

Fuel oil, no. 2

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006



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

1.1 Product identifier

| | |
|---------------------------------|-----------------------|
| Commercial Product Name: | Gasoil |
| Chemical name of the substance: | Fuel oil, no. 2 |
| EC No: | 270-671-4 |
| CAS No: | 68476-30-2 |
| REACH Registration Number: | 01-2119475501-42-0010 |
| Synonyms: | Diesel |

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

| | |
|-----------------------|---|
| Specific use(s): | Fuel |
| | Further information: see exposure scenarios attached to this safety data sheet. |
| Uses advised against: | None known. |

1.3 Details of the supplier of the safety data sheet

| | |
|-----------------|---|
| Company: | Mabanaft Ltd 20th Floor, Portland House Bressenden Place SW1E 5BH-London UNITED KINGDOM |
| Tel.: | +44 (0)20 7802 3300 |
| Fax: | +44 (0)20 7931 8353 |
| E-mail address: | robin.lloyd@mabanaft.co.uk |

1.4 Emergency telephone number

| | |
|------------------------------|---------------------|
| OAMPS 24/7 Emergency Number: | +44 (0)844 560 1124 |
|------------------------------|---------------------|

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

2.1.1. Classification according to Regulation (EU) 1272/2008

The product is classified as hazardous in accordance with Regulation (EC) No. 1272/2008.

Flam. Liq. 3; H226
Asp. Tox. 1; H304
Skin Irrit. 2; H315
Acute Tox. 4 (Inhalation); H332
Carc. 2; H351
STOT RE 2; H373
Aquatic Chronic 2; H411

Full text of H-phrases: see section 16

2.1.2. Classification according to EU Directives 67/548/EEC or 1999/45/EC

The product is classified as dangerous in accordance with Directive 67/548/EEC.

Carc.Cat.3; R40
Xn; R20
Xn; R65
Xi; R38
N; R51/53

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Full text of R-phrases: see section 16

2.2 Label elements

2.2.1. Labelling according to Regulation (EU) 1272/2008

CLP pictograms



GHS02



GHS08



GHS07



GHS09

Signal word: Danger

Hazard statements (CLP)

H226 - Flammable liquid and vapour.

H304 - May be fatal if swallowed and enters airways.

H315 - Causes skin irritation.

H332 - Harmful if inhaled.

H351 - Suspected of causing cancer.

H373 - May cause damage to organs through prolonged or repeated exposure.

H411 - Toxic to aquatic life with long lasting effects.

Precautionary statements (CLP)

P261 - Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection.

P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.

P331 - Do NOT induce vomiting.

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

2.2.2. Labelling according to Directives (67/548 - 1999/45)

Not relevant

2.3 Other hazards

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT). This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

SECTION 3: Composition/information on ingredients

3.1 Substances

| Substance name | Product identifier | % | Classification according to Directive 67/548/EEC |
|-----------------|--|-----|---|
| Fuel oil, No. 2 | (CAS No.) 68476-30-2 (EC No) 270-671-4 (EC Index) 649-225-00-1 (REACH-no) 01-2119475501-42-0010 | 100 | Carc.Cat.3; R40 Xn; R20 Xn; R65 Xi; R38 N; R51/53 |

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| Substance name | Product identifier | % | Classification according to Regulation (EC) No. 1272/2008 [CLP] |
|-----------------|--|-----|--|
| Fuel oil, No. 2 | (CAS No.) 68476-30-2 (EC No) 270-671-4 (EC Index) 649-225-00-1 (REACH-no) 01-2119475501-42-0010 | 100 | Flam. Liq. 3, H226 Asp. Tox. 1, H304 Skin Irrit. 2, H315 Acute Tox. 4 (Inhalation), H332 Carc. 2, H351 STOT RE 2, H373 Aquatic Chronic 2, H411 |

Full text of R-, H- and EUH-phrases: see section 16

3.2 Mixtures

Not applicable

Full text of R-, H- and EUH-phrases: see section 16

SECTION 4: First aid measures

4.1 Description of first aid measures

Inhalation: Keep at rest. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Remove person to fresh air. If signs/symptoms continue, get medical attention.

