SAFETY DATA SHEET

Orfom® MC17 Collector
Version 1.9
Revision Date 2019-12-17

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

Product information
Product Name: Orfom® MC17 Collector
Material: 1122712, 1122623, 1119870, 1119869, 1119868, 1119860, 1119867, 1119866, 1119861, 1119859

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

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 (telexfax)
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

SECTION 2: Hazards identification

Classification of the substance or mixture
This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Classification:
- Flammable liquids, Category 4
- Skin irritation, Category 2
- Eye irritation, Category 2A
- Skin sensitization, Category 1
- Aspiration hazard, Category 1

SDS Number: 100000103015 1/21
SAFETY DATA SHEET

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Labeling

Symbol(s) : [Danger]

Signal Word : Danger

Hazard Statements : H227: Combustible liquid.
 H304: May be fatal if swallowed and enters airways.
 H315: Causes skin irritation.
 H317: May cause an allergic skin reaction.
 H319: Causes serious eye irritation.

Precautionary Statements: Prevention:
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/eye protection/face protection.

Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P331 Do NOT induce vomiting.
P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.
P337 + P313 If eye irritation persists: Get medical advice/attention.
P362 Take off contaminated clothing and wash 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.

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

Carcinogenicity:

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

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

SECTION 3: Composition/information on ingredients

Synonyms : Orfom® MC17a Collector
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 : 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. 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 : 79°C (175°F)

Suitable extinguishing media : Carbon dioxide (CO2).

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. 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.

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). Keep in suitable, closed containers for disposal.

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. Provide sufficient air exchange and/or exhaust in work rooms. 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. Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage areas and containers : No smoking. Keep in a 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>Components</th>
<th>Basis</th>
<th>Value</th>
<th>Control parameters</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>tert-Dodecanethiol</td>
<td>Manufacturer</td>
<td>TWA</td>
<td>0.1 ppm.</td>
<td></td>
</tr>
<tr>
<td>C12-C14 Isoalkanes</td>
<td>Manufacturer</td>
<td>TWA</td>
<td>1,200 mg/m3</td>
<td>RCP.</td>
</tr>
</tbody>
</table>

RCP  Reciprocal Calculation Procedure

US

<table>
<thead>
<tr>
<th>Components</th>
<th>Basis</th>
<th>Value</th>
<th>Control parameters</th>
<th>Note</th>
</tr>
</thead>
</table>

Engineering measures

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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: Full-Face Air-Purifying Respirator for Organic Vapors, Dusts and Mists. 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 protective clothing. Remove and wash contaminated clothing before re-use. Skin should be washed after contact. Footwear protecting against chemicals.

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**
- Physical state: Liquid
- Color: Colorless
- Odor: Mild hydrocarbon

**Safety data**
- Flash point: 79°C (175°F)
- Lower explosion limit: No data available
Orfom® MC17 Collector

Upper explosion limit : No data available
Molecular weight : 202.44 g/mol
pH : Not applicable
Pour point : No data available

Boiling point/boiling range : 233°C (451°F)
Vapor pressure : 4.00 Pa
   at 24°C (75°F)
Relative density : 0.80
   at 16 °C (61 °F)
Density : 6.7 L/G
Water solubility : No data available
Partition coefficient: n-octanol/water : Pow. 7.43
   at 20°C (68°F)
Viscosity, dynamic : 2.6 cP
   at 20°C (68°F)
Viscosity, kinematic : No data available
Relative vapor density : 3
   (Air = 1.0)
Evaporation rate : < 1

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 : 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**

tert-Dodecanethiol

- **LD50**: > 2,000 mg/kg
- **Species**: Rat
- **Sex**: female
- **Method**: OECD Test Guideline 423

C13-C16 Isoalkanes

- **LD50**: > 5,000 mg/kg
- **Species**: Rat
- **Sex**: male and female
- **Method**: OECD Test Guideline 401
- Information given is based on data obtained from similar substances.

C12-C14 Isoalkanes

- **LD50**: > 5,000 mg/kg
- **Species**: Rat
- **Sex**: male and female
- **Method**: OECD Test Guideline 401
- Information given is based on data obtained from similar substances.

