

Orfom® MC27 Collector

Version 1.4

Revision Date 2023-07-13

according to GB/T 16483 and GB/T 17519

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

Product Name : Orfom® MC27 Collector
 Material : 1118796, 1111603, 1111604, 1111606, 1111607, 1111608,
 1111609, 1111612

Company : Chevron Phillips Chemical Company LP
 Mining Chemicals
 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

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

EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Austria: VIZ +43 1 406 43 43 (24 hours/day, 7 days/week)

Belgium: 070 245 245 (24 hours/day, 7 days/week)

Bulgaria: +359 2 9154 233

Croatia: +3851 2348 342 (24 hours/day, 7 days/week)

Cyprus: 1401

Czech Republic: Toxicological Information Center +420 224 919 293, +420 224 915 402

Denmark: Danish Poison Center (Giftlinjen): +45 8212 1212

Estonia: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Finland: 0800 147 111 09 471 977 (24 hours/day)

France: ORFILA number (INRS): + 33 (0) 1 45 42 59 59 (24 hours/day, 7 days/week)

Germany: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Greece: (0030) 2107793777 (24 hours/day, 7 days/week)

Hungary: +36-80-201-199 (24 hours/day, 7 days/week)

Iceland: 543 2222 (24 hours/day, 7 days/week)

Ireland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Italy: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

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Latvia: State Fire and Rescue Service, phone number: 112; Toxicology and Sepsis Clinic Poisoning and Drug Information Center, Hipokrāta 2, Riga, Latvia, LV-1038, phone number +371 67042473. (24 hours.)

Liechtenstein: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Lithuania: +370 (85) 2362052

Luxembourg: (+352) 8002 5500 (24 hours/day, 7 days/week)

Malta: +356 2395 2000

The Netherlands: NVIC: +31 (0)88 755 8000

Norway: 22 59 13 00 (24 hours/day, 7 days/week)

Poland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Portugal: CIAV phone number: +351 800 250 250

Romania: +40213183606

Slovakia: +421 2 5477 4166

Slovenia: Phone number: 112

Spain: National Emergency Telephone Number of Spanish Poison Centre: +34 91 562 04 20 (24 hours/day, 7 days/week)

Sweden: 112 – ask for Poisons Information

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**

GHS Classification and Labeling: Follow GB 13690, GB 15258 and GB 30000.2 to GB 30000.29 (GHS 2011)

Emergency Overview**Danger**

Form: liquid **Physical state:** liquid **Color:** Amber **Odor:** petroleum

Hazards : Flammable liquid and vapor. May be harmful if swallowed. Causes skin irritation. Causes serious eye irritation. May cause an allergic skin reaction. May cause cancer. May cause damage to organs through prolonged or repeated exposure. May be fatal if swallowed and enters airways. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

Classification


: Flammable liquids, Category 3
 Acute toxicity, Category 5, Oral
 Skin corrosion/irritation, Category 2
 Serious eye damage/eye irritation, Category 2A
 Skin sensitization, Category 1
 Carcinogenicity, Category 1B
 Specific target organ toxicity - repeated exposure, Category 2,
 Blood, Liver, thymus gland
 Aspiration hazard, Category 1
 Short-term (acute) aquatic hazard, Category 1
 Long-term (chronic) aquatic hazard, Category 1

Labeling

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Symbol(s)	:	
Signal Word	:	Danger
Hazard Statements	:	<p>H226: Flammable liquid and vapor. H303 + H333: May be harmful if swallowed or if inhaled. 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. H350: May cause cancer. H373: May cause damage to organs (Blood, Liver, thymus gland) through prolonged or repeated exposure. H410: Very toxic to aquatic life with long lasting effects.</p>
Precautionary Statements	:	<p>Prevention: P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P210: Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking. 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. P260: Do not breathe dust/ fume/ gas/ mist/ vapors/ spray. P264: Wash skin thoroughly after handling. P273: Avoid release to the environment. P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.</p> <p>Response: P301+P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor. P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower. P304 + P312: IF INHALED: Call a POISON CENTER/ doctor if you feel unwell. P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P312: Call a POISON CENTER/doctor if you feel unwell. 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+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. P391: Collect spillage.</p> <p>Storage: P403 + P235: Store in a well-ventilated place. Keep cool.</p> <p>Disposal: P501: Dispose of contents/ container to an approved waste disposal plant.</p>

