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

1.1 Product information

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Diesel Reference Fuel U-32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>1108915, 1024281, 1024280, 1032195, 1024277, 1024279, 1024278</td>
</tr>
</tbody>
</table>

EC-No. Registration number

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No. EC-No. Index No.</th>
<th>Legal Entity Registration number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Cycle Oil</td>
<td>64741-59-9 265-060-4 649-435-00-3</td>
<td>Chevron Phillips Chemicals International NV 01-2119489734-23-0015</td>
</tr>
<tr>
<td>C12-C14 Isoalkanes</td>
<td>68551-19-9 271-369-5</td>
<td>Chevron Phillips Chemicals International NV 01-2119491311-45-0000</td>
</tr>
</tbody>
</table>

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant Identified Uses

- Manufacture
- Use as a fuel - industrial
- Use as a fuel – professional

1.3 Details of the supplier of the safety data sheet

Company

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

Local

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

SDS Requests: (800) 852-5530
1.4 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 +32.14.583516 (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

SECTION 2: Hazards identification

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

- Flammable liquids, Category 3 (H226: Flammable liquid and vapor)
- Skin irritation, Category 2 (H315: Causes skin irritation)
- Carcinogenicity, Category 1B (H350: May cause cancer)
- Specific target organ toxicity - repeated exposure, Category 2 (H373: May cause damage to organs through prolonged or repeated exposure)
- Aspiration hazard, Category 1 (H304: May be fatal if swallowed and enters airways)
- Short-term (acute) aquatic hazard, Category 1 (H400: Very toxic to aquatic life)
- Long-term (chronic) aquatic hazard, Category 1 (H410: Very toxic to aquatic life with long lasting effects)

2.2 Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms:
- Flammable
- Health hazard
- Signal word: Danger
- Hazard Statements
  - H226: Flammable liquid and vapor
  - H304: May be fatal if swallowed and enters airways
  - H315: Causes skin irritation
  - H350: May cause cancer

SDS Number: 100000100096 2/40
SAFETY DATA SHEET

Diesel Reference Fuel U-32

Version 1.14  Revision Date 2019-08-06

H373  May cause damage to organs through prolonged or repeated exposure.
H410  Very toxic to aquatic life with long lasting effects.

Precautionary Statements:

Prevention:
- P201  Obtain special instructions before use.
- P210  Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P240  Ground and bond container and receiving equipment.
- P241  Use explosion-proof electrical/ ventilating/ lighting/ equipment.
- P242  Use only non-sparking tools.
- P243  Take action to prevent static discharges.
- P260  Do not breathe dust/fume/gas/mist/vapor/spray.
- P273  Avoid release to the environment.
- P280  Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
- P301 + P310  IF SWALLOWED: Immediately call a POISON CENTER/doctor.
- P302 + P352  IF ON SKIN: Wash with plenty of water.
- P308 + P313  IF exposed or concerned: Get medical advice/ attention.
- P314  Get medical advice/ attention if you feel unwell.
- P331  Do NOT induce vomiting.
- P370 + P378  In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
- P391  Collect spillage.

Storage:
- P403 + P235  Store in a well-ventilated place. Keep cool.

Hazardous ingredients which must be listed on the label:
- 64741-59-9  Light Cycle Oil
- 68551-19-9  C12-C14 Isoalkanes

Additional Labeling:
Restricted to professional users.

SECTION 3: Composition/information on ingredients

3.1 - 3.2  Substance or Mixture
Synonyms  :  Diesel Reference Fuel U
Molecular formula  :  Mixture

Hazardous ingredients

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Classification (REGULATION (EC) No)</th>
<th>Concentration [wt%]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EC-No.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SDS Number:100000100096  3/40
4.1 Description of 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: Flush eyes with water as a precaution. 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: 48 °C (118 °F)
Method: Tag closed cup

Autoignition temperature: No data available

5.1 Extinguishing media

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

Unsuitable extinguishing media: High volume water jet.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting: Do not allow run-off from fire fighting to enter drains or water courses.
### 5.3 Advice for firefighters

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special protective equipment for fire-fighters</td>
<td>Wear self-contained breathing apparatus for firefighting if necessary.</td>
</tr>
<tr>
<td>Further information</td>
<td>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.</td>
</tr>
<tr>
<td>Fire and explosion protection</td>
<td>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). Keep away from open flames, hot surfaces and sources of ignition.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Carbon oxides.</td>
</tr>
</tbody>
</table>

### SECTION 6: Accidental release measures

#### 6.1 Personal precautions, protective equipment and emergency procedures

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal precautions</td>
<td>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.</td>
</tr>
</tbody>
</table>

#### 6.2 Environmental precautions

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental precautions</td>
<td>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.</td>
</tr>
</tbody>
</table>

#### 6.3 Methods and materials for containment and cleaning up

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methods for cleaning up</td>
<td>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).</td>
</tr>
</tbody>
</table>

#### 6.4 Reference to other sections

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference to other sections</td>
<td>For personal protection see section 8. For disposal considerations see section 13.</td>
</tr>
</tbody>
</table>

### SECTION 7: Handling and storage

#### 7.1 Precautions for safe handling

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handling</td>
<td>Avoid formation of aerosol. Do not breathe vapors/dust. Avoid</td>
</tr>
</tbody>
</table>

SDS Number: 100000100096
Diezol Reference Fuel U-32

Version 1.14

Revision Date 2019-08-06

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.

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). Keep away from open flames, hot surfaces and sources of ignition.

