic acid:**

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of skin sensitization in humans

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Test Type: Local lymph node assay (LLNA)  
Routes of exposure: Skin contact  
Species: Mouse  
Method: OECD Test Guideline 429  
Result: positive  
Assessment: Probability or evidence of skin sensitization in humans

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Test Type: Maximization Test  
Routes of exposure: Skin contact  
Species: Guinea pig  
Result: negative

**Germ cell mutagenicity**

Not classified based on available information.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)

Species: Mouse  
Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative

**Propoxylated neopentyl glycol diacrylate esters:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Mouse  
Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative  
Remarks: Based on data from similar materials

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

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

: Test Type: Chromosome aberration test in vitro  
Result: negative

: Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

: Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: negative

: Test Type: In vitro mammalian cell gene mutation test  
Method: OECD Test Guideline 476  
Result: negative

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative

**Glycerol, propoxylated, esters with acrylic acid:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Test Type: Chromosome aberration test in vitro  
Result: negative

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)

Species: Mouse  
Application Route: Ingestion  
Method: OECD Test Guideline 474  
Result: negative

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
Species: Hamster  
Application Route: Ingestion  
Result: negative

**Carcinogenicity**

Not classified based on available information.

**IARC** Group 1: Carcinogenic to humans  
Nickel compounds

**OSHA** No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**NTP** No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

**Reproductive toxicity**

May damage fertility. May damage the unborn child.

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative  
Remarks: May cause adverse reproductive effects.  
Based on a Significant New Use Rule regulation

Effects on fetal development : Remarks: May cause developmental effects  
Based on a Significant New Use Rule regulation

**Propoxylated neopentyl glycol diacrylate esters:**

Effects on fertility : Test Type: Reproduction/Developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 421  
Result: negative

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rat  
Application Route: Ingestion  
Result: negative  
Remarks: Based on data from similar materials

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

Effects on fertility : Test Type: Fertility  
Species: Rat  
Application Route: Ingestion

Result: positive

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Effects on fetal development : Test Type: Fertility/early embryonic development  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: negative

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Effects on fertility : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Result: positive

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 414  
Result: positive

Reproductive toxicity - Assessment : Clear evidence of adverse effects on development, based on animal experiments., Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

**Glycerol, propoxylated, esters with acrylic acid:**

Effects on fetal development : Test Type: Embryo-fetal development  
Species: Rat  
Application Route: Ingestion  
Result: negative

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative

Effects on fetal development : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 422  
Result: negative

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Effects on fertility : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 415  
Result: negative

Effects on fetal development : Test Type: One-generation reproduction toxicity study  
Species: Rat  
Application Route: Ingestion  
Method: OECD Test Guideline 415  
Result: positive

Reproductive toxicity - Assessment : Clear evidence of adverse effects on development, based on animal experiments.

**STOT-single exposure**

Not classified based on available information.

**STOT-repeated exposure**

Not classified based on available information.

**Repeated dose toxicity**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Species: Rat  
NOAEL: 160 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days  
Method: OECD Test Guideline 407

**Propoxylated neopentyl glycol diacrylate esters:**

Species: Rat  
NOAEL: 1,000 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days  
Method: OECD Test Guideline 407

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

Species: Rat  
NOAEL: 100 mg/kg  
LOAEL: 300 mg/kg  
Application Route: Ingestion  
Exposure time: 90 Days

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Species: Rat  
NOAEL: 1,000 mg/kg  
Application Route: Ingestion  
Exposure time: 90 Days  
Method: OECD Test Guideline 408

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Species: Rat  
NOAEL: 75 mg/kg  
LOAEL: 220 mg/kg  
Application Route: Ingestion  
Exposure time: 90 Days  
Method: OECD Test Guideline 408

**Glycerol, propoxylated, esters with acrylic acid:**

Species: Rat  
NOAEL: 250 mg/kg  
LOAEL: 750 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days  
Method: OECD Test Guideline 422  
Remarks: Based on data from similar materials

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Species: Rat  
NOAEL: > 900 mg/kg  
Application Route: Ingestion

Exposure time: 5 Weeks  
Method: OECD Test Guideline 422

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Species: Rat  
NOAEL: >= 100 mg/kg  
Application Route: Ingestion  
Exposure time: 28 Days

**Aspiration toxicity**

Not classified based on available information.

**Further information**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Remarks: May cause internal organ effects  
Based on a Significant New Use Rule regulation

**SECTION 12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

- Toxicity to fish : LC50 (Danio rerio (zebra fish)): 6.8 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203
  
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 55 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202
  
- Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): 10 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
  
NOEC (Desmodesmus subspicatus (green algae)): 0.78 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201
  
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 0.26 mg/l  
Exposure time: 21 d  
Method: OECD Test Guideline 211
  
- Toxicity to microorganisms : EC50: 741 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209
  
- Propoxylated neopentyl glycol diacrylate esters:**
- Toxicity to fish : LC50 (Danio rerio (zebra fish)): 2.7 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203
  
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 37 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202
  
- Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): 11 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
  
NOEC (Pseudokirchneriella subcapitata (green algae)): 1 mg/l  
Exposure time: 72 h

Method: OECD Test Guideline 201

Toxicity to microorganisms : NOEC: 2 mg/l  
Exposure time: 28 d

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

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 1 - 10 mg/l  
Exposure time: 96 h

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 3.53 mg/l  
aquatic invertebrates : Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 2.01 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

EC10 (Pseudokirchneriella subcapitata (green algae)): 1.56 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 1,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**Propylidynetrimehanol, propoxylated, esters with acrylic acid:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 1 - 10 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203  
Remarks: Based on data from similar materials

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): > 10 - 100 mg/l  
aquatic invertebrates : Exposure time: 48 h  
Method: OECD Test Guideline 202  
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): > 10 - 100 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

EC10 (Desmodesmus subspicatus (green algae)): > 1 - 10 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 90 µg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203  
Remarks: No toxicity at the limit of solubility.

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): > 1.18 mg/l  
aquatic invertebrates : Exposure time: 48 h  
Method: OECD Test Guideline 202  
Remarks: No toxicity at the limit of solubility.

Toxicity to algae/aquatic plants : NOEC (Desmodesmus subspicatus (green algae)): 260 µg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
Remarks: No toxicity at the limit of solubility.



Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 8.1 µg/l  
Exposure time: 21 d  
Method: OECD Test Guideline 211  
Remarks: No toxicity at the limit of solubility.

Toxicity to microorganisms : EC50: > 100 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Toxicity to fish : LC50 (Zebrafish): 9 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 15.3 mg/l  
Exposure time: 24 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 1.6 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

NOEC (Desmodesmus subspicatus (green algae)): 0.39 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : IC50: > 100 mg/l  
Exposure time: 3 h

**Glycerol, propoxylated, esters with acrylic acid:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 5.74 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 91.4 mg/l  
Exposure time: 48 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 12.2 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

EC10 (Desmodesmus subspicatus (green algae)): 2.06 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 1,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Toxicity to fish : LL50 (Cyprinus carpio (Carp)): > 100 mg/l  
Exposure time: 96 h  
Test substance: Water Accommodated Fraction  
Method: ISO 7346/1  
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : LL50 (Daphnia magna (Water flea)): > 100 mg/l  
Exposure time: 48 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EL50 (Pseudokirchneriella subcapitata (green algae)): 105 mg/l  
Exposure time: 72 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 201

NOELR (Pseudokirchneriella subcapitata (green algae)): 1.2 mg/l  
Exposure time: 72 h  
Test substance: Water Accommodated Fraction  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 1,000 mg/l  
Exposure time: 3 h  
Method: OECD Test Guideline 209

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 0.46 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 0.8 mg/l  
Exposure time: 24 h  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): > 2 mg/l  
Exposure time: 72 h  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50: > 100 mg/l  
Exposure time: 30 min  
Method: OECD Test Guideline 209

**Persistence and degradability**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 84.4 %  
Exposure time: 28 d

**Propoxylated neopentyl glycol diacrylate esters:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 51 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301D

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

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 0 - 10 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F

**Propylidynetrimethanol, propoxylated, esters with acrylic acid:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 65 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B  
Remarks: Based on data from similar materials

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 1 %

Exposure time: 28 d  
Method: OECD Test Guideline 301B

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 1 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301E

**Glycerol, propoxylated, esters with acrylic acid:**

Biodegradability : Result: Readily biodegradable.  
Biodegradation: 72 - 85 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 42 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301F

**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 3 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

**Bioaccumulative potential**

**Components:**

**2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester:**

Partition coefficient: : log Pow: 1.7  
n-octanol/water

**Propoxylated neopentyl glycol diacrylate esters:**

Partition coefficient: : log Pow: 2.41 - 3.87  
n-octanol/water

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

Bioaccumulation : Species: Cyprinus carpio (Carp)  
Bioconcentration factor (BCF): 18 - 72

Partition coefficient: : log Pow: 3.1 - 3.8  
n-octanol/water

**Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide:**

Bioaccumulation : Species: Fish  
Bioconcentration factor (BCF): < 5

Partition coefficient: : log Pow: 5.8  
n-octanol/water

**2-Methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one:**

Bioaccumulation : Bioconcentration factor (BCF): 13

Partition coefficient: : log Pow: 3.09  
n-octanol/water

**Glycerol, propoxylated, esters with acrylic acid:**

Partition coefficient: : log Pow: 2.52  
n-octanol/water

**4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, esters with acrylic acid:**Partition coefficient: : log Pow: 1.6 - 3.8  
n-octanol/water**2-Benzyl-2-dimethylamino-4-morpholinobutyrophenone:**Partition coefficient: : log Pow: 2.91  
n-octanol/water**Mobility in soil**

No data available

**Other adverse effects**

No data available

**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**

Waste from residues : Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.  
If not otherwise specified: Dispose of as unused product.**SECTION 14. TRANSPORT INFORMATION****International Regulations****UNRTDG**

Not regulated as dangerous goods

**IATA-DGR**

Not regulated as dangerous goods

**IMDG-Code**

Not regulated as dangerous goods

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**Domestic regulation****49 CFR**

Not regulated as dangerous goods

**SECTION 15. REGULATORY INFORMATION****EPCRA - Emergency Planning and Community Right-to-Know****CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

This material does not contain any components with a section 302 EHS TPQ.

**SARA 311/312 Hazards** : Acute toxicity (any route of exposure)  
Respiratory or skin sensitization  
Reproductive toxicity**SARA 313** : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

## US State Regulations

### Pennsylvania Right To Know

2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester	86273-46-3
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8
Propoxylated neopentyl glycol diacrylate esters	84170-74-1
Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide	162881-26-7
Propylidynetrimethanol, propoxylated, esters with acrylic acid	53879-54-2

### California Prop. 65

WARNING: This product can expose you to chemicals including Nickel compounds and Benzophenone, which are known to the State of California to cause cancer, and Toluene, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

### Additional regulatory information

2-Propenoic acid, 2-[2-(ethenyloxy)ethoxy]ethyl ester 86273-46-3  
The United States Environmental Protection Agency (USEPA) has established a Significant New Use Rule (SNUR) for one of the components in this product.  
See 40 CFR § 721.10064

## SECTION 16. OTHER INFORMATION

### Further information

### Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation, Restriction and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

compile the Material Safety  
Data Sheet

eChem Portal search results and European Chemicals Agency,  
<http://echa.europa.eu/>

Revision Date : 2021-05-10

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.