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SECTION 3: Composition/information on ingredients

Synonyms : Orfom® MC27C
Orfom ® MC27a Collector

Molecular formula : Mixture

Chemical name	CAS-No. / EINECS-No.	Concentration [wt%]
Light Cycle Oil	64741-59-9	0 - 80
tert-Dodecanethiol	25103-58-6	0 - 80
Thiol synthesis by-products		0 - 4
Naphthalene	91-20-3	0 - 4
Polynuclear Aromatics	130498-29-2	0 - 0.8

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 : $\geq 60^{\circ}\text{C}$ ($\geq 140^{\circ}\text{F}$)

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

Unsuitable extinguishing media : High volume water jet.

Specific hazards during fire fighting : 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.

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- 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 a naked flame or any incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Keep away from open flames, hot surfaces and sources of ignition.

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).

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 a naked flame or any incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Keep away from open flames, hot surfaces and sources of ignition.

Storage

- Requirements for storage : No smoking. Keep container tightly closed in a dry and well-

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areas and containers

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**

Components	Basis	Value	Control parameters	Note
tert-Dodecanethiol	Manufacturer	TWA	0.1 ppm,	

CN

Components	Basis	Value	Control parameters	Note
Naphthalene	CN OEL	PC-TWA	50 mg/m3	G2B, Skin,
	CN OEL	PC-STEL	75 mg/m3	G2B, Skin,

G2B Skin G2B - Possibly carcinogenic to humans
Skin Skin

Not applicable

CN

Substance name	CAS-No.	Control parameters	Sampling time	Update

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 : If ventilation or other engineering controls are not adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure, a supplied-air NIOSH approved respirator may be appropriate. If exposure to harmful levels of airborne material may occur, a NIOSH approved respirator that provides protection may be appropriate, such as: Air-Purifying Respirator for Organic Vapors. Full-Face Air-Purifying Respirator for Organic Vapors, Dusts and Mists. A positive pressure, air-supplying respirator may be appropriate if there is potential for uncontrolled release, aerosolization, 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.

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- 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. 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**

- Form : liquid
 Physical state : liquid
 Color : Amber
 Odor : petroleum
 Odor Threshold : No data available

Safety data

- Flash point : $\geq 60^{\circ}\text{C}$ ($\geq 140^{\circ}\text{F}$)
- Lower explosion limit : Not applicable
- Upper explosion limit : Not applicable
- Molecular formula : Mixture
- Molecular weight : Not applicable
- Pour point : -44°C (-47°F)
- Initial boiling point and boiling range : 142°C (287°F)
- Vapor pressure : No data available
- Relative density : 0.936
- Density : 7.81 L/G
at 15.6°C (60.1°F)
- Viscosity, kinematic : 2.03 mm²/s
at 40°C (104°F)

SECTION 10: Stability and reactivity

- Reactivity** : Stable under recommended storage conditions.

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- 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: Vapors may form explosive mixture with air.
- Conditions to avoid** : Heat, flames and sparks.
- Other data** : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

- Orfom® MC27 Collector
Acute oral toxicity** : Acute toxicity estimate: 3,125 mg/kg
Method: Calculation method
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Acute inhalation toxicity** : Acute toxicity estimate: 5.81 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method
- Orfom® MC27 Collector
Acute dermal toxicity** : Acute toxicity estimate: > 2,000 mg/kg
Method: Calculation method
- Orfom® MC27 Collector
Skin irritation** : Skin irritation
largely based on animal evidence.
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Eye irritation** : Eye irritation
largely based on animal evidence.
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Sensitization** : Causes sensitization.
largely based on animal evidence.
- Repeated dose toxicity**
- Light Cycle Oil : Species: Rat, males
Sex: males
Application Route: Dermal
Dose: 0, 8, 25, 125, 500, 1250 mg/kg
Exposure time: 90 day
Number of exposures: 5 days/wk
NOEL: 25 mg/kg
Target Organs: Blood, Liver, Thymus

