



SAFETY DATA SHEET

THE DOW CHEMICAL COMPANY

Product name: UCON™ Calender Lubricant 51K

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THE DOW CHEMICAL COMPANY encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: UCON™ Calender Lubricant 51K

Recommended use of the chemical and restrictions on use

Identified uses: Selection of the appropriate polyglycol product for a specific application requires knowledge of the fluid requirements of the application, awareness of the most important of these requirements, and a match-up with the properties of the various polyglycol materials. Polyglycol products can be formulated for use in numerous industry applications such as hydraulic fluids, quenchants, compressor and refrigeration lubricants, heat transfer fluids, machinery lubricants, solder assist fluids, metalworking lubricants, textile finishing, etc. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

COMPANY IDENTIFICATION

THE DOW CHEMICAL COMPANY
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UNITED STATES

Customer Information Number:

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SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: CHEMTREC +1 800-424-9300

Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Category 2 - Inhalation

Skin sensitisation - Category 1

Reproductive toxicity - Category 2

Specific target organ toxicity - repeated exposure - Category 1 - Inhalation

Specific target organ toxicity - repeated exposure - Category 2

Label elements**Hazard pictograms**Signal word: **DANGER!****Hazards**

H317	May cause an allergic skin reaction.
H330	Fatal if inhaled.
H361	Suspected of damaging fertility or the unborn child.
H372	Causes damage to organs (Lungs) through prolonged or repeated exposure if inhaled.
H373	May cause damage to organs (Blood, Kidney) through prolonged or repeated exposure.

Precautionary statements**Prevention**

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe mist or vapours.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing must not be allowed out of the workplace.
P280	Wear protective gloves, protective clothing, eye protection and face protection.
P284	In case of inadequate ventilation wear respiratory protection.

Response

P302 + P352	IF ON SKIN: Wash with plenty of water.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.

Storage

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Disposal

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

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

Component	CASRN	Concentration
Polyalkylene glycol monobutyl ether	9038-95-3	>= 90.0 - <= 98.0 %
2,5-Furandione, dihydro-3-(tetrapropenyl)-	26544-38-7	>= 1.0 - < 3.0 %
N-phenyl-alpha-naphthylamine	90-30-2	>= 1.0 - <= 2.4 %
Phosphoric acid tricresyl ester	1330-78-5	>= 0.5 - <= 1.5 %
Bisphenol A	80-05-7	>= 0.1 - < 1.0 %
benzothiazole-2-thiol	149-30-4	>= 0.1 - < 0.5 %

4. FIRST AID MEASURES

Description of first aid measures

General advice:

First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation or rash occurs. Wash clothing before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Ingestion: Rinse mouth with water. No emergency medical treatment necessary.

Most important symptoms and effects, both acute and delayed:

May cause an allergic skin reaction. Fatal if inhaled. Suspected of damaging fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure if inhaled. May cause damage to organs through prolonged or repeated exposure.

Indication of any immediate medical attention and special treatment needed

Notes to physician: Maintain adequate ventilation and oxygenation of the patient. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Extinguishing media

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

Unsuitable extinguishing media: None known..

Special hazards arising from the substance or mixture

Hazardous combustion products: Carbon oxides. Nitrogen oxides (NO_x).

Unusual Fire and Explosion Hazards: Exposure to combustion products may be a hazard to health..

Advice for firefighters

Fire Fighting Procedures: Use water spray to cool unopened containers.. Evacuate area.. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage.. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Remove undamaged containers from fire area if it is safe to do so.

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Evacuate personnel to safe areas. Only trained personnel should re-enter the area. Follow safe handling advice and personal protective equipment recommendations.

Environmental precautions: Do not release the product to the aquatic environment above defined regulatory levels. 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. Clean up remaining materials from spill with suitable absorbant. 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. For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container. See sections: 7, 8, 11, 12 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling: Do not get on skin or clothing. Do not breathe vapours or spray mist. Avoid contact with eyes. Do not swallow. Keep container tightly closed. Take care to prevent spills, waste and minimize release to the environment. Handle in accordance with good industrial hygiene and safety practice. This material in contact with increased surface area substrates, such as, but not limited to, filters, absorbents, gloves, rags, and insulation, is subject to increased rates of oxidation. This can result in self-heating and spontaneous ignition. CONTAINERS MAY BE HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue follow all (M)SDS and label warnings even after container is emptied.