Skin contact: Take off contaminated clothing and shoes immediately. Wash off with soap and water. If skin irritation persists, call a physician. Wash contaminated clothing before re-use.

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.

Ingestion: Call a physician immediately. Do NOT induce vomiting. Move to fresh air. Keep at rest.

Additional advice: First aider needs to protect himself. See also section 8 Treat symptomatically. Show this safety data sheet to the doctor in attendance. When symptoms persist or in all cases of doubt seek medical advice. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

Inhalation: Harmful by inhalation. May cause irritation of respiratory tract. Effects of breathing high concentrations of vapour may include: headache, nausea, dizziness. Inhalation of high vapour concentrations can cause CNS-depression and narcosis.

Skin contact: Irritating to skin. Skin contact may provoke the following symptoms: Redness. Swelling of the skin. Hot product (liquid) can cause thermal burns.

Eye contact: May cause eye irritation. Hot product (liquid) can cause thermal burns.

Ingestion: Harmful: may cause lung damage if swallowed. Aspiration hazard if swallowed - can enter lungs and cause damage. Smallest quantities reaching the lungs through swallowing or subsequent vomiting may result in lung oedema or pneumonia. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

4.3 Indication of any immediate medical attention and special treatment needed

When symptoms persist or in all cases of doubt seek medical advice.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use water spray to cool unopened containers.

Extinguishing media which shall not be used for safety reasons: High volume water jet.

5.2 Special hazards arising from the substance or mixture

Fire hazard: Combustible material

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Specific hazards: Temperature above flashpoint: higher fire/explosion hazard Vapours may form explosive mixtures with air. Vapours are heavier than air and may spread along floors. In case of fire hazardous decomposition products may be produced such as: Carbon oxides, nitrogen oxides (NO_x), Sulphur oxides, hydrogen sulphide (H₂S). Flash back possible over considerable distance. Container may explode if heated.

5.3 Advice for firefighters

Evacuate personnel to safe areas. Special protective equipment for firefighters In the event of fire, wear self-contained breathing apparatus. In the event of fire, cool tanks with water spray.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Wear personal protective equipment. See also section 8. Evacuate personnel to safe areas. Ensure adequate ventilation. Keep away from open flames, hot surfaces and sources of ignition. Keep people away from and upwind of spill/leak. Avoid contact with skin and eyes. Do not breathe vapours or spray mist.

Advice for emergency responders: Only qualified personnel equipped with suitable protective equipment may intervene.

6.2 Environmental precautions

Prevent product from entering drains.

6.3 Methods and material for containment and cleaning up

Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges. Prevent further leakage or spillage if safe to do so. Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal. Collect and dispose of waste product at an authorised disposal facility. Pick up contaminated soil. After cleaning, flush away traces with water. Local authorities should be advised if significant spillages cannot be contained. Contaminated surfaces will be extremely slippery.

6.4 Reference to other sections

See also section 8. See also section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Handling: Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Wear personal protective equipment. See also section 8. Do not breathe vapours or spray mist. Ensure all equipment is electrically grounded before beginning transfer operations. Do not use sparking tools. Heating can release hazardous gases. Take care to avoid waste and spillage when weighing, loading and mixing the product. Take any precaution to avoid mixing with incompatible materials See also section 10 Vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air.

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke. Remove and wash contaminated clothing before re-use.

7.2 Conditions for safe storage, including any incompatibilities

Storage: Keep containers tightly closed in a dry, cool and well-ventilated place. Store in original container. Keep in a bunded area. Keep away from open flames, hot surfaces and sources of ignition. Do not store near or with any of the incompatible materials listed in section 10. Keep away from food, drink and animal feedingstuffs.