7.2 Conditions for safe storage, including any incompatibilities

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

8.1 Control parameters

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>C12-C14 Isoalkanes</td>
<td>Manufacturer</td>
<td>TWA 1,200 mg/m³</td>
<td>RCP.</td>
<td></td>
</tr>
</tbody>
</table>

HR

Sastojci | Temelj | Vrijednost | Nadzorni parametri | Bilješka
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Cycle Oil</td>
<td>HR OEL</td>
<td>GVI 100 ppm, 400 mg/m³</td>
<td>2, 2, T,</td>
<td></td>
</tr>
</tbody>
</table>

DE

Inhaltsstoffe | Grundlage | Wert | Zu überwachende Parameter | Bemerkung
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Cycle Oil</td>
<td>DE TRGS 900</td>
<td>AGW 100 mg/m³</td>
<td>Gruppen-AGW, AGS,</td>
<td></td>
</tr>
</tbody>
</table>

BG

Съставки | Основа | Стойност | Параметри на контрол | Бележка
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Cycle Oil</td>
<td>BG OEL</td>
<td>TWA 300 mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8.2 Exposure controls

Engineering measures

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits.

SDS Number: 100000100096
Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

**Personal protective equipment**

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

#### 9.1 Information on basic physical and chemical properties

**Appearance**

- **Physical state**: Liquid
- **Color**: Yellow
- **Odor**: Mild

**Safety data**

- **Flash point**: 48 °C (118 °F)  
  Method: Tag closed cup
- **Lower explosion limit**: No data available
- **Upper explosion limit**: No data available

SDS Number:100000100096
# Diesel Reference Fuel U-32

**Oxidizing properties**: No

**Autoignition temperature**: No data available

**Thermal decomposition**: No data available

**Molecular formula**: Mixture

**Molecular weight**: Not applicable

**pH**: Not applicable

**Pour point**: No data available

**Boiling point/boiling range**: 176 - 317 °C (349 - 603 °F)

**Vapor pressure**: No data available

**Relative density**: 0.869 at 15.6 °C (60.1 °F)

**Density**: 0.8690 g/cm³

**Bulk density**: 7.25 L/G

**Water solubility**: Negligible

**Partition coefficient: n-octanol/water**: No data available

**Viscosity, kinematic**: 1.898 cSt at 40 °C (104 °F)

**Relative vapor density**: 3 (Air = 1.0)

**Evaporation rate**: < 1

**Percent volatile**: > 99 %

70 %
Concentration: 608.3 g/l

70 %
Concentration: 608.3 g/l

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Stable under recommended storage conditions.

### 10.2
Chemical stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 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.

10.4 Conditions to avoid: Heat, flames and sparks.

10.5 Materials to avoid: May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Thermal decomposition: No data available

10.6 Hazardous decomposition products: Carbon oxides

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

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Diesel Reference Fuel U-32
Acute oral toxicity: LD50: > 5.000 mg/kg
Species: Rat
Method: Acute toxicity estimate

Diesel Reference Fuel U-32
Acute inhalation toxicity: LC50: > 20 mg/l
Exposure time: 4 h
Species: Rat
Test atmosphere: dust/mist
Method: Acute toxicity estimate

Diesel Reference Fuel U-32
Acute dermal toxicity: LD50: > 5.000 mg/kg
Species: Rabbit
Method: Acute toxicity estimate
Skin irritation : Skin irritation largely based on animal evidence.

Diesel Reference Fuel U-32
Eye irritation : May irritate eyes.

Diesel Reference Fuel U-32
Sensitization : Does not cause sensitization.

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

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

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.
### Diesel Reference Fuel U-32

**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

**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

**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

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

#### Diesel Reference Fuel U-32  
**Carcinogenicity**  
Remarks: May cause cancer.

#### Reproductive toxicity
## Diesel Reference Fuel U-32

### SDS Number: 100000100096

### 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

**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

### Diesel Reference Fuel U-32

#### Aspiration toxicity

May be fatal if swallowed and enters airways.

#### CMR effects

**Light Cycle Oil**  
**Carcinogenicity:** Possible human carcinogen

**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.

### Further information

Solvents may degrease the skin.

### SECTION 12: Ecological information

#### 12.1 Toxicity

**Ecotoxicity effects**  
**Toxicity to fish**

**Light Cycle Oil**  
**LL50:** > 0.3 mg/l  
**Exposure time:** 96 h  
**Species:** Oncorhynchus mykiss (rainbow trout)  
**semi-static test Method:** OECD Test Guideline 203

**C12-C14 Isoalkanes**  
**LL50:** > 1.000 mg/l
Diesel Reference Fuel U-32

Version 1.14

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

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

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

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

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.

M-Factor
Distillates (petroleum), light catalytic cracked: M-Factor (Acute Aquat. Tox.) 1
M-Factor (Chron. Aquat. Tox.) 1

Toxicity to fish (Chronic toxicity)

C12-C14 Isoalkanes: No data available:

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

C12-C14 Isoalkanes: No data available

12.2 Persistence and degradability

Biodegradability: Taking into consideration the properties of several ingredients, the product is estimated not to be readily biodegradable according to OECD classification.
12.3 Bioaccumulative potential
Elimination information (persistence and degradability)

Bioaccumulation : The product may be accumulated in organisms.

12.4 Mobility in soil

Mobility : This product may float or sink in water.

12.5 Results of PBT and vPvB assessment

Results of PBT assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

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

Ecotoxicology Assessment

Short-term (acute) aquatic hazard
Light Cycle Oil : Very toxic to aquatic life.