Use with local exhaust ventilation. See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

Conditions for safe storage: Keep in properly labelled containers. Store locked up. Keep tightly closed. Keep in a cool, well-ventilated place. Store in the following material(s): Stainless steel Glass-lined container. 316 stainless steel. Teflon. Polyethylene-lined container. Polypropylene. Carbon steel Store in accordance with the particular national regulations. This material may soften and lift certain paint and surface coatings.

Storage stability

Shelf life: Use within
24 Month

Do not store with the following product types: Strong oxidizing agents. Flammable liquids. Flammable solids. Pyrophoric liquids. Pyrophoric solids. Self-heating substances and mixtures. Substances and mixtures, which in contact with water, emit flammable gases. Explosives. Gases. Unsuitable materials for containers: None known.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Component	Regulation	Type of listing	Value
Bisphenol A	Dow IHG	TWA Inhalable fraction and vapor	2 mg/m ³
benzothiazole-2-thiol	US WEEL	TWA	5 mg/m ³
Further information: Skin; DSEN: Dermal Sensitization Notation			

Exposure controls

Engineering controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields).

Skin protection

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into

account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use an approved respirator. Selection of air-purifying or positive-pressure supplied-air will depend on the specific operation and the potential airborne concentration of the material. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus.

The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Liquid.
Color	Yellow to brown
Odor	pungent
Odor Threshold	No test data available
pH	No test data available
Melting point/ range	No test data available
Freezing point	See Pour Point
Boiling point (760 mmHg)	> 200 °C (> 392 °F) <i>Calculated.</i>
Flash point	closed cup 241 °C (466 °F) <i>ASTM D 93</i>
Evaporation Rate (Butyl Acetate = 1)	<0.01 <i>Calculated.</i>
Flammability (solid, gas)	Not applicable to liquids
Flammability (liquids)	Not expected to be a static-accumulating flammable liquid.
Lower explosion limit	No test data available
Upper explosion limit	No test data available
Vapor Pressure	< 0.01 mmHg at 20 °C (68 °F) <i>ASTM E1719</i>
Relative Vapor Density (air = 1)	>10 <i>Calculated.</i>
Relative Density (water = 1)	1.060 at 20 °C (68 °F) / 20 °C <i>Calculated.</i>
Water solubility	Not applicable
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No data available
Kinematic Viscosity	963 - 1120 cSt at 40 °C (104 °F) <i>ASTM D 445</i>
Explosive properties	No data available
Oxidizing properties	No data available

Molecular weight	No data available
Molecular formula	Trade secret
Pour point	-30 °C (-22 °F) <i>ASTM D97</i>

NOTE: The physical data presented above are typical values and should not be construed as a specification.

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: Avoid contact with oxidizing materials.

Hazardous decomposition products:

Decomposition products can include and are not limited to: Aldehydes. Alcohols. Ethers. Organic acids. Ketones. Low molecular weight hydrocarbons. Irritating fumes. Carbon monoxide. Carbon dioxide. Naphthalene. Amines.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data are available.

Information on likely routes of exposure

Inhalation, Eye contact, Skin contact, Ingestion.

Acute toxicity (represents short term exposures with immediate effects - no chronic/delayed effects known unless otherwise noted)

Acute Toxicity Endpoints:

Fatal if inhaled.

Acute oral toxicity

Information for the Product:

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.

As product: Single dose oral LD50 has not been determined.

Based on information for component(s):
LD50, Rat, > 5,000 mg/kg Estimated.

Information for components:

Polyalkylene glycol monobutyl ether

LD50, Rat, > 45,000 mg/kg

2,5-Furandione, dihydro-3-(tetrapropenyl)-

LD50, Rat, 1,875 mg/kg

N-phenyl-alpha-naphthylamine

LD50, Rat, 1,625 mg/kg

Phosphoric acid tricresyl ester

LD50, Rat, > 5,000 mg/kg

Bisphenol A

LD50, Rat, male and female, > 2,000 mg/kg

benzothiazole-2-thiol

LD50, Rat, > 2,830 mg/kg

Acute dermal toxicity

Information for the Product:

Prolonged skin contact is unlikely to result in absorption of harmful amounts.

As product: The dermal LD50 has not been determined.

Based on information for component(s):

LD50, Rabbit, > 5,000 mg/kg Estimated.