Packaging material: metal containers

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7.3 Specific end use(s)

see attached exposure scenario.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Exposure limit(s)

Component: Fuel oil, No. 2 (68476-30-2)

TLV-TWA (mg/m³): 100 (BE)

DNEL/DMEL (workers)

Acute - systemic effects, inhalation: (15min) 4300 mg/m³ (aerosol)

Long-term - systemic effects, dermal: (8h) 2,9 mg/kg bodyweight/day

Long-term - systemic effects, inhalation: (8h) 68 mg/m³ (aerosol)

DNEL/DMEL (general population)

Acute - systemic effects, inhalation: (15min) 2600 mg/kg bodyweight/day (aerosol)

Long-term - systemic effects, inhalation: 20 mg/m³ (aerosol)

Long-term - systemic effects, dermal: 1,3 mg/kg bodyweight/day

PNEC (additional information)

Substance of unknown or variable composition, complex reaction products or biological material (UVCB)

No data available

Recommended monitoring procedures

Concentration measurement in air. Personal monitoring

8.2 Exposure controls

Personal protective equipment: The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection: In the case of vapour formation use a respirator with an approved filter. Respirator with a full face mask (EN 136), Respirator with a half face mask (EN 140), Recommended Filter type: A (EN 141).

Hand protection: Protective gloves (EN 374): Viton (R), Nitrile rubber . The selection of specific gloves for a specific application and time of use in a working area, should also take into account other factors on the working space, such as (but not limited to): other chemicals that are possibly used, physical requirements (protection against cutting/drilling, skill, thermal protection), and the instructions/specification of the supplier of gloves.

Eye protection: Safety glasses with side-shields (EN 166).

Skin and body protection: Overalls, apron and boots recommended. (EN 340).

Thermal hazard protection: Not required under normal use. Use dedicated equipment.

Engineering measures: Provide sufficient air exchange and/or exhaust in work rooms. Ensure that eyewash stations and safety showers are close to the workstation location. Organisational measures to prevent /limit releases, dispersion and exposure See also section 7

Environmental exposure controls: Do not flush into surface water or sanitary sewer system. Comply with applicable Community environmental protection legislation.

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SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

| | |
|---|--|
| Appearance: | liquid |
| Colour: | clear, yellow, red |
| Odour: | characteristic |
| Odour Threshold: | No data available |
| Odour Threshold: | No data available |
| pH: | NA: Justification for data waiving -> UVCB |
| Melting point/range: | -40 - 6 °C |
| Boiling point/boiling range: | 141 - 462 °C |
| Flash point: | > 56 °C (CC PM) |
| Evaporation rate: | < 1 Relative evaporation rate (butylacetate=1) |
| Flammability (solid, gas): | NA: Justification for data waiving, -> other justification |
| Explosion limits: | 0,6 - 6,5 vol % |
| Vapour pressure: | 4 hPa (40°C) |
| Vapour density: | > 1 Relative vapour density at 20 °C (air=1) |
| Relative density: | 0,8 - 0,91 g/cm ³ |
| Water solubility: | NA: Justification for data waiving -> UVCB |
| Solubility in other solvents: | Hydrocarbons |
| Partition coefficient: n-octanol/water: | NA: UVCB -> Justification for data waiving |
| Autoignition temperature: | > 225 °C |
| Decomposition temperature: | > 141 °C |
| Viscosity: | > 1,5 mm ² /s |
| Explosive properties: | NA: Justification for data waiving, -> other justification |
| Oxidizing properties: | NA: Justification for data waiving -> other justification |

9.2 Other information

Other data: Not applicable.

SECTION 10: Stability and reactivity

10.1 Reactivity

See also section 10.5

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

None under normal processing.

10.4 Conditions to avoid

Heat, flames and sparks. Exposure to sunlight. See also section 7 Handling and storage.

10.5 Incompatible materials

Strong oxidizing agents See also section 7 Handling and storage.

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10.6 Hazardous decomposition products

No decomposition if stored and applied as directed. Burning produces noxious and toxic fumes. Possible decomposition products are: Carbon oxides, nitrogen oxides (NO_x), Sulphur oxides, hydrogen sulphide (H₂S).