**Acute inhalation toxicity**

tert-Dodecanethiol

- **LC50**: > 1.97 mg/l
  - **Exposure time**: 4 h
  - **Species**: Rat
  - **Sex**: male and female
  - **Method**: OECD Test Guideline 403
  - Information given is based on data obtained from similar substances.

C13-C16 Isoalkanes

- **LC50**: > 5.3 mg/l
  - **Exposure time**: 4 h
  - **Species**: Rat
  - **Sex**: male and female
  - **Test atmosphere**: dust/mist
  - **Method**: OECD Test Guideline 403
  - An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.
  - Information given is based on data obtained from similar substances.

C12-C14 Isoalkanes

- **LC50**: > 5.3 mg/l
  - **Exposure time**: 4 h
  - **Species**: Rat
  - **Sex**: male and female
  - **Test atmosphere**: dust/mist
  - **Method**: OECD Test Guideline 403
  - An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.
  - Information given is based on data obtained from similar substances.
<table>
<thead>
<tr>
<th><strong>Acute dermal toxicity</strong></th>
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</thead>
<tbody>
<tr>
<td>tert-Dodecanethiol</td>
<td>LD50: &gt; 2,000 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Species: Rat</td>
</tr>
<tr>
<td></td>
<td>Sex: male</td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 402</td>
</tr>
<tr>
<td></td>
<td>Information given is based on data obtained from similar substances.</td>
</tr>
<tr>
<td>C13-C16 Isoalkanes</td>
<td>LD50: &gt; 2,000 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Species: Rabbit</td>
</tr>
<tr>
<td></td>
<td>Sex: male and female</td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 402</td>
</tr>
<tr>
<td></td>
<td>Information given is based on data obtained from similar substances.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Orfom® MC17 Collector</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skin irritation</strong></td>
<td>Irritating to skin.</td>
</tr>
<tr>
<td></td>
<td>largely based on animal evidence.</td>
</tr>
<tr>
<td><strong>Eye irritation</strong></td>
<td>Irritating to eyes.</td>
</tr>
<tr>
<td></td>
<td>largely based on animal evidence.</td>
</tr>
<tr>
<td><strong>Sensitization</strong></td>
<td>Causes sensitization.</td>
</tr>
<tr>
<td></td>
<td>largely based on animal evidence.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Repeated dose toxicity</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>tert-Dodecanethiol</td>
<td>Species: Rat, male</td>
</tr>
<tr>
<td></td>
<td>Sex: male</td>
</tr>
<tr>
<td></td>
<td>Application Route: Inhalation</td>
</tr>
<tr>
<td></td>
<td>Dose: 0, 26, 98 ppm</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 4 wk</td>
</tr>
<tr>
<td></td>
<td>Number of exposures: 6 h/d, 5 d/wk</td>
</tr>
<tr>
<td></td>
<td>Lowest observable effect level: 26 ppm</td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 412</td>
</tr>
<tr>
<td></td>
<td>Target Organs: Kidney, Liver</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Species</th>
<th>Sex</th>
<th>Application Route</th>
<th>Dose</th>
<th>Exposure time</th>
<th>Number of exposures</th>
<th>NOEL</th>
<th>Method</th>
<th>Target Organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat, female</td>
<td>female</td>
<td>Inhalation</td>
<td>0, 26, 98 ppm</td>
<td>4 wk</td>
<td>6 h/d, 5 d/wk</td>
<td>26 ppm</td>
<td>OECD Guideline 412</td>
<td>Liver, Kidney</td>
</tr>
<tr>
<td>Rat, male</td>
<td>male</td>
<td>oral gavage</td>
<td>10, 50, 250 mg/kg</td>
<td>35 d</td>
<td>once daily</td>
<td>50 mg/kg</td>
<td>OECD Guideline 422</td>
<td>Liver, spleen</td>
</tr>
<tr>
<td>Dog, male and female</td>
<td>male and female</td>
<td>Inhalation</td>
<td>0, 25, 106 ppm</td>
<td>4 wk</td>
<td>6 h/d, 5 d/wk</td>
<td>25 ppm</td>
<td>OECD Test Guideline 412</td>
<td>Liver</td>
</tr>
<tr>
<td>Dog, male and female</td>
<td>male and female</td>
<td>Inhalation</td>
<td>0, 25, 109 ppm</td>
<td>4 wk</td>
<td>6 h/d, 5 d/wk</td>
<td>25 ppm</td>
<td>OECD Test Guideline 412</td>
<td>Liver</td>
</tr>
<tr>
<td>Mouse, male and female</td>
<td>male and female</td>
<td>Inhalation</td>
<td>0, 25, 109 ppm</td>
<td>4 wk</td>
<td>6 h/d, 5 d/wk</td>
<td>25 ppm</td>
<td>OECD Test Guideline 412</td>
<td>Liver</td>
</tr>
<tr>
<td>Rat, male</td>
<td>male</td>
<td>Inhalation</td>
<td>5, 25, 100 ppm</td>
<td>90 d</td>
<td></td>
<td></td>
<td>OECD Guideline 412</td>
<td>Liver, spleen</td>
</tr>
</tbody>
</table>