Information for components:

Polyalkylene glycol monobutyl ether

LD50, Rabbit, > 21,140 mg/kg

2,5-Furandione, dihydro-3-(tetrapropenyl)-

LD50, Rabbit, 2,006 mg/kg

N-phenyl-alpha-naphthylamine

LD50, Rabbit, > 5,000 mg/kg

Phosphoric acid tricresyl ester

LD50, Rabbit, > 10,000 mg/kg

Bisphenol A

LD50, Rabbit, 3,000 mg/kg

benzothiazole-2-thiol

LD50, Rabbit, > 7,940 mg/kg

Acute inhalation toxicity

Information for the Product:

At room temperature, exposure to vapor is minimal due to low volatility. Prolonged exposure to aerosol/mist may cause serious adverse effects, even death. This product should not be used in aerosol applications.

As product: The LC50 has not been determined.

Based on information for component(s):
LC50, Rat, Aerosol, 0.106 - 0.26 mg/l Estimated.

Information for components:

Polyalkylene glycol monobutyl ether

LC50, Rat, 4 Hour, dust/mist, 0.106 - 0.26 mg/l

2,5-Furandione, dihydro-3-(tetrapropenyl)-

The LC50 has not been determined.

For similar material(s): LC50, Rat, male and female, 4 Hour, dust/mist, 5.3 mg/l

N-phenyl-alpha-naphthylamine

Rat, 8 Hour, vapour, No deaths occurred following exposure to a saturated atmosphere.

Phosphoric acid tricresyl ester

Rat, 1 Hour, Aerosol, > 11.1 mg/l

Bisphenol A

At room temperature, exposure to vapor is minimal due to low volatility; vapor from heated material may cause respiratory irritation. Dust may cause irritation to upper respiratory tract (nose and throat). For narcotic effects: No relevant data found.

The LC50 has not been determined.

benzothiazole-2-thiol

LC50, Rat, 4 Hour, dust/mist, > 1.27 mg/l No deaths occurred at this concentration.

Skin corrosion/irritation

Not classified based on available information.

Information for the Product:

Based on product testing:
Prolonged contact may cause slight skin irritation with local redness.

Information for components:

Polyalkylene glycol monobutyl ether

Prolonged contact may cause slight skin irritation with local redness.

2,5-Furandione, dihydro-3-(tetrapropenyl)-

Prolonged contact may cause slight skin irritation with local redness.
Repeated contact may cause slight skin irritation with local redness.

N-phenyl-alpha-naphthylamine

Brief contact is essentially nonirritating to skin.

Phosphoric acid tricresyl ester

Essentially nonirritating to skin.

Bisphenol A

Brief contact is essentially nonirritating to skin.

Prolonged contact may cause skin irritation with local redness.

Repeated contact may cause skin irritation with local redness.

benzothiazole-2-thiol

Essentially nonirritating to skin.

Serious eye damage/eye irritation

Not classified based on available information.

Information for the Product:

Based on product testing:

Essentially nonirritating to eyes.

Corneal injury is unlikely.

Information for components:

Polyalkylene glycol monobutyl ether

Essentially nonirritating to eyes.

Corneal injury is unlikely.

2,5-Furandione, dihydro-3-(tetrapropenyl)-

May cause moderate eye irritation.

Corneal injury is unlikely.

N-phenyl-alpha-naphthylamine

May cause slight temporary eye irritation.

Corneal injury is unlikely.

Phosphoric acid tricresyl ester

Essentially nonirritating to eyes.

Bisphenol A

May cause moderate eye irritation.

May cause slight corneal injury.

Dust may irritate eyes.

May cause permanent impairment of vision.

benzothiazole-2-thiol

May cause slight eye irritation.

Sensitization

For skin sensitization:

May cause an allergic skin reaction.

For respiratory sensitization:

Not classified based on available information.

Information for the Product:

For skin sensitization:

Contains component(s) which have caused allergic skin sensitization in guinea pigs.
A component in this mixture has caused allergic skin reactions in humans.

For respiratory sensitization:

No specific, relevant data available for assessment.

Information for components:

Polyalkylene glycol monobutyl ether

A similar material did not cause allergic skin reactions when tested in humans.

For respiratory sensitization:

No relevant data found.

2,5-Furandione, dihydro-3-(tetrapropenyl)-

For similar material(s):

Has caused allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:

No relevant data found.

N-phenyl-alpha-naphthylamine

Has caused allergic skin reactions in humans.

Has caused allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:

No relevant data found.

Phosphoric acid tricresyl ester

Did not demonstrate the potential for contact allergy in mice.

For respiratory sensitization:

No relevant data found.

Bisphenol A

Skin contact may cause an allergic skin reaction.

For respiratory sensitization:

No relevant data found.

benzothiazole-2-thiol

Has caused allergic skin reactions in humans.

Has caused allergic skin reactions when tested in guinea pigs.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Not classified based on available information.

Information for the Product:

Product test data not available.

Information for components:

Polyalkylene glycol monobutyl ether

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

2,5-Furandione, dihydro-3-(tetrapropenyl)-

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

N-phenyl-alpha-naphthylamine

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Phosphoric acid tricresyl ester

Available data are inadequate to determine single exposure specific target organ toxicity.

Bisphenol A

May cause respiratory irritation.

Route of Exposure: Inhalation

Target Organs: Respiratory Tract

benzothiazole-2-thiol

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Aspiration Hazard

Not classified based on available information.

Information for the Product:

Based on physical properties, not likely to be an aspiration hazard.

Information for components:

Polyalkylene glycol monobutyl ether

Based on physical properties, not likely to be an aspiration hazard.

2,5-Furandione, dihydro-3-(tetrapropenyl)-

Based on physical properties, not likely to be an aspiration hazard.

N-phenyl-alpha-naphthylamine

Based on physical properties, not likely to be an aspiration hazard.

Phosphoric acid tricresyl ester

Based on physical properties, not likely to be an aspiration hazard.

Bisphenol A

Based on physical properties, not likely to be an aspiration hazard.

benzothiazole-2-thiol

Based on physical properties, not likely to be an aspiration hazard.

Chronic toxicity (represents longer term exposures with repeated dose resulting in chronic/delayed effects - no immediate effects known unless otherwise noted)

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Causes damage to organs (Lungs) through prolonged or repeated exposure if inhaled., May cause damage to organs (Blood, Kidney) through prolonged or repeated exposure.

Information for the Product:

Product test data not available.

Information for components:

Polyalkylene glycol monobutyl ether

In animals, effects have been reported on the following organs:

Lung.

2,5-Furandione, dihydro-3-(tetrapropenyl)-

Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

N-phenyl-alpha-naphthylamine

In animals, effects have been reported on the following organs:

Blood.

Kidney

Phosphoric acid tricresyl ester

Observations in animals include:

May cause peripheral neuropathy (pain and damage to nerves of the extremities).

In animals, effects have been reported on the following organs:

Adrenal gland.

Testes.

Ovaries.

Kidney.

Bisphenol A

Liver effects and questionable kidney and bladder effects were observed in animals fed bisphenol A.

benzothiazole-2-thiol

Based on available data, repeated exposures to small amounts are not anticipated to cause significant adverse effects.

Carcinogenicity

Not classified based on available information.

Information for the Product:

Product test data not available.

Information for components:**Polyalkylene glycol monobutyl ether**

Did not cause cancer in laboratory animals.

2,5-Furandione, dihydro-3-(tetrapropenyl)-

No relevant data found.

N-phenyl-alpha-naphthylamine

Did not cause cancer in laboratory animals.

Phosphoric acid tricresyl ester

Did not cause cancer in laboratory animals.

Bisphenol A

No convincing evidence for carcinogenicity of Bisphenol A has been seen in long-term animal studies.

benzothiazole-2-thiol

Has caused cancer in laboratory animals.

Carcinogenicity**Component****benzothiazole-2-thiol****List**

IARC

Classification

Group 2A: Probably carcinogenic to humans

Teratogenicity

Suspected of damaging fertility or the unborn child.

Information for the Product:

Product test data not available.

Information for components:**Polyalkylene glycol monobutyl ether**

No relevant data found.

2,5-Furandione, dihydro-3-(tetrapropenyl)-

For similar material(s): Did not cause birth defects or any other fetal effects in laboratory animals.

N-phenyl-alpha-naphthylamine

For similar material(s): Did not cause birth defects or any other fetal effects in laboratory animals.

Phosphoric acid tricresyl ester

Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

Bisphenol A

Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

benzothiazole-2-thiol

Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

Reproductive toxicity

Suspected of damaging fertility or the unborn child.

Information for the Product:

Product test data not available.

Information for components:

Polyalkylene glycol monobutyl ether

No relevant data found.

2,5-Furandione, dihydro-3-(tetrapropenyl)-

For similar material(s): In animal studies, did not interfere with reproduction.

N-phenyl-alpha-naphthylamine

In animal studies, a similar material has been shown not to interfere with reproduction.

Phosphoric acid tricresyl ester

In animal studies, has been shown to interfere with fertility in males. In animal studies, has been shown to interfere with reproduction.

Bisphenol A

Bisphenol A affected reproduction in rats and mice, but only at high exposure levels that exceeded the body's capacity to metabolize and deactivate the chemical. Maintaining exposures below appropriate workplace exposure limits should avoid these and other effects.

benzothiazole-2-thiol

In animal studies, did not interfere with reproduction.

Mutagenicity

Not classified based on available information.

Information for the Product:

Product test data not available.

Information for components:

Polyalkylene glycol monobutyl ether

No relevant data found.

2,5-Furandione, dihydro-3-(tetrapropenyl)-

For similar material(s): In vitro genetic toxicity studies were negative.

N-phenyl-alpha-naphthylamine

In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

Phosphoric acid tricresyl ester

In vitro genetic toxicity studies were negative.

Bisphenol A

In vitro genetic toxicity studies were predominantly negative. Animal genetic toxicity studies were negative.

benzothiazole-2-thiol

In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data are available.

Toxicity**Polyalkylene glycol monobutyl ether****Acute toxicity to fish**

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Pimephales promelas (fathead minnow), static test, 96 Hour, 3,170 - 11,900 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), static test, 48 Hour, 17,000 - 19,000 mg/l, OECD Test Guideline 202 or Equivalent

Toxicity to bacteria

EC50, Bacteria, static test, 16 Hour, Growth inhibition, 10,000 mg/l

2,5-Furandione, dihydro-3-(tetrapropenyl)-**Acute toxicity to fish**

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, > 100 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

For similar material(s):
EC50, Daphnia dubia (water flea), 48 Hour, > 100 mg/l, OECD Test Guideline 202

Acute toxicity to algae/aquatic plants

EC50, Pseudokirchneriella subcapitata (green algae), static test, 96 Hour, Growth rate, 110 mg/l

Toxicity to bacteria

EC50, activated sludge, static test, 3 Hour, Respiration rates., 800 mg/l, OECD Test Guideline 209

N-phenyl-alpha-naphthylamine**Acute toxicity to fish**

Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, 0.44 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

LC50, Daphnia magna (Water flea), static test, 48 Hour, 0.3 mg/l, OECD Test Guideline 202 or Equivalent

Toxicity to bacteria

EC50, activated sludge, static test, 3 Hour, Respiration rates., > 10,000 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), 21 d, 0.032 mg/l

Phosphoric acid tricresyl ester

Acute toxicity to fish

Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).
LC50, Oncorhynchus mykiss (rainbow trout), static test, 96 Hour, 0.6 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), static test, 48 Hour, 0.15 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (green algae), static test, 72 Hour, Growth rate inhibition, > 4.7 mg/l, OECD Test Guideline 201 or Equivalent

Chronic toxicity to fish

NOEC, American flagfish (Jordanella floridae)., semi-static test, 28 d, mortality, 0.01 mg/l

Bisphenol A

Acute toxicity to fish

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).
LC50, Fathead minnow (Pimephales promelas), 96 Hour, 4.6 mg/l
LC50, Atlantic silverside (Menidia menidia), 96 Hour, 9.4 mg/l

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 48 Hour, 10.2 mg/l
EC50, saltwater mysid Mysidopsis bahia, 96 Hour, 1.1 mg/l

Acute toxicity to algae/aquatic plants

EC50, Skeletonema costatum (marine diatom), static test, 96 Hour, Growth rate inhibition, 1.1 mg/l

Toxicity to bacteria

EC50, Bacteria, 96 Hour, Respiration rates., > 320 mg/l

Chronic toxicity to fish

NOEC, Fathead minnow (Pimephales promelas), 164 d, mortality, 0.160 mg/l
NOEC, Pimephales promelas (fathead minnow), 444 d, number of offspring, 0.016 mg/l

NOEC, Cyprinodon variegatus (sheepshead minnow), 116 d, number of offspring, 0.066 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, saltwater mysid Mysidopsis bahia, 28 d, number of offspring, 0.17 mg/l

NOEC, Marisa cornuarietis (Giant Ramshorn Snail), 328 d, growth, 0.025 mg/l

benzothiazole-2-thiol

Acute toxicity to fish

Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested).

LC50, Lepomis macrochirus (Bluegill sunfish), static test, 96 Hour, 1.5 mg/l, Method Not Specified.

LC50, Oncorhynchus mykiss (rainbow trout), static test, 96 Hour, 0.75 mg/l, Method Not Specified.

Acute toxicity to aquatic invertebrates

EC50, Daphnia magna (Water flea), 48 Hour, 0.71 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants

ErC50, Pseudokirchneriella subcapitata (algae), 72 Hour, Growth rate inhibition, 0.5 mg/l, OECD Test Guideline 201

NOEC, Pseudokirchneriella subcapitata (algae), 72 Hour, Growth rate inhibition, 0.066 mg/l, OECD Test Guideline 201

Toxicity to bacteria

EC50, Protozoa, 24 Hour, 10 mg/l

Chronic toxicity to fish

NOEC, Oncorhynchus mykiss (rainbow trout), 89 d, 0.041 mg/l

MATC (Maximum Acceptable Toxicant Level), Oncorhynchus mykiss (rainbow trout), 89 d, 0.041 - 0.078 mg/l

LOEC, Oncorhynchus mykiss (rainbow trout), 89 d, 0.078 mg/l

Chronic toxicity to aquatic invertebrates

NOEC, Daphnia magna (Water flea), 21 d, 0.08 mg/l

Persistence and degradability

Polyalkylene glycol monobutyl ether

Biodegradability:

Biodegradation under aerobic static laboratory conditions is moderate (BOD20 or BOD28/ThOD between 10 and 40%).

10-day Window: Fail

Biodegradation: 7 %

Exposure time: 28 d

Method: OECD Test Guideline 301B or Equivalent

Chemical Oxygen Demand: 1.90 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
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5 d	6.000 %
10 d	13.000 %
20 d	24.000 %

2,5-Furandione, dihydro-3-(tetrapropenyl)-

Biodegradability: Biodegradation under aerobic static laboratory conditions is low (BOD20 or BOD28/ThOD between 2.5 and 10%).

10-day Window: Fail

Biodegradation: 9.9 %

Exposure time: 28 d

Method: OECD Test Guideline 301D

Photodegradation

Sensitization: OH radicals

Atmospheric half-life: 1.7 - 1.9 Hour

Method: Estimated.

Photodegradation

Sensitization: Ozone.

Atmospheric half-life: 1.4 - 2.1 Hour

Method: Estimated.

N-phenyl-alpha-naphthylamine

Biodegradability: Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

10-day Window: Not applicable

Biodegradation: 0 %

Exposure time: 28 d

Method: OECD Test Guideline 301C or Equivalent

10-day Window: Not applicable

Biodegradation: 0 %

Exposure time: 14 d

Method: OECD Test Guideline 301C or Equivalent

Theoretical Oxygen Demand: 2.99 mg/mg

Biological oxygen demand (BOD)

Incubation Time	BOD
5 d	< 5 %
10 d	< 5 %
20 d	< 5 %

Photodegradation

Test Type: Half-life (indirect photolysis)

Sensitization: OH radicals

Atmospheric half-life: 0.031 d

Method: Estimated.

Phosphoric acid tricresyl ester

Biodegradability: Material is expected to be readily biodegradable.

10-day Window: Not applicable
Biodegradation: 65 - 100 %
Exposure time: 28 d
Method: OECD Test Guideline 301C or Equivalent

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitization: OH radicals
Atmospheric half-life: 0.781 d
Method: Estimated.

Bisphenol A

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
10-day Window: Pass
Biodegradation: 93.1 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent
10-day Window: Not applicable
Biodegradation: 87 - 95 %
Exposure time: 28 d
Method: OECD Test Guideline 302A or Equivalent

Theoretical Oxygen Demand: 2.52 mg/mg

Photodegradation
Test Type: Half-life (direct photolysis)
Method: Measured

benzothiazole-2-thiol

Biodegradability: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability.
10-day Window: Not applicable
Biodegradation: 2.5 %
Exposure time: 14 d
Method: OECD Test Guideline 301C or Equivalent

Bioaccumulative potential

Polyalkylene glycol monobutyl ether

Bioaccumulation: For this family of materials: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

2,5-Furandione, dihydro-3-(tetrapropenyl)-

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).
Partition coefficient: n-octanol/water(log Pow): > 4.39 OECD Test Guideline 107

N-phenyl-alpha-naphthylamine

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).
Partition coefficient: n-octanol/water(log Pow): 4.20 Measured
Bioconcentration factor (BCF): 427 - 2,730 Fish Measured

Phosphoric acid tricresyl ester

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).