SECTION 11: Toxicological information

11.1 Information on toxicological effects

| | |
|---|--|
| Acute toxicity: | Harmful if inhaled. LD50/oral/rat = 7600 mg/kg (OECD 401) LD50/dermal/rabbit = > 4300 mg/kg (OECD 434) LC50/inhalation/4h/rat = 4,1 mg/l/4h (OECD 404) |
| Skin corrosion/irritation: | Causes skin irritation. OECD Test Guideline 404 |
| Serious eye damage/irritation: | Not classified (Based on available data, the classification criteria are not met.) Test Method : OECD TG 405 |
| Respiratory/skin sensitisation: | Not classified (Based on available data, the classification criteria are not met.) OECD Test Guideline 406 |
| Germ cell mutagenicity: | Not classified (Based on available data, the classification criteria are not met.) OECD Test Guideline 471, 475 |
| Carcinogenicity: | Suspected of causing cancer. OECD Test Guideline 451 |
| Reproductive toxicity: | Not classified (Based on available data, the classification criteria are not met.) OECD 414. NOAEL (dermal,rat/rabbit) : 125 mg/kg/d (dev.), 125 mg/kg (mat.) NOAEL (inhalation,rat,vapour) : > 401ppm (NOAEC) |
| Specific target organ toxicity (single exposure): | Not classified (Based on available data, the classification criteria are not met.) |
| Specific target organ toxicity (repeated exposure): | May cause damage to organs through prolonged or repeated exposure. Target Organs : blood liver thymus NOAEL (dermal,rat/rabbit,90 days) : 30 mg/kg/d NOAEL (dermal,rat/rabbit) : 0,5 ml/kg (28d) NOAEL (inhalation,rat,dust/mist/fume,90 days) : > 1710 mg/m ³ (NOAEC) |
| Aspiration hazard: | May be fatal if swallowed and enters airways. |
| Further information: | Symptoms related to the physical, chemical and toxicological characteristics See section 4.2. |

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SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicity effects:

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Acute aquatic toxicity :

LC50/96h/fish = 21mg/L (LL50) (OECD 203)

EC50/48h/daphnia = 68 mg/L (EL50) (OECD 202)

EC50/72h/algae = 22 mg/L (IL50) (OECD 201)

Chronic aquatic toxicity :

NOEL = 0,083 mg/L (Fish), 0,21 mg/L (Daphnia)

Fuel oil, No. 2 (68476-30-2):

LC50/96h/fish:

35 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])

12.2 Persistence and degradability

Substance is complex UVCB

Readily biodegradable (60 % after 28 days).

12.3 Bioaccumulative potential

Substance is complex UVCB

Not applicable

12.4 Mobility in soil

Substance is complex UVCB

Not applicable

12.5 Results of PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT). This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Waste from residues / unused products: Handle with care. See also section 7 Where possible recycling is preferred to disposal or incineration. Collect and dispose of waste product at an authorised disposal facility. Dispose of as hazardous waste in compliance with local and national regulations.

Contaminated packaging: Container hazardous when empty. Do not puncture or incinerate. Do not use pressure to empty drums. Do not burn, or use a cutting torch on, the empty drum. Dispose of in accordance with local regulations.

Additional ecological information: Do not flush into surface water or sanitary sewer system.

List of suggested waste codes/waste designations in accordance with the EWC.: The following Waste Codes are only suggestions: 13 07 01* - fuel oil and diesel . Waste codes should be assigned by the user based on the application for which the product was used.

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SECTION 14: Transport information

14.1 UN number

UN-No.: 1202

14.2 UN proper shipping name

Proper shipping name: DIESEL FUEL

Proper shipping name IATA/IMDG: DIESEL FUEL

14.3 Transport hazard class(es)

14.3.1. Overland transport (ADR/RID)

Class: 3 - Flammable liquid

Hazard identification number (Kemler No.): 30

Classification code (ADR): F1

ADR/RID-Labels: 3 - Flammable liquid



14.3.2. Inland waterway transport (ADN)

ADN: Hazards : 3+(N2+F)

Class (ADN): 3

14.3.3. Transport by sea (IMDG)

Class: 3 - Flammable liquids

14.3.4. Air transport (IATA)

Class: 3 - Flammable liquids

14.4 Packing group

Packing group: III

14.5 Environmental hazards

Environmental hazards:



Other information: ADN : N2.

14.6 Special precautions for user

Special Provision 640L (ADR).

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

Code: IBC: no data available.