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

Long-term (chronic) aquatic hazard
Light Cycle Oil : Very toxic to aquatic life with long lasting effects.

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

SECTION 13: Disposal considerations

13.1 Waste treatment methods

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

14.1 - 14.7 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)
UN1202, DIESEL FUEL, 3, III

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN1202, DIESEL FUEL, 3, III, (48 °C), MARINE POLLUTANT, (LIGHT CYCLE OIL)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN1202, DIESEL FUEL, 3, III

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN1202, DIESEL FUEL, 3, III, (D/E), ENVIRONMENTALLY HAZARDOUS, (LIGHT CYCLE OIL)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN1202, DIESEL FUEL, 3, III, ENVIRONMENTALLY HAZARDOUS, (LIGHT CYCLE OIL)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN1202, DIESEL FUEL, 3, III, ENVIRONMENTALLY HAZARDOUS, (LIGHT CYCLE OIL)

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

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

National legislation


Water contaminating class : WGK 3 highly water endangering
Diesel Reference Fuel U-32

Version 1.14  Revision Date 2019-08-06

(Germany)

15.2

Chemical Safety Assessment

Components: Distillates (petroleum), light catalytic cracked 265-060-4

Chemical Safety Assessment

Alkanes, C12-14-iso- 271-369-5

Major Accident Hazard Legislation

96/82/EC Update:
Flammable.
Quantity 1: 5.000 t
Quantity 2: 50.000 t

96/82/EC Update:
Dangerous for the environment
Quantity 1: 200 t
Quantity 2: 500 t

96/82/EC Update:
Petroleum products: (a) gasolines and naphthas, (b) kerosenes (including jet fuels), (c) gas oils (including diesel fuels, home heating oils and gas oil blending streams), (d) heavy fuel oils
Quantity 1: 2.500 t
Quantity 2: 25.000 t

ZEU_SEVES3 Update:
FLAMMABLE LIQUIDS
P5c
Quantity 1: 5.000 t
Quantity 2: 50.000 t

ZEU_SEVES3 Update:
ENVIRONMENTAL HAZARDS
E1
Quantity 1: 100 t
Quantity 2: 200 t

ZEU_SEVES3 Update:
Petroleum products: (a) gasolines and naphthas, (b) kerosenes (including jet fuels), (c) gas oils (including diesel fuels, home heating oils and gas oil blending streams), (d) heavy fuel oils (e) alternative fuels serving the same purposes and with similar properties as regards flammability and environmental hazards as the products referred to in points (a) to (d)
Quantity 1: 2.500 t
Quantity 2: 25.000 t

Notification status

Europe REACH: This mixture contains only ingredients which have been

SDS Number:100000100096 16/40
Diesel Reference Fuel U-32

Version 1.14
Revision Date 2019-08-06

United States of America (USA) : On or in compliance with the active portion of the TSCA inventory
Switzerland CH INV : On the inventory, or in compliance with the 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 : 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: 2
- Reactivity Hazard: 0

Further information
Legacy SDS Number : 664950

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

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

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
<td>American Conference of Government Industrial Hygienists</td>
</tr>
<tr>
<td>LD50</td>
<td>Lethal Dose 50%</td>
</tr>
<tr>
<td>AICS</td>
<td>Australia, Inventory of Chemical Substances</td>
</tr>
<tr>
<td>LOAEL</td>
<td>Lowest Observed Adverse Effect Level</td>
</tr>
<tr>
<td>DSL</td>
<td>Canada, Domestic Substances List</td>
</tr>
<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Safety &amp; Health</td>
</tr>
<tr>
<td>CNS</td>
<td>Central Nervous System</td>
</tr>
<tr>
<td>NTP</td>
<td>National Toxicology Program</td>
</tr>
</tbody>
</table>
### Diesel Reference Fuel U-32

**Version 1.14**  
**Revision Date 2019-08-06**

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

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

- **H226** Flammable liquid and vapor.
- **H304** May be fatal if swallowed and enters airways.
- **H315** Causes skin irritation.
- **H332** Harmful if inhaled.
- **H350** May cause cancer.
- **H373** May cause damage to organs through prolonged or repeated exposure.
- **H400** Very toxic to aquatic life.
- **H410** Very toxic to aquatic life with long lasting effects.
### Annex

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

<table>
<thead>
<tr>
<th>Main User Groups</th>
<th>SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU3: Industrial Manufacturing (all)</td>
</tr>
<tr>
<td>Process category</td>
<td>PROC1: Use in closed process, no likelihood of exposure</td>
</tr>
<tr>
<td></td>
<td>PROC2: Use in closed, continuous process with occasional controlled exposure</td>
</tr>
<tr>
<td></td>
<td>PROC3: Use in closed batch process (synthesis or formulation)</td>
</tr>
<tr>
<td></td>
<td>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC15: Use as laboratory reagent</td>
</tr>
<tr>
<td>Environmental release category</td>
<td>ERC1, ERC4: Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles</td>
</tr>
<tr>
<td>Further information</td>
<td>Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities</td>
</tr>
</tbody>
</table>

#### 2.1 Contributing scenario controlling environmental exposure for: ERC1, ERC4: Manufacture of substances, Industrial use of processing aids in processes and products, not becoming part of articles

**Product characteristics**

- **Remarks:** Substance is complex UVCB., Predominantly hydrophobic.