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tert-Dodecanethiol

Species: Rat, females
Sex: females
Application Route: Dermal
Dose: 0, 8, 25, 125, 500, 1250 mg/kg
Exposure time: 90 day
Number of exposures: 5 days/wk
NOEL: 125 mg/kg
Target Organs: Blood, Liver, Thymus

Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 0, 26, 98 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
Lowest observable effect level: 26 ppm
Method: OECD Test Guideline 412
Target Organs: Kidney, Liver

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Species: Rat, female
Sex: female
Application Route: Inhalation
Dose: 0, 26, 98 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: 26 ppm
Method: OECD Guideline 412
Target Organs: Liver, Kidney

Species: Dog, male and female
Sex: male and female
Application Route: Inhalation
Dose: 0, 25, 106 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
NOEL: 25 ppm
Lowest observable effect level: 109 ppm
Method: OECD Test Guideline 412
Target Organs: Liver

Species: Mouse, male and female
Sex: male and female
Application Route: Inhalation
Dose: 0, 25, 109 ppm
Exposure time: 4 wk
Number of exposures: 6 h/d, 5 d/wk
Lowest observable effect level: 25 ppm
Method: OECD Test Guideline 412
Target Organs: Liver

Species: Rat, male
Sex: male
Application Route: oral gavage
Dose: 50, 100, 200 mg/kg
Exposure time: 10 wk
Number of exposures: once daily
NOEL: 200 mg/kg
Method: OECD Guideline 422
Target Organs: Kidney, Liver

Species: Rat, female
Sex: female
Application Route: oral gavage
Dose: 50, 100, 200 mg/kg
Exposure time: 8 - 9 wk
Number of exposures: once daily
NOEL: 200 mg/kg
Method: OECD Guideline 422
Target Organs: Liver

Species: Rat, male
Sex: male
Application Route: Inhalation
Dose: 5, 25, 100 ppm
Exposure time: 13 wk
Number of exposures: 6h/d, 5d/wk
NOEL: 25 ppm
Method: OECD Test Guideline 413

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Species: Rat, female
 Sex: female
 Application Route: Inhalation
 Dose: 5, 25, 100 ppm
 Exposure time: 13 wk
 Number of exposures: 6h/d, 5d/wk
 NOEL: 25 ppm
 Method: OECD Test Guideline 413

Genotoxicity in vitro

Light Cycle Oil : Test Type: Modified Ames test
 Result: positive

Test Type: Mouse lymphoma assay
 Result: positive

Test Type: Sister Chromatid Exchange Assay
 Result: negative

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 Test Guideline 473
 Result: negative

Naphthalene Test Type: Ames test
 Result: negative

Test Type: Sister Chromatid Exchange Assay
 Result: negative

Test Type: Unscheduled DNA synthesis assay
 Result: negative

Genotoxicity in vivo

Light Cycle Oil : Test Type: Cytogenetic assay
 Result: negative

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)

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Result: negative
 Remarks: Information given is based on data obtained from similar substances.

Naphthalene

Test Type: Mouse micronucleus assay
 Result: negative

Carcinogenicity

Naphthalene

: Species: Mouse
 Sex: male
 Dose: 10, 30 ppm
 Exposure time: 105 weeks
 Number of exposures: 6 hours/day, 5 days/week
 Test substance: yes
 Print Date: No information available.
 Remarks: No evidence of carcinogenicity

Species: Mouse
 Sex: female
 Dose: 10, 30 ppm
 Exposure time: 105 weeks
 Number of exposures: 6 hours/day, 5 days/week
 Test substance: yes
 Print Date: No information available.
 Remarks: increased incidence of alveolar/bronchiolar adenomas

Species: Rat
 Sex: male and female
 Dose: 10, 30, 60 ppm
 Exposure time: 105 weeks
 Number of exposures: 6 hours/day, 5 days/week
 Test substance: yes
 Print Date: No information available.
 Remarks: nose respiratory epithelial adenoma, increased incidence of olfactory neuroblastomas

Reproductive toxicity

tert-Dodecanethiol

: Species: Rat
 Sex: male
 Application Route: oral gavage
 Dose: 50, 100, 200 mg/kg/d
 Exposure time: 10 wk
 Number of exposures: Daily
 Method: OECD Guideline 422
 NOAEL Parent: 200 mg/kg
 Animal testing did not show any effects on fertility.

