SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product information

Product Name: Scentinel® F-35 Gas Odorant
Material: 1086514, 1098152, 1086548, 1024699, 1024698, 1024700, 1029446, 1105016, 1105017

EC-No. Registration number

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Legal Entity</th>
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<tbody>
<tr>
<td></td>
<td>EC-No.</td>
<td>Registration number</td>
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<tr>
<td></td>
<td>Index No.</td>
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<tr>
<td>I-Butyl Mercaptan</td>
<td>75-66-1</td>
<td>Chevron Phillips Chemicals International NV</td>
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<tr>
<td></td>
<td>200-890-2</td>
<td>01-2119491288-26-0000</td>
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<td>Dimethyl Sulfide</td>
<td>75-18-3</td>
<td>Chevron Phillips Chemicals International NV</td>
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<tr>
<td></td>
<td>200-846-2</td>
<td>01-2119487127-32-0001</td>
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</table>

Relevant Identified Uses

Supported: Distribution
Formulation
Use as an intermediate
Injection as odorant in fuels – industrial

Company

Chevron Phillips Chemical Company LP
Specialty Chemicals
10001 Six Pines Drive
The Woodlands, TX 77380

Local

Chevron Phillips Chemicals International N.V.
Airport Plaza (Stockholm Building)
Leonardo Da Vincipla 19
1831 Diegem
Belgium

SDS Requests: (800) 852-5530
Technical Information: (832) 813-4862
Responsible Party: Product Safety Group
Email: sds@cpchem.com

Emergency telephone:
Health:
866.442.9628 (North America)
1.832.813.4984 (International)

Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431

Responsible Department : Product Safety and Toxicology Group
E-mail address : SDS@CPChem.com
Website : www.CPChem.com

ODOR-FADE WARNING

A GAS LEAK CAN CAUSE A FIRE OR EXPLOSION RESULTING IN SERIOUS INJURY OR DEATH.

Be aware that the stenching chemical added to gas to make it detectable may not warn of a gas leak or the presence of propane or natural gas to all persons in every instance.

Instances where the odorant in an odorized gas may be undetectable include:

- Odor intensity may fade or be eliminated for a variety of chemical and physical causes, including the oxidation of rusting pipes, adsorption into or sticking onto the interior of pipes or appliances, or absorption into liquids.
- Contact with soil in underground leaks may de-odorize or remove odorant from the gas.
- Some people have a diminished ability, or inability to smell the stench. Factors that negatively affect a person’s sense of smell include age, gender, medical conditions, and alcohol/tobacco usage.
- The stench of odorized gas may not awaken sleeping persons.
- Other odors may mask or hide the stench.
- Exposure to the odor for even a short period of time, may cause nasal fatigue, where a person can no longer smell the stench.

Gas detectors listed by the Underwriters Laboratories (UL) can be used as an extra measure of safety for detecting gas leaks, especially under conditions where the odorant alone may not provide an adequate warning. Gas detectors emit a loud, shrill sound when gas is present and do not depend on sense of smell. Because the odor intensity can fade or people may have problems with their sense of smell, we recommend installing, per manufacturer’s instructions, one or more combustible gas detectors, in suitable locations to ensure adequate coverage to detect gas leaks.

Educate yourself, your employees, and your customers with the content of this warning and other important facts associated with the so-called “odor-fade phenomenon.”

SECTION 2: Hazards identification

Classification of the substance or mixture
REGULATION (EC) No 1272/2008

<table>
<thead>
<tr>
<th>Flammable liquids, Category 2</th>
<th>H225:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly flammable liquid and vapor.</td>
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<tr>
<td>Eye irritation, Category 2</td>
<td>H319:</td>
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<tr>
<td>Causes serious eye irritation.</td>
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<tr>
<td>Skin sensitization, Category 1</td>
<td>H317:</td>
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<tr>
<td>May cause an allergic skin reaction.</td>
<td></td>
</tr>
<tr>
<td>Acute aquatic toxicity, Category 2</td>
<td>H401:</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Chronic aquatic toxicity, Category 2

H411: Toxic to aquatic life with long lasting effects.

Label elements

Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms:

Signal Word: Danger

Hazard Statements:
H225 Highly flammable liquid and vapor.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H411 Toxic to aquatic life with long lasting effects.

Precautionary Statements:

Prevention:
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P273 Avoid release to the environment.

Response:
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Hazardous ingredients which must be listed on the label:
- 75-66-1 t-Butyl Mercaptan

SECTION 3: Composition/information on ingredients

Synonyms: Mercaptan Mixture
Gas Odorant

Molecular formula: Mixture

Mixtures

Hazardous ingredients

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Classification (REGULATION (EC) No 1272/2008)</th>
<th>Concentration [wt%]</th>
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<tbody>
<tr>
<td>t-Butyl Mercaptan</td>
<td>75-66-1</td>
<td>Flam. Liq. 2; H225 Aquatic Acute 2; H401 Skin Sens. 1; H317</td>
<td>63 - 67</td>
</tr>
</tbody>
</table>

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SECTION 4: First aid measures

General advice: Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

If inhaled: Move to fresh air. If symptoms persist, call a physician. If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

In case of skin contact: If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact: Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed: Keep respiratory tract clear. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point: -18 °C (0 °F) estimated

Autoignition temperature: No data available

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

Unsuitable extinguishing media: High volume water jet.

Specific hazards during firefighting: Do not allow run-off from fire fighting to enter drains or water courses.

Special protective equipment for fire-fighters: Wear self-contained breathing apparatus for firefighting if necessary.

Further information: 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. For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.
**SECTION 6: Accidental release measures**

**Personal precautions**: Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

**Environmental precautions**: Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

**Methods for cleaning up**: Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

For additional details, see the Exposure Scenario in the Annex portion.

**SECTION 7: Handling and storage**

**Handling**

**Advice on safe handling**: Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitization problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

**Advice on protection against fire and explosion**: Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

**Storage**

**Requirements for storage areas and containers**: No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.
### SECTION 8: Exposure controls/personal protection

#### Ingredients with workplace control parameters

**Chevron Phillips Chemical Company LP**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Basis</th>
<th>Value</th>
<th>Control parameters</th>
<th>Note</th>
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</thead>
<tbody>
<tr>
<td>1-Butyl Mercaptan</td>
<td></td>
<td></td>
<td>Manufacturer TWA</td>
<td>0.5 ppm,</td>
</tr>
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</table>

**SE**

<table>
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<tr>
<th>Bestandseil</th>
<th>Grundval</th>
<th>Värde</th>
<th>Kontrollparametrar</th>
<th>Anmärkning</th>
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</thead>
<tbody>
<tr>
<td>Dimethyl Sulfide</td>
<td>SE AFS</td>
<td>NGV</td>
<td>1 ppm,</td>
<td>22.</td>
</tr>
</tbody>
</table>

22 Nivågränsvärden 1 ppm gäller för summan av haltarna av dimetyldisulfid, dimetylsulfid och metantiol.

#### Engineering measures

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

#### Personal protective equipment

**Respiratory protection:** Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to

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maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Organic Vapors. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Hand protection: The suitability for a specific workplace should be discussed with the producers of the protective gloves. For prolonged or repeated contact use protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection: Eye wash bottle with pure water. Tightly fitting safety goggles. Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection: Choose body protection according to the amount and concentration of the dangerous substance at the work place. Wear as appropriate: Footwear protecting against chemicals. Flame retardant antistatic protective clothing. Skin should be washed after contact. Workers should wear antistatic footwear. Remove and wash contaminated clothing before re-use.

Hygiene measures: When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

For additional details, see the Exposure Scenario in the Annex portion

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance
Form: Liquid
Physical state: Liquid
Color: Clear
Odor: Repulsive

Safety data
Flash point: -18 °C (0 °F) estimated
Lower explosion limit: No data available
Upper explosion limit: No data available
Oxidizing properties: no
### SECTION 10: Stability and reactivity

**Chemical stability**: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

**Possibility of hazardous reactions**

- **Conditions to avoid**: Heat, flames and sparks.
- **Hazardous decomposition products**: Carbon oxides, Sulfur oxides

**Other data**: No decomposition if stored and applied as directed.
SECTION 11: Toxicological information

**Scentinel® F-35 Gas Odorant**

**Acute oral toxicity**
- LD50: > 5,000 mg/kg
  - Species: Rat
  - Method: Acute toxicity estimate

**Acute inhalation toxicity**
- LC50: > 20 mg/l
  - Test atmosphere: vapor
  - Method: Acute toxicity estimate

**Acute dermal toxicity**
- LD50: > 2,000 mg/kg
  - Method: Acute toxicity estimate

**Skin irritation**
- No skin irritation. largely based on animal evidence.

**Eye irritation**
- Eye irritation. largely based on animal evidence.

**Sensitization**
- Causes sensitization. largely based on animal evidence.

**Repeated dose toxicity**
**t-Butyl Mercaptan**
- Species: Rat, Male and female
- Sex: Male and female
- Application Route: Inhalation
- Dose: 9, 97, 196 ppm
- Exposure time: 13 wks
- Number of exposures: 6 hrs/d, 5 d/wk
- NOEL: > 196 ppm
Species: Rat, Male and female  
Sex: Male and female  
Application Route: oral gavage  
Dose: 10, 50, 200 mg/kg bw/day  
Exposure time: 42-53 days  
Number of exposures: Daily  
NOEL: 50 mg/kg bw/day  
Lowest observable effect level: 200 mg/kg bw/day  
Method: OECD Guideline 422

Species: Rat, Male and female  
Sex: Male and female  
Application Route: Inhalation  
Dose: 25.1, 99.6, 403.4 ppm  
Exposure time: 13 wks  
Number of exposures: 6 hrs/d, 5 d/wk  
NOEL: 99.6 ppm  
Lowest observable effect level: 403.4 ppm  
Method: OECD Guideline 413  
Target Organs: Liver, Kidney, Blood, Upper respiratory tract  
Information given is based on data obtained from similar substances.

Dimethyl Sulfide  
Species: Rat  
Application Route: Oral diet  
Dose: 0, 2.5, 25, 250 mg/kg bw/day  
Exposure time: 14 wk  
Number of exposures: daily  
NOEL: 250 mg/kg

Species: Rat, Male and female  
Sex: Male and female  
Application Route: inhalation (vapor)  
Dose: 0, 0.310, 0.964, 2.783 mg/l  
Exposure time: 13 wk (6 h)  
Number of exposures: 7 d/wk  
NOEL: 2,783 mg/l  
Method: OECD Guideline 413  
Information given is based on data obtained from similar substances.

Reproductive toxicity  
t-Butyl Mercaptan  
Species: Rat  
Sex: male and female  
Application Route: oral gavage  
Dose: 10, 50, 200 mg/kg bw/day  
Number of exposures: Daily  
Test period: 42-53 days  
Method: OECD Guideline 422  
NOAEL Parent: 200 mg/kg bw/day  
NOAEL F1: 50 mg/kg bw/day  
No adverse effects expected

Developmental Toxicity  
t-Butyl Mercaptan  
Species: Mouse  
Application Route: Inhalation  
Dose: 11, 99, 195 ppm
### Scentinel® F-35 Gas Odorant

**Aspiration toxicity**
- May be harmful if swallowed and enters airways.

**CMR effects**
- **t-Butyl Mercaptan**
  - Carcinogenicity: Not available
  - Mutagenicity: Did not show mutagenic effects in animal experiments.
  - Teratogenicity: Did not show teratogenic effects in animal experiments.
  - Reproductive toxicity: No toxicity to reproduction

- **Dimethyl Sulfide**
  - Carcinogenicity: Not available
  - Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. In vivo tests did not show mutagenic effects.
  - Teratogenicity: Animal testing did not show any effects on fetal development.
  - Reproductive toxicity: Animal testing did not show any effects on fertility.

**Further information**
- Solvents may degrease the skin.

### SECTION 12: Ecological information
Toxicity to fish

- t-Butyl Mercaptan: LC50: 34 mg/l, Exposure time: 96 h, Species: Oncorhynchus mykiss (rainbow trout), Method: OECD Test Guideline 203

- Dimethyl Sulfide: LC50: 213 mg/l, Exposure time: 96 h, Species: Oncorhynchus mykiss (rainbow trout), Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates

- t-Butyl Mercaptan: EC50: 6.7 mg/l, Exposure time: 48 h, Species: Daphnia magna (Water flea), Method: OECD Test Guideline 202

- Dimethyl Sulfide: EC50: 29 mg/l, Exposure time: 48 h, Species: Daphnia magna (Water flea), Method: OECD Test Guideline 202

Toxicity to algae

- t-Butyl Mercaptan: EC50: 24 mg/l, Exposure time: 72 h, Species: Pseudokirchneriella subcapitata (green algae), Method: OECD Test Guideline 201

- Dimethyl Sulfide: IC50: > 113.7 mg/l, Exposure time: 72 h, Species: Selenastrum capricornutum (algae), Method: OECD Test Guideline 201

Elimination information (persistence and degradability)

Bioaccumulation

- t-Butyl Mercaptan: Bioconcentration factor (BCF): 12, Bioaccumulation is unlikely.

Biodegradability

- Taking into consideration the properties of several ingredients, the product is estimated not to be readily biodegradable according to OECD classification.

Ecotoxicology Assessment

- Acute aquatic toxicity
  - t-Butyl Mercaptan: Toxic to aquatic life.
  - Dimethyl Sulfide: Harmful to aquatic life.
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### Scentinel® F-35 Gas Odorant

#### Version 2.0

**Revision Date 2018-04-02**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Information</th>
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</thead>
<tbody>
<tr>
<td>Chronic aquatic toxicity t-Butyl Mercaptan</td>
<td>Toxic to aquatic life with long lasting effects.</td>
</tr>
<tr>
<td>Toxicity Data on Soil</td>
<td>No data available</td>
</tr>
<tr>
<td>Other organisms relevant to the environment</td>
<td>No data available</td>
</tr>
<tr>
<td>Impact on Sewage Treatment</td>
<td>No data available</td>
</tr>
<tr>
<td>Results of PBT assessment t-Butyl Mercaptan</td>
<td>Non-classified PBT substance, Non-classified vPvB substance</td>
</tr>
<tr>
<td>Dimethyl Sulfide</td>
<td>Non-classified PBT substance, Non-classified vPvB substance</td>
</tr>
<tr>
<td>Additional ecological information</td>
<td>Toxic to aquatic life with long lasting effects.</td>
</tr>
</tbody>
</table>

### SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

**Product**

The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

**Contaminated packaging**

Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

For additional details, see the Exposure Scenario in the Annex portion

### SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.). Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

**US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)**

UN3336, MERCAPTANS, LIQUID, FLAMMABLE, N.O.S., (TERTIARY BUTYL MERCAPTAN, DIMETHYL SULFIDE), 3, II

**IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)**

UN3336, MERCAPTANS, LIQUID, FLAMMABLE, N.O.S., (TERTIARY BUTYL MERCAPTAN,
Scentinel® F-35 Gas Odorant

DIMETHYL SULFIDE), 3, II, (-18 °C), MARINE POLLUTANT, (TERTIARY BUTYL MERCAPTAN)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN3336, MERCAPTANS, LIQUID, FLAMMABLE, N.O.S., (TERTIARY BUTYL MERCAPTAN, DIMETHYL SULFIDE), 3, II

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN3336, MERCAPTANS, LIQUID, FLAMMABLE, N.O.S., (TERTIARY BUTYL MERCAPTAN, DIMETHYL SULFIDE), 3, II, (D/E), ENVIRONMENTALLY HAZARDOUS, (TERTIARY BUTYL MERCAPTAN)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN3336, MERCAPTANS, LIQUID, FLAMMABLE, N.O.S., (TERTIARY BUTYL MERCAPTAN, DIMETHYL SULFIDE), 3, II, ENVIRONMENTALLY HAZARDOUS, (TERTIARY BUTYL MERCAPTAN)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN3336, MERCAPTANS, LIQUID, FLAMMABLE, N.O.S., (TERTIARY BUTYL MERCAPTAN, DIMETHYL SULFIDE), 3, II, ENVIRONMENTALLY HAZARDOUS, (TERTIARY BUTYL MERCAPTAN)

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

SECTION 15: Regulatory information

National legislation

Major Accident Hazard Legislation : 96/82/EC Update: 2003
Highly flammable
7b Quantity 1: 5,000 t
Quantity 2: 50,000 t

Water contaminating class (Germany) : WGK 3 highly water endangering

Notification status
Europe REACH : On the inventory, or in compliance with the inventory
United States of America (USA) TSCA : On the inventory, or in compliance with the inventory
SAFETY DATA SHEET

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Revision Date 2018-04-02

Canada DSL: On the inventory, or in compliance with the inventory
Australia AICS: On the inventory, or in compliance with the inventory
New Zealand NZIoC: On the inventory, or in compliance with the inventory
Japan ENCS: On the inventory, or in compliance with the inventory
Korea KECI: On the inventory, or in compliance with the inventory
Philippines PICCS: On the inventory, or in compliance with the inventory
China IECSC: On the inventory, or in compliance with the inventory

SECTION 16: Other information

**NFPA Classification**
- Health Hazard: 2
- Fire Hazard: 3
- Reactivity Hazard: 0

**Further information**

Legacy SDS Number: 34290

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

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 given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**Key or legend to abbreviations and acronyms used in the safety data sheet**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>American Conference of Government Industrial Hygienists</td>
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<tr>
<td>LD50</td>
<td>Lethal Dose 50%</td>
</tr>
<tr>
<td>LOAEL</td>
<td>Lowest Observed Adverse Effect Level</td>
</tr>
<tr>
<td>NFPA</td>
<td>National Fire Protection Agency</td>
</tr>
<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Safety &amp; Health</td>
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<tr>
<td>NTP</td>
<td>National Toxicology Program</td>
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<td>NZIoC</td>
<td>New Zealand Inventory of Chemicals</td>
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<td>NOAEL</td>
<td>No Observable Adverse Effect Level</td>
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<tr>
<td>NOEC</td>
<td>No Observed Effect Concentration</td>
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<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health Administration</td>
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<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
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<tr>
<td>PICCS</td>
<td>Philippines Inventory of Commercial Chemical Substances</td>
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<tr>
<td>PRNT</td>
<td>Presumed Not Toxic</td>
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<tr>
<td>RCRA</td>
<td>Resource Conservation Recovery</td>
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</table>

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### SAFETY DATA SHEET

**Scentinel® F-35 Gas Odorant**

Version 2.0  
Revision Date 2018-04-02

<table>
<thead>
<tr>
<th>&gt;=</th>
<th>Greater Than or Equal To</th>
<th>Act</th>
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<tbody>
<tr>
<td>IC50</td>
<td>Inhibition Concentration 50%</td>
<td>SARA</td>
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<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
<td>TLV</td>
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<tr>
<td>IECSC</td>
<td>Inventory of Existing Chemical Substances in China</td>
<td>TWA</td>
</tr>
<tr>
<td>ENCS</td>
<td>Japan, Inventory of Existing and New Chemical Substances</td>
<td>TSCA</td>
</tr>
<tr>
<td>KECI</td>
<td>Korea, Existing Chemical Inventory</td>
<td>UVCB</td>
</tr>
<tr>
<td>&lt;=</td>
<td>Less Than or Equal To</td>
<td>WHMIS</td>
</tr>
</tbody>
</table>

### Full text of H-statements referred to under sections 2 and 3.

- **H225** Highly flammable liquid and vapor.
- **H317** May cause an allergic skin reaction.
- **H319** Causes serious eye irritation.
- **H401** Toxic to aquatic life.
- **H411** Toxic to aquatic life with long lasting effects.
## Annex

**1. Short title of Exposure Scenario:** Distribution

<table>
<thead>
<tr>
<th>Main User Groups</th>
<th>SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU3: Industrial Manufacturing (all)</td>
</tr>
<tr>
<td>Process category</td>
<td>PROC1: Use in closed process, no likelihood of exposure</td>
</tr>
<tr>
<td></td>
<td>PROC2: Use in closed, continuous process with occasional controlled exposure</td>
</tr>
<tr>
<td></td>
<td>PROC3: Use in closed batch process (synthesis or formulation)</td>
</tr>
<tr>
<td></td>
<td>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</td>
</tr>
<tr>
<td></td>
<td>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</td>
</tr>
<tr>
<td></td>
<td>PROC15: Use as laboratory reagent</td>
</tr>
</tbody>
</table>

| Environmental release category | ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7: Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial use of substances in closed systems |

| Further information | Lead substance(s)  
|                    | EC-No. 200-890-2  
|                    | Ec-No. 200-846-2  
|                    | Distribution of Substance: loading (including marine vessel/barge, rail/road car IBC loading), and repacking including drums and small packs of substance, including its distribution and associated laboratory activities. |

**2.2 Contributing scenario controlling worker exposure for:** PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent
Amount used
Remarks : Not applicable

2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7: Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial use of substances in closed systems
Product characteristics
Viscosity, dynamic : 1,6 mPa.s at 20 °C

Environment factors not influenced by risk management
Flow rate : 18.000 m3/d
Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure
Number of emission days per year : 300
Emission or Release Factor: Air : 0,01 %
Emission or Release Factor: Water : 0,001 %
Emission or Release Factor: Soil : 0,001 %

Technical conditions and measures / Organizational measures
Air : Treat air emission to provide the required removal efficiency of (%): (Effectiveness: > 99,9 %)
Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 99,9 %)
Remarks : Negligible wastewater emissions as process operates without water contact.

Conditions and measures related to municipal sewage treatment plant
Flow rate of sewage treatment plant effluent : 2.000 m3/d
Remarks : Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal
Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste
Recovery Methods : External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process
(synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent

Organizational measures to prevent/limit releases, dispersion and exposure
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source

### Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartments</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7</td>
<td>EUSES</td>
<td></td>
<td>Freshwater</td>
<td>0.107 µg/L</td>
<td>0.016</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.10 µg/L</td>
<td>0.149</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>0.44 µg/kg</td>
<td>0.0379</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.411 µg/kg</td>
<td>0.354</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Soil</td>
<td>1.63 µg/kg</td>
<td>0.236</td>
<td></td>
</tr>
</tbody>
</table>

ERC1: Manufacture of substances
ERC2: Formulation of preparations
ERC3: Formulation in materials
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
ERC5: Industrial use resulting in inclusion into or onto a matrix
ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6b: Industrial use of reactive processing aids
ERC6c: Industrial use of monomers for manufacture of thermoplastics
ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ERC7: Industrial use of substances in closed systems

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

SDS Number:100000013482
When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1. RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.

1. Short title of Exposure Scenario: **Formulation**

<table>
<thead>
<tr>
<th>Main User Groups</th>
<th>SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU 10: Formulation [mixing] of preparations and/or re-packing (excluding alloys)</td>
</tr>
<tr>
<td>Process category</td>
<td>PROC1: Use in closed process, no likelihood of exposure</td>
</tr>
<tr>
<td></td>
<td>PROC2: Use in closed, continuous process with occasional controlled exposure</td>
</tr>
<tr>
<td></td>
<td>PROC3: Use in closed batch process (synthesis or formulation)</td>
</tr>
<tr>
<td></td>
<td>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</td>
</tr>
<tr>
<td></td>
<td>PROC5: Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting;</td>
</tr>
<tr>
<td></td>
<td>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</td>
</tr>
<tr>
<td></td>
<td>PROC15: Use as laboratory reagent</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental release category</th>
<th>ERC2: Formulation of preparations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Further information</td>
<td>Lead substance(s)</td>
</tr>
<tr>
<td></td>
<td>EC-No. 200-890-2</td>
</tr>
<tr>
<td></td>
<td>Ec-No. 200-846-2</td>
</tr>
<tr>
<td></td>
<td>Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials, transfers, mixing, large and small scale packing, maintenance and associated laboratory activities.</td>
</tr>
</tbody>
</table>

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting; Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
Scentinel® F-35 Gas Odorant

Version 2.0

Revision Date 2018-04-02

Amount used

Remarks : Not applicable

2.1 Contributing scenario controlling environmental exposure for: ERC2: Formulation of preparations

Product characteristics

Viscosity, dynamic : 1,6 mPa.s at 20 °C

Environment factors not influenced by risk management

Flow rate : 18.000 m3/d
Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Number of emission days per year : 365
Emission or Release Factor: Air : 0,25 %
Emission or Release Factor: Water : 0,001 %
Emission or Release Factor: Soil : 0,01 %

Technical conditions and measures / Organizational measures

Air : Treat air emission to provide the required removal efficiency of (%): (Effectiveness: > 99,8 %)
Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 99,9 %)
Remarks : Negligible wastewater emissions as process operates without water contact.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent : 2.000 m3/d
Remarks : Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal

Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery Methods : External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting;, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated
facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent

Organizational measures to prevent /limit releases, dispersion and exposure
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent /minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartments</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC2</td>
<td>EUSES</td>
<td>Freshwater</td>
<td>0.0395 µg/L</td>
<td>0.00589</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.0367 µg/L</td>
<td>0.0548</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>0.162 µg/kg</td>
<td>0.0140</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.151 µg/kg</td>
<td>0.130</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soil</td>
<td>1.71 µg/kg</td>
<td>0.248</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ERC2: Formulation of preparations

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1. RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.

1. Short title of Exposure Scenario: **Use as an intermediate**

Main User Groups: **SU 3**: Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use: **SU3, SU8, SU9**: Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
Process category: **PROC1**: Use in closed process, no likelihood of exposure **PROC2**: Use in closed, continuous process with occasional controlled exposure **PROC3**: Use in closed batch process (synthesis or formulation) **PROC4**: Use in batch and other process (synthesis) where opportunity for exposure arises

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| PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
| PROC15: Use as laboratory reagent |

**Environmental release category:** ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

**Further information:**
- Lead substance(s)
  - EC-No. 200-890-2
  - Ec-No. 200-846-2
- Use as an isolated intermediate under strictly controlled conditions

**2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15:**
- Use in closed process, no likelihood of exposure,
- Use in closed, continuous process with occasional controlled exposure,
- Use in closed batch process (synthesis or formulation),
- Use in batch and other process (synthesis) where opportunity for exposure arises,
- Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities,
- Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities,
- Use as laboratory reagent

**Amount used**

**Remarks:** Not applicable

**2.1 Contributing scenario controlling environmental exposure for: ERC6a:**

**Product characteristics**

**Viscosity, dynamic:** 1,6 mPa.s at 20 °C

**Environment factors not influenced by risk management**

- Flow rate: 18,000 m3/d
- Dilution Factor (River): 10
- Dilution Factor (Coastal Areas): 100

**Other given operational conditions affecting environmental exposure**

- Number of emission days per year: 300
- Emission or Release Factor: Air: 0,5 %
- Emission or Release Factor: Water: 1,0 %
- Emission or Release Factor: Soil: 0,1 %

**Technical conditions and measures / Organizational measures**

- **Air:** Treat air emission to provide the required removal efficiency of (%): (Effectiveness: > 99,5 %)
- **Water:** Treat onsite wastewater (prior to receiving water discharge) to

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23/27
provide the required removal efficiency of ≥ (%): (Effectiveness: 99 %)

Remarks: Negligible wastewater emissions as process operates without water contact.

Conditions and measures related to municipal sewage treatment plant
Flow rate of sewage treatment plant effluent: 2.000 m³/d
Remarks: Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal
Waste treatment: External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste
Recovery Methods: External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities, Use as laboratory reagent

Organizational measures to prevent /limit releases, dispersion and exposure
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC6a</td>
<td>EUSES</td>
<td>Freshwater</td>
<td>0.178 µg/L</td>
<td>0.0266</td>
<td>0.224</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.167 µg/L</td>
<td>0.249</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>0.732 µg/kg</td>
<td>0.0631</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.685 µg/kg</td>
<td>0.590</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Soil</td>
<td>2.52 µg/kg</td>
<td>0.364</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario
When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1. RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.

1. Short title of Exposure Scenario: **Injection as odorant in fuels – industrial**

<table>
<thead>
<tr>
<th>Main User Groups</th>
<th>SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU3: Industrial Manufacturing (all)</td>
</tr>
<tr>
<td>Process category</td>
<td>PROC1: Use in closed process, no likelihood of exposure</td>
</tr>
<tr>
<td></td>
<td>PROC2: Use in closed, continuous process with occasional controlled exposure</td>
</tr>
<tr>
<td></td>
<td>PROC3: Use in closed batch process (synthesis or formulation)</td>
</tr>
<tr>
<td></td>
<td>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC15: Use as laboratory reagent</td>
</tr>
<tr>
<td>Environmental release category</td>
<td>ERC7: Industrial use of substances in closed systems</td>
</tr>
<tr>
<td>Further information</td>
<td>Lead substance(s)</td>
</tr>
<tr>
<td></td>
<td>EC-No. 200-890-2</td>
</tr>
<tr>
<td></td>
<td>Ec-No. 200-846-2</td>
</tr>
<tr>
<td></td>
<td>Covers injection as odourant in fuel and includes activities associated with its transfer, use, equipment maintenance and handling of waste.</td>
</tr>
</tbody>
</table>

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities, Use as laboratory reagent

| Amount used | Remarks | Not applicable |

2.1 Contributing scenario controlling environmental exposure for: ERC7: Industrial use of substances in closed systems

| Product characteristics | Viscosity, dynamic | 1,6 mPa.s at 20 °C |
Environment factors not influenced by risk management

Flow rate: 18,000 m³/d
Dilution Factor (River): 10
Dilution Factor (Coastal Areas): 100

Other given operational conditions affecting environmental exposure

Number of emission days per year: 365
Emission or Release Factor: Air: 0.25 %
Emission or Release Factor: Water: 0.001 %
Emission or Release Factor: Soil: 0 %

Technical conditions and measures / Organizational measures

Air: Treat air emission to provide the required removal efficiency of (%): (Effectiveness: > 99.8 %)
Water: Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 99.9 %)
Remarks: Soil emission controls are not applicable as there is no direct release to soil.
Remarks: Negligible wastewater emissions as process operates without water contact.
Remarks: Wastewater emissions generated from equipment cleaning with water.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent: 2,000 m³/d
Remarks: Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal

Waste treatment: External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery Methods: External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities, Use as laboratory reagent

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

SDS Number: 100000013482
3. Exposure estimation and reference to its source

Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC7</td>
<td>EUSES</td>
<td>Freshwater</td>
<td>0.0324 µg/L</td>
<td>0.00484</td>
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<tr>
<td></td>
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<td>Marine water</td>
<td>0.0301 µg/L</td>
<td>0.0449</td>
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<tr>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.124 µg/kg</td>
<td>0.107</td>
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<tr>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>0.133 µg/kg</td>
<td>0.0115</td>
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<tr>
<td></td>
<td></td>
<td>Soil</td>
<td>1.61 µg/kg</td>
<td>0.233</td>
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</tr>
</tbody>
</table>

ERC7: Industrial use of substances in closed systems

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.

RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis. When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.