- **Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): (Msafe)**: 930,000

**Environment factors not influenced by risk management**

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

**Other given operational conditions affecting environmental exposure**

- **Continuous exposure**
  - **Number of emission days per year**: 300
  - **Emission or Release Factor: Air**: 1 %
  - **Emission or Release Factor: Water**: 0.03 %
  - **Emission or Release Factor: Soil**: 0.01 %
Technical conditions and measures / Organizational measures

Air
Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 90 %)

Water
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):
(Effectiveness: 98,7 %)

Remarks
Do not apply industrial sludge to natural soils.

Water
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):
(Effectiveness: 83.6 %)

Remarks
Sludge should be incinerated, contained or reclaimed.

Remarks
Common practices vary across sites thus conservative process release estimates used.

Remarks
Risk from environmental exposure is driven by freshwater sediment.

Remarks
Onsite wastewater treatment required.

Conditions and measures related to external recovery of waste

Recovery Methods
During manufacturing no waste of the substance is generated.

2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure

Product characteristics
Substance is complex UVCB., Predominantly hydrophobic.

Remarks
Liquid, vapour pressure < 0.5 kPa at STP

Frequency and duration of use
Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure
Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures
Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: Restrict access to authorized persons; provide specific activity training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. Handle substance within a predominantly closed system provided with extract ventilation. Store substance within a closed system.

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

SDS Number:100000100096 20/40
# 2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure

## Product characteristics
- **Remarks**: Liquid, vapour pressure < 0.5 kPa at STP

## Frequency and duration of use
- **Remarks**: Covers daily exposures up to 8 hours (unless stated differently)

## Other operational conditions affecting workers exposure
- **Remarks**: Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

## Technical conditions and measures
Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: Restrict access to authorized persons; provide specific activity training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.

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

# 2.2 Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)

## Product characteristics
- **Remarks**: Liquid, vapour pressure < 0.5 kPa at STP

## Frequency and duration of use
- **Remarks**: Covers daily exposures up to 8 hours (unless stated differently)

## Other operational conditions affecting workers exposure
- **Remarks**: Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

## Technical conditions and measures
Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: Restrict access to authorized persons; provide specific activity training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
**Diesel Reference Fuel U-32**

**SAFETY DATA SHEET**

Version 1.14  
Revision Date 2019-08-06

Arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk-based health surveillance. Sample via a closed loop or other system intended to avoid exposure.

**Organizational measures to prevent /limit releases, dispersion and exposure**

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

**2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities**

<table>
<thead>
<tr>
<th><strong>Product characteristics</strong></th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Liquid, vapour pressure &lt; 0.5 kPa at STP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Frequency and duration of use</strong></th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Covers daily exposures up to 8 hours (unless stated differently)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Other operational conditions affecting workers exposure</strong></th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.</td>
</tr>
</tbody>
</table>

**Technical conditions and measures**

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance.

Where there is potential for exposure: Restrict access to authorized persons; provide specific activity training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk-based health surveillance. Drain down and flush system prior to equipment opening or maintenance.

**Organizational measures to prevent /limit releases, dispersion and exposure**

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

**2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/ large containers at dedicated facilities**

<table>
<thead>
<tr>
<th><strong>Product characteristics</strong></th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Liquid, vapour pressure &lt; 0.5 kPa at STP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Frequency and duration of use</strong></th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Covers daily exposures up to 8 hours (unless stated differently)</td>
</tr>
</tbody>
</table>
### Diesel Reference Fuel U-32

**SAFETY DATA SHEET**  
Version 1.14  
Revision Date 2019-08-06

#### Other operational conditions affecting workers exposure

**Remarks:** Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

#### Technical conditions and measures

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable

#### Organizer measures to prevent /limit releases, dispersion and exposure

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

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

Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.

#### 2.2 Contributing scenario controlling worker exposure for: PROC15: Use as laboratory reagent

#### Product characteristics

**Remarks:** Liquid, vapour pressure < 0.5 kPa at STP

#### Frequency and duration of use

**Remarks:** Covers daily exposures up to 8 hours (unless stated differently)

#### Other operational conditions affecting workers exposure

**Remarks:** Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

#### Technical conditions and measures

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance.

#### Organizer measures to prevent /limit releases, dispersion and exposure

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

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

Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.
(tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

### 3. Exposure estimation and reference to its source

#### Environment

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartments</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC1, ERC4</td>
<td>Hydrocarbon Block Method with Petrorisk</td>
<td>Air</td>
<td>Air</td>
<td>0.046 mg/m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freshwater</td>
<td>0.0056 mg/L</td>
<td>0.73</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.00056 mg/L</td>
<td>0.073</td>
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<tr>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>0.46 mg/kg wet weight</td>
<td>0.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.046 mg/kg wet weight</td>
<td>0.091</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agricultural soil</td>
<td>0.00069 mg/kg wet weight</td>
<td>0.0018</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ERC1: Manufacture of substances
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles

#### Workers/Consumers

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC1, CS15</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0.01 mg/m³</td>
<td>0.00</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0.34 mg/kg/d</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC1, CS85</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0.5 mg/m³</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>1.37 mg/kg/d</td>
<td>0.57</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC2, CS85</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0.05 mg/m³</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>1.37 mg/kg/d</td>
<td>0.57</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC3, CS2</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>1 mg/m³</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0.34 mg/kg/d</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC8a, CS39</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>5 mg/m³</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>1.371 mg/kg/d</td>
<td>0.57</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0.59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Diesel Reference Fuel U-32

Version 1.14
Revision Date 2019-08-06

PROC8b, CS39
ECETOC TRA Modified
Worker – inhalation, long-term – systemic
5 mg/m³
0,18
Worker – dermal, long-term – systemic
1,37 mg/kg/d
0,57
Worker – long-term – systemic Combined routes

PROC15, CS36
ECETOC TRA Modified
Worker – inhalation, long-term – systemic
0,5 mg/m³
0,00
Worker – dermal, long-term – systemic
0,03 mg/kg/d
0,01
Worker – long-term – systemic Combined routes
0,01

PROC1: Use in closed process, no likelihood of exposure
CS15: General exposures (closed systems)

PROC1: Use in closed process, no likelihood of exposure
CS85: Bulk product storage

PROC2: Use in closed, continuous process with occasional controlled exposure
CS85: Bulk product storage

PROC3: Use in closed batch process (synthesis or formulation)
CS2: Process sampling

PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
CS39: Equipment cleaning and maintenance

PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
CS39: Equipment cleaning and maintenance

PROC15: Use as laboratory reagent
CS36: Laboratory activities

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

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not support the need for a DNEL to be established for other health effects.

Risk Management Measures are based on qualitative risk characterisation. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

SDS Number:1000000100096

25/40
Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file – “Site-Specific Production” worksheet.

1. Short title of Exposure Scenario: **Use as a fuel - industrial**

<table>
<thead>
<tr>
<th>Main User Groups</th>
<th>SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector of use</td>
<td>SU3: Industrial Manufacturing (all)</td>
</tr>
<tr>
<td>Process category</td>
<td>PROC1: Use in closed process, no likelihood of exposure</td>
</tr>
<tr>
<td></td>
<td>PROC2: Use in closed, continuous process with occasional controlled exposure</td>
</tr>
<tr>
<td></td>
<td>PROC3: Use in closed batch process (synthesis or formulation)</td>
</tr>
<tr>
<td></td>
<td>PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td></td>
<td>PROC16: Using material as fuel sources, limited exposure to unburned product to be expected</td>
</tr>
<tr>
<td>Environmental release category</td>
<td>ERC7: Industrial use of substances in closed systems</td>
</tr>
<tr>
<td>Further information</td>
<td>Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.</td>
</tr>
</tbody>
</table>

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

Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

**Product characteristics**

<table>
<thead>
<tr>
<th>Remarks</th>
<th>Substance is complex UVCB., Predominantly hydrophobic.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum allowable site tonnage ((M_{\text{Safe}})) based on release following total wastewater treatment removal (kg/d): (M_{\text{Safe}})</td>
<td>920,000</td>
</tr>
</tbody>
</table>

**Environment factors not influenced by risk management**

<table>
<thead>
<tr>
<th>Flow rate</th>
<th>18,000 m3/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dilution Factor (River)</td>
<td>10</td>
</tr>
<tr>
<td>Dilution Factor (Coastal Areas)</td>
<td>100</td>
</tr>
</tbody>
</table>

**Other given operational conditions affecting environmental exposure**

<table>
<thead>
<tr>
<th>Continuous exposure</th>
<th>Number of emission days per year</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission or Release Factor: Air</td>
<td>0,5 %</td>
<td></td>
</tr>
<tr>
<td>Emission or Release Factor: Water</td>
<td>0,001 %</td>
<td></td>
</tr>
<tr>
<td>Emission or Release Factor: Soil</td>
<td>0 %</td>
<td></td>
</tr>
</tbody>
</table>
Technical conditions and measures / Organizational measures

Air: Treat air emission to provide a typical removal efficiency of (%): (Effectiveness: 95%)

Water: Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 88.9%)

Remarks: Do not apply industrial sludge to natural soils.

Water: If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%): (Effectiveness: 0%)

Remarks: Sludge should be incinerated, contained or reclaimed.

Remarks: Common practices vary across sites thus conservative process release estimates used.

Remarks: Risk from environmental exposure is driven by freshwater sediment.

Remarks: If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Conditions and measures related to municipal sewage treatment plant

Type of Sewage Treatment Plant: Municipal sewage treatment plant

Flow rate of sewage treatment plant effluent: 2,000 m³/d

Effectiveness (of a measure): 92.3%

Percentage removed from waste water: 92.3%

Conditions and measures related to external treatment of waste for disposal


Conditions and measures related to external recovery of waste

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

2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure

Product characteristics

Remarks: Substance is complex UVCB., Predominantly hydrophobic.

Physical Form (at time of use): Liquid mixture

Remarks: Liquid, vapour pressure < 0.5 kPa at STP

Frequency and duration of use

Remarks: Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure

Remarks: Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance.

Where there is potential for exposure: Restrict access to authorized persons; provide specific activity

SDS Number: 100000100096
training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. Store substance within a closed system.

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

2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure

Product characteristics

<table>
<thead>
<tr>
<th>Remarks</th>
<th>Substance is complex UVCB., Predominantly hydrophobic.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Form (at time of use) Remarks</td>
<td>Liquid mixture, Liquid, vapour pressure &lt; 0.5 kPa at STP</td>
</tr>
</tbody>
</table>

Frequency and duration of use

<table>
<thead>
<tr>
<th>Remarks</th>
<th>Covers daily exposures up to 8 hours (unless stated differently)</th>
</tr>
</thead>
</table>

Other operational conditions affecting workers exposure

<table>
<thead>
<tr>
<th>Remarks</th>
<th>Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.</th>
</tr>
</thead>
</table>

Technical conditions and measures
Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance.

Where there is potential for exposure: Restrict access to authorized persons; provide specific activity training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. Store substance within a closed system.