Information given is based on data obtained from similar substances.
| C13-C16 Isoalkanes | Species: Rat, male and female  
|                   | Sex: male and female  
|                   | Application Route: oral gavage  
|                   | Exposure time: 13 wk  
|                   | Number of exposures: 7 d/wk  
|                   | NOEL: > 5,000 mg/kg  
|                   | Method: OECD Test Guideline 408  
|                   | No significant adverse effects were reported  
|                   | Information given is based on data obtained from similar substances.

| C12-C14 Isoalkanes | Species: Rat, male and female  
|                   | Sex: male and female  
|                   | Application Route: oral gavage  
|                   | Dose: 500, 2500, 5000 mg/kg/d  
|                   | Exposure time: 13 wk  
|                   | Number of exposures: daily  
|                   | NOEL: >= 5000 mg/kg/d  
|                   | Method: OECD Test Guideline 408  
|                   | No adverse effects expected  
|                   | Information given is based on data obtained from similar substances.
Species: Rat, male and female  
Sex: male and female  
Application Route: Dermal  
Dose: 165, 330, 495 mg/kg  
Exposure time: 13 wk  
Number of exposures: 5 d/wk  
NOEL: > 495 mg/kg/d  
Method: OECD Guideline 411  
No adverse effects expected  
Information given is based on data obtained from similar substances.

Species: Rat, male and female  
Sex: male and female  
Application Route: Inhalation  
Dose: 5, 10, 30 mg/L  
Exposure time: 90 d  
Number of exposures: 6 h/d  
NOEL: > 30 mg/l  
Method: OECD Test Guideline 413  
No adverse effects expected  
Information given is based on data obtained from similar substances.

Genotoxicity in vitro

tert-Dodecanethiol  
Test Type: Ames test  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative

Test Type: Mouse lymphoma assay  
Metabolic activation: with and without metabolic activation  
Method: OECD Guideline 476  
Result: negative

Test Type: Sister Chromatid Exchange Assay  
Metabolic activation: with and without metabolic activation  
Method: OECD Guideline 479  
Result: negative

Test Type: Chromosome aberration test in vitro  
Metabolic activation: with and without metabolic activation  
Method: OECD Guideline 473  
Result: Ambiguous

C13-C16 Isoalkanes  
Test Type: Reverse mutation assay  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative  
Remarks: Information given is based on data obtained from similar substances.
Test Type: Cytogenetic assay
Test system: Chinese hamster cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative
Remarks: Information given is based on data obtained from similar substances.

Test Type: Mouse lymphoma assay
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
Remarks: Information given is based on data obtained from similar substances.

C12-C14 Isoalkanes
Test Type: Ames test
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: Mouse lymphoma assay
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: Sister Chromatid Exchange Assay
Metabolic activation: with and without metabolic activation
Result: negative

Genotoxicity in vivo
tert-Dodecanethiol
Test Type: In vivo micronucleus test
Species: Mouse
Route of Application: Oral
Dose: 1250, 2500, 5000 mg/kg/bw
Method: Mutagenicity (micronucleus test)
Result: negative
Remarks: Information given is based on data obtained from similar substances.

Reproductive toxicity
tert-Dodecanethiol
Species: Rat
Sex: male
Application Route: oral gavage
Dose: 10, 50, 250 mg/kg/d
Exposure time: 35 d
Number of exposures: Daily
Method: OECD Guideline 422
NOAEL Parent: >= 250 mg/kg
Information given is based on data obtained from similar substances.
Species: Rat  
Sex: female  
Application Route: oral gavage  
Dose: 10, 50, 250 mg/kg/d  
Exposure time: 53 d  
Number of exposures: Daily  
Method: OECD Guideline 422  
NOAEL Parent: 50 mg/kg  
NOAEL F1: 50 mg/kg  
Information given is based on data obtained from similar substances.  
Decrease in Delivery Index

C13-C16 Isoalkanes  
Species: Rat  
Sex: male and female  
Application Route: oral gavage  
Dose: 50, 100, 750 mg/kg/d  
Exposure time: 70 d  
Number of exposures: Daily  
Method: OECD Test Guideline 416  
NOAEL Parent: >= 750 mg/kg  
NOAEL F1: >= 750 mg/kg  
No adverse effects expected  
Information given is based on data obtained from similar substances.

C12-C14 Isoalkanes  
Species: Rat  
Sex: male and female  
Application Route: oral gavage  
Dose: 50, 200, 750 mg/kg/bw/d  
Number of exposures: daily  
Test period: 70 d  
Method: OECD Test Guideline 416  
NOAEL Parent: >750 mg/kg/bw/d  
NOAEL F1: >750 mg/kg/bw/d  
No adverse effects expected  
Information given is based on data obtained from similar substances.

Developmental Toxicity
tert-Dodecanethiol : Species: Rat
Application Route: Inhalation
Dose: 0, 22.7, 88.6 ppm
Number of exposures: 6 hrs/d
Test period: GD 6-19
Method: OECD Guideline 414
NOAEL Teratogenicity: >= 88.6 ppm
No adverse effects expected

Species: Mouse
Application Route: Inhalation
Dose: 0, 22.7, 88.6 ppm
Number of exposures: 6 hrs/d
Test period: GD 6-19
Method: OECD Guideline 414
NOAEL Teratogenicity: >= 88.6 ppm
No adverse effects expected

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**Aspiration toxicity** : May be fatal if swallowed and enters airways.

**CMR effects**

tert-Dodecanethiol : Carcinogenicity: Not available
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: No toxicity to reproduction

C13-C16 Isoalkanes Carcinogenicity: Not available
Mutagenicity: In vitro tests did not show mutagenic effects
Reproductive toxicity: No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

C12-C14 Isoalkanes 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.

**Orfom® MC17 Collector**

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

**SECTION 12: Ecological information**

**Toxicity to fish**

tert-Dodecanethiol : LL50: > 100 mg/l
Exposure time: 96 h
Species: Danio rerio (Zebra Fish)
static test Method: OECD Test Guideline 203
C13-C16 Isoalkanes
LL50: > 1,000 mg/l
Exposure time: 96 h
Species: Oncorhynchus mykiss (rainbow trout)
static test Method: OECD Test Guideline 203
Information given is based on data obtained from similar substances.

C12-C14 Isoalkanes
LL50: > 1,000 mg/l
Exposure time: 96 h
Species: Oncorhynchus mykiss (rainbow trout)
semi-static test Method: OECD Test Guideline 203
Information given is based on data obtained from similar substances.

Toxicity to daphnia and other aquatic invertebrates

tert-Dodecanethiol
EC50: > 0.056 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
semi-static test Method: OECD Test Guideline 202
No toxicity at the limit of solubility.

C13-C16 Isoalkanes
EL50: > 1,000 mg/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
Immobilization Method: OECD Test Guideline 202
Information given is based on data obtained from similar substances.

C12-C14 Isoalkanes
LL50: > 3,000 mg/l
Exposure time: 48 h
Species: Acartia tonsa (Marine Copepod)
static test Method: ISO 14669 and PARCOM method
Information given is based on data obtained from similar substances.

Toxicity to algae

C13-C16 Isoalkanes
EL50: > 1,000 mg/l
Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (green algae)
Growth inhibition Method: OECD Test Guideline 201
Information given is based on data obtained from similar substances.

C12-C14 Isoalkanes
EL50: > 1,000 mg/l
Exposure time: 72 h
Species: Pseudokirchneriella subcapitata (green algae)
Growth inhibition Method: OECD Test Guideline 201
Information given is based on data obtained from similar substances.

Toxicity to bacteria
tert-Dodecanethiol : NOEC: 8.6 mg/l
Exposure time: 3 h
Growth rate
Respiration inhibition
Method: OECD Test Guideline 209

NOEC: > 10 mg/l
Exposure time: 3 h
Growth rate
Respiration inhibition
Method: OECD Test Guideline 209

C13-C16 Isoalkanes : > 100 mg/l
Exposure time: 3 h
Respiration inhibition
Method: OECD Test Guideline 209

Information given is based on data obtained from similar substances.

Toxicity to fish (Chronic toxicity)

C12-C14 Isoalkanes : No data available:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

tert-Dodecanethiol : NOEC: 0.0108 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
semi-static test
Method: OECD Test Guideline 211
No toxicity at the limit of solubility.

C12-C14 Isoalkanes : No data available

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

Elimination information (persistence and degradability)

Bioaccumulation

tert-Dodecanethiol : Species: Danio rerio (zebra fish)
Exposure time: 15 d
Bioconcentration factor (BCF): > 500 - < 1,950
Method: OECD Test Guideline 305
Biomagnification factor <1
The product may be accumulated in organisms.

Mobility

C13-C16 Isoalkanes : immobile

Results of PBT assessment

tert-Dodecanethiol : Non-classified PBT substance, Non-classified vPvB substance
**SAFETY DATA SHEET**

**Orfom® MC17 Collector**

**Version 1.9**

**Revision Date** 2019-12-17

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<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>C13-C16 Isoalkanes</td>
<td>Non-classified PBT substance, Non-classified vPvB substance</td>
</tr>
<tr>
<td>C12-C14 Isoalkanes</td>
<td>Non-classified PBT substance, Non-classified vPvB substance</td>
</tr>
</tbody>
</table>

**Additional ecological information**

**Ecotoxicology Assessment**

**Short-term (acute) aquatic hazard**

- tert-Dodecanethiol: No toxicity at the limit of solubility.

**C13-C16 Isoalkanes**: This product has no known ecotoxicological effects.

**C12-C14 Isoalkanes**: This product has no known ecotoxicological effects.

**Long-term (chronic) aquatic hazard**

- tert-Dodecanethiol: May cause long lasting harmful effects to aquatic life.

**C13-C16 Isoalkanes**: This product has no known ecotoxicological effects.

**C12-C14 Isoalkanes**: This product has no known ecotoxicological effects.

**Toxicity Data on Soil**: No information available.

**Other organisms relevant to the environment**: No information available.

**Impact on Sewage Treatment**: No information available.

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**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.

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**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

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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)**
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

Testing (ASTM D4206) has shown product does not sustain combustion.

**IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)**
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))**
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))**
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

**ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)**
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

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

**SECTION 15: Regulatory information**

**National legislation**

**SARA 311/312 Hazards**
- Flammable (gases, aerosols, liquids, or solids)
- Skin corrosion or irritation
- Serious eye damage or eye irritation
- Respiratory or skin sensitization
- Aspiration hazard

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

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SARA 302 Reportable Quantity: This material does not contain any components with a SARA 302 RQ.

SARA 302 Threshold Planning Quantity: This material does not contain any components with a section 302 EHS TPQ.

SARA 304 Reportable Quantity: This material does not contain any components with a section 304 EHS RQ.

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

Clean Air Act

Ozone-Depletion Potential: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC’s (40 CFR 60.489).