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Species: Rat
 Sex: female
 Application Route: oral gavage
 Dose: 50, 100, 200 mg/kg/d
 Exposure time: 8 - 9 wk
 Number of exposures: Daily
 Method: OECD Guideline 422
 NOAEL Parent: 200 mg/kg
 NOAEL F1: 100 mg/kg
 Animal testing did not show any effects on fertility.
 Reduced fetal weight.

Species: Rat
 Sex: male
 Application Route: oral gavage
 Dose: 25, 75, 200 mg/kg/d
 Exposure time: 18 wk
 Number of exposures: Daily
 Method: OECD Test Guideline 443
 NOAEL Parent: 200 mg/kg
 NOAEL F1: 200 mg/kg
 NOAEL F2: 200 mg/kg
 Animal testing did not show any effects on fertility.

Species: Rat
 Sex: female
 Application Route: oral gavage
 Dose: 25, 75, 200 mg/kg/d
 Exposure time: 16 - 18 wk
 Number of exposures: Daily
 Method: OECD Test Guideline 443
 NOAEL Parent: 200 mg/kg
 NOAEL F1: 200 mg/kg
 NOAEL F2: 200 mg/kg
 Animal testing did not show any effects on fertility.
 Reduced fetal weight.

Developmental Toxicity

Light Cycle Oil

: Species: Rat
 Application Route: Dermal
 Dose: 1, 50, 250 mg/kg/d
 Number of exposures: once daily
 Test period: GD 0-19
 Method: OECD Guideline 414
 NOAEL Teratogenicity: 1 mg/kg
 NOAEL Maternal: 1 mg/kg

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: \geq 88.6 ppm
 No adverse effects expected

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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: \geq 88.6 ppm
 No adverse effects expected

Species: Rabbit
 Application Route: oral gavage
 Dose: 0, 50, 100, 200 mg/kg/d
 Number of exposures: Daily
 Test period: GD 6-28
 Method: OECD Guideline 414
 NOAEL Teratogenicity: 100 mg/kg
 NOAEL Maternal: 100 mg/kg
 Embryotoxic effects and adverse effects on the offspring were detected only at high maternally toxic doses

Naphthalene

Species: Rabbit
 Application Route: oral gavage
 Dose: 40, 200, 400 mg/kg
 Test period: 29 d, GD 6-18
 NOAEL Teratogenicity: 400 mg/kg

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Aspiration toxicity

: May be fatal if swallowed and enters airways.

CMR effects

Light Cycle Oil

: Carcinogenicity: Possible human carcinogen

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

Naphthalene

Carcinogenicity: Limited evidence of carcinogenicity in animal studies

Polynuclear Aromatics

Carcinogenicity: Human carcinogen.
 Mutagenicity: In vivo tests showed mutagenic effects

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Further information

: Solvents may degrease the skin.

SECTION 12: Ecological information**Toxicity to fish**

Light Cycle Oil

: LL50: > 0.3 mg/l
 Exposure time: 96 h
 Species: Oncorhynchus mykiss (rainbow trout)

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semi-static test Method: OECD Test Guideline 203

tert-Dodecanethiol

LL50: > 100 mg/l
 Exposure time: 96 h
 Species: Danio rerio (Zebra Fish)
 static test Method: OECD Test Guideline 203
 No toxicity at the limit of solubility.

Naphthalene

LC50: 3.2 mg/l
 Exposure time: 96 h
 Species: Pimephales promelas (fathead minnow)

Toxicity to daphnia and other aquatic invertebrates

Light Cycle Oil

: EL50: 0.32 mg/l
 Exposure time: 48 h
 Species: Daphnia magna (Water flea)
 Immobilization Method: OECD Test Guideline 202

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.

Naphthalene

LC50: 2.16 mg/l
 Exposure time: 48 h
 Species: Daphnia magna (Water flea)

Toxicity to algae

Light Cycle Oil

: EL50: 0.51 mg/l
 Exposure time: 72 h
 Species: Pseudokirchneriella subcapitata (green algae)
 Growth inhibition Method: OECD Test Guideline 201

Naphthalene

EC50: 2.96 mg/l
 Exposure time: 48 h
 Species: Selenastrum capricornutum (algae)

M-Factor

Distillates (petroleum), light catalytic cracked

: M-Factor (Acute Aquat. Tox.) 1
 M-Factor (Chron. Aquat. Tox.) 1

Toxicity to bacteria

tert-Dodecanethiol

: NOEC: 8.6 mg/l
 Exposure time: 3 h
 Growth rate
 Respiration inhibition
 Method: OECD Test Guideline 209

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

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.

Biodegradability

Light Cycle Oil : aerobic
 56.32 %
 Testing period: 28 d
 Method: OECD Test Guideline 301F
 Expected to be inherently biodegradable.

tert-Dodecanethiol : aerobic
 Result: Not readily biodegradable.
 0 %
 Testing period: 28 d
 Method: OECD Test Guideline 301D

Bioaccumulation

Light Cycle Oil : The product may be accumulated in organisms.

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

Light Cycle Oil : No data available

tert-Dodecanethiol : After release, adsorbs onto soil.

Results of PBT assessment

Light Cycle Oil : Non-classified PBT substance, Non-classified vPvB substance

tert-Dodecanethiol : Non-classified PBT substance, Non-classified vPvB substance

Additional ecological information : Very toxic to aquatic life with long lasting effects.

Ecotoxicology Assessment

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Short-term (acute) aquatic hazard

Light Cycle Oil : Very toxic to aquatic life.

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

Thiol synthesis by-products : No toxicity at the limit of solubility.

Naphthalene : Very toxic to aquatic life.

Long-term (chronic) aquatic hazard

Light Cycle Oil : Very toxic to aquatic life with long lasting effects.

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

Thiol synthesis by-products : May cause long lasting harmful effects to aquatic life.

Naphthalene : Very toxic 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)

UN1268, PETROLEUM PRODUCTS, N.O.S., 3, III

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

UN1268, PETROLEUM PRODUCTS, N.O.S., 3, III, (>= 60 °C c.c.), MARINE POLLUTANT,

Orfom® MC27 Collector

Version 1.4

Revision Date 2023-07-13

(LIGHT CYCLE OIL)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

UN1268, PETROLEUM PRODUCTS, N.O.S., 3, III

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))

UN1268, PETROLEUM PRODUCTS, N.O.S., 3, III, (D/E), ENVIRONMENTALLY HAZARDOUS, (LIGHT CYCLE OIL)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))

30, UN1268, PETROLEUM PRODUCTS, N.O.S., 3, III, ENVIRONMENTALLY HAZARDOUS, (LIGHT CYCLE OIL)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)

UN1268, PETROLEUM PRODUCTS, N.O.S., 3, III, ENVIRONMENTALLY HAZARDOUS, (LIGHT CYCLE OIL)

Maritime transport in bulk according to IMO instruments**SECTION 15: Regulatory information****Notification status**

Europe REACH	:	This product is in full compliance according to REACH regulation 1907/2006/EC.
Switzerland CH INV	:	On the inventory, or in compliance with the inventory
United States of America (USA) TSCA	:	On TSCA Inventory
Canada DSL	:	On the inventory, or in compliance with the inventory
Other AICS	:	On the inventory, or in compliance with the inventory
New Zealand NZIoC	:	Not 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 or the exported amount does not exceed the minimum threshold quantity of the non-registered substance(s).
Philippines PICCS	:	On the inventory, or 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

Other regulations : Law on the Prevention and Control of Occupational Diseases

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SECTION 16: Other information**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.

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

ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AIIC	Australian Inventory of Industrial Chemicals	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%	ATE	Acute toxicity estimate