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SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

Restrictions on use: Annex XVII: 3

This product contains an ingredient according to the candidate list of Annex XIV of the REACH Regulation 1907/2006/EC.: none

Authorisations Not applicable

15.1.2. National regulations

WGK: 2

German storage class (LGK): LGK 12 - Non-flammable liquids in non-flammable packages

TA-Luft: Organic Substances

Technische Regeln für Gefahrstoffe (TRGS): TRGS 001 TRGS 900

ABM: 6 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Issuing date: 14/januari/2013

Revision nr: 1

Supersedes:

Safety datasheet sections which have been updated:

Full text of R-, H- and EUH-phrases:

| | |
|---------------------------|---|
| Acute Tox. 4 (Inhalation) | Acute toxicity (inhalation) Category 4 |
| Aquatic Chronic 2 | Hazardous to the aquatic environment - chronic hazard category 2 |
| Asp. Tox. 1 | Aspiration hazard Category 1 |
| Carc. 2 | Carcinogenicity Category 2 |
| Flam. Liq. 3 | Flammable liquids Category 3 |
| Skin Irrit. 2 | skin corrosion/irritation Category 2 |
| STOT RE 2 | Specific target organ toxicity (repeated exposure) Category 2 |
| H226 | Flammable liquid and vapour. |
| H304 | May be fatal if swallowed and enters airways. |
| H315 | Causes skin irritation. |
| H332 | Harmful if inhaled. |
| H351 | Suspected of causing cancer. |
| H373 | May cause damage to organs through prolonged or repeated exposure. |
| H411 | Toxic to aquatic life with long lasting effects. |
| R20 | Harmful by inhalation. |
| R38 | Irritating to skin. |
| R40 | Limited evidence of a carcinogenic effect. |
| R51/53 | Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. |
| R65 | Harmful: may cause lung damage if swallowed. |
| N | Dangerous for the environment |
| Xi | irritating |

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Xn

Harmful

Sources of key data used to compile the Safety Data Sheet

European Chemicals Bureau: <http://ecb.jrc.it>;
CONCAWE C&L guidance;
CSR VHGO Concaawe

Further information

Not applicable

Abbreviations and acronyms

ADN = Accord Européen relatif au Transport International des Marchandises Dangereuses par voie de Navigation du Rhin

ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route

CLP = Classification, Labelling and Packaging Regulation according to 1272/2008/EC

IATA = International Air Transport Association

IMDG = International Maritime Dangerous Goods Code

LEL = Lower Explosive Limit/Lower Explosion Limit

UEL = Upper Explosion Limit/Upper Explosive Limit

REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals

WGK = Wassergefährdungsklasse (Water Hazard Class under German Federal Water Management Act)

PNEC = Predicted No Effect Concentration

DNEL = Derived No Effect Level

NA = not applicable

NOAEL = No observed adverse effect level

DMEL = Derived minimal effect level

NOEL = No-observed-effect level

UVCB = Substance of unknown or variable composition, complex reaction products or biological material (UVCB)

Annex: Exposure scenarios

| Title | Sector of use | Product category | Process category | Environmental release | SPERC |
|--|---------------|------------------|--|--|----------------------|
| Distribution of substance | SU3 | | PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC15, PROC9 | ERC6a, ERC2, ERC1, ERC3, ERC4, ERC5, ERC6b, ERC6c, ERC6d, ERC7 | ESVOC SPERC 1.1b.v1 |
| Formulation & (re)packing of substances and mixtures | SU3, SU10 | | PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC15, PROC9, PROC5, PROC14 | ERC2 | ESVOC SPERC 2.2.v1 |
| Use as a fuel | SU3 | | PROC1, PROC2, PROC3, PROC8A, PROC8B, PROC16 | ERC7 | ESVOC SPERC 7.12a.v1 |
| Use as a fuel | SU22 | | PROC1, PROC2, PROC3, PROC8A, PROC8B, PROC16 | ERC9a, ERC9b | ESVOC SPERC 9.12b.v1 |
| Use as a fuel | SU21 | PC13 | | ERC9a, ERC9b | ESVOC SPERC 9.12c.v1 |

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Exposure scenario

| 1. Title: Distribution of substance | |
|-------------------------------------|---|
| Use descriptors | PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC9, PROC15 SU3 ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7 ESVOC SPERC 1.1b.v1 |
| Processes, tasks activities covered | 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. Industrial use |
| Assessment method | ECETOC TRA The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. |

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8A, PROC8B, PROC9, PROC15)

PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8A: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8B: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC15: Use as laboratory reagent