Partition coefficient: n-octanol/water(log Pow): 6.34 Estimated.

Bisphenol A

Bioaccumulation: Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).

Partition coefficient: n-octanol/water(log Pow): 3.4 at 21.5 °C OECD Test Guideline 107 or Equivalent

Bioconcentration factor (BCF): 5.1 - 13.3 Cyprinus carpio (Carp) 42 d Measured

benzothiazole-2-thiol

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): 2.34 - 2.5 Measured

Bioconcentration factor (BCF): < 0.8 Cyprinus carpio (Carp) 42 d Measured

Mobility in soil**Polyalkylene glycol monobutyl ether**

No relevant data found.

2,5-Furandione, dihydro-3-(tetrapropenyl)-

Partition coefficient (Koc): 825 Measured

N-phenyl-alpha-naphthylamine

Partition coefficient (Koc): 21000 Estimated.

Phosphoric acid tricresyl ester

Partition coefficient (Koc): > 5000 Estimated.

Bisphenol A

Partition coefficient (Koc): 636 - 931 Measured

benzothiazole-2-thiol

No relevant data found.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Waste characterizations and compliance with applicable laws are the responsibility of the waste generator. FOR UNUSED & UNCONTAMINATED PRODUCT, dispose the product in a permitted industrial waste facility per applicable regulations. Consult the local waste disposal expert about the appropriate waste disposal method. Mechanical and chemical recycling or energy recovery are the preferred options. If not possible, consult with the respective regulating authorities to determine the available treatment and disposal facilities.

Contaminated packaging: Empty containers may retain product residues and should be disposed of by an approved waste management facility. Label warnings should be followed even after container is emptied. Improper disposal or reuse of this container may be dangerous and illegal. Consult with the

respective regulating authorities to determine the available treatment and disposal facilities. All disposal practices must be in compliance with Federal, State/Provincial and local regulations.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(N-phenyl-alpha-naphthylamine, 2-Mercaptobenzothiazole)
UN number	UN 3082
Class	9
Packing group	III
Marine pollutant	N-phenyl-alpha-naphthylamine, 2-Mercaptobenzothiazole
Special precautions for user	EmS: F-A, S-F
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code	Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Proper shipping name	Environmentally hazardous substance, liquid, n.o.s.(N-phenyl-alpha-naphthylamine, 2-Mercaptobenzothiazole)
UN number	UN 3082
Class	9
Packing group	III

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Acute toxicity (any route of exposure)
Respiratory or skin sensitisation
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 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.

Components	CASRN
benzothiazole-2-thiol	149-30-4

Pennsylvania Right To Know

The following chemicals are listed because of the additional requirements of Pennsylvania law:

Components	CASRN
Polyalkylene glycol monobutyl ether	9038-95-3

California Prop. 65

WARNING: This product can expose you to chemicals including benzothiazole-2-thiol, Aniline, Naphthalenamine, Naphthylamine, which is/are known to the State of California to cause cancer, and Bisphenol A, Toluene, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

United States TSCA Inventory (TSCA)

All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Hazard Rating System

NFPA

Health	Flammability	Instability
4	1	0

Revision

Identification Number: 99062145 / A001 / Issue Date: 06/16/2025 / Version: 18.0

In case this version of the SDS contains significant changes from the previous version, they are listed below or noted by bold, double bars in the left-hand margin throughout this document.

Changes encompass identification, hazards, tox/eco-tox information and the addition/removal of the ingredients, and regulatory information, hazard information, uses, risk management measures and other key regulatory changes of the product. Detailed explanation of the changes can be obtained upon request.

Legend

Dow IHG	Dow Industrial Hygiene Guideline
TWA	8-hr TWA
US WEEL	USA. Workplace Environmental Exposure Levels (WEEL)

Full text of other abbreviations

AIIC - Australian Inventory of Industrial Chemicals; 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; TECI - Thailand Existing Chemicals 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

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

THE DOW CHEMICAL COMPANY urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

US