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

2.2 Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)

Product characteristics

<table>
<thead>
<tr>
<th>Remarks</th>
<th>Substance is complex UVCB., Predominantly hydrophobic.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Form (at time of use) Remarks</td>
<td>Liquid mixture, Liquid, vapour pressure &lt; 0.5 kPa at STP</td>
</tr>
</tbody>
</table>

SDS Number:100000100096 28/40
# Diesel Reference Fuel U-32

## Version 1.14

### SDS Number: 100000100096

### Date: 2019-08-06

### Frequency and duration of use

**Remarks:** Covers daily exposures up to 8 hours (unless stated differently)

### Other operational conditions affecting workers exposure

**Remarks:** Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

### Technical conditions and measures

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance.

Where there is potential for exposure: Restrict access to authorized persons; provide specific activity training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.

### Organizational measures to prevent /limit releases, dispersion and exposure

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

### 2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

#### Product characteristics

**Remarks:** Substance is complex UVCB, Predominantly hydrophobic.

**Physical Form (at time of use):** Liquid mixture

**Remarks:** Liquid, vapour pressure < 0.5 kPa at STP

### Frequency and duration of use

**Remarks:** Covers daily exposures up to 8 hours (unless stated differently)

### Other operational conditions affecting workers exposure

**Remarks:** Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

### Technical conditions and measures

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance.

Where there is potential for exposure: Restrict access to authorized persons; provide specific activity training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. Drain down and flush system prior to equipment
Opening or maintenance.
Clear spills immediately.

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

Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.

2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities

Product characteristics
Remarks: Substance is complex UVCB., Predominantly hydrophobic.

Physical Form (at time of use)
Remarks: Liquid mixture
Remarks: Liquid, vapour pressure < 0.5 kPa at STP

Frequency and duration of use
Remarks: Covers daily exposures up to 8 hours (unless stated differently)

2.2 Contributing scenario controlling worker exposure for: PROC16: Using material as fuel sources, limited exposure to unburned product to be expected

Product characteristics
Remarks: Substance is complex UVCB., Predominantly hydrophobic.

Physical Form (at time of use)
Remarks: Liquid mixture

SDS Number: 100000100096

30/40
**Diesel Reference Fuel U-32**

**Version 1.14**

**Revision Date 2019-08-06**

**Remarks:** Liquid, vapour pressure < 0.5 kPa at STP

**Frequency and duration of use**

**Remarks:** Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting workers exposure**

**Remarks:** Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

**Technical conditions and measures**

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: Restrict access to authorized persons; provide specific activity training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. Handle substance within a closed system.

**Organizational measures to prevent/limit releases, dispersion and exposure**

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

### 3. Exposure estimation and reference to its source

**Environment**

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Compartment</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC7</td>
<td>Hydrocarbon Block Method with Petrorisk</td>
<td></td>
<td>Air</td>
<td>0.039 mg/m³</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Freshwater</td>
<td>0.028 mg/L</td>
<td>0.65</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine water</td>
<td>0.0028 mg/L</td>
<td>0.065</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Freshwater sediment</td>
<td>1.4 mg/kg wet weight</td>
<td>0.74</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0.14 mg/kg wet weight</td>
<td>0.074</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Agricultural soil</td>
<td>0.00055 mg/kg wet weight</td>
<td>0.0072</td>
<td></td>
</tr>
</tbody>
</table>

ERC7: Industrial use of substances in closed systems

**Workers/Consumers**

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC1, CS85</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0.5 mg/m³</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>1.37 mg/kg/d</td>
<td>0.57</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term –</td>
<td></td>
<td>0.59</td>
<td></td>
</tr>
</tbody>
</table>

SDS Number: 100000100096

31/40
### Diesel Reference Fuel U-32

#### Version 1.14

**Revision Date 2019-08-06**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC2, CS85</td>
<td>Modified ECETOC TRA</td>
<td>0.5 mg/m³</td>
<td>1.37 mg/kg/d</td>
<td>0.59</td>
</tr>
<tr>
<td>PROC3, CS107</td>
<td>Modified ECETOC TRA</td>
<td>1 mg/m³</td>
<td>0.34 mg/kg/d</td>
<td>0.14</td>
</tr>
<tr>
<td>PROC8a, CS39</td>
<td>Modified ECETOC TRA</td>
<td>0.5 mg/m³</td>
<td>13.71 mg/kg/d</td>
<td>0.57</td>
</tr>
<tr>
<td>PROC8b, CS14, CS8</td>
<td>Modified ECETOC TRA</td>
<td>0.5 mg/m³</td>
<td>0.69 mg/kg/d</td>
<td>0.31</td>
</tr>
<tr>
<td>PROC16, CS107</td>
<td>Modified ECETOC TRA</td>
<td>5 mg/m³</td>
<td>0.03 mg/kg/d</td>
<td>0.01</td>
</tr>
</tbody>
</table>

**PROC1:** Use in closed process, no likelihood of exposure
**CS85:** Bulk product storage

**PROC2:** Use in closed, continuous process with occasional controlled exposure
**CS85:** Bulk product storage

**PROC3:** Use in closed batch process (synthesis or formulation)
**CS107:** (closed systems)

**PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
**CS39:** Equipment cleaning and maintenance

**PROC8b:** Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities
**CS14:** Bulk transfers
**CS8:** Drum/batch transfers

**PROC16:** Using material as fuel sources, limited exposure to unburned product to be expected
**CS107:** (closed systems)

---

### 4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
Available hazard data do not enable the derivation of a DNEL for carcinogenic effects.
Available hazard data do not support the need for a DNEL to be established for other health effects.

Risk Management Measures are based on qualitative risk characterisation. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

1. Short title of Exposure Scenario: Use as a fuel – professional

Main User Groups: SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sector of use: SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process category:
PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16: Using material as fuel sources, limited exposure to unburned product to be expected

Environmental release category: ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems. Wide dispersive outdoor use of substances in closed systems

Further information:
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

2.1 Contributing scenario controlling environmental exposure for: ERC9a, ERC9b: Wide dispersive indoor use of substances in closed systems, Wide dispersive outdoor use of substances in closed systems
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

Product characteristics
Remarks: Substance is complex UVCB, Predominantly hydrophobic.
### Maximum allowable site tonnage

(MSafe) based on release following total wastewater treatment removal (kg/d): (MSafe)

<table>
<thead>
<tr>
<th>Maximum allowable site tonnage</th>
<th>31.000</th>
</tr>
</thead>
</table>

### Environment factors not influenced by risk management

<table>
<thead>
<tr>
<th>Flow rate</th>
<th>18,000 m³/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dilution Factor (River)</td>
<td>10</td>
</tr>
<tr>
<td>Dilution Factor (Coastal Areas)</td>
<td>100</td>
</tr>
</tbody>
</table>

### Other given operational conditions affecting environmental exposure

<table>
<thead>
<tr>
<th>Continuous exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of emission days per year</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emission or Release Factor: Water</th>
<th>0,001 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission or Release Factor: Soil</td>
<td>0,001 %</td>
</tr>
</tbody>
</table>

### Technical conditions and measures / Organizational measures

**Water**

- Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):
  - Effectiveness: 0 %

**Remarks**

- Do not apply industrial sludge to natural soils.
- If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):
  - Effectiveness: 0 %
- Sludge should be incinerated, contained or reclaimed.
- Common practices vary across sites thus conservative process release estimates used.
- No wastewater treatment required.
- Risk from environmental exposure is driven by freshwater.
- No wastewater treatment required.
- Treat air emission to provide a typical removal efficiency of (%):
  - Not applicable

**Air**

### Conditions and measures related to municipal sewage treatment plant

- Type of Sewage Treatment Plant: Municipal sewage treatment plant
- Flow rate of sewage treatment plant effluent: 2,000 m³/d
- Effectiveness (of a measure): 92,3 %
- Percentage removed from wastewater: 92,3 %

### Conditions and measures related to external treatment of waste for disposal

<table>
<thead>
<tr>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.</td>
</tr>
</tbody>
</table>

### Conditions and measures related to external recovery of waste

<table>
<thead>
<tr>
<th>Recovery Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>This substance is consumed during use and no waste of the substance is generated.</td>
</tr>
</tbody>
</table>

### 2.2 Contributing scenario controlling worker exposure for: PROC1: Use in closed process, no likelihood of exposure

<table>
<thead>
<tr>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance is complex UVCB., Predominantly hydrophobic.</td>
</tr>
</tbody>
</table>

| SDS Number:100000100096 | 34/40 |
# Diesel Reference Fuel U-32

<table>
<thead>
<tr>
<th>Physical Form (at time of use)</th>
<th>Liquid mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remarks</td>
<td>Liquid, vapour pressure &lt; 0.5 kPa at STP</td>
</tr>
</tbody>
</table>

## Frequency and duration of use

| Remarks | Covers daily exposures up to 8 hours (unless stated differently) |

## Other operational conditions affecting workers exposure

| Remarks | Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented. |

## Technical conditions and measures

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance.

Where there is potential for exposure: Restrict access to authorized persons; provide specific activity training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures.

Consider the need for risk based health surveillance.

## Organizational measures to prevent /limit releases, dispersion and exposure

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

## 2.2 Contributing scenario controlling worker exposure for: PROC2: Use in closed, continuous process with occasional controlled exposure

<table>
<thead>
<tr>
<th>Product characteristics</th>
<th>Substance is complex UVCB., Predominantly hydrophobic.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remarks</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical Form (at time of use)</th>
<th>Liquid mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remarks</td>
<td>Liquid, vapour pressure &lt; 0.5 kPa at STP</td>
</tr>
</tbody>
</table>

## Frequency and duration of use

| Remarks | Covers daily exposures up to 8 hours (unless stated differently) |

## Other operational conditions affecting workers exposure

| Remarks | Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented. |

## Technical conditions and measures

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance.

Where there is potential for exposure: Restrict access to authorized persons; provide specific activity training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures.
Diesel Reference Fuel U-32

Consider the need for risk based health surveillance.

Organizational measures to prevent /limit releases, dispersion and exposure
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimize exposures and to report any skin problems that may develop. No other specific measures identified.

2.2 Contributing scenario controlling worker exposure for: PROC3: Use in closed batch process (synthesis or formulation)

<table>
<thead>
<tr>
<th>Product characteristics</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub stance is complex UVCB., Predominantly hydrophobic.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical Form (at time of use)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid mixture</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid, vapour pressure &lt; 0.5 kPa at STP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency and duration of use</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Covers daily exposures up to 8 hours (unless stated differently)</td>
<td></td>
</tr>
</tbody>
</table>

2.2 Contributing scenario controlling worker exposure for: PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

<table>
<thead>
<tr>
<th>Product characteristics</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance is complex UVCB., Predominantly hydrophobic.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical Form (at time of use)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid mixture</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid, vapour pressure &lt; 0.5 kPa at STP</td>
</tr>
</tbody>
</table>

SDS Number:100000100096 36/40
## Diesel Reference Fuel U-32

### Frequency and duration of use

**Remarks**
- Covers daily exposures up to 8 hours (unless stated differently)

### Other operational conditions affecting workers exposure

**Remarks**
- Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

### Technical conditions and measures

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance.