Product characteristics

| | |
|---|---|
| Physical form | Liquid |
| Concentration of the Substance in Mixture/Article | Covers percentage substance in the product up to 100 % (unless stated differently). |
| Vapour pressure | Liquid, vapour pressure < 0,5 kPa at STP. |

Operational conditions

| | | |
|---|--|--|
| Frequency and duration of use | Covers daily exposures up to 8 hours (unless stated differently). | |
| Other given operational conditions affecting workers exposure | Assumes use at not more than 20°C above ambient temperature. Assumes a good basic standard of occupational hygiene is implemented. | |

Risk management measures

| | | |
|--------------------------------|---|--|
| Other risk management measures | General measures applicable to all activities | Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory |
|--------------------------------|---|--|

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| | | |
|--------------------------------|---|--|
| | | requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions. |
| Other risk management measures | General measures (skin irritants) | Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. wash off any skin contamination immediately. provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. |
| Other risk management measures | General exposures (closed systems) | E47 - Handle substance within a closed system. |
| Other risk management measures | CS16 - General exposures (open systems) | PPE15 - Wear suitable gloves tested to EN374. |
| Other risk management measures | CS2 - Process sampling | No other specific measures identified. |
| Other risk management measures | Bulk closed loading and unloading | E47 - Handle substance within a closed system. PPE15 - Wear suitable gloves tested to EN374. |
| Other risk management measures | Bulk open loading and unloading | PPE15 - Wear suitable gloves tested to EN374. |
| Other risk management measures | CS6 - Drum and small package filling | PPE15 - Wear suitable gloves tested to EN374. |
| Other risk management measures | CS39 - Equipment cleaning and maintenance | E65 - Drain down system prior to equipment opening or maintenance. PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Other risk management measures | CS36 - Laboratory activities | No other specific measures identified. |
| Other risk management measures | Storage | E84 - Store substance within a closed system. |

2.2 Contributing scenario controlling environmental exposure (ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7)

ERC1: Manufacture of substances
 ERC2: Formulation of preparations
 ERC3: Formulation in materials
 ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
 ERC5: Industrial use resulting in inclusion into or onto a matrix
 ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)
 ERC6b: Industrial use of reactive processing aids
 ERC6c: Industrial use of monomers for manufacture of thermo-plastics
 ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
 ERC7: Industrial use of substances in closed systems

Product characteristics

Other product characteristics Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

| | | |
|-------------|--|----------|
| Amount used | Fraction of EU tonnage used in region: | 0,1 |
| Amount used | Regional use tonnage (tons/year): | 28000000 |
| Amount used | Fraction of Regional tonnage used locally: | 0,002 |
| Amount used | Annual site tonnage (tons/year): | 56000 |
| Amount used | Maximum daily site tonnage (kg/day): | 190000 |

Fuel oil, no. 2

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| | | |
|---|---|----------|
| Frequency and duration of use | Continuous use/release. | |
| Frequency and duration of use | Number of emission days per year | 300 |
| Environmental factors not influenced by risk management | Local freshwater dilution factor: | 10 |
| Environmental factors not influenced by risk management | Local marine water dilution factor: | 100 |
| Other given operational conditions affecting environmental exposure | Release fraction to air from process (initial release prior to RMM): | 0,001 |
| Other given operational conditions affecting environmental exposure | Release fraction to wastewater from process (initial release prior to RMM): | 0,000001 |
| Other given operational conditions affecting environmental exposure | Release fraction to soil from process (initial release prior to RMM): | 0,00001 |

Risk management measures

| | | |
|--|--|---------|
| Technical conditions and measures at process level to prevent release | Common practices vary across sites thus conservative process release estimates used. | |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). Prevent discharge of undissolved substance to or recover from onsite wastewater. No wastewater treatment required. | |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | Treat air emission to provide a typical removal efficiency of (%): | 90 |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): | 0 |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%): | 0 |
| Organizational measures to prevent/limit release from the site | Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. | |
| Conditions and measures related to municipal sewage treatment plant | Estimated substance removal from wastewater via on-site sewage treatment (%): | 94,1 |
| Conditions and measures related to municipal sewage treatment plant | Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%): | 94,1 |
| Conditions and measures related to municipal sewage treatment plant | Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): | 2900000 |
| Conditions and measures related to municