SECTION 1. IDENTIFICATION

Product name : Temephos Liquid Formulation
Other means of identification : No data available

Manufacturer or supplier's details
Company name of supplier : Merck & Co., Inc
Address : 126 E. Lincoln Avenue
Rahway, New Jersey U.S.A. 07065
Telephone : 908-740-4000
Emergency telephone : 1-908-423-6000
E-mail address : EHSDATASTEWARD@merck.com

Recommended use of the chemical and restrictions on use
Recommended use : Veterinary product
Restrictions on use : Not applicable

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the Hazardous Products Regulations
Acute toxicity (Inhalation) : Category 4
Serious eye damage : Category 1
Skin sensitization : Category 1
Germ cell mutagenicity : Category 2
Specific target organ toxicity - single exposure : Category 3
Specific target organ toxicity - repeated exposure : Category 1 (Nervous system)
Specific target organ toxicity - repeated exposure : Category 2 (nasal cavity)
Aspiration hazard : Category 1

GHS label elements
Hazard pictograms :

Signal Word : Danger
Hazard Statements : H304 May be fatal if swallowed and enters airways.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
SAFETY DATA SHEET
according to the Hazardous Products Regulations

Temephos Liquid Formulation

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 vapors.
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 should not be allowed out of the workplace.
P280 Wear protective gloves, protective clothing, eye protection and face protection.

Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER.
P302 + P352 IF ON SKIN: Wash with plenty of water.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a doctor if you feel unwell.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER.
P308 + P313 IF exposed or concerned: Get medical attention.
P331 Do NOT induce vomiting.
P333 + P313 If skin irritation or rash occurs: Get medical attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.

Storage:
P405 Store locked up.

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

Other hazards
Repeated exposure may cause skin dryness or cracking.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture: Mixture
Components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common Name/Synonym</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocarbons, C10, aromatics, &lt;1% naphthalene</td>
<td>Solvent naphtha (petroleum), heavy arom.</td>
<td>64742-94-5</td>
<td>45</td>
</tr>
<tr>
<td>Calcium dodecylbenzenesulphonate</td>
<td>Benzenesulfonic acid, dodecyl-, calcium salt (2:1)</td>
<td>26264-06-2</td>
<td>8</td>
</tr>
<tr>
<td>7-Oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate</td>
<td>3,4-Epoxycyclohexylmethyl-3,4-epoxycyclohexane-carboxylate</td>
<td>2386-87-0</td>
<td>4</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>Phenol, 2,6-bis(1,1-dimethylethyl)-4-methyl-</td>
<td>128-37-0</td>
<td>2</td>
</tr>
</tbody>
</table>

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. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

In case of skin contact: In case of contact, immediately flush skin with 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: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention immediately.

If swallowed: If swallowed, DO NOT induce vomiting. If vomiting occurs have person lean forward. Call a physician or poison control center immediately. Rinse mouth thoroughly with water.
**SAFETY DATA SHEET**  
according to the Hazardous Products Regulations

**Temephos Liquid Formulation**

<table>
<thead>
<tr>
<th>Version</th>
<th>Revision Date:</th>
<th>SDS Number:</th>
<th>Date of last issue:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>09/30/2023</td>
<td>10814452-00004</td>
<td>03/27/2023</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>07/21/2022</td>
</tr>
</tbody>
</table>

**Most important symptoms and effects, both acute and delayed**
- Never give anything by mouth to an unconscious person.
- May be fatal if swallowed and enters airways.
- May cause an allergic skin reaction.
- Causes serious eye damage.
- Harmful if inhaled.
- May cause drowsiness or dizziness.
- Suspected of causing genetic defects.
- Causes damage to organs through prolonged or repeated exposure.
- Prolonged or repeated contact may dry skin and cause irritation.

**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
- Sulfur oxides
- Oxides of phosphorus
- Metal oxides
- Sulfur compounds

**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**
- Avoid release to the environment.
- 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:
If sufficient ventilation is unavailable, use with local exhaust ventilation.

Advice on safe handling:
Do not get on skin or clothing.
Do not breathe mist or vapors.
Do not swallow.
Do not get in eyes.
Wash skin thoroughly after handling.
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment
Keep container tightly closed.
Do not eat, drink or smoke when using this product.
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.

Materials to avoid:
Do not store with the following product types:
Strong oxidizing agents
Self-reactive substances and mixtures
Organic peroxides
Explosives
Gases

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
</table>

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**Engineering measures**

Use appropriate engineering controls and manufacturing technologies to control airborne concentrations (e.g., drip-less quick connections).

All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment.

Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices).

Minimize open handling.

**Personal protective equipment**

**Respiratory protection**

If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.

**Filter type**

Combined particulates and organic vapor type

**Hand protection**

Chemical-resistant gloves

---

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS Number</th>
<th>TWA (Mist)</th>
<th>STEL (Mist)</th>
<th>TWA (Mist - Inhalable dust)</th>
<th>TWA (Inhalable particulate matter)</th>
<th>TWA (Total)</th>
<th>STEL (Total)</th>
<th>TWAEV (Inhalable fraction and vapour)</th>
<th>TWAEV (Inhalable dust)</th>
<th>TWA (Vapour and inhalable aerosols)</th>
<th>TWA (Inhalable fraction and vapor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocarbons, C10, aromatics,</td>
<td>64742-94-5</td>
<td>5 mg/m³</td>
<td>10 mg/m³</td>
<td>5 mg/m³</td>
<td>5 mg/m³</td>
<td>10 mg/m³</td>
<td>20 mg/m³</td>
<td>10 mg/m³</td>
<td>1 mg/m³</td>
<td>2 mg/m³</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>&lt;1% naphthalene</td>
<td></td>
<td>CA AB OEL</td>
<td>CA AB OEL</td>
<td>CA BC OEL</td>
<td>CA QC OEL</td>
<td>CA AB OEL</td>
<td>CA BC OEL</td>
<td>CA BC OEL</td>
<td>CA QC OEL</td>
<td>CA BC OEL</td>
<td>CA QC OEL</td>
</tr>
<tr>
<td>Temephos</td>
<td>3383-96-8</td>
<td>1 mg/m³</td>
<td>1 mg/m³</td>
<td>1 mg/m³</td>
<td>1 mg/m³</td>
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<td>2 mg/m³</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CA AB OEL</td>
<td>CA AB OEL</td>
<td>CA BC OEL</td>
<td>CA QC OEL</td>
<td>CA AB OEL</td>
<td>CA BC OEL</td>
<td>CA BC OEL</td>
<td>CA QC OEL</td>
<td>CA BC OEL</td>
<td>CA QC OEL</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>128-37-0</td>
<td>10 mg/m³</td>
<td>2 mg/m³</td>
<td>2 mg/m³</td>
<td>2 mg/m³</td>
<td>10 mg/m³</td>
<td>20 mg/m³</td>
<td>10 mg/m³</td>
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<td>2 mg/m³</td>
<td>2 mg/m³</td>
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<tr>
<td></td>
<td></td>
<td>CA AB OEL</td>
<td>CA BC OEL</td>
<td>CA QC OEL</td>
<td>CA QC OEL</td>
<td>CA AB OEL</td>
<td>CA BC OEL</td>
<td>CA BC OEL</td>
<td>CA QC OEL</td>
<td>CA BC OEL</td>
<td>CA QC OEL</td>
</tr>
</tbody>
</table>
# Temephos Liquid Formulation

## Remarks
- Consider double gloving.

## Eye protection
- Wear safety glasses with side shields or goggles.
- If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles.
- Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or aerosols.

## Skin and body protection
- Work uniform or laboratory coat.
- Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces.
- Use appropriate degowning techniques to remove potentially contaminated clothing.

## 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.
- Contaminated work clothing should not be allowed out of the workplace.
- Wash contaminated clothing before re-use.
- The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>liquid</td>
</tr>
<tr>
<td>Color</td>
<td>clear, Straw-colored</td>
</tr>
<tr>
<td>Odor</td>
<td>characteristic</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>No data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (liquids)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper explosion limit / Upper flammability limit</td>
<td>No data available</td>
</tr>
</tbody>
</table>
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
**SAFETY DATA SHEET**
according to the Hazardous Products Regulations

**Temephos Liquid Formulation**

<table>
<thead>
<tr>
<th>Component</th>
<th>Acute oral toxicity</th>
<th>Method</th>
<th>Acute dermal toxicity</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocarbons, C10, aromatics, &lt;1% naphthalene</td>
<td>LD50 (Rat): &gt; 5,000 mg/kg</td>
<td>OECD Test Guideline 420</td>
<td>LD50 (Rabbit): &gt; 2,000 mg/kg</td>
<td>OECD Test Guideline 402</td>
</tr>
<tr>
<td></td>
<td>LD50 (Rat): &gt; 4.778 mg/l</td>
<td>OECD Test Guideline 403</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LD50 (Rabbit): &gt; 2,000 mg/kg</td>
<td>OECD Test Guideline 402</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remains: Based on data from similar materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temephos</td>
<td>LD50 (Mouse, female): 2,062 mg/kg</td>
<td></td>
<td>LD50 (Rat, male): 2,000 mg/kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LC50 (Rat): &gt; 4.79 mg/l</td>
<td>OECD Test Guideline 403</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium dodecylbenzenesulphonate</td>
<td>LD50 (Rat): &gt; 500 - 2,000 mg/kg</td>
<td>OECD Test Guideline 401</td>
<td>LD50 (Rabbit): &gt; 2,000 mg/kg</td>
<td>OECD Test Guideline 402</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remarks: Based on data from similar materials</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Acute toxicity**
Harmful if inhaled.

**Product:**
- **Acute oral toxicity:** Acute toxicity estimate: > 2,000 mg/kg
  - Method: Calculation method
- **Acute inhalation toxicity:** Acute toxicity estimate: 4.69 mg/l
  - Exposure time: 4 h
  - Test atmosphere: dust/mist
  - Method: Calculation method
- **Acute dermal toxicity:** Acute toxicity estimate: > 2,000 mg/kg
  - Method: Calculation method

**Components:**

**Hydrocarbons, C10, aromatics, <1% naphthalene:**
- **Acute oral toxicity:**
  - LD50 (Rat): > 5,000 mg/kg
  - Method: OECD Test Guideline 420
  - Remarks: Based on data from similar materials

**Temephos:**
- **Acute oral toxicity:** LD50 (Mouse, female): 2,062 mg/kg
- **Acute inhalation toxicity:** LC50 (Rat): > 4.79 mg/l
  - Exposure time: 4 h
  - Test atmosphere: dust/mist
- **Acute dermal toxicity:** LD50 (Rat, male): 2,000 mg/kg

**Calcium dodecylbenzenesulphonate:**
- **Acute oral toxicity:** LD50 (Rat): > 500 - 2,000 mg/kg
  - Method: OECD Test Guideline 401
  - Remarks: Based on data from similar materials
- **Acute dermal toxicity:** LD50 (Rabbit): > 2,000 mg/kg
  - Method: OECD Test Guideline 402
  - Remarks: Based on data from similar materials
7-Oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:

Acute oral toxicity : LD50 (Rat, male): > 2,959 - 5,000 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity : LC50 (Rat): >= 5.19 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 436
Assessment: The substance or mixture has no acute inhalation 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

2,6-Di-tert-butyl-p-cresol:

Acute oral toxicity : LD50 (Rat): > 6,000 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:

Hydrocarbons, C10, aromatics, <1% naphthalene:
Assessment : Repeated exposure may cause skin dryness or cracking.

Temephos:
Species : Rabbit
Result : No skin irritation

Calcium dodecylbenzenesulphonate:
Species : Rabbit
Method : OECD Test Guideline 404
Result : Skin irritation
Remarks : Based on data from similar materials

7-Oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:
Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

2,6-Di-tert-butyl-p-cresol:
Temephos Liquid Formulation

Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation
Remarks: Based on data from similar materials

Serious eye damage/eye irritation
Causes serious eye damage.

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:
Species: Rabbit
Result: No eye irritation
Remarks: Based on data from similar materials

Temephos:
Species: Rabbit
Result: No eye irritation

Calcium dodecylbenzenesulphonate:
Species: Rabbit
Result: Irreversible effects on the eye
Method: OECD Test Guideline 405
Remarks: Based on data from similar materials

7-Oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:
Species: Rabbit
Result: No eye irritation
Method: OECD Test Guideline 405

2,6-Di-tert-butyl-p-cresol:
Species: Rabbit
Result: No eye irritation
Method: OECD Test Guideline 405
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:

Hydrocarbons, C10, aromatics, <1% naphthalene:
Test Type: Maximization Test
Routes of exposure: Skin contact
Species: Guinea pig
Result: negative
Temephos Liquid Formulation

Remarks: Based on data from similar materials

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

**Calcium dodecylbenzenesulphonate:**
- **Test Type:** Maximization Test
- **Routes of exposure:** Skin contact
- **Species:** Guinea pig
- **Method:** OECD Test Guideline 406
- **Result:** negative
- **Remarks:** Based on data from similar materials

**7-Oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**
- **Test Type:** Maximization Test
- **Routes of exposure:** Skin contact
- **Species:** Guinea pig
- **Result:** positive
- **Assessment:** Probability or evidence of skin sensitization in humans

**2,6-Di-tert-butyl-p-cresol:**
- **Test Type:** Human repeat insult patch test (HRIPT)
- **Routes of exposure:** Skin contact
- **Species:** Humans
- **Result:** negative

**Germ cell mutagenicity**
Suspected of causing genetic defects.

**Components:**

**Hydrocarbons, C10, aromatics, <1% naphthalene:**
- **Genotoxicity in vitro:**
  - **Test Type:** In vitro sister chromatid exchange assay in mammalian cells
  - **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:** Rat
  - **Application Route:** inhalation (vapor)
  - **Result:** negative
  - **Remarks:** Based on data from similar materials
Genotoxicity in vitro:
- Test Type: Bacterial reverse mutation assay (AMES)
  Result: negative
- Test Type: In vitro mammalian cell gene mutation test
  Result: negative
- Test Type: Chromosome aberration test in vitro
  Result: negative
- Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
  Result: negative

Calcium dodecylbenzenesulphonate:
Genotoxicity in vitro:
- Test Type: Bacterial reverse mutation assay (AMES)
  Method: OECD Test Guideline 471
  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
  Method: OECD Test Guideline 473
  Result: negative
  Remarks: Based on data from similar materials

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

7-Oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:
Genotoxicity in vitro:
- Test Type: Bacterial reverse mutation assay (AMES)
  Method: OECD Test Guideline 471
  Result: positive
- Test Type: In vitro mammalian cell gene mutation test
  Result: positive
- Test Type: In vitro sister chromatid exchange assay in mammalian cells
  Result: positive
- Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
  Result: positive

Genotoxicity in vivo:
- Test Type: Unscheduled DNA synthesis (UDS) test with
mammalian liver cells in vivo
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 486
Result: negative

Test Type: Micronucleus test
Species: Mouse
Application Route: Intraperitoneal injection
Result: negative

Test Type: Transgenic rodent somatic cell gene mutation assay
Species: Mouse
Application Route: Ingestion
Method: OECD Test Guideline 488
Result: positive

Germ cell mutagenicity - Assessment: Positive result(s) from in vivo mammalian somatic cell mutagenicity tests.

2,6-Di-tert-butyl-p-cresol:
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Result: negative

Test Type: Chromosome aberration test in vitro
Result: negative

Genotoxicity in vivo: Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
Species: Rat
Application Route: Ingestion
Result: negative

Carcinogenicity
Not classified based on available information.

Components:

Temephos:
Species: Rat
Application Route: Ingestion
Exposure time: 24 Months
Result: negative

7-Oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:
Species: Mouse
Application Route: Skin contact
Exposure time: 29 Months
## Temephos Liquid Formulation

<table>
<thead>
<tr>
<th>Component</th>
<th>Test Type</th>
<th>Application Route</th>
<th>Result</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocarbons, C10, aromatics, &lt;1% naphthalene</td>
<td>Three-generation reproduction toxicity study</td>
<td>Ingestion</td>
<td>negative</td>
<td>Based on data from similar materials</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>Test Type: Three-generation reproduction toxicity study</td>
<td>Ingestion</td>
<td>negative</td>
<td></td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td></td>
<td></td>
<td>negative</td>
<td>Not classified based on available information.</td>
</tr>
<tr>
<td>Calcium dodecylbenzenesulphonate</td>
<td>Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test</td>
<td>Ingestion</td>
<td>negative</td>
<td>Based on data from similar materials</td>
</tr>
</tbody>
</table>

### Result: negative

### 2,6-Di-tert-butyl-p-cresol:
- **Species**: Rat
- **Application Route**: Ingestion
- **Exposure time**: 22 Months
- **Result**: negative

### Reproductive toxicity:
Not classified based on available information.

### Components:

#### Hydrocarbons, C10, aromatics, <1% naphthalene:
- **Test Type**: Three-generation reproduction toxicity study
- **Species**: Rat
- **Application Route**: Inhalation (vapor)
- **Result**: negative
- **Remarks**: Based on data from similar materials

#### Temephos:
- **Test Type**: One-generation reproduction toxicity study
- **Species**: Rat
- **Application Route**: Ingestion
- **Result**: negative

#### Calcium dodecylbenzenesulphonate:
- **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**: Based on data from similar materials
Result: negative
Remarks: Based on data from similar materials

7-Oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:
Effects on fetal development
Test Type: Embryo-fetal development
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 414
Result: negative

2,6-Di-tert-butyl-p-cresol:
Effects on fertility
Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative

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

STOT-single exposure
May cause drowsiness or dizziness.

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:
Assessment: May cause drowsiness or dizziness.
Remarks: Based on data from similar materials

STOT-repeated exposure
Causes damage to organs (Nervous system) through prolonged or repeated exposure.
May cause damage to organs (nasal cavity) through prolonged or repeated exposure.

Components:

Temephos:
Routes of exposure: Ingestion
Target Organs: Nervous system
Assessment: Shown to produce significant health effects in animals at concentrations of 10 mg/kg bw or less.

Calcium dodecylbenzenesulphonate:
Assessment: No significant health effects observed in animals at concentrations of 100 mg/kg bw or less.

7-Oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:
Routes of exposure: Ingestion
Target Organs: Nasal cavity
Assessment: Shown to produce significant health effects in animals at con-
centrations of >10 to 100 mg/kg bw.

2,6-Di-tert-butyl-p-cresol:
Assessment : No significant health effects observed in animals at concentrations of 100 mg/kg bw or less.

Repeated dose toxicity

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:
Species : Rat
NOAEL : 300 mg/kg
Application Route : Ingestion
Exposure time : 13 Weeks
Remarks : Based on data from similar materials

Temephos:
Species : Dog
NOAEL : 0.45 mg/kg
LOAEL : 12.5 mg/kg
Application Route : Ingestion
Exposure time : 90 Days

Calcium dodecylbenzenesulphonate:
Species : Rat
LOAEL : > 200 mg/kg
Application Route : Ingestion
Exposure time : 6 - 7 Weeks
Method : OECD Test Guideline 422
Remarks : Based on data from similar materials
Species : Rabbit
NOAEL : > 100 mg/kg
Application Route : Skin contact
Exposure time : 28 Days
Method : OECD Test Guideline 410
Remarks : Based on data from similar materials

7-Oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:
Species : Rat
NOAEL : 5 mg/kg
LOAEL : 50 mg/kg
Application Route : Ingestion
Exposure time : 90 Days
Method : OECD Test Guideline 408

2,6-Di-tert-butyl-p-cresol:
Species : Rat
SAFETY DATA SHEET
according to the Hazardous Products Regulations

Temephos Liquid Formulation

NOAEL: 25 mg/kg
Application Route: Ingestion
Exposure time: 22 Months

Aspiration toxicity
May be fatal if swallowed and enters airways.

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:
The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity hazard.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Hydrocarbons, C10, aromatics, <1% naphthalene:
Toxicity to fish:
LL50 (Oncorhynchus mykiss (rainbow trout)): 2 - 5 mg/l
Exposure time: 96 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 203
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates:
EL50 (Daphnia magna (Water flea)): 3 - 10 mg/l
Exposure time: 48 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants:
EL50 (Pseudokirchneriella subcapitata (green algae)): > 1 - 3 mg/l
Exposure time: 72 h
Test substance: Water Accommodated Fraction
Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

Temephos:
Toxicity to fish:
LC50 : 0.04 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates:
EC50 (Daphnia magna (Water flea)): 0.000007 mg/l
Exposure time: 48 h

Calcium dodecylbenzenesulphonate:
Toxicity to fish:
LC50 (Leuciscus idus (Golden orfe)): > 1 - 10 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials
### Toxicity to daphnia and other aquatic invertebrates

**EC50 (Daphnia magna (Water flea)):** > 1 - 10 mg/l
**Exposure time:** 48 h
**Remarks:** Based on data from similar materials

### Toxicity to algae/aquatic plants

**ErC50 (Pseudokirchneriella subcapitata (green algae)):** > 10 - 100 mg/l
**Exposure time:** 72 h
**Remarks:** Based on data from similar materials

**NOEC (Pseudokirchneriella subcapitata (green algae)):** > 0.1 - 1 mg/l
**Exposure time:** 72 h
**Remarks:** Based on data from similar materials

### Toxicity to fish (Chronic toxicity)

**NOEC (Pimephales promelas (fathead minnow)):** > 0.1 - 1 mg/l
**Exposure time:** 28 d
**Remarks:** Based on data from similar materials

### Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

**NOEC (Daphnia magna (Water flea)):** > 1 mg/l
**Exposure time:** 21 d
**Remarks:** Based on data from similar materials

### Toxicity to microorganisms

**EC50 (activated sludge):** > 100 mg/l
**Exposure time:** 3 h
**Method:** OECD Test Guideline 209
**Remarks:** Based on data from similar materials

### 7-Oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:

**Toxicity to fish**

**LC50 (Oncorhynchus mykiss (rainbow trout)):** 24 mg/l
**Exposure time:** 96 h
**Method:** OECD Test Guideline 203

**Toxicity to daphnia and other aquatic invertebrates**

**EC50 (Daphnia magna (Water flea)):** 40 mg/l
**Exposure time:** 48 h
**Method:** OECD Test Guideline 202

**Toxicity to algae/aquatic plants**

**ErC50 (Raphidocelis subcapitata (freshwater green alga)):** > 110 mg/l
**Exposure time:** 72 h
**Method:** OECD Test Guideline 201

**NOEC (Raphidocelis subcapitata (freshwater green alga)):** 30 mg/l
**Exposure time:** 72 h
**Method:** OECD Test Guideline 201

**Toxicity to microorganisms**

**EC10 (activated sludge):** 409 mg/l
**Exposure time:** 3 h
**Method:** OECD Test Guideline 209

### 2,6-Di-tert-butyl-p-cresol:
## Toxicity to fish

<table>
<thead>
<tr>
<th>Method</th>
<th>LC50 (Danio rerio (zebra fish))</th>
<th>&gt; 0.57 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>96 h</td>
<td></td>
</tr>
</tbody>
</table>

## Toxicity to daphnia and other aquatic invertebrates

<table>
<thead>
<tr>
<th>Method</th>
<th>EC50 (Daphnia magna (Water flea))</th>
<th>0.48 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>48 h</td>
<td></td>
</tr>
<tr>
<td>OECD Test Guideline</td>
<td>202</td>
<td></td>
</tr>
</tbody>
</table>

## Toxicity to algae/aquatic plants

<table>
<thead>
<tr>
<th>Method</th>
<th>ErC50 (Pseudokirchneriella subcapitata (green algae))</th>
<th>&gt; 0.24 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>72 h</td>
<td></td>
</tr>
<tr>
<td>OECD Test Guideline</td>
<td>201</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method</th>
<th>NOEC (Pseudokirchneriella subcapitata (green algae))</th>
<th>0.24 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>72 h</td>
<td></td>
</tr>
<tr>
<td>OECD Test Guideline</td>
<td>201</td>
<td></td>
</tr>
</tbody>
</table>

## Toxicity to fish (Chronic toxicity)

<table>
<thead>
<tr>
<th>Method</th>
<th>NOEC (Oryzias latipes (Japanese medaka))</th>
<th>0.053 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>30 d</td>
<td></td>
</tr>
<tr>
<td>OECD Test Guideline</td>
<td>210</td>
<td></td>
</tr>
</tbody>
</table>

## Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

<table>
<thead>
<tr>
<th>Method</th>
<th>NOEC (Daphnia magna (Water flea))</th>
<th>0.316 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>21 d</td>
<td></td>
</tr>
</tbody>
</table>

## Toxicity to microorganisms

<table>
<thead>
<tr>
<th>Method</th>
<th>EC50: &gt; 10,000 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>3 h</td>
</tr>
<tr>
<td>OECD Test Guideline</td>
<td>209</td>
</tr>
</tbody>
</table>

## Persistence and degradability

### Components:

**Hydrocarbons, C10, aromatics, <1% naphthalene:**

- Biodegradability: Result: Not readily biodegradable.
- Biodegradation: 49.56 %
- Exposure time: 28 d
- OECD Test Guideline: 301F

**Calcium dodecylbenzenesulphonate:**

- Biodegradability: Result: Readily biodegradable.
- Remarks: Based on data from similar materials

**7-Oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:**

- Biodegradability: Result: Not readily biodegradable.
- Biodegradation: 71 %
- Exposure time: 28 d
- OECD Test Guideline: 301B

**2,6-Di-tert-butyl-p-cresol:**

- Biodegradability: Result: Not readily biodegradable.
Bioaccumulative potential

Components:

Temephos:
- Bioaccumulation: Species: Lepomis macrochirus (Bluegill sunfish)
  Bioconcentration factor (BCF): 2,300
- Partition coefficient: n-octanol/water: log Pow: 4.91
  Method: OECD Test Guideline 107
- Remarks: Calculation

Calcium dodecylbenzenesulphonate:
- Bioaccumulation: Bioconcentration factor (BCF): < 500
  Remarks: Based on data from similar materials
- Partition coefficient: n-octanol/water: log Pow: 4.77
  Remarks: Calculation

7-Oxabicyclo[4.1.0]hept-3-ylmethyl 7-oxabicyclo[4.1.0]heptane-3-carboxylate:
- Partition coefficient: n-octanol/water: log Pow: 1.34
  Method: OECD Test Guideline 107

2,6-Di-tert-butyl-p-cresol:
- Bioaccumulation: Species: Cyprinus carpio (Carp)
  Bioconcentration factor (BCF): 330 - 1,800
- Partition coefficient: n-octanol/water: log Pow: 5.1

Mobility in soil
No data available

Other adverse effects
No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
- Waste from residues: Do not dispose of waste into sewer.
  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
UN number : UN 3082
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Class : 9
Packing group : III
Labels : 9
Environmentally hazardous : no

IATA-DGR
UN/ID No. : UN 3082
Proper shipping name : Environmentally hazardous substance, liquid, n.o.s.
Class : 9
Packing group : III
Labels : Miscellaneous
Packing instruction (cargo aircraft) : 964
Packing instruction (passenger aircraft) : 964

IMDG-Code
UN number : UN 3082
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(Temephos, 2,6-Di-tert-butyl-p-cresol)
Class : 9
Packing group : III
Labels : 9
EmS Code : F-A, S-F
Marine pollutant : yes

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

Domestic regulation

TDG
UN number : UN 3082
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Class : 9
Packing group : III
Labels : 9
ERG Code : 171
Marine pollutant : yes(Temephos, 2,6-Di-tert-butyl-p-cresol)

Special precautions for user
The transport classification(s) provided herein are for informational purposes only, and solely
based upon the properties of the unpackaged material as it is described within this Safety Data
Sheet. Transportation classifications may vary by mode of transportation, package sizes, and
variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

The ingredients of this product are reported in the following inventories:
SAFETY DATA SHEET
according to the Hazardous Products Regulations

Temephos Liquid Formulation

SECTION 16. OTHER INFORMATION

Full text of other abbreviations
ACGIH : USA. ACGIH Threshold Limit Values (TLV)
CA BC OEL : Canada. British Columbia OEL
CA QC OEL : Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
ACGIH / TWA : 8-hour, time-weighted average
CA AB OEL / TWA : 8-hour Occupational exposure limit
CA AB OEL / STEL : 15-minute occupational exposure limit
CA BC OEL / TWA : 8-hour time weighted average
CA BC OEL / STEL : short-term exposure limit
CA QC OEL / TWAEV : Time-weighted average exposure value

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; 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; 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; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; 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; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recom-
Temephos Liquid Formulation

Version: 2.1    Revision Date: 09/30/2023    SDS Number: 10814452-00004    Date of last issue: 03/27/2023

Revision Date: 09/30/2023    Date format: mm/dd/yyyy

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.

CA / Z8