US State Regulations

Pennsylvania Right To Know: C12-C14 Isoalkanes - 68551-19-9
tert-Dodecanethiol - 25103-58-6
C13-C16 Isoalkanes - 68551-20-2
California Prop. 65 : This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

Europe REACH : This mixture contains only ingredients which have been registered according to Regulation (EU) No. 1907/2006 (REACH).

Switzerland CH INV : On the inventory, or in compliance with the inventory

United States of America (USA) TSCA : On or in compliance with the active portion of the TSCA inventory

Canada DSL : All components of this product are on the Canadian DSL

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 : A substance(s) in this product was not registered, notified to be registered, or exempted from registration by CPChem according to K-REACH regulations. Importation or manufacture of this product is still permitted provided the Korean Importer of Record has themselves notified the substance.

Philippines PICCS : Not in compliance with the inventory

China IECSC : On the inventory, or in compliance with the inventory

Taiwan TCSI : On the inventory, or in compliance with the inventory

SECTION 16: Other information

NFPA Classification : Health Hazard: 2
Fire Hazard: 1
Reactivity Hazard: 0

Further information

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>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
</tr>
<tr>
<td>LD50</td>
</tr>
<tr>
<td>AICS</td>
</tr>
<tr>
<td>LOAEL</td>
</tr>
</tbody>
</table>

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# SAFETY DATA SHEET

## Orfom® MC17 Collector

Version 1.9  
Revision Date 2019-12-17

<table>
<thead>
<tr>
<th>Substances</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSL Canada, Domestic Substances List</td>
<td>NFPA National Fire Protection Agency</td>
</tr>
<tr>
<td>NDSL Canada, Non-Domestic Substances List</td>
<td>NIOSH National Institute for Occupational Safety &amp; Health</td>
</tr>
<tr>
<td>CNS Central Nervous System</td>
<td>NTP National Toxicology Program</td>
</tr>
<tr>
<td>CAS Chemical Abstract Service</td>
<td>NZIoC New Zealand Inventory of Chemicals</td>
</tr>
<tr>
<td>EC50 Effective Concentration</td>
<td>NOAEL No Observable Adverse Effect Level</td>
</tr>
<tr>
<td>EC50 Effective Concentration 50%</td>
<td>NOEC No Observed Effect Concentration</td>
</tr>
<tr>
<td>EGEST EOSCA Generic Exposure Scenario Tool</td>
<td>OSHA Occupational Safety &amp; Health Administration</td>
</tr>
<tr>
<td>EOSCA European Oilfield Specialty Chemicals Association</td>
<td>PEL Permissible Exposure Limit</td>
</tr>
<tr>
<td>EINECS European Inventory of Existing Chemical Substances</td>
<td>PICCS Philippines Inventory of Commercial Chemical Substances</td>
</tr>
<tr>
<td>MAK Germany Maximum Concentration Values</td>
<td>PRNT Presumed Not Toxic</td>
</tr>
<tr>
<td>GHS Globally Harmonized System</td>
<td>RCRA Resource Conservation Recovery Act</td>
</tr>
<tr>
<td>&gt;= Greater Than or Equal To</td>
<td>STEL Short-term Exposure Limit</td>
</tr>
<tr>
<td>IC50 Inhibition Concentration 50%</td>
<td>SARAC Superfund Amendments and Reauthorization Act</td>
</tr>
<tr>
<td>IARC International Agency for Research on Cancer</td>
<td>TLV Threshold Limit Value</td>
</tr>
<tr>
<td>IECSC Inventory of Existing Chemical Substances in China</td>
<td>TWA Time Weighted Average</td>
</tr>
<tr>
<td>ENCS Japan, Inventory of Existing and New Chemical Substances</td>
<td>TSCA Toxic Substance Control Act</td>
</tr>
<tr>
<td>KECI Korea, Existing Chemical Inventory</td>
<td>UVCB Unknown or Variable Composition, Complex Reaction Products, and Biological Materials</td>
</tr>
<tr>
<td>&lt;= Less Than or Equal To</td>
<td>WHMIS Workplace Hazardous Materials Information System</td>
</tr>
<tr>
<td>LC50 Lethal Concentration 50%</td>
<td></td>
</tr>
</tbody>
</table>

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