

# SAFETY DATA SHEET



EXXSOL™ ISOPENTANE T

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

### 1.1 Product identifier

**Product name** : EXXSOL™ ISOPENTANE T

**EC number** : 201-142-8

**REACH Registration number**

**Registration number**

01-2119475602-38-0003

**CAS number** : 78-78-4

**Product description** : Aliphatic Hydrocarbon

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

**Intended Use** : Solvent

#### Identified uses

Manufacture of substance  
Distribution of substance  
Formulation and (re)packing of substances and mixtures  
Use in coatings - Industrial  
Use in cleaning agents - Industrial  
Blowing agents  
Use as a fuel - Industrial  
Functional fluids - Industrial  
Use in laboratories - Industrial  
Not available.  
Use in cleaning agents - Professional  
Use as a fuel - Professional  
Functional fluids - Professional  
Use in laboratories - Professional  
Use as a fuel - Consumer  
Other consumer uses

#### Uses advised against

Not applicable.

### 1.3 Details of the supplier of the safety data sheet

**Supplier** : ExxonMobil Petroleum & Chemical BV  
POLDERDIJKWEG  
Antwerpen B-2030 Belgium

**Supplier General Contact** : + 32 2 239 3111  
**e-mail address of person responsible for this SDS** : SDS-CC@exxonmobil.com

**SDS Internet Address** : [www.sds.exxonmobil.com](http://www.sds.exxonmobil.com)

#### National contact

ExxonMobil Chemical Ltd.  
MAILPOINT 14  
MARSH LANE  
FAWLEY, SOUTHAMPTON  
SO45 1TX HAMPSHIRE  
Great Britain  
+44 (0)23-8089-3822

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

### 1.4 Emergency telephone number

National advisory body/  
Poison Centre : (UK) 111

24 Hour Emergency  
Telephone : +44 20 3807 3798 / +1-703-527-3887 (CHEMTREC)

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

**Product definition** : Mono-constituent substance

#### Classification according to UK CLP/GHS

Flam. Liq. 1, H224

STOT SE 3, H336

Asp. Tox. 1, H304

Aquatic Chronic 2, H411

The product is classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

### 2.2 Label elements

#### **Hazard pictograms**



**Signal word** : Danger

**Hazard statements** : H224 - Extremely flammable liquid and vapour.  
H304 - May be fatal if swallowed and enters airways.  
H336 - May cause drowsiness or dizziness.  
H411 - Toxic to aquatic life with long lasting effects.

#### Precautionary statements

##### **Prevention**

: 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 or lighting equipment.  
P242 - Use non-sparking tools.  
P243 - Take action to prevent static discharges.  
P261 - Avoid breathing vapour.  
P271 - Use only outdoors or in a well-ventilated area.  
P273 - Avoid release to the environment.  
P280 - Wear protective gloves, protective clothing, eye protection, face protection, or hearing protection.

##### **Response**

: P301 + P331, P310 - IF SWALLOWED: Do NOT induce vomiting. Immediately call a POISON CENTER or doctor.  
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.  
P304 + P312, P340 - IF INHALED: Call a POISON CENTER or doctor if you feel unwell. Remove person to fresh air and keep comfortable for breathing.  
P370 + P378 - In case of fire: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.  
P391 - Collect spillage.

##### **Storage**

: P403 + P233 - Store in a well-ventilated place. Keep container tightly closed.  
P403 + P235 - Keep cool.  
P405 - Store locked up.

##### **Disposal**

: P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

**SECTION 2: Hazards identification**

- Hazardous ingredients** : 2-methylbutane
- Supplemental label elements** : Repeated exposure may cause skin dryness or cracking.
- Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles** : 3, 40
- Special packaging requirements**
- Containers to be fitted with child-resistant fastenings** : Not applicable.
- Tactile warning of danger** : Not applicable.

**2.3 Other hazards**

- Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII** :
- | PBT | P   | B   | T  | vPvB | vP  | vB  |
|-----|-----|-----|----|------|-----|-----|
| No  | N/A | N/A | No | N/A  | N/A | N/A |
- Other hazards which do not result in classification** : None known.
- Nota** : This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

**SECTION 3: Composition/information on ingredients****3.1 Substances** : Mono-constituent substance

Product/ingredient name	Identifiers	%	Classification	Type
isopentane	REACH #: 01-2119475602-38 EC: 201-142-8 CAS: 78-78-4	100	Flam. Liq. 1, H224 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411 EUH066 <b>See Section 16 for the full text of the H statements declared above.</b>	[1]

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type

[1] Constituent

Occupational exposure limits, if available, are listed in Section 8.

**SECTION 4: First aid measures****4.1 Description of first aid measures**

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

**SECTION 4: First aid measures**

- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

**4.2 Most important symptoms and effects, both acute and delayed****Over-exposure signs/symptoms**

- Eye contact** : No specific data.
- Inhalation** : Adverse symptoms may include the following:  
nausea or vomiting  
headache  
drowsiness/fatigue  
dizziness/vertigo  
unconsciousness
- Skin contact** : No specific data.
- Ingestion** : Adverse symptoms may include the following:  
nausea or vomiting

**4.3 Indication of any immediate medical attention and special treatment needed**

- Notes to physician** : If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately. This material, or a component, may be associated with cardiac sensitization following very high exposures (well above occupational exposure limits) or with concurrent exposure to high stress levels or heart-stimulating substances like epinephrine. Administration of such substances should be avoided.
- Specific treatments** : No specific treatment.

See toxicological information (Section 11)

**SECTION 5: Firefighting measures****5.1 Extinguishing media**

- Suitable extinguishing media** : Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam.
- Unsuitable extinguishing media** : Do not use water jet.

## SECTION 5: Firefighting measures

### 5.2 Special hazards arising from the substance or mixture

- Specific hazards arising from the chemical** : Extremely flammable liquid and vapour. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapour/gas is heavier than air and will spread along the ground. Vapours may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
- Hazardous combustion products** : Incomplete combustion products, Oxides of carbon, Smoke, Fume

### 5.3 Advice for firefighters

- Special protective actions for fire-fighters** : Use standard firefighting procedures and consider the hazards of other involved materials. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. Assure an extended cooling down period to prevent re-ignition. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. No action shall be taken involving any personal risk or without suitable training.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## SECTION 6: Accidental release measures

### NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

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

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Put on appropriate personal protective equipment. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

### 6.2 Environmental precautions

- : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

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

- Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Eliminate all ignition sources. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spill product. Do not confine in area of spill. Allow liquid to evaporate from

## SECTION 6: Accidental release measures

the surface. Seek the advice of a specialist before using dispersants. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

- 6.4 Reference to other sections** :
- See Section 1 for emergency contact information.
  - See Section 8 for information on appropriate personal protective equipment.
  - See Section 13 for additional waste treatment information.

## SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

### 7.1 Precautions for safe handling

- Protective measures** :
- Put on appropriate personal protective equipment (see Section 8). Do not swallow. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Advice on general occupational hygiene** :
- Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
- Static Accumulator** :
- This material is a static accumulator. A liquid is typically considered a nonconductive, static accumulator if its conductivity is below 100 pS/m (100x10E-12 Siemens per meter) and is considered a semiconductive, static accumulator if its conductivity is below 10,000 pS/m. Whether a liquid is nonconductive or semiconductive, the precautions are the same. A number of factors, for example liquid temperature, presence of contaminants, anti-static additives and filtration can greatly influence the conductivity of a liquid.
- Loading/Unloading Temperature** :
- <28 °C
- Transport Temperature** :
- <28 °C
- Transport Pressure** :
- Ambient

### 7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidising materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

#### Seveso Directive - Reporting thresholds

##### Danger criteria



SECTION 7: Handling and storage

Category	Notification and MAPP threshold	Safety report threshold
P5a E2	10 tonnes 200 tonnes	50 tonnes 500 tonnes

- Storage Temperature

: <28 °C
- Storage Pressure

: Ambient
- Suitable Containers/  
Packing

: Tank Trucks, Bulk Liquid Container (BLC), Barges, Drums
- Suitable Materials and  
Coatings

: Carbon Steel, Stainless Steel, polyethylene, polypropylene, Polyester, Teflon
- Unsuitable Materials and  
Coatings

: Natural Rubber, butyl rubber, Ethylene-propylene-diene monomer (EPDM),  
Polystyrene

7.3 Specific end use(s)

- Recommendations

: Not available.
- Industrial sector specific  
solutions

: Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
Isopentane	<b>EH40/2005 WELs (United Kingdom (UK), 1/2020)</b> TWA 8 hours: 600 ppm. TWA 8 hours: 1800 mg/m³. <b>EU OEL (Europe, 1/2022)</b> TWA 8 hours: 3000 mg/m³. TWA 8 hours: 1000 ppm. <b>ACGIH TLV (United States, 1/2024) [Pentane]</b> TWA 8 hours: 1000 ppm.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

- Recommended monitoring  
procedures

: Reference should be made to monitoring standards, such as the following: British Standard BS EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) British Standard BS EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) British Standard BS EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name

2-methylbutane

Result

- DNEL - General population - Long term - Inhalation**

643 mg/m³

Effects: Systemic
- DNEL - General population - Long term - Dermal**

214 mg/kg bw/day

Effects: Systemic
- DNEL - Workers - Long term - Inhalation**

3000 mg/m³

Effects: Systemic

**SECTION 8: Exposure controls/personal protection****DNEL - General population - Long term - Oral**

214 mg/kg bw/day

Effects: Systemic**DNEL - Workers - Long term - Dermal**

432 mg/kg bw/day

Effects: Systemic**PNECs**

Not available.

**8.2 Exposure controls****Appropriate engineering controls**

- : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

**Environmental exposure controls**

- : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

**Individual protection measures****Hygiene measures**

- : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection**

- : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

**Skin protection****Hand protection**

- : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. > 8 hours (breakthrough time): Nitrile, minimum 0.38 mm thickness or comparable protective barrier material  
CEN standards EN 420 and EN 374 provide general requirements and lists of glove types.

**Body protection**

- : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

**Other skin protection**

- : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Respiratory protection**

- : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Recommended: organic vapour filter (Type AX)



SECTION 8: Exposure controls/personal protection

Environmental exposure controls : European Committee for Standardization (CEN) standards EN 136, 140 and 405 provide respirator masks and EN 149 and 143 provide filter recommendations. Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Section 9. Physical and chemical properties and safety characteristics

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information. The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1 Information on basic physical and chemical properties

Appearance

- Physical state : Liquid. [Clear]
- Colour : Colourless
- Odour : Slight
- Odour threshold : Not available.
- pH : Not applicable.
- Melting point/freezing point : Not available.
- Boiling point or initial boiling point and boiling range : 27 to 28°C (80.6 to 82.4°F) [In-house method ,]
- Flash point : Closed cup: -55°C (-67°F) [Calculated]
- Evaporation rate : 61 (butyl acetate = 1) [In-house method ,]
- Flammability : Flammable liquids - Category 1
- Lower and upper explosive (flammable) limits : Lower: 1.4% [Extrapolated]  
Upper: 8% [In-house method ,]
- Vapour pressure : 585.05 mm Hg [20 °C] [Calculated]
- Relative vapour density : 2.5 [Air = 1] [In-house method ,]
- Relative density : 0.62 [Calculated]
- Density : 0.62 g/cm³ [15°C (59°F)] [ISO 12185]
- Solubility in water : Negligible
- Partition coefficient: n-octanol/ water : <4 [Estimated]
- Auto-ignition temperature : 369°C (696.2°F) [ASTM E659]
- Decomposition temperature : Not available.
- Viscosity : 0.4 cSt [20 °C] [ASTM D341]
- Molecular weight : 72
- Particle characteristics
- Median particle size : Not applicable.
- Pour point : <-20°C [Calculated]
- Hygroscopic : No
- Coefficient of Thermal Expansion : 0.00166 per Deg C

SECTION 10: Stability and reactivity

- 10.1 Reactivity

: No specific test data related to reactivity available for this product or its ingredients.
- 10.2 Chemical stability

: The product is stable.
- 10.3 Possibility of hazardous reactions

: Under normal conditions of storage and use, hazardous reactions will not occur.
- 10.4 Conditions to avoid

: Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapour to accumulate in low or confined areas.
- 10.5 Incompatible materials


: Reactive or incompatible with the following materials:.,oxidising materials,Strong oxidisers
- 10.6 Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result
 -methylbutane	<b>Rat - Oral - LD50</b> >2000 mg/kg  <b>Rat - Inhalation - LC50 Vapour</b> >25.3 mg/l [4 hours]

Conclusion/Summary

- Inhalation

: Minimally Toxic. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 403
- Dermal

: Minimally Toxic. No end point data for material.
- Oral

: Minimally Toxic. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 423

Acute toxicity estimates

N/A

Irritation/Corrosion

Conclusion/Summary

- Skin

: May dry the skin leading to discomfort and dermatitis. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 404
- Eyes

: May cause mild, short-lasting discomfort to eyes. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 405
- Respiratory

: Negligible hazard at ambient/normal handling temperatures. No end point data for material.

Respiratory or skin sensitization

Conclusion/Summary

- Skin

: Not expected to be a skin sensitizer. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 406
- Respiratory

: Not expected to be a respiratory sensitizer. No end point data for material.

Mutagenicity

SECTION 11: Toxicological information

**Conclusion/Summary** : Not expected to be a germ cell mutagen. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 471 473 474

Carcinogenicity

**Conclusion/Summary** : Not expected to cause cancer. No end point data for material.

Reproductive toxicity

**Conclusion/Summary** : Not expected to be a reproductive toxicant. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 414 416

Specific target organ toxicity (single exposure)

**Conclusion/Summary** : May cause drowsiness or dizziness. No end point data for material.

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Target organs
2-methylbutane	Not applicable.	-

**Conclusion/Summary** : Not expected to cause organ damage from prolonged or repeated exposure. Data available. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 413

Aspiration hazard

Product/ingredient name	Result
2-methylbutane	Category 1

**Conclusion/Summary** : May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material. Data available.

**Information on likely routes of exposure** : Not available.

Other information

**Product** : Prolonged and/or repeated skin contact with low viscosity materials may defat the skin resulting in possible irritation and dermatitis. Vapour concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anaesthetic and may have other central nervous system effects. Exposure to this material, or one of its components, in situations where there is the potential for high levels, such as in confined spaces or with abuse, may result in abnormal heart rhythm (arrhythmia). High-level exposure to hydrocarbons (above occupational exposure limits) may initiate arrhythmia in a worker that is undergoing stress or is taking a heart-stimulating substance such as epinephrine, a nasal decongestant, or an asthma or cardiovascular drug. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Section 12. Ecological information

The information given is based on data for the material, components of the material, or for similar materials, through the application of bridging principals.

12.1 Toxicity

Product/ingredient name	Result
2-methylbutane	<b>Acute - NOEC</b> Algae - <i>Pseudokirchneriella subcapitata</i> 7.51 mg/l - data for similar materials [72 hours]  <b>Acute - LC50</b> Fish - <i>Oncorhynchus mykiss</i> 4.26 mg/l - data for similar materials [96 hours]  <b>Acute - EC50</b> daphnia - <i>Daphnia magna</i>

## Section 12. Ecological information

2.3 mg/l - data for similar materials [48 hours]

**Acute - EC50**Algae - *Pseudokirchneriella subcapitata*

10.7 mg/l - data for similar materials [72 hours]

**Conclusion/Summary****Acute toxicity** : Toxic to aquatic life.**Chronic toxicity** : Toxic to aquatic life with long lasting effects.**12.2 Persistence and degradability**

Product/ingredient name	Result
2-methylbutane	Ready Biodegradability 71.4% [28 days]

**Photolysis** : 2.3 day(s) data for similar materials**Biodegradability** : Material -- Available OECD 301F biodegradation data indicate that material is readily biodegradable (=60% in 28 days).**Hydrolysis** : Material -- Transformation due to hydrolysis not expected to be significant.**Photolysis** : Material -- Transformation due to photolysis not expected to be significant.**Atmospheric Oxidation** : Material -- Expected to degrade rapidly in air**12.3 Bioaccumulative potential**

Not determined.

**12.4 Mobility in soil****Mobility** : Material -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.**12.5 Results of PBT and vPvB assessment**

According to the results of its assessment, this substance is not a PBT or a vPvB.

**12.6 Other adverse effects****Other adverse effects** : No known significant effects or critical hazards.

## SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

**13.1 Waste treatment methods****Product**

**Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

**Hazardous waste** : The classification of the product may meet the criteria for a hazardous waste.

**Packaging**





**Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

SECTION 13: Disposal considerations

Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

**Special precautions** : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	UN1265	UN1265	UN1265	UN1265
14.2 UN proper shipping name	PENTANES	PENTANES	PENTANES	Pentanes
14.3 Transport hazard class(es)	3 	3 	3 	3 
14.4 Packing group	I	I	I	I
14.5 Environmental hazards	Yes.	Yes.	Yes.	Yes. The environmentally hazardous substance mark is not required.

Additional information

**ADR/RID** : The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.  
**Hazard identification number** 33  
**Limited quantity** 0  
**Tunnel code** (D/E)

**ADN** : The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.  
N2

**IMDG** : The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.  
**Emergency schedules** F-E, S-D  
Flash point -55 °C C.C.

**IATA** : The environmentally hazardous substance mark may appear if required by other transportation regulations.  
**Quantity limitation** Passenger and Cargo Aircraft: 1 L. Packaging instructions: 351. Cargo Aircraft Only: 30 L. Packaging instructions: 361. Limited Quantities - Passenger Aircraft: Forbidden. Packaging instructions: Forbidden.

EXXSOL™ ISOPENTANE T

## SECTION 14: Transport information

**14.6 Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**14.7 Transport in bulk according to IMO instruments**

<b>Proper shipping name</b>	: Pentane (all isomers)
<b>Remarks</b>	: <b>Liquid bulk cargoes:</b> Ship type: 3 Pollution category: Y

## SECTION 15: Regulatory information

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**  
**UK (GB)/REACH**

**Annex XIV - List of substances subject to authorisation**

**Annex XIV**

None of the components are listed.

**Substances of very high concern**

None of the components are listed.

**Ozone depleting substances**

Not listed.

**Prior Informed Consent (PIC)**

Not listed.

**Persistent Organic Pollutants**

Not listed.

**Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles** : 3, 40

**Seveso Directive**

This product is controlled under the Seveso Directive.

**Danger criteria**

**Category**

 5a

E2

**EU regulations**

**Industrial emissions (integrated pollution prevention and control) - Air** : Not listed

**Industrial emissions (integrated pollution prevention and control) - Water** : Not listed

**Inventory list**

<b>Australia inventory (AIIIC)</b>	: All components are listed or exempted.
<b>Canada inventory (DSL-NDSL)</b>	: All components are listed or exempted.
<b>China inventory (IECSC)</b>	: All components are listed or exempted.
<b>Japan inventory (CSCL)</b>	: All components are listed or exempted.



## SECTION 15: Regulatory information

Japan inventory (Industrial Safety and Health Act)	: All components are listed or exempted.
New Zealand Inventory of Chemicals (NZIoC)	: All components are listed or exempted.
Philippines inventory (PICCS)	: All components are listed or exempted.
Korea inventory (KECI)	: All components are listed or exempted.
Taiwan Chemical Substances Inventory (TCSI)	: All components are listed or exempted.
United States inventory (TSCA 8b)	: All components are active or exempted.

15.2 Chemical safety assessment	: This product contains substances for which Chemical Safety Assessments are still required.
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## SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms	: ATE = Acute Toxicity Estimate GB CLP = UK CLP (EC No 1272/2008) on the Classification, Labelling and Packaging of Substances and Mixtures as amended by (EU Exit) Regulations 2019 No. 720 and amendments DMEL = Derived Minimal Effect Level DNEL = Derived No Effect Level EUH statement = GB CLP-specific Hazard statement N/A = Not available PBT = Persistent, Bioaccumulative and Toxic PNEC = Predicted No Effect Concentration RRN = REACH Registration Number SGG = Segregation Group vPvB = Very Persistent and Very Bioaccumulative
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### Procedure used to derive the classification

Classification	Justification
Flam. Liq. 1, H224 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411	On basis of test data Calculation method Calculation method Calculation method

### Full text of abbreviated H statements

H224	Extremely flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H336	May cause drowsiness or dizziness.
H411	Toxic to aquatic life with long lasting effects.
EUH066	Repeated exposure may cause skin dryness or cracking.

### Full text of classifications

Aquatic Chronic 2	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2
Asp. Tox. 1	ASPIRATION HAZARD - Category 1
Flam. Liq. 1	FLAMMABLE LIQUIDS - Category 1
STOT SE 3	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3

Date of issue/ Date of revision	: 19 August 2025
Date of previous issue	: 29 January 2025
Version	: 1.04
Product code	: 1168358_13527858

### Notice to reader

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SECTION 16: Other information

"The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available from ExxonMobil. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to insure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, re-publication or retransmission of this document, in whole or in part, is not permitted. The term, ""ExxonMobil"" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest."

## Annex to the extended Safety Data Sheet (eSDS)

Industrial

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Manufacture of substance

**List of use descriptors** : **Identified use name:** Manufacture of substance  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15  
**Sector of end use:** SU03, SU08, SU09, SU10  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC01, ERC04

**Environmental contributing scenarios** : **General exposures** - ERC01, ERC04

**Health Contributing scenarios** : **General measures applicable to all activities** - PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC15  
**General exposures (closed systems)** - PROC01, PROC02, PROC03  
**General exposures (open systems)** - PROC04  
**Process sampling** - PROC08b  
**Laboratory activities** - PROC15  
**Bulk transfers** - PROC08b  
**Equipment cleaning and maintenance** - PROC08a  
**Storage** - PROC01, PROC02

**Processes and activities covered by the exposure scenario** : Manufacture of the substance or use as an intermediate, process chemical or extracting agent. Includes recycling/ recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.

**Amounts used** : Annual site tonnage (tonnes/year): 37 000 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 1  
Maximum daily site tonnage (kg/day): 120 000 kg/day  
Regional use tonnage (tonnes/year): 37 000 tonnes/year

**Frequency and duration of use** : Continuous release  
Emission days (days per year): 300 days per year

**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100

**Other operational conditions of use affecting environmental exposure** : Release fraction to air from process (initial release prior to RMM): 0.05  
Release fraction to soil from process (initial release prior to RMM): 0.0001  
Release fraction to wastewater from process (initial release prior to RMM): 0.003

**Technical conditions and measures at process level (source) to prevent release** : Common practices vary across sites thus conservative process release estimates used.

<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	: If discharging to municipal sewage treatment plant, no on-site wastewater treatment required. If discharging to municipal sewage treatment plant, provide the required on-site wastewater removal efficiency of =: 0 % Risk from environmental exposure is driven by freshwater. Treat air emission to provide a typical removal efficiency of: 90 % Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 91.9 %
<b>Organisational measures to prevent/limit release from site</b>	: Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>	: Assumed domestic sewage treatment plant flow: 10 000 m <sup>3</sup> /day Estimated substance removal from wastewater via municipal sewage treatment: 96 % Maximum allowable site tonnage (MSafe) (kg/d):: [Assumed domestic sewage treatment plant flow]: 250 000 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96 %
<b>Conditions and measures related to external treatment of waste for disposal</b>	: During manufacturing, no waste of the substance is generated.
<b>Conditions and measures related to external recovery of waste</b>	: During manufacturing, no waste of the substance is generated.

### Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

#### General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 3: General exposures (closed systems)**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 4: General exposures (open systems)**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 5: Process sampling**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 6: Laboratory activities**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 7: Bulk transfers**

Open systems/Closed systems

**Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 8: Equipment cleaning and maintenance****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 9: Storage****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Section 3 - Exposure estimation and reference to its source****Website:** : Not applicable.**Exposure estimation and reference to its source - Environment: 1: General exposures****Exposure assessment (environment):** : Hydrocarbon Block Method (Petrisk)**Exposure estimation and reference to its source** : ESVOC SPERC 1.1.v1**Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities****Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.



**Exposure estimation and reference to its source - Workers: 3: General exposures (closed systems)**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 4: General exposures (open systems)**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 5: Process sampling**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 6: Laboratory activities**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 7: Bulk transfers**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 8: Equipment cleaning and maintenance**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 9: Storage**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

- Environment** : Further details on scaling and control technologies are provided in SPERC factsheet. 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.  
Maximum Risk Characterization Ratios for air emissions 0.00074  
Maximum Risk Characterisation Ratios for waste water emissions 0.49  
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.  
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.  
Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet.
- Health** : 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.  
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH CSA**

Environment : Not available.

Health : Not available.

## Annex to the extended Safety Data Sheet (eSDS)

Industrial

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Distribution of substance

**List of use descriptors** : **Identified use name:** Distribution of substance  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09, PROC15  
**Sector of end use:** SU03, SU08, SU09  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC01, ERC02, ERC03, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07

**Environmental contributing scenarios** : **General exposures** - ERC01, ERC02, ERC03, ERC04, ERC05, ERC06a, ERC06b, ERC06c, ERC06d, ERC07

**Health Contributing scenarios** : **General measures applicable to all activities** - PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09, PROC15  
**General exposures (closed systems)** - PROC01, PROC02, PROC03  
**General exposures (open systems)** - PROC04  
**Process sampling** - PROC03  
**Laboratory activities** - PROC15  
**Bulk transfers** - PROC08b  
**Drum and small package filling** - PROC09  
**Equipment cleaning and maintenance** - PROC08a  
**Storage** - PROC01, PROC02

<b>Processes and activities covered by the exposure scenario</b>	: Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.
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### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.

**Amounts used** : Annual site tonnage (tonnes/year): 23 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 0.002  
Maximum daily site tonnage (kg/day): 1 100 kg/day  
Regional use tonnage (tonnes/year): 11 000 tonnes/year

**Frequency and duration of use** : Continuous release  
Emission days (days per year): 20 days per year

**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100

**Other operational conditions of use affecting environmental exposure** : Release fraction to air from process (initial release prior to RMM): 0.001  
Release fraction to soil from process (initial release prior to RMM): 0.00001  
Release fraction to wastewater from process (initial release prior to RMM): 0.00001

**Technical conditions and measures at process level (source) to prevent release** : Common practices vary across sites thus conservative process release estimates used.

<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	: If discharging to municipal sewage treatment plant, provide the required on-site wastewater removal efficiency of =: 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emission to provide a typical removal efficiency of: 90 % Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 0 %
<b>Organisational measures to prevent/limit release from site</b>	: Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>	: Assumed domestic sewage treatment plant flow: 2 000 m <sup>3</sup> /day Estimated substance removal from wastewater via municipal sewage treatment: 96 % Not applicable as there is no release to wastewater. Maximum allowable site tonnage (MSafe) (kg/d):: [Assumed domestic sewage treatment plant flow]: 7 600 000 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96 %
<b>Conditions and measures related to external treatment of waste for disposal</b>	: External treatment and disposal of waste should comply with applicable local and/or national regulations.
<b>Conditions and measures related to external recovery of waste</b>	: External recovery and recycling of waste should comply with applicable local and/or national regulations.

### Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

#### General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances.

Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.

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

<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented
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**Contributing scenario controlling worker exposure for 3: General exposures (closed systems)**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 4: General exposures (open systems)**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 5: Process sampling**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 6: Laboratory activities**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 7: Bulk transfers**

Open systems/Closed systems

**Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 8: Drum and small package filling****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 9: Equipment cleaning and maintenance****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 10: Storage****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented



### Section 3 - Exposure estimation and reference to its source

<b>Website:</b>	: Not applicable.
<b>Exposure estimation and reference to its source - Environment: 1: General exposures</b>	
<b>Exposure assessment (environment):</b>	: Hydrocarbon Block Method (Petrorisk)
<b>Exposure estimation and reference to its source</b>	: ESVOC SPERC 1.1b.v1
<b>Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 3: General exposures (closed systems)</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 4: General exposures (open systems)</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 5: Process sampling</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 6: Laboratory activities</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 7: Bulk transfers</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 8: Drum and small package filling</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 9: Equipment cleaning and maintenance</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 10: Storage**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

- Environment** : Further details on scaling and control technologies are provided in SPERC factsheet. 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.  
Maximum Risk Characterization Ratios for air emissions 0.000000072  
Maximum Risk Characterisation Ratios for waste water emissions 0.00015  
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.  
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
- Health** : 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.  
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH CSA**

- Environment** : Not available.
- Health** : Not available.

## Annex to the extended Safety Data Sheet (eSDS)

Industrial

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Formulation and (re)packing of substances and mixtures

**List of use descriptors** : **Identified use name:** Formulation and (re)packing of substances and mixtures  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC14, PROC15  
**Sector of end use:** SU03, SU10  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC02

**Environmental contributing scenarios** : **General exposures** - ERC02

**Health Contributing scenarios** : **General measures applicable to all activities** - PROC01, PROC02, PROC03, PROC04, PROC05, PROC08a, PROC08b, PROC09, PROC14, PROC15  
**General exposures (closed systems)** - PROC01, PROC02, PROC03  
**General exposures (open systems)** - PROC04  
**Batch processes at elevated temperatures** - PROC03  
**Process sampling** - PROC03  
**Laboratory activities** - PROC15  
**Bulk transfers** - PROC08b  
**Mixing operations (open systems)** - PROC05  
**Transfer from/pouring from containers** - PROC08a  
**Drum/batch transfers** - PROC08b  
**Production of preparation or articles by tableting, compression, extrusion or pelletisation** - PROC14  
**Drum and small package filling** - PROC09  
**Equipment cleaning and maintenance** - PROC08a  
**Storage** - PROC01, PROC02

**Processes and activities covered by the exposure scenario** : Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.

**Amounts used** : Annual site tonnage (tonnes/year): 11 000 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 1  
Maximum daily site tonnage (kg/day): 37 000 kg/day  
Regional use tonnage (tonnes/year): 11 000 tonnes/year

**Frequency and duration of use** : Continuous release  
Emission days (days per year): 300 days per year

**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100

<b>Other operational conditions of use affecting environmental exposure</b>	: Release fraction to air from process (initial release prior to RMM): 0.025 Release fraction to soil from process (initial release prior to RMM): 0.0001 Release fraction to wastewater from process (initial release prior to RMM): 0.002
<b>Technical conditions and measures at process level (source) to prevent release</b>	: Common practices vary across sites thus conservative process release estimates used.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	: If discharging to municipal sewage treatment plant, no on-site wastewater treatment required. If discharging to municipal sewage treatment plant, provide the required on-site wastewater removal efficiency of =: 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emission to provide a typical removal efficiency of: 0 % Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 92 %
<b>Organisational measures to prevent/limit release from site</b>	: Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>	: Assumed domestic sewage treatment plant flow: 2 000 m <sup>3</sup> /day Estimated substance removal from wastewater via municipal sewage treatment: 96 % Not applicable as there is no release to wastewater. Maximum allowable site tonnage (MSafe) (kg/d):: [Assumed domestic sewage treatment plant flow]: 75 000 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96 %
<b>Conditions and measures related to external treatment of waste for disposal</b>	: External treatment and disposal of waste should comply with applicable local and/or national regulations.
<b>Conditions and measures related to external recovery of waste</b>	: External recovery and recycling of waste should comply with applicable local and/or national regulations.

### Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

#### General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 3: General exposures (closed systems)**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 4: General exposures (open systems)**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 5: Batch processes at elevated temperatures**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Operation is carried out at elevated temperature (> 20°C above ambient temperature)

**Technical conditions and measures at process level (source) to prevent release** : Formulate in enclosed or ventilated mixing vessels

**Ventilation control measures** : Provide a good standard of controlled ventilation (10 to 15 air changes per hour).

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 6: Process sampling**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 7: Laboratory activities**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 8: Bulk transfers**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 9: Mixing operations (open systems)**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented



**Contributing scenario controlling worker exposure for 10: Transfer from/pouring from containers**

Manual

**Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 11: Drum/batch transfers****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 12: Production of preparation or articles by tableting, compression, extrusion or pelletisation****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 13: Drum and small package filling****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 14: Equipment cleaning and maintenance**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 15: Storage**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Section 3 - Exposure estimation and reference to its source**

**Website:** : Not applicable.

**Exposure estimation and reference to its source - Environment: 1: General exposures**

<b>Exposure assessment (environment):</b>	: Hydrocarbon Block Method (Petrisk)
<b>Exposure estimation and reference to its source</b>	: ESVOC SPERC 2.2.v1

**Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 3: General exposures (closed systems)**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 4: General exposures (open systems)**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 5: Batch processes at elevated temperatures**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 6: Process sampling**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 7: Laboratory activities**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 8: Bulk transfers**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 9: Mixing operations (open systems)**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 10: Transfer from/pouring from containers**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 11: Drum/batch transfers**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 12: Production of preparation or articles by tableting, compression, extrusion or pelletisation**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 13: Drum and small package filling**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 14: Equipment cleaning and maintenance**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 15: Storage**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

- Environment** : Further details on scaling and control technologies are provided in SPERC factsheet. 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.  
Maximum Risk Characterization Ratios for air emissions 0.0011  
Maximum Risk Characterisation Ratios for waste water emissions 0.5  
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.  
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
- Health** : 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.  
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH CSA**

- Environment** : Not available.
- Health** : Not available.

## Annex to the extended Safety Data Sheet (eSDS)

Industrial

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Use in coatings - Industrial

**List of use descriptors** : **Identified use name:** Use in coatings - Industrial  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC15  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC04

**Environmental contributing scenarios** : **General exposures** - ERC04

**Health Contributing scenarios** : **General measures applicable to all activities** - PROC01, PROC02, PROC03, PROC04, PROC05, PROC07, PROC08a, PROC08b, PROC09, PROC10, PROC13, PROC14, PROC15  
**General exposures (closed systems)** - PROC01, PROC02  
**Film formation - force drying, stoving and other technologies** - PROC02  
**Mixing operations (closed systems)** - PROC03  
**Film formation - air drying** - PROC04  
**Preparation of material for application** - PROC05  
**Spraying (automatic/robotic)** - PROC07  
**Manual spraying** - PROC07  
**Material transfers** - PROC08a, PROC08b  
**Roller, spreader, flow application** - PROC10  
**Dipping, immersion and pouring** - PROC13  
**Laboratory activities** - PROC15  
**Drum/batch transfers** - PROC09  
**Production of preparation or articles by tableting, compression, extrusion or pelletisation** - PROC14  
**Equipment cleaning and maintenance** - PROC08a  
**Storage** - PROC01

**Processes and activities covered by the exposure scenario** : Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.

**Amounts used** : Annual site tonnage (tonnes/year): 0.6 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 1  
Maximum daily site tonnage (kg/day): 30 kg/day  
Regional use tonnage (tonnes/year): 0.6 tonnes/year

**Frequency and duration of use** : Continuous release  
Emission days (days per year): 20 days per year

<b>Environment factors not influenced by risk management</b>	: Local freshwater dilution factor: 10 Local marine water dilution factor: 100
<b>Other operational conditions of use affecting environmental exposure</b>	: Release fraction to air from process (initial release prior to RMM): 0.98 Release fraction to soil from process (initial release prior to RMM): 0 Release fraction to wastewater from process (initial release prior to RMM): 0.007
<b>Technical conditions and measures at process level (source) to prevent release</b>	: Common practices vary across sites thus conservative process release estimates used.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	: If discharging to municipal sewage treatment plant, provide the required on-site wastewater removal efficiency of =: >=0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emission to provide a typical removal efficiency of: 90 % Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: >=0 %
<b>Organisational measures to prevent/limit release from site</b>	: Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>	: Assumed domestic sewage treatment plant flow: 2 000 m <sup>3</sup> /day Estimated substance removal from wastewater via municipal sewage treatment: 96 % Not applicable as there is no release to wastewater. Maximum allowable site tonnage (MSafe) (kg/d):: [Assumed domestic sewage treatment plant flow]: 21 000 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96 %
<b>Conditions and measures related to external treatment of waste for disposal</b>	: External treatment and disposal of waste should comply with applicable local and/or national regulations.
<b>Conditions and measures related to external recovery of waste</b>	: External recovery and recycling of waste should comply with applicable local and/or national regulations.

### Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

#### General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances.

Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)



**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 3: General exposures (closed systems)**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

**Technical conditions and measures at process level (source) to prevent release** : Handle substance within a closed system.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 4: Film formation - force drying, stoving and other technologies**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Operation is carried out at elevated temperature (> 20°C above ambient temperature)

**Technical conditions and measures at process level (source) to prevent release** : Handle substance within a closed system.

**Ventilation control measures** : Provide a good standard of controlled ventilation (10 to 15 air changes per hour).

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 5: Mixing operations (closed systems)**

General exposures (closed systems)

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

**Technical conditions and measures at process level (source) to prevent release** : Handle substance within a closed system.

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



**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 6: Film formation - air drying

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 7: Preparation of material for application

Mixing operations (open systems)

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 8: Spraying (automatic/robotic)

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 9: Manual spraying

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 10: Material transfers**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 11: Roller, spreader, flow application**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 12: Dipping, immersion and pouring**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Organisational measures to prevent/limit releases, dispersion and exposure</b>	: Avoid manual contact with wet work pieces.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 13: Laboratory activities**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 14: Drum/batch transfers**

Material transfers/Transfer from/pouring from containers

**Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 15: Production of preparation or articles by tableting, compression, extrusion or pelletisation****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 16: Equipment cleaning and maintenance****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 17: Storage****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

### Section 3 - Exposure estimation and reference to its source

<b>Website:</b>	: Not applicable.
<b>Exposure estimation and reference to its source - Environment: 1: General exposures</b>	
<b>Exposure assessment (environment):</b>	: Hydrocarbon Block Method (Petrorisk)
<b>Exposure estimation and reference to its source</b>	: ESVOC SPERC 4.3a.v1
<b>Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Not available.
<b>Exposure estimation and reference to its source - Workers: 3: General exposures (closed systems)</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Not available.
<b>Exposure estimation and reference to its source - Workers: 4: Film formation - force drying, stoving and other technologies</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Not available.
<b>Exposure estimation and reference to its source - Workers: 5: Mixing operations (closed systems)</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Not available.
<b>Exposure estimation and reference to its source - Workers: 6: Film formation - air drying</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Not available.
<b>Exposure estimation and reference to its source - Workers: 7: Preparation of material for application</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Not available.
<b>Exposure estimation and reference to its source - Workers: 8: Spraying (automatic/robotic)</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Not available.
<b>Exposure estimation and reference to its source - Workers: 9: Manual spraying</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Not available.

**Exposure estimation and reference to its source - Workers: 10: Material transfers**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 11: Roller, spreader, flow application**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 12: Dipping, immersion and pouring**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 13: Laboratory activities**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 14: Drum/batch transfers**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 15: Production of preparation or articles by tableting, compression, extrusion or pelletisation**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 16: Equipment cleaning and maintenance**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 17: Storage**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

**Environment** : Further details on scaling and control technologies are provided in SPERC factsheet. 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.

Maximum Risk Characterization Ratios for air emissions 0.00000029

Maximum Risk Characterisation Ratios for waste water emissions 0.0014

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

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

Health	: Available hazard data do not support the need for a DNEL to be established for other health effects. Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Risk management measures are based on qualitative risk characterisation. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
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**Additional good practice advice beyond the REACH CSA**

Environment	: Not available.
Health	: Not available.

## Annex to the extended Safety Data Sheet (eSDS)

Industrial

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Use in cleaning agents - Industrial

**List of use descriptors** : **Identified use name:** Use in cleaning agents - Industrial  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC07, PROC08a, PROC08b, PROC10, PROC13  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC04

**Environmental contributing scenarios** : **General exposures** - ERC04

**Health Contributing scenarios** : **General measures applicable to all activities** - PROC01, PROC02, PROC03, PROC04, PROC07, PROC08a, PROC08b, PROC10, PROC13  
**Bulk transfers** - PROC08a  
**Automated process with (semi) closed systems** - PROC02, PROC03  
**Application of cleaning products in closed systems** - PROC02  
**Filling/preparation of equipment from drums or containers.** - PROC08b  
**Use in contained batch processes** - PROC04  
**Degreasing small objects in cleaning station** - PROC13  
**Cleaning with low-pressure washers** - PROC10  
**Cleaning with high pressure washers** - PROC07  
**Surface cleaning** - PROC10  
**Storage** - PROC01

**Processes and activities covered by the exposure scenario** : Covers the use as a component of cleaning products including transfer from storage, pouring/unloading from drums or containers. Exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping, automated and by hand), related equipment cleaning and maintenance.

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.

**Amounts used** : Annual site tonnage (tonnes/year): 5.3 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 1  
Maximum daily site tonnage (kg/day): 220 kg/day  
Regional use tonnage (tonnes/year): 4.3 tonnes/year

**Frequency and duration of use** : Continuous release  
Emission days (days per year): 20 days per year

**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100

**Other operational conditions of use affecting environmental exposure** : Release fraction to air from process (initial release prior to RMM): 1  
Release fraction to soil from process (initial release prior to RMM): 0  
Release fraction to wastewater from process (initial release prior to RMM): 0.00003

**Technical conditions and measures at process level (source) to prevent release** : Common practices vary across sites thus conservative process release estimates used.

**Date of issue/Date of revision** : 1/26/2022

46/109



<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	: If discharging to municipal sewage treatment plant, provide the required on-site wastewater removal efficiency of =: 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emission to provide a typical removal efficiency of: 70 % Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 0 %
<b>Organisational measures to prevent/limit release from site</b>	: Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>	: Assumed domestic sewage treatment plant flow: 2 000 m <sup>3</sup> /day Estimated substance removal from wastewater via municipal sewage treatment: 96 % Not applicable as there is no release to wastewater. Maximum allowable site tonnage (MSafe) (kg/d):: [Assumed domestic sewage treatment plant flow]: 1 800 000 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96 %
<b>Conditions and measures related to external treatment of waste for disposal</b>	: External treatment and disposal of waste should comply with applicable local and/or national regulations.
<b>Conditions and measures related to external recovery of waste</b>	: External recovery and recycling of waste should comply with applicable local and/or national regulations.

### Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

#### General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 3: Bulk transfers**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 4: Automated process with (semi) closed systems**

Use in contained systems/Drum/batch transfers

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 5: Application of cleaning products in closed systems**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 6: Filling/preparation of equipment from drums or containers.**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 7: Use in contained batch processes****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 8: Degreasing small objects in cleaning station****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 9: Cleaning with low-pressure washers****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 10: Cleaning with high pressure washers****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 11: Surface cleaning**

Manual

**Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 12: Storage****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Section 3 - Exposure estimation and reference to its source****Website:** : Not applicable.**Exposure estimation and reference to its source - Environment: 1: General exposures****Exposure assessment (environment):** : Hydrocarbon Block Method (Petrisk)**Exposure estimation and reference to its source** : ESVOG SPERC 4.4a.v1**Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities****Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.**Exposure estimation and reference to its source - Workers: 3: Bulk transfers****Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.**Exposure estimation and reference to its source - Workers: 4: Automated process with (semi) closed systems****Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 5: Application of cleaning products in closed systems**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 6: Filling/preparation of equipment from drums or containers.**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 7: Use in contained batch processes**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 8: Degreasing small objects in cleaning station**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 9: Cleaning with low-pressure washers**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 10: Cleaning with high pressure washers**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 11: Surface cleaning**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 12: Storage**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

- Environment** : Further details on scaling and control technologies are provided in SPERC factsheet. 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.  
Maximum Risk Characterization Ratios for air emissions 0.0000049  
Maximum Risk Characterisation Ratios for waste water emissions 0.00012  
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.  
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Health	: 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. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
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**Additional good practice advice beyond the REACH CSA**

Environment	: Not available.
Health	: Not available.

## Annex to the extended Safety Data Sheet (eSDS)

Industrial

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Blowing agents

**List of use descriptors** : **Identified use name:** Blowing agents  
**Process Category:** PROC01, PROC02, PROC03, PROC08b, PROC09, PROC12  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC04

**Environmental contributing scenarios** : **General exposures** - ERC04

**Health Contributing scenarios** : **General measures applicable to all activities** - PROC01, PROC02, PROC03, PROC08b, PROC09, PROC12  
**Bulk transfers** - PROC08b  
**Mixing operations (closed systems)** - PROC01  
**Extrusion and expansion of polymer mass** - PROC12  
**Cutting and shaving** - PROC12  
**Collection and re-processing of shavings, cuttings, etc** - PROC12  
**Product packaging** - PROC12  
**Storage** - PROC12  
**Mixing operations** - PROC03  
**Intermediate polymer storage** - PROC03  
**Centrifuging including discharging** - PROC03  
**Drying and storage** - PROC12  
**Semi-bulk packaging** - PROC08b  
**Treatment by heating** - PROC12  
**Article formation in mould** - PROC12  
**Cutting by heated wire** - PROC12  
**Drum and small package filling** - PROC09  
**Foaming** - PROC12  
**Compression** - PROC12

**Processes and activities covered by the exposure scenario** : Use as a blowing agent for rigid and flexible foams, including material transfers, mixing and injection, curing, cutting, storage and packing.

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.

**Amounts used** : Annual site tonnage (tonnes/year): 960 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 1  
Maximum daily site tonnage (kg/day): 48 000 kg/day  
Regional use tonnage (tonnes/year): 960 tonnes/year

**Frequency and duration of use** : Continuous release  
Emission days (days per year): 20 days per year

**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100

**Date of issue/Date of revision** : 1/28/2022

53/109



<b>Other operational conditions of use affecting environmental exposure</b>	: Release fraction to air from process (initial release prior to RMM): 1 Release fraction to soil from process (initial release prior to RMM): 0 Release fraction to wastewater from process (initial release prior to RMM): 0.0003
<b>Technical conditions and measures at process level (source) to prevent release</b>	: Common practices vary across sites thus conservative process release estimates used.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	: If discharging to municipal sewage treatment plant, no on-site wastewater treatment required. If discharging to municipal sewage treatment plant, provide the required on-site wastewater removal efficiency of =: 0 % Risk from environmental exposure is driven by freshwater. Treat air emission to provide a typical removal efficiency of: 0 % Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 58.6 %
<b>Organisational measures to prevent/limit release from site</b>	: Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>	: Assumed domestic sewage treatment plant flow: 2 000 m <sup>3</sup> /day Estimated substance removal from wastewater via municipal sewage treatment: 96 % Maximum allowable site tonnage (MSafe) (kg/d):: [Assumed domestic sewage treatment plant flow]: 500 000 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96 %
<b>Conditions and measures related to external treatment of waste for disposal</b>	: External treatment and disposal of waste should comply with applicable local and/or national regulations.
<b>Conditions and measures related to external recovery of waste</b>	: External recovery and recycling of waste should comply with applicable local and/or national regulations.

### Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

#### General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances.

Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 3: Bulk transfers**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 4: Mixing operations (closed systems)**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 5: Extrusion and expansion of polymer mass**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 6: Cutting and shaving**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 7: Collection and re-processing of shavings, cuttings, etc**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 8: Product packaging**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 9: Storage**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 10: Mixing operations**

Closed systems

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Operation is carried out at elevated temperature (> 20°C above ambient temperature)
<b>Ventilation control measures</b>	: Provide a good standard of controlled ventilation (10 to 15 air changes per hour).
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 11: Intermediate polymer storage

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Operation is carried out at elevated temperature (> 20°C above ambient temperature)

**Ventilation control measures** : Provide a good standard of controlled ventilation (10 to 15 air changes per hour).

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 12: Centrifuging including discharging

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Operation is carried out at elevated temperature (> 20°C above ambient temperature)

**Ventilation control measures** : Provide a good standard of controlled ventilation (10 to 15 air changes per hour).

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 13: Drying and storage

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 14: Semi-bulk packaging

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 15: Treatment by heating**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Operation is carried out at elevated temperature (> 20°C above ambient temperature)

**Ventilation control measures** : Provide a good standard of controlled ventilation (10 to 15 air changes per hour).

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 16: Article formation in mould**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Operation is carried out at elevated temperature (> 20°C above ambient temperature)

**Ventilation control measures** : Ensure the ventilation system is regularly maintained and tested.  
Provide a good standard of controlled ventilation (10 to 15 air changes per hour).

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 17: Cutting by heated wire**

Manual

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 18: Drum and small package filling**

Filling/preparation of equipment from drums or containers.

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 19: Foaming**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 20: Compression**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Section 3 - Exposure estimation and reference to its source**

**Website:** : Not applicable.

**Exposure estimation and reference to its source - Environment: 1: General exposures**

**Exposure assessment (environment):** : Hydrocarbon Block Method (Petrorisk)

**Exposure estimation and reference to its source** : ESVOC SPERC 4.9.v1

**Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.



**Exposure estimation and reference to its source - Workers: 3: Bulk transfers**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 4: Mixing operations (closed systems)**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 5: Extrusion and expansion of polymer mass**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 6: Cutting and shaving**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 7: Collection and re-processing of shavings, cuttings, etc**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 8: Product packaging**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 9: Storage**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 10: Mixing operations**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 11: Intermediate polymer storage**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 12: Centrifuging including discharging**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.



**Exposure estimation and reference to its source - Workers: 13: Drying and storage**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 14: Semi-bulk packaging**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 15: Treatment by heating**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 16: Article formation in mould**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 17: Cutting by heated wire**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 18: Drum and small package filling**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 19: Foaming**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 20: Compression**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

- Environment** : Further details on scaling and control technologies are provided in SPERC factsheet. 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.
- Maximum Risk Characterization Ratios for air emissions 0.0036
- Maximum Risk Characterisation Ratios for waste water emissions 0.096
- Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.
- Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Health	: 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. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
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**Additional good practice advice beyond the REACH CSA**

Environment	: Not available.
Health	: Not available.

## Annex to the extended Safety Data Sheet (eSDS)

Industrial

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Use as a fuel - Industrial

**List of use descriptors** : **Identified use name:** Use as a fuel - Industrial  
**Process Category:** PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC16  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC07

**Environmental contributing scenarios** : **General exposures** - ERC07

**Health Contributing scenarios** : **General measures applicable to all activities** - PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC16  
**Bulk transfers** - PROC08b  
**Drum/batch transfers** - PROC08b  
**General exposures (closed systems)** - PROC01, PROC02, PROC03  
**Use as a fuel** - PROC16  
**Equipment cleaning and maintenance** - PROC08a  
**Vessel and container cleaning** - PROC08a  
**Storage** - PROC01, PROC02

**Processes and activities covered by the exposure scenario** : Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.

**Amounts used** : Annual site tonnage (tonnes/year): 10 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 1  
Maximum daily site tonnage (kg/day): 500 kg/day  
Regional use tonnage (tonnes/year): 10 tonnes/year

**Frequency and duration of use** : Continuous release  
Emission days (days per year): 20 days per year

**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100

**Other operational conditions of use affecting environmental exposure** : Release fraction to air from process (initial release prior to RMM): 0.5  
Release fraction to soil from process (initial release prior to RMM): 0  
Release fraction to wastewater from process (initial release prior to RMM): 0.00001

**Technical conditions and measures at process level (source) to prevent release** : Common practices vary across sites thus conservative process release estimates used.

<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	: If discharging to municipal sewage treatment plant, provide the required on-site wastewater removal efficiency of =: 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emission to provide a typical removal efficiency of: 95 % Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 0 %
<b>Organisational measures to prevent/limit release from site</b>	: Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>	: Assumed domestic sewage treatment plant flow: 2 000 m <sup>3</sup> /day Estimated substance removal from wastewater via municipal sewage treatment: 96 % Maximum allowable site tonnage (MSafe) (kg/d):: [Assumed domestic sewage treatment plant flow]: 4 500 000 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96 %
<b>Conditions and measures related to external treatment of waste for disposal</b>	: Combustion emissions considered in regional exposure assessment. Combustion emissions limited by required exhaust emission controls.
<b>Conditions and measures related to external recovery of waste</b>	: This substance is consumed during use and no waste from the substance is generated.

### Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

#### General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 3: Bulk transfers**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Technical conditions and measures at process level (source) to prevent release</b>	: Handle substance within a closed system.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 4: Drum/batch transfers**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 5: General exposures (closed systems)**

Use in contained batch processes

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Technical conditions and measures at process level (source) to prevent release</b>	: Handle substance within a closed system.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 6: Use as a fuel**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

**Technical conditions and measures at process level (source) to prevent release** : Handle substance within a closed system.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 7: Equipment cleaning and maintenance**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 8: Vessel and container cleaning**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 9: Storage**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

**Technical conditions and measures at process level (source) to prevent release** : Store substance within a closed system.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

### Section 3 - Exposure estimation and reference to its source

<b>Website:</b>	: Not applicable.
<b>Exposure estimation and reference to its source - Environment: 1: General exposures</b>	
<b>Exposure assessment (environment):</b>	: Hydrocarbon Block Method (Petrorisk)
<b>Exposure estimation and reference to its source</b>	: ESVOC SPERC 7.12a.v1
<b>Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 3: Bulk transfers</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 4: Drum/batch transfers</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 5: General exposures (closed systems)</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 6: Use as a fuel</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 7: Equipment cleaning and maintenance</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 8: Vessel and container cleaning</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 9: Storage</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

### Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES



Environment	<p>: Further details on scaling and control technologies are provided in SPERC factsheet. 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.</p> <p>Maximum Risk Characterization Ratios for air emissions 0.00000016</p> <p>Maximum Risk Characterisation Ratios for waste water emissions 0.00011</p> <p>Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.</p> <p>Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>
Health	<p>: Available hazard data do not support the need for a DNEL to be established for other health effects.</p> <p>Risk management measures are based on qualitative risk characterisation.</p> <p>Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</p>

### Additional good practice advice beyond the REACH CSA

Environment	: Not available.
Health	: Not available.

## Annex to the extended Safety Data Sheet (eSDS)

Industrial

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Functional fluids - Industrial

**List of use descriptors** : **Identified use name:** Functional fluids - Industrial  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC07

**Environmental contributing scenarios** : **General exposures** - ERC07

**Health Contributing scenarios** : **General measures applicable to all activities** - PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC09  
**Bulk transfers** - PROC01, PROC02  
**Drum/batch transfers** - PROC08b  
**Filling of articles/equipment** - PROC09  
**Filling/preparation of equipment from drums or containers.** - PROC08a  
**General exposures (closed systems)** - PROC02  
**General exposures (open systems)** - PROC04  
**Remanufacture of reject articles** - PROC09  
**Equipment maintenance** - PROC08a  
**Storage** - PROC01, PROC02

**Processes and activities covered by the exposure scenario** : Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.

**Amounts used** : Annual site tonnage (tonnes/year): 10 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 1  
Maximum daily site tonnage (kg/day): 500 kg/day  
Regional use tonnage (tonnes/year): 46 tonnes/year

**Frequency and duration of use** : Continuous release  
Emission days (days per year): 20 days per year

**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100

**Other operational conditions of use affecting environmental exposure** : Release fraction to air from process (initial release prior to RMM): 0.01  
Release fraction to soil from process (initial release prior to RMM): 0.001  
Release fraction to wastewater from process (initial release prior to RMM): 0.0003

**Technical conditions and measures at process level (source) to prevent release** : Common practices vary across sites thus conservative process release estimates used.

<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	: If discharging to municipal sewage treatment plant, provide the required on-site wastewater removal efficiency of $\approx$ 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater sediment. Treat air emission to provide a typical removal efficiency of: 0 % Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of $\approx$ 0 %
<b>Organisational measures to prevent/limit release from site</b>	: Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>	: Assumed domestic sewage treatment plant flow: 2 000 m <sup>3</sup> /day Estimated substance removal from wastewater via municipal sewage treatment: 96 % Not applicable as there is no release to wastewater. Maximum allowable site tonnage (MSafe) (kg/d):: [Assumed domestic sewage treatment plant flow]:500 000 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96 %
<b>Conditions and measures related to external treatment of waste for disposal</b>	: External treatment and disposal of waste should comply with applicable local and/or national regulations.
<b>Conditions and measures related to external recovery of waste</b>	: External recovery and recycling of waste should comply with applicable local and/or national regulations.

### Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

#### General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 3: Bulk transfers**

Closed systems

**Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 4: Drum/batch transfers****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 5: Filling of articles/equipment**

Closed systems

**Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 6: Filling/preparation of equipment from drums or containers.****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 7: General exposures (closed systems)**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 8: General exposures (open systems)**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Operation is carried out at elevated temperature (> 20°C above ambient temperature)
<b>Ventilation control measures</b>	: Provide a good standard of controlled ventilation (10 to 15 air changes per hour).
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 9: Remanufacture of reject articles**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 10: Equipment maintenance**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 11: Storage**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Section 3 - Exposure estimation and reference to its source**

**Website:** : Not applicable.

**Exposure estimation and reference to its source - Environment: 1: General exposures**

<b>Exposure assessment (environment):</b>	: Hydrocarbon Block Method (Petrorisk)
<b>Exposure estimation and reference to its source</b>	: ESVOC SPERC 7.13a.v1

**Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 3: Bulk transfers**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 4: Drum/batch transfers**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 5: Filling of articles/equipment**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 6: Filling/preparation of equipment from drums or containers.**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 7: General exposures (closed systems)**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 8: General exposures (open systems)**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 9: Remanufacture of reject articles**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 10: Equipment maintenance**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 11: Storage**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

<b>Environment</b>	<p>: Further details on scaling and control technologies are provided in SPERC factsheet. 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.</p> <p>Maximum Risk Characterization Ratios for air emissions 0.00000045</p> <p>Maximum Risk Characterisation Ratios for waste water emissions 0.001</p> <p>Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.</p> <p>Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>
<b>Health</b>	<p>: Available hazard data do not support the need for a DNEL to be established for other health effects.</p> <p>Risk management measures are based on qualitative risk characterisation.</p> <p>Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</p>

**Additional good practice advice beyond the REACH CSA**

<b>Environment</b>	: Not available.
<b>Health</b>	: Not available.



## Annex to the extended Safety Data Sheet (eSDS)

Industrial

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Use in laboratories - Industrial  
**List of use descriptors** : **Identified use name:** Use in laboratories - Industrial  
**Process Category:** PROC10, PROC15  
**Sector of end use:** SU03  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC02, ERC04  
**Environmental contributing scenarios** : **General exposures** - ERC02, ERC04  
**Health Contributing scenarios** : **General measures applicable to all activities** - PROC10, PROC15  
**Laboratory activities** - PROC15  
**Cleaning** - PROC10

**Processes and activities covered by the exposure scenario** : Use of the substance within laboratory settings, including material transfers and equipment cleaning

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.  
**Amounts used** : Annual site tonnage (tonnes/year): 2 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 1  
Maximum daily site tonnage (kg/day): 100 kg/day  
Regional use tonnage (tonnes/year): 5 tonnes/year  
**Frequency and duration of use** : Continuous release  
Emission days (days per year): 20 days per year  
**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100  
**Other operational conditions of use affecting environmental exposure** : Release fraction to air from process (initial release prior to RMM): 0.025  
Release fraction to soil from process (initial release prior to RMM): 0.0001  
Release fraction to wastewater from process (initial release prior to RMM): 0.02  
**Technical conditions and measures at process level (source) to prevent release** : Common practices vary across sites thus conservative process release estimates used.  
**Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil** : If discharging to municipal sewage treatment plant, no on-site wastewater treatment required.  
If discharging to municipal sewage treatment plant, provide the required on-site wastewater removal efficiency of =: 0 %  
No secondary wastewater treatment required.  
Risk from environmental exposure is driven by freshwater sediment.  
Treat air emission to provide a typical removal efficiency of: 0 %  
Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 0 %

<b>Organisational measures to prevent/limit release from site</b>	: Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>	: Assumed domestic sewage treatment plant flow: 2 000 m <sup>3</sup> /day Estimated substance removal from wastewater via municipal sewage treatment: 96 % Not applicable as there is no release to wastewater. Maximum allowable site tonnage (MSafe) (kg/d):: [Assumed domestic sewage treatment plant flow]: 7 500 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96 %
<b>Conditions and measures related to external treatment of waste for disposal</b>	: External treatment and disposal of waste should comply with applicable local and/or national regulations.
<b>Conditions and measures related to external recovery of waste</b>	: External recovery and recycling of waste should comply with applicable local and/or national regulations.

### Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

#### General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

### Contributing scenario controlling worker exposure for 3: Laboratory activities

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 4: Cleaning**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

### Section 3 - Exposure estimation and reference to its source

**Website:** : Not applicable.

**Exposure estimation and reference to its source - Environment: 1: General exposures**

**Exposure assessment (environment):** : Hydrocarbon Block Method (Petrisk)

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 3: Laboratory activities**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 4: Cleaning**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

### Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

**Environment** : 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.  
Maximum Risk Characterization Ratios for air emissions 0.00000034  
Maximum Risk Characterisation Ratios for waste water emissions 0.013  
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.  
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.

Health	: 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. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
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**Additional good practice advice beyond the REACH CSA**

Environment	: Not available.
Health	: Not available.

## Annex to the extended Safety Data Sheet (eSDS)

Professional

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Use in cleaning agents - Professional

**List of use descriptors** : **Identified use name:** Use in cleaning agents - Professional  
**Process Category:** PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC10, PROC11, PROC13, PROC19  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC08a, ERC08d

**Environmental contributing scenarios** : **General exposures** - ERC08a, ERC08d

**Health Contributing scenarios** : **General measures applicable to all activities** - PROC01, PROC02, PROC03, PROC04, PROC08a, PROC08b, PROC10, PROC11, PROC13, PROC19  
**Filling/preparation of equipment from drums or containers.** - PROC08a, PROC08b  
**Automated process with (semi) closed systems** - PROC02, PROC03  
**Semi-automated process. (e.g. Semi-automatic application of floor care and maintenance products)** - PROC04  
**Dipping, immersion and pouring** - PROC13  
**Cleaning with low-pressure washers** - PROC10  
**Cleaning with high pressure washers** - PROC11  
**Surface cleaning** - PROC10  
**Ad hoc manual application via trigger sprays, dipping, etc.** - PROC10  
**Application of cleaning products in closed systems** - PROC04  
**Cleaning of medical devices** - PROC04  
**Storage** - PROC01

**Processes and activities covered by the exposure scenario** : Covers the use as a component of cleaning products including pouring/unloading from drums or containers; and exposures during mixing/diluting in the preparatory phase and cleaning activities (including spraying, brushing, dipping, wiping automated and by hand).

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.

**Amounts used** : Annual site tonnage (tonnes/year): 0.005 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 1  
Maximum daily site tonnage (kg/day): 0.014 kg/day  
Regional use tonnage (tonnes/year): 10 tonnes/year

**Frequency and duration of use** : Continuous release  
Emission days (days per year): 365 days per year

**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100

**Other operational conditions of use affecting environmental exposure** : Release fraction to air from process (initial release prior to RMM): 0.02  
Release fraction to soil from process (initial release prior to RMM): 0  
Release fraction to wastewater from process (initial release prior to RMM): 0.000001

**Date of issue/Date of revision** : 1/31/2022

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<b>Technical conditions and measures at process level (source) to prevent release</b>	: Common practices vary across sites thus conservative process release estimates used.
<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	: If discharging to municipal sewage treatment plant, provide the required on-site wastewater removal efficiency of =: 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emission to provide a typical removal efficiency of: Not applicable. Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 0 %
<b>Organisational measures to prevent/limit release from site</b>	: Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>	: Assumed domestic sewage treatment plant flow: 2 000 m <sup>3</sup> /day Estimated substance removal from wastewater via municipal sewage treatment: 96 % Not applicable as there is no release to wastewater. Maximum allowable site tonnage (MSafe) (kg/d):: [Assumed domestic sewage treatment plant flow]: 170 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96 %
<b>Conditions and measures related to external treatment of waste for disposal</b>	: External treatment and disposal of waste should comply with applicable local and/or national regulations.
<b>Conditions and measures related to external recovery of waste</b>	: This substance is consumed during use and no waste from the substance is generated.

### Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

#### General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances.

Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented



**Contributing scenario controlling worker exposure for 3: Filling/preparation of equipment from drums or containers.**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 4: Automated process with (semi) closed systems**

Use in contained systems/Drum/batch transfers

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 5: Semi-automated process. (e.g. Semi-automatic application of floor care and maintenance products)**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 6: Dipping, immersion and pouring**

Manual/Cleaning

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	



**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 7: Cleaning with low-pressure washers

Rolling, Brushing/No spraying

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 8: Cleaning with high pressure washers

Indoor and outdoor use.

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 9: Surface cleaning

Manual spraying

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 10: Ad hoc manual application via trigger sprays, dipping, etc.

Rolling, Brushing

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 11: Application of cleaning products in closed systems**

Outdoor

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 12: Cleaning of medical devices**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 13: Storage**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

### Section 3 - Exposure estimation and reference to its source

**Website:** : Not applicable.

**Exposure estimation and reference to its source - Environment: 1: General exposures**

<b>Exposure assessment (environment):</b>	: Hydrocarbon Block Method (Petrorisk)
<b>Exposure estimation and reference to its source</b>	: ESVOC SPERC 8.4b.v1

**Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 3: Filling/preparation of equipment from drums or containers.**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 4: Automated process with (semi) closed systems**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 5: Semi-automated process. (e.g. Semi-automatic application of floor care and maintenance products)**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 6: Dipping, immersion and pouring**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 7: Cleaning with low-pressure washers**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 8: Cleaning with high pressure washers**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 9: Surface cleaning**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 10: Ad hoc manual application via trigger sprays, dipping, etc.**

<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 11: Application of cleaning products in closed systems**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 12: Cleaning of medical devices**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 13: Storage**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

<b>Environment</b>	<p>: Further details on scaling and control technologies are provided in SPERC factsheet. 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.</p> <p>Maximum Risk Characterization Ratios for air emissions 0.000000063</p> <p>Maximum Risk Characterisation Ratios for waste water emissions 0.000083</p> <p>Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.</p> <p>Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>
<b>Health</b>	<p>: Available hazard data do not support the need for a DNEL to be established for other health effects.</p> <p>Risk management measures are based on qualitative risk characterisation.</p> <p>Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</p>

**Additional good practice advice beyond the REACH CSA**

<b>Environment</b>	: Not available.
<b>Health</b>	: Not available.

## Annex to the extended Safety Data Sheet (eSDS)

Professional

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Use as a fuel - Professional

**List of use descriptors** : **Identified use name:** Use as a fuel - Professional  
**Process Category:** PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC16  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC09a, ERC09b

**Environmental contributing scenarios** : **General exposures** - ERC09a, ERC09b

**Health Contributing scenarios** : **General measures applicable to all activities** - PROC01, PROC02, PROC03, PROC08a, PROC08b, PROC16  
**Bulk transfers** - PROC08b  
**Drum/batch transfers** - PROC08b  
**Refuelling** - PROC08b  
**General exposures (closed systems)** - PROC01, PROC02, PROC03  
**Use as a fuel** - PROC16  
**Equipment cleaning and maintenance** - PROC08a  
**Storage** - PROC01

**Processes and activities covered by the exposure scenario** : Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.

**Amounts used** : Annual site tonnage (tonnes/year): 0.035 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 1  
Maximum daily site tonnage (kg/day): 0.096 kg/day  
Regional use tonnage (tonnes/year): 70 tonnes/year

**Frequency and duration of use** : Continuous release  
Emission days (days per year): 365 days per year

**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100

**Other operational conditions of use affecting environmental exposure** : Release fraction to air from process (initial release prior to RMM): 0.01  
Release fraction to soil from process (initial release prior to RMM): 0.00001  
Release fraction to wastewater from process (initial release prior to RMM): 0.00001

**Technical conditions and measures at process level (source) to prevent release** : Common practices vary across sites thus conservative process release estimates used.

<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	: If discharging to municipal sewage treatment plant, provide the required on-site wastewater removal efficiency of =: 0 % No secondary wastewater treatment required. Risk from environmental exposure is driven by freshwater. Treat air emission to provide a typical removal efficiency of: Not applicable. Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 0 %
<b>Organisational measures to prevent/limit release from site</b>	: Do not apply industrial sludge to natural soils. Prevent discharge of undissolved substance to or recover from onsite wastewater. Sludge should be incinerated, contained or reclaimed.
<b>Conditions and measures related to municipal sewage treatment plant</b>	: Assumed domestic sewage treatment plant flow: 2 000 m <sup>3</sup> /day Estimated substance removal from wastewater via municipal sewage treatment: 96 % Not applicable as there is no release to wastewater. Maximum allowable site tonnage (MSafe) (kg/d):: [Assumed domestic sewage treatment plant flow]:1 200 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96 %
<b>Conditions and measures related to external treatment of waste for disposal</b>	: Combustion emissions considered in regional exposure assessment. Combustion emissions limited by required exhaust emission controls.
<b>Conditions and measures related to external recovery of waste</b>	: This substance is consumed during use and no waste from the substance is generated.

### Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

#### General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances.

Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented



**Contributing scenario controlling worker exposure for 3: Bulk transfers**

Dedicated facility

**Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 4: Drum/batch transfers****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 5: Refuelling****Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Conditions and measures related to personal protection, hygiene and health evaluation****Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented**Contributing scenario controlling worker exposure for 6: General exposures (closed systems)**

Use in contained batch processes

**Product characteristics** : Liquid**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.**Frequency and duration of use/exposure** : Covers daily exposures up to 8 hours (unless stated differently)**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.**Technical conditions and measures at process level (source) to prevent release** : Handle substance within a closed system.**Conditions and measures related to personal protection, hygiene and health evaluation**



**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 7: Use as a fuel

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

**Technical conditions and measures at process level (source) to prevent release** : Handle substance within a closed system.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 8: Equipment cleaning and maintenance

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

#### Contributing scenario controlling worker exposure for 9: Storage

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

**Technical conditions and measures at process level (source) to prevent release** : Store substance within a closed system.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

### Section 3 - Exposure estimation and reference to its source

**Website:** : Not applicable.

**Exposure estimation and reference to its source - Environment: 1: General exposures**

**Exposure assessment (environment):** : Hydrocarbon Block Method (Petrorisk)

**Exposure estimation and reference to its source** : ESVOC SPERC 9.12b.v1

**Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 3: Bulk transfers**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 4: Drum/batch transfers**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 5: Refuelling**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 6: General exposures (closed systems)**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 7: Use as a fuel**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 8: Equipment cleaning and maintenance**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Exposure estimation and reference to its source - Workers: 9: Storage**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Not available.

**Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

Environment	<p>: Further details on scaling and control technologies are provided in SPERC factsheet. 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.</p> <p>Maximum Risk Characterization Ratios for air emissions 0.000000064</p> <p>Maximum Risk Characterisation Ratios for waste water emissions 0.000083</p> <p>Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.</p> <p>Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.</p>
Health	<p>: Available hazard data do not support the need for a DNEL to be established for other health effects.</p> <p>Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented.</p> <p>Risk management measures are based on qualitative risk characterisation.</p> <p>Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.</p>

### Additional good practice advice beyond the REACH CSA

Environment	: Not available.
Health	: Not available.

## Annex to the extended Safety Data Sheet (eSDS)

Professional

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Functional fluids - Professional

**List of use descriptors** : **Identified use name:** Functional fluids - Professional  
**Process Category:** PROC01, PROC02, PROC03, PROC08a, PROC09, PROC20  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC09a, ERC09b

**Environmental contributing scenarios** : **General exposures** - ERC09a, ERC09b

**Health Contributing scenarios** : **General measures applicable to all activities** - PROC01, PROC02, PROC03, PROC08a, PROC09, PROC20  
**Drum/batch transfers** - PROC08a  
**Transfer from/pouring from containers** - PROC09  
**Filling/preparation of equipment from drums or containers.** - PROC09  
**General exposures (closed systems)** - PROC01, PROC02, PROC03  
**Operation of equipment containing engine oils and similar** - PROC20  
**Remanufacture of reject articles** - PROC09  
**Equipment maintenance** - PROC08a  
**Storage** - PROC01, PROC02

**Processes and activities covered by the exposure scenario** : Use as functional fluids e.g. cable oils, transfer oils, coolants, insulators, refrigerants, hydraulic fluids in industrial equipment including maintenance and related material transfers.

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.

**Amounts used** : Annual site tonnage (tonnes/year): 0.011 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 1  
Maximum daily site tonnage (kg/day): 0.031 kg/day  
Regional use tonnage (tonnes/year): 23 tonnes/year

**Frequency and duration of use** : Continuous release  
Emission days (days per year): 365 days per year

**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100

**Other operational conditions of use affecting environmental exposure** : Release fraction to air from process (initial release prior to RMM): 0.05  
Release fraction to soil from process (initial release prior to RMM): 0.025  
Release fraction to wastewater from process (initial release prior to RMM): 0.025

**Technical conditions and measures at process level (source) to prevent release** : Common practices vary across sites thus conservative process release estimates used.

<b>Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil</b>	<ul style="list-style-type: none"> <li>If discharging to municipal sewage treatment plant, no on-site wastewater treatment required.</li> <li>If discharging to municipal sewage treatment plant, provide the required on-site wastewater removal efficiency of =: 0 %</li> <li>No secondary wastewater treatment required.</li> <li>Risk from environmental exposure is driven by freshwater sediment.</li> <li>Treat air emission to provide a typical removal efficiency of: Not applicable.</li> <li>Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 0 %</li> </ul>
<b>Organisational measures to prevent/limit release from site</b>	<ul style="list-style-type: none"> <li>Do not apply industrial sludge to natural soils.</li> <li>Prevent discharge of undissolved substance to or recover from onsite wastewater.</li> <li>Sludge should be incinerated, contained or reclaimed.</li> </ul>
<b>Conditions and measures related to municipal sewage treatment plant</b>	<ul style="list-style-type: none"> <li>Assumed domestic sewage treatment plant flow: 2 000 m<sup>3</sup>/day</li> <li>Estimated substance removal from wastewater via municipal sewage treatment: 96 %</li> <li>Not applicable as there is no release to wastewater.</li> <li>Maximum allowable site tonnage (MSafe) (kg/d):: [Assumed domestic sewage treatment plant flow]: 350 kg/day</li> <li>Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96 %</li> </ul>
<b>Conditions and measures related to external treatment of waste for disposal</b>	<ul style="list-style-type: none"> <li>External treatment and disposal of waste should comply with applicable local and/or national regulations.</li> </ul>
<b>Conditions and measures related to external recovery of waste</b>	<ul style="list-style-type: none"> <li>External recovery and recycling of waste should comply with applicable local and/or national regulations.</li> </ul>

### Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

#### General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 3: Drum/batch transfers**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 4: Transfer from/pouring from containers**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 5: Filling/preparation of equipment from drums or containers.**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 6: General exposures (closed systems)**

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Technical conditions and measures at process level (source) to prevent release</b>	: Handle substance within a closed system.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 7: Operation of equipment containing engine oils and similar**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Operation is carried out at elevated temperature (> 20°C above ambient temperature)

**Ventilation control measures** : Provide a good standard of controlled ventilation (10 to 15 air changes per hour).

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 8: Remanufacture of reject articles**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 9: Equipment maintenance**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

**Contributing scenario controlling worker exposure for 10: Storage**

**Product characteristics** : Liquid

**Concentration of substance in mixture or article** : Covers percentage substance in the product up to 100 %.

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

**Other operational conditions affecting worker exposure** : Assumes use at not more than 20°C above ambient temperature.



**Technical conditions and measures at process level (source) to prevent release** : Store substance within a closed system.

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

**Advice on general occupational hygiene** : Assumes a good basic standard of occupational hygiene is implemented

### Section 3 - Exposure estimation and reference to its source

**Website:** : Not applicable.

**Exposure estimation and reference to its source - Environment: 1: General exposures**

**Exposure assessment (environment):** : Hydrocarbon Block Method (Petrorisk)

**Exposure estimation and reference to its source** : ESVOC SPERC 9.13b.v1

**Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 3: Drum/batch transfers**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 4: Transfer from/pouring from containers**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 5: Filling/preparation of equipment from drums or containers.**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 6: General exposures (closed systems)**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 7: Operation of equipment containing engine oils and similar**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 8: Remanufacture of reject articles**

**Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

**Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 9: Equipment maintenance**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Exposure estimation and reference to its source - Workers: 10: Storage**

- Exposure assessment (human):** : The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
- Exposure estimation and reference to its source** : Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

**Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

- Environment** : Further details on scaling and control technologies are provided in SPERC factsheet. 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.  
Maximum Risk Characterization Ratios for air emissions 0.0000013  
Maximum Risk Characterisation Ratios for waste water emissions 0.000087  
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination.  
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
- Health** : 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.  
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH CSA**

- Environment** : Not available.
- Health** : Not available.

## Annex to the extended Safety Data Sheet (eSDS)

Professional

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Use in laboratories - Professional  
**List of use descriptors** : **Identified use name:** Use in laboratories - Professional  
**Process Category:** PROC10, PROC15  
**Sector of end use:** SU22  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC08a  
**Environmental contributing scenarios** : **General exposures** - ERC08a  
**Health Contributing scenarios** : **General measures applicable to all activities** - PROC10, PROC15  
**Laboratory activities** - PROC15  
**Cleaning** - PROC10

**Processes and activities covered by the exposure scenario** : Use of small quantities within laboratory settings, including material transfers and equipment cleaning

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.  
**Amounts used** : Annual site tonnage (tonnes/year): 0.0025 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 0.0005  
Maximum daily site tonnage (kg/day): 0.0069 kg/day  
Regional use tonnage (tonnes/year): 5 tonnes/year  
**Frequency and duration of use** : Continuous release  
Emission days (days per year): 365 days per year  
**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100  
**Other operational conditions of use affecting environmental exposure** : Release fraction to air from process (initial release prior to RMM): 0.5  
Release fraction to soil from process (initial release prior to RMM): 0  
Release fraction to wastewater from process (initial release prior to RMM): 0.5  
**Technical conditions and measures at process level (source) to prevent release** : Common practices vary across sites thus conservative process release estimates used.  
**Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil** : If discharging to municipal sewage treatment plant, provide the required on-site wastewater removal efficiency of =: 0 %  
No secondary wastewater treatment required.  
Risk from environmental exposure is driven by freshwater.  
Treat air emission to provide a typical removal efficiency of: 0 %  
Treat on-site wastewater (prior to receiving water discharge) to provide the required removal efficiency of =: 0 %  
**Organisational measures to prevent/limit release from site** : Do not apply industrial sludge to natural soils.  
Prevent discharge of undissolved substance to or recover from onsite wastewater.  
Sludge should be incinerated, contained or reclaimed.

**Date of issue/Date of revision** : 3/14/2022

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<b>Conditions and measures related to municipal sewage treatment plant</b>	: Assumed domestic sewage treatment plant flow: 2 000 m <sup>3</sup> /day Estimated substance removal from wastewater via municipal sewage treatment: 96 % Not applicable as there is no release to wastewater. Maximum allowable site tonnage (MSafe) (kg/d):: [Assumed domestic sewage treatment plant flow]: 67 kg/day Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs: 96 %
<b>Conditions and measures related to external treatment of waste for disposal</b>	: External treatment and disposal of waste should comply with applicable local and/or national regulations.
<b>Conditions and measures related to external recovery of waste</b>	: External recovery and recycling of waste should comply with applicable local and/or national regulations.

### Contributing scenario controlling worker exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting.

#### General measures (flammability)

Risks from the physicochemical hazards of substances, such as flammability or explosiveness can be controlled by implementing risk management measures at the workplace. It is recommended to follow the Dangerous Substances and Explosion Atmospheres Regulations (DSEAR) and The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations (EPS). Based on the implementation of a selection of handling and storage risk management measures for the identified uses, the risk can be regarded as controlled to an acceptable level.

Use in contained systems. Keep away from sources of ignition - No smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances.

Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Refer to relevant technical standards/EU regulations/national regulations. Review SDS for additional advice..

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

### Contributing scenario controlling worker exposure for 3: Laboratory activities

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	

<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented
<b>Contributing scenario controlling worker exposure for 4: Cleaning</b>	
<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers percentage substance in the product up to 100 %.
<b>Frequency and duration of use/exposure</b>	: Covers daily exposures up to 8 hours (unless stated differently)
<b>Other operational conditions affecting worker exposure</b>	: Assumes use at not more than 20°C above ambient temperature.
<b>Conditions and measures related to personal protection, hygiene and health evaluation</b>	
<b>Advice on general occupational hygiene</b>	: Assumes a good basic standard of occupational hygiene is implemented

### Section 3 - Exposure estimation and reference to its source

<b>Website:</b>	: Not applicable.
<b>Exposure estimation and reference to its source - Environment: 1: General exposures</b>	
<b>Exposure assessment (environment):</b>	: Hydrocarbon Block Method (Petrisk)
<b>Exposure estimation and reference to its source</b>	: ESVOC SPERC 8.17.v1
<b>Exposure estimation and reference to its source - Workers: 2: General measures applicable to all activities</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 3: Laboratory activities</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.
<b>Exposure estimation and reference to its source - Workers: 4: Cleaning</b>	
<b>Exposure assessment (human):</b>	: The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
<b>Exposure estimation and reference to its source</b>	: Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted.

### Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

<b>Environment</b>	: Further details on scaling and control technologies are provided in SPERC factsheet. 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. Maximum Risk Characterization Ratios for air emissions 0.0000059 Maximum Risk Characterisation Ratios for waste water emissions 0.0001 Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination.
<b>Health</b>	: 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. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH CSA****Environment** : Not available.**Health** : Not available.

## Annex to the extended Safety Data Sheet (eSDS)

Consumer

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Use as a fuel - Consumer  
**List of use descriptors** : **Identified use name:** Use as a fuel - Consumer  
**Sector of end use:** SU21  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC09a, ERC09b  
**Market sector by type of chemical product:** PC13  
**Environmental contributing scenarios** : **General exposures** - ERC09a, ERC09b  
**Health Contributing scenarios** : **General measures applicable to all activities** - PC13  
**Liquid:** automotive refuelling - PC13  
**Liquid:** Scooter refuelling - PC13  
**Liquid:** garden equipment - use - PC13  
**Liquid:** garden equipment - refuelling - PC13  
**Liquid:** home space heater fuel - PC13

**Processes and activities covered by the exposure scenario** : Covers consumer uses in liquid fuels.

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.  
**Amounts used** : Annual site tonnage (tonnes/year): 10 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 0.0005  
Maximum daily site tonnage (kg/day): 29 kg/day  
Regional use tonnage (tonnes/year): 21 000 tonnes/year  
**Frequency and duration of use** : Continuous release  
Emission days (days per year): 365 days per year  
**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100  
**Other operational conditions of use affecting environmental exposure** : Release fraction to air from process (initial release prior to RMM): 0.001  
Release fraction to soil from process (initial release prior to RMM): 0.00001  
Release fraction to wastewater from process (initial release prior to RMM): 0.00001  
**Conditions and measures related to municipal sewage treatment plant** : Assumed domestic sewage treatment plant flow: 2 000 m<sup>3</sup>/day  
Estimated substance removal from wastewater via municipal sewage treatment: 96 %  
Not applicable as there is no release to wastewater.  
Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow] (kg/day): 340 000 kg/day  
**Conditions and measures related to external treatment of waste for disposal** : Combustion emissions considered in regional exposure assessment.  
Combustion emissions limited by required exhaust emission controls.



**Conditions and measures related to external recovery of waste** : This substance is consumed during use and no waste from the substance is generated.

### Contributing scenario controlling consumer exposure for 2: General measures applicable to all activities

#### General measures (aspiration)

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting. Just a sip of lamp oil - or even sucking the wick of lamps - may lead to life-threatening lung damage. Keep lamps filled with this liquid out of the reach of children.

#### General measures (flammability)

Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For flammable substances a selection of the following measures need to be implemented to control unintended ignition of flammable substances. These measures are expected to be suitable to prevent minor accidents which might occur during consumer use. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, it is anticipated that there is no immediate concern as the risk should be controlled to an acceptable level. Use only with adequate ventilation. Avoid all possible sources of ignition (spark or flame). - No smoking. Review SDS for additional advice..

**Product characteristics** : Liquid  
**Amounts used** : Not applicable.  
**Frequency and duration of use/exposure** : Not applicable.  
**Other given operational conditions affecting consumers exposure** : Not applicable.

#### Conditions and measures related to personal protection and hygiene

**Advice on general occupational hygiene** : Not applicable.

### Contributing scenario controlling consumer exposure for 3: Liquid: automotive refuelling

**Product characteristics** : Liquid  
**Concentration of substance in mixture or article** : Covers concentrations up to 100 %  
**Amounts used** : Covers skin contact area up to (cm<sup>2</sup>): 210 cm<sup>2</sup>  
 For each use event, covers use amounts up to (g): 37 500 g  
 Covers use in room size of (m<sup>3</sup>): 100 m<sup>3</sup>  
**Frequency and duration of use/exposure** : Covers use up to: 1 times per day  
 Covers use up to: 52 days per year  
 Covers exposure up to: 0.05 hour(s)  
 Covers outdoor use.  
**Other given operational conditions affecting consumers exposure** : Covers use at ambient temperatures.  
 Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure

#### Conditions and measures related to personal protection and hygiene

**Advice on general occupational hygiene** : Not applicable.

### Contributing scenario controlling consumer exposure for 4: Liquid: Scooter refuelling

**Product characteristics** : Liquid  
**Concentration of substance in mixture or article** : Covers concentrations up to 100 %  
**Amounts used** : Covers skin contact area up to (cm<sup>2</sup>): 210 cm<sup>2</sup>  
 For each use event, covers use amounts up to (g): 3 750 g  
 Covers use in room size of (m<sup>3</sup>): 100 m<sup>3</sup>

<b>Frequency and duration of use/exposure</b>	: Covers use up to: 1 times per day Covers use up to: 52 days per year Covers exposure up to: 0.03 hour(s) Covers outdoor use.
<b>Other given operational conditions affecting consumers exposure</b>	: Covers use at ambient temperatures. Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
<b>Conditions and measures related to personal protection and hygiene</b>	
<b>Advice on general occupational hygiene</b>	: Not applicable.

#### Contributing scenario controlling consumer exposure for 5: Liquid: garden equipment - use

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers concentrations up to: 100 %
<b>Amounts used</b>	: Covers skin contact area up to (cm <sup>2</sup> ): 420 cm <sup>2</sup> For each use event, covers use amounts up to (g): 750 g Covers use in room size of (m <sup>3</sup> ): 100 m <sup>3</sup>
<b>Frequency and duration of use/exposure</b>	: Covers use up to: 1 times per day Covers use up to: 26 days per year Covers exposure up to: 2 hour(s) Covers outdoor use.
<b>Other given operational conditions affecting consumers exposure</b>	: Covers use at ambient temperatures. Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
<b>Conditions and measures related to personal protection and hygiene</b>	
<b>Advice on general occupational hygiene</b>	: Not applicable.

#### Contributing scenario controlling consumer exposure for 6: Liquid: garden equipment - refuelling

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers concentrations up to: 100 %
<b>Amounts used</b>	: Covers skin contact area up to (cm <sup>2</sup> ): 420 cm <sup>2</sup> For each use event, covers use amounts up to (g): 750 g Covers use in room size of (m <sup>3</sup> ): 34 m <sup>3</sup>
<b>Frequency and duration of use/exposure</b>	: Covers use up to: 1 times per day Covers use up to: 26 days per year Covers use in a one car garage (34 m <sup>3</sup> ) under typical ventilation. Covers exposure up to: 0.03 hour(s)
<b>Other given operational conditions affecting consumers exposure</b>	: Covers use at ambient temperatures. Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
<b>Conditions and measures related to personal protection and hygiene</b>	
<b>Advice on general occupational hygiene</b>	: Not applicable.

#### Contributing scenario controlling consumer exposure for 7: Liquid: home space heater fuel

<b>Product characteristics</b>	: Liquid
<b>Concentration of substance in mixture or article</b>	: Covers concentrations up to: 100 %
<b>Amounts used</b>	: Covers skin contact area up to (cm <sup>2</sup> ): 210 cm <sup>2</sup> For each use event, covers use amounts up to (g): 3 000 g Covers use in room size of (m <sup>3</sup> ): 20 m <sup>3</sup>
<b>Frequency and duration of use/exposure</b>	: Covers use up to: 1 times per day Covers use up to: 365 days per year Covers exposure up to: 0.03 hour(s) Covers use under typical household ventilation.

<b>Other given operational conditions affecting consumers exposure</b>	: Covers use at ambient temperatures. Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
<b>Conditions and measures related to personal protection and hygiene</b>	
<b>Advice on general occupational hygiene</b>	: Not applicable.

### Section 3 - Exposure estimation and reference to its source

<b>Website:</b>	: Not applicable.
<b>Exposure estimation and reference to its source - Environment: 1: General exposures</b>	
<b>Exposure assessment (environment):</b>	: Hydrocarbon Block Method (Petrorisk)
<b>Exposure estimation and reference to its source</b>	: ESVOC SPERC 9.12c.v1
<b>Exposure estimation and reference to its source - Consumers: 2: General measures applicable to all activities</b>	
<b>Exposure assessment (human):</b>	: ECETOC TRA, consumer
<b>Exposure estimation and reference to its source</b>	: Not available.
<b>Exposure estimation and reference to its source - Consumers: 3: Liquid: automotive refuelling</b>	
<b>Exposure assessment (human):</b>	: ECETOC TRA, consumer
<b>Exposure estimation and reference to its source</b>	: Not available.
<b>Exposure estimation and reference to its source - Consumers: 4: Liquid: Scooter refuelling</b>	
<b>Exposure assessment (human):</b>	: ECETOC TRA, consumer
<b>Exposure estimation and reference to its source</b>	: Not available.
<b>Exposure estimation and reference to its source - Consumers: 5: Liquid: garden equipment - use</b>	
<b>Exposure assessment (human):</b>	: ECETOC TRA, consumer
<b>Exposure estimation and reference to its source</b>	: Not available.
<b>Exposure estimation and reference to its source - Consumers: 6: Liquid: garden equipment - refuelling</b>	
<b>Exposure assessment (human):</b>	: ECETOC TRA, consumer
<b>Exposure estimation and reference to its source</b>	: Not available.
<b>Exposure estimation and reference to its source - Consumers: 7: Liquid: home space heater fuel</b>	
<b>Exposure assessment (human):</b>	: ECETOC TRA, consumer
<b>Exposure estimation and reference to its source</b>	: Not available.

### Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES

<b>Environment</b>	: Maximum Risk Characterization Ratios for air emissions 0.00000049 Maximum Risk Characterisation Ratios for waste water emissions 0.000084 Not applicable for wide dispersive uses
<b>Health</b>	: Estimated consumer exposures are not expected to exceed DNELs when the identified operating conditions are adopted. [ConsG1] Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

**Additional good practice advice beyond the REACH CSA****Environment** : Not available.**Health** : Not available.

## Annex to the extended Safety Data Sheet (eSDS)

Consumer

### Identification of the substance or mixture

**Product definition** : Mono-constituent substance  
**Code** : 1168358\_13527858  
**Product name** : EXXSOL ISOPENTANE T <C>

### Section 1 - Title

**Short title of the exposure scenario** : Other consumer uses  
**List of use descriptors** : **Identified use name:** Other consumer uses  
**Sector of end use:** SU21  
**Subsequent service life relevant for that use:** No.  
**Environmental Release Category:** ERC08a, ERC08d  
**Market sector by type of chemical product:** PC28, PC39  
**Environmental contributing scenarios** : **General exposures** - ERC08a, ERC08d  
**Health Contributing scenarios** : **General measures applicable to all activities** - PC28, PC39

**Processes and activities covered by the exposure scenario** : Consumer uses e.g. as a carrier in cosmetics/personal care products, perfumes and fragrances. Note: For cosmetic and personal care products, risk assessment only required for the environment under REACH as human health is covered by alternative legislation.

### Section 2 - Exposure controls

#### Contributing scenario controlling environmental exposure for 1: General exposures

**Product characteristics** : Predominantly hydrophobic  
Substance is complex UVCB.  
**Amounts used** : Annual site tonnage (tonnes/year): 0.005 tonnes/year  
Fraction of EU tonnage used in region: 0.1  
Fraction of Regional tonnage used locally: 0.0005  
Maximum daily site tonnage (kg/day): 0.014 kg/day  
Regional use tonnage (tonnes/year): 10 tonnes/year  
**Frequency and duration of use** : Continuous release  
Emission days (days per year): 365 days per year  
**Environment factors not influenced by risk management** : Local freshwater dilution factor: 10  
Local marine water dilution factor: 100  
**Other operational conditions of use affecting environmental exposure** : Release fraction to air from process (initial release prior to RMM): 0.95  
Release fraction to soil from process (initial release prior to RMM): 0.025  
Release fraction to wastewater from process (initial release prior to RMM): 0.025  
**Conditions and measures related to municipal sewage treatment plant** : Assumed domestic sewage treatment plant flow: 2 000 m<sup>3</sup>/day  
Estimated substance removal from wastewater via municipal sewage treatment: 96 %  
Not applicable as there is no release to wastewater.  
Maximum allowable site tonnage (MSafe) (kg/d): [Assumed domestic sewage treatment plant flow] (kg/day): 160 kg/day  
**Conditions and measures related to external treatment of waste for disposal** : External treatment and disposal of waste should comply with applicable local and/or national regulations.  
**Conditions and measures related to external recovery of waste** : External recovery and recycling of waste should comply with applicable local and/or national regulations.

**Contributing scenario controlling consumer exposure for 2: General measures applicable to all activities****General measures (aspiration)**

The H304 risk phrase (May be fatal if swallowed and enters airways) relates to potential for aspiration, a non-quantifiable hazard determined by physico-chemical properties (i.e. viscosity) that can occur during ingestion and also if it is vomited following ingestion. A DNEL cannot be derived. Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For substances classified as H304, the following measures need to be implemented to control the aspiration hazard.

Product safety-related measures: Do not ingest. If swallowed then seek immediate medical assistance. Do not induce vomiting. Just a sip of lamp oil - or even sucking the wick of lamps - may lead to life-threatening lung damage. Keep lamps filled with this liquid out of the reach of children.

**General measures (flammability)**

Risks from the physicochemical hazards of substances can be controlled by implementing risk management measures. For flammable substances a selection of the following measures need to be implemented to control unintended ignition of flammable substances. These measures are expected to be suitable to prevent minor accidents which might occur during consumer use. Based on the implementation of a selection of handling and storage risk management measures for the identified uses, it is anticipated that there is no immediate concern as the risk should be controlled to an acceptable level. Use only with adequate ventilation. Avoid all possible sources of ignition (spark or flame). - No smoking. Review SDS for additional advice..

**Product characteristics** : Liquid

**Amounts used** : Not applicable.

**Frequency and duration of use/exposure** : Not applicable.

**Conditions and measures related to personal protection and hygiene**

**Advice on general occupational hygiene** : Not applicable.

**Section 3 - Exposure estimation and reference to its source**

**Website:** : Not applicable.

**Exposure estimation and reference to its source - Environment: 1: General exposures**

**Exposure assessment (environment):** : Hydrocarbon Block Method (Petrisk)

**Exposure estimation and reference to its source** : ESVOC SPERC 8.16.v1

**Exposure estimation and reference to its source - Consumers: 2: General measures applicable to all activities**

**Exposure assessment (human):** : Not applicable.

**Exposure estimation and reference to its source** : Not applicable.

**Section 4 - Guidance to DU to evaluate whether he works inside the boundaries set by the ES**

**Environment** : Maximum Risk Characterization Ratios for air emissions 0.00000058  
Maximum Risk Characterisation Ratios for waste water emissions 0.000085  
Not applicable for wide dispersive uses

**Health** : Not applicable.

**Additional good practice advice beyond the REACH CSA**

**Environment** : Not available.

**Health** : Not available.

EXXSOL™ ISOPENTANE T