Where there is potential for exposure: Restrict access to authorized persons; provide specific activity training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.

### Organizational measures to prevent /limit releases, dispersion and exposure

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

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

Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.

### 2.2 Contributing scenario controlling worker exposure for: PROC8b: Transfer of substance or preparation (charging/ discharging) from/to vessels/ large containers at dedicated facilities

#### Product characteristics

**Remarks**
- Substance is complex UVCB., Predominantly hydrophobic.

**Physical Form (at time of use)**
- Liquid mixture
- Liquid, vapour pressure < 0.5 kPa at STP

#### Frequency and duration of use

**Remarks**
- Covers daily exposures up to 8 hours (unless stated differently)

#### Technical conditions and measures

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance.

Where there is potential for exposure: Restrict access to authorized persons; provide specific activity training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios;
Diesel Reference Fuel U-32

clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. Ensure material transfers are under containment or extract ventilation.

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

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

2.2 Contributing scenario controlling worker exposure for: PROC16: Using material as fuel sources, limited exposure to unburned product to be expected

Product characteristics
Remarks: Substance is complex UVCB., Predominantly hydrophobic.

Physical Form (at time of use) Remarks: Liquid mixture

Liquid, vapour pressure < 0.5 kPa at STP

Frequency and duration of use Remarks: Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting workers exposure Remarks: Assumes use at not more than 20°C above ambient temperature, unless stated differently., Assumes a good basic standard of occupational hygiene is implemented.

Technical conditions and measures
Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimize exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance.

Where there is potential for exposure: Restrict access to authorized persons; provide specific activity training to operators to minimize exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.

Organizational measures to prevent /limit releases, dispersion and exposure
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop., No other specific measures identified.

3. Exposure estimation and reference to its source

<table>
<thead>
<tr>
<th>Environment</th>
<th>Contributing Assessment</th>
<th>Exposure Specific</th>
<th>Compart Value type</th>
<th>Level Risk characterization</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDS Number: 100000110096</td>
<td>38/40</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Diesel Reference Fuel U-32

### SAFETY DATA SHEET

**Version 1.14**

**Revision Date 2019-08-06**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Method</th>
<th>conditions</th>
<th>Exposure ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC9a, ERC9b</td>
<td>Hydrocarbon Block Method with Petronsk</td>
<td>Air</td>
<td>0,00015 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freshwater</td>
<td>0,000029 mg/L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine water</td>
<td>0,000005 mg/L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Freshwater</td>
<td>0,0032 mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marine sediment</td>
<td>0,0001 mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agricultural soil</td>
<td>0,00022 mg/kg</td>
</tr>
</tbody>
</table>

**ERC9a:** Wide dispersive indoor use of substances in closed systems  
**ERC9b:** Wide dispersive outdoor use of substances in closed systems

### Workers/Consumers

<table>
<thead>
<tr>
<th>Contributing Scenario</th>
<th>Exposure Assessment Method</th>
<th>Specific conditions</th>
<th>Value type</th>
<th>Level of Exposure</th>
<th>Risk characterization ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC1, CS67</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,01 mg/m³</td>
<td>0,00</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,34 mg/kg/d</td>
<td>0,14</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC2, CS15</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,5 mg/m³</td>
<td>0,04</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>1,37 mg/kg/d</td>
<td>0,57</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC3, CS107</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>1 mg/m³</td>
<td>0,04</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,34 mg/kg/d</td>
<td>0,14</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC8a, CS39</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>5 mg/m³</td>
<td>0,18</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>13,71 mg/kg/d</td>
<td>0,57</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC8b, CS14</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>5 mg/m³</td>
<td>0,04</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – inhalation, long-term – systemic</td>
<td>0,69 mg/kg/d</td>
<td>0,28</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC8b, CS8, CS507</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>5 mg/m³</td>
<td>0,18</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – inhalation, long-term – systemic</td>
<td>6,86 mg/kg/d</td>
<td>0,57</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – long-term – systemic Combined routes</td>
<td>0,75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROC16, CS107</td>
<td>ECETOC TRA Modified</td>
<td>Worker – inhalation, long-term – systemic</td>
<td>20 mg/m³</td>
<td>0,76</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worker – dermal, long-term – systemic</td>
<td>0,34 mg/kg/d</td>
<td>0,14</td>
<td></td>
</tr>
</tbody>
</table>

**SDS Number:** 100000100096  
39/40
**Diesel Reference Fuel U-32**

**Version 1.14**

| PROC1: Use in closed process, no likelihood of exposure | 0.87 |
| CS67: Storage |
| PROC2: Use in closed, continuous process with occasional controlled exposure | |
| CS15: General exposures (closed systems) |
| PROC3: Use in closed batch process (synthesis or formulation) | |
| CS107: (closed systems) |
| PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities | |
| CS39: Equipment cleaning and maintenance |
| PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | |
| CS14: Bulk transfers |
| PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities | |
| CS8: Drum/batch transfers |
| CS507: Refueling |
| PROC16: Using material as fuel sources, limited exposure to unburned product to be expected | |
| CS107: (closed systems) |

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

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.

Available hazard data do not enable the derivation of a DNEL for carcinogenic effects.

Available hazard data do not support the need for a DNEL to be established for other health effects.

Risk Management Measures are based on qualitative risk characterisation. Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.

Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).

**SDS Number:** 100000100096

40/40