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

Product information
Product Name: Scentinel® T Gas Odorant
Material: 1121590, 1119675, 1111642, 1108705, 1105021, 1091012,
1093286, 1098227, 1099968, 1093716, 1070716, 1086438,
1097237, 1076222, 1070717, 1084326, 1096408, 1086439,
1024792, 1024724, 1024797, 1024795, 1028520, 1024791,
1024723, 1024794, 1024796, 1024793

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

Local: CHEVRON PHILLIPS CHEMICALAS ASIA PTE, LTD.
C/O DONG WOO CORPORATION
#B-2601,JEONGJAIL-RO,
BUNDANG-GU,SEONGNAMI-SI,
GYEONGGI-DO,13557
SOUTH KOREA
Telephone no.: +612-9186-1132

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
Standards for classification and labeling of chemical substances and material safety data sheet (ministry of employment and labor public notice No. 2016-19) (GHS 2011)

Classification

: Flammable liquids, Category 2
Acute toxicity, Category 4, Oral
Skin corrosion/irritation, Category 2
Serious eye damage/eye irritation, Category 2
Aspiration hazard, Category 2
Long-term (chronic) aquatic hazard, Category 3

Labeling

Symbol(s)

: 

Signal Word

: Danger

Hazard Statements

: H225: Highly flammable liquid and vapor.
H302: Harmful if swallowed.
H305: May be harmful if swallowed and enters airways.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H412: Harmful 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.
- P240: Ground/bond container and receiving equipment.
- P241: Use explosion-proof electrical/ventilating/lighting/equipment.
- P242: Use only non-sparking tools.
- P243: Take precautionary measures against static discharge.
- P264: Wash the contact area thoroughly after handling.
- P273: Avoid release to the environment.
- P280: Wear protective gloves/eye protection/face protection.

**Response:**
- P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
- P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P321: Specific treatment (see supplemental first aid instructions on this label).
- P331: Do NOT induce vomiting.
- P332 + P313: If skin irritation occurs: Get medical advice/attention.
- P337 + P313: If eye irritation persists: Get medical advice/attention.
- P362 + P364: Take off contaminated clothing and wash it before reuse.
- P370 + P378: In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

**Storage:**
- P403 + P235: Store in a well-ventilated place. Keep cool.
- P405: Store locked up.

**Disposal:**
- P501: Dispose of contents and container according to wastes control act.

### SECTION 3: Composition/information on ingredients

<table>
<thead>
<tr>
<th>Synonyms</th>
<th>Tetrahydrothiophene</th>
<th>Thiophane</th>
<th>THT</th>
</tr>
</thead>
</table>

| Molecular formula | C4H8S               |

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration</th>
<th>KECl Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrahydrothiophene</td>
<td>110-01-0</td>
<td>99 % - 100%</td>
<td>KE-33509</td>
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</tbody>
</table>

### 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 : Consult a physician after significant exposure. If unconscious, place in recovery position and seek medical advice.

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. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point : 13 °C (55 °F)
Method: Tagliabue Open Cup

Autoignition temperature : 215 °C (419 °F)
at 1,013.00 hPa
Method: EU Method A.15

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.

Fire and explosion protection : 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.

Hazardous decomposition products : Carbon oxides. Sulfur oxides.
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).

Additional advice: No conditions to be specially mentioned.

SECTION 7: Handling and storage

Handling

Advice on safe handling: Avoid formation of aerosol. Do not breathe vapors/dust. 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.

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

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 workplace 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 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. 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.

**Skin and body protection**: Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate: Flame retardant antistatic protective clothing. Workers should wear antistatic footwear.

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

**SECTION 9: Physical and chemical properties**

**Information on basic physical and chemical properties**

**Appearance**
- Form: Liquid
- Physical state: Liquid
- Color: Colorless
- Odor: Pungent

**Safety data**
- Flash point: 13 °C (55 °F)
  - Method: Tagliabue Open Cup
- Lower explosion limit: 1.1 %(V)
- Upper explosion limit: 12.3 %(V)
Oxidizing properties : No

Autoignition temperature : 215 °C (419 °F)
  at 1,013.00 hPa
  Method: EU Method A.15

Molecular formula : C4H8S

Molecular weight : 88.1 g/mol

pH : Not applicable

Pour point : No data available

Boiling point/boiling range : 119 °C (246 °F)

Vapor pressure : 5.51 kPa
  at 38 °C (100 °F)

Density : 1 g/cm³

Water solubility : 5.8 g/l
  at 20 °C (68 °F)
  Method: OECD Test Guideline 105

Partition coefficient: n-octanol/water : Pow: 1.8
  at 20 °C (68 °F)

Viscosity, dynamic : 1.6 mPa.s
  at 20 °C (68 °F)

Viscosity, kinematic : No data available

Relative vapor density : No data available

Evaporation rate : No data available

Percent volatile : > 99 %

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

Hazardous reactions : Hazardous reactions: Hazardous polymerization does not occur.

Further information: No decomposition if stored and applied as directed.
Hazardous reactions: Vapors may form explosive mixture with air.

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

Other data:
- No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Acute oral toxicity
Tetrahydrothiophene: LD50: 1,850 mg/kg
Species: Rat
Sex: male and female
Method: OECD Test Guideline 401

Acute inhalation toxicity
Tetrahydrothiophene: LC50: 22.6 mg/l
Exposure time: 4 h
Species: Rat
Sex: male and female
Test atmosphere: vapor
Method: OECD Test Guideline 403

Acute dermal toxicity
Tetrahydrothiophene: LD50: > 2,000 mg/kg
Species: Rat
Sex: male and female

Scentinel® T Gas Odorant Skin irritation:
- May cause skin irritation in susceptible persons.

Scentinel® T Gas Odorant Eye irritation:
- May cause irreversible eye damage.

Sensitization
Tetrahydrothiophene:
- Did not cause sensitization on laboratory animals.
  Information given is based on data obtained from similar substances.

Repeated dose toxicity
Tetrahydrothiophene:
- Species: Rat, Male and female
- Sex: Male and female
- Application Route: Inhalation
- Dose: 0, 51, 236, 1442 ppm
- Exposure time: 13 wk
- Number of exposures: 6 h/d, 5 d/wk
- NOEL: 51 ppm
- Method: OECD Guideline 413
Target Organs: Upper respiratory tract

Developmental Toxicity
Tetrahydrothiophene : Species: Rat
Application Route: Inhalation
Dose: 234, 782, 1910 ppm
Method: OECD Guideline 414
NOAEL Teratogenicity: 1910 ppm
NOAEL Maternal: 234 ppm
No adverse effects expected

Scentinel® T Gas Odorant
Aspiration toxicity : May be harmful if swallowed and enters airways.

CMR effects
Tetrahydrothiophene : Mutagenicity: Tests on bacterial or mammalian cell cultures 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.

Scentinel® T Gas Odorant
Further information : Solvents may degrease the skin.

SECTION 12: Ecological information

Toxicity to fish
Tetrahydrothiophene : LC50: > 24 mg/l
Exposure time: 96 h
Species: Danio rerio (Zebra Fish)
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates
Tetrahydrothiophene : EC50: 24 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 202

Toxicity to algae
Tetrahydrothiophene : EC50: > 153.2 mg/l
Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (green algae)
Method: OECD Test Guideline 201

Toxicity to bacteria

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Tetrahydrothiophene: EC50: 1,530 mg/l
Exposure time: 3 h
Respiration inhibition
Method: OECD Test Guideline 209

Biodegradability
Tetrahydrothiophene: < 10 %
According to the results of tests of biodegradability this product is not readily biodegradable.

Bioaccumulation
Tetrahydrothiophene: Bioaccumulation is unlikely.

Results of PBT assessment
Tetrahydrothiophene: Non-classified PBT substance, Non-classified vPvB substance

Additional ecological information
Ecotoxicology Assessment
Long-term (chronic) aquatic hazard
Tetrahydrothiophene: Harmful to aquatic life with long lasting effects.

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.

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)**
UN2412, TETRAHYDROTHIOPHENE, 3, II

**IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)**
UN2412, TETRAHYDROTHIOPHENE, 3, II, (13 °C)

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**
UN2412, TETRAHYDROTHIOPHENE, 3, II

**ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))**
UN2412, TETRAHYDROTHIOPHENE, 3, II, (D/E)

**RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))**
UN2412, TETRAHYDROTHIOPHENE, 3, II

**ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)**
UN2412, TETRAHYDROTHIOPHENE, 3, II

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

### SECTION 15: Regulatory information

**National legislation**

**Regulation under the Occupational Safety and Health Act**
A Material Safety Datasheet (MSDS) for this product is not required according to article 41 of the ISHA.

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Chemical name</th>
<th>Threshold limits</th>
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</thead>
<tbody>
<tr>
<td>Harmful Substances Prohibited from Manufacturing</td>
<td>Not applicable</td>
<td></td>
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<tr>
<td>Harmful Substances Required Permission for Manufacture</td>
<td>Not applicable</td>
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</tr>
</tbody>
</table>

**Act on the Registration and Evaluation, etc. of Chemical Substances, Chemicals Control Act**

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Chemical name</th>
<th>Threshold limits</th>
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</thead>
<tbody>
<tr>
<td>Toxic Chemicals</td>
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</tr>
<tr>
<td>Prohibited Chemicals</td>
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<tr>
<td>Restricted Chemicals</td>
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<tr>
<td>Toxic Release Inventory</td>
<td>Not applicable</td>
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</tbody>
</table>

SDS Number:100000068737 11/13
Scentinel® T Gas Odorant

Section 1: Identification

Identification

*Product Name:* Scentinel® T Gas Odorant

*Version:* 2.5

*Revision Date:* 2018-09-04

*SDS Number:* 100000068737

Section 2: Hazards Identification

*Dangerous Substances Safety Management Act*

Dangerous Substances: Flammable liquids, Type 1 petroleum, Water insoluble liquid

*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
- 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
- Japan ISHL: 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

*Further Information*

Legacy SDS Number: 387250

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.

<table>
<thead>
<tr>
<th>Key or legend to abbreviations and acronyms used in the safety data sheet</th>
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>GHS</td>
<td>Globally Harmonized System</td>
</tr>
<tr>
<td>&gt;=</td>
<td>Greater Than or Equal To</td>
</tr>
<tr>
<td>IC50</td>
<td>Inhibition Concentration 50%</td>
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<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
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<td>IECSC</td>
<td>Inventory of Existing Chemical Substances in China</td>
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<tr>
<td>ENCS</td>
<td>Japan, Inventory of Existing and New Chemical Substances</td>
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<td>Korea, Existing Chemical Inventory</td>
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<td>LC50</td>
<td>Lethal Concentration 50%</td>
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<td>RCRA</td>
<td>Resource Conservation Recovery Act</td>
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<td>Short-term Exposure Limit</td>
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<tr>
<td>SARA</td>
<td>Superfund Amendments and Reauthorization Act</td>
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<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
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<tr>
<td>TWA</td>
<td>Time Weighted Average</td>
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<tr>
<td>TSCA</td>
<td>Toxic Substance Control Act</td>
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<tr>
<td>UVCB</td>
<td>Unknown or Variable Composition, Complex Reaction Products, and Biological Materials</td>
</tr>
<tr>
<td>WHMIS</td>
<td>Workplace Hazardous Materials Information System</td>
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</table>

**SAFETY DATA SHEET**

**Scentinel® T Gas Odorant**

Version 2.5

Revision Date 2018-09-04

SDS Number: 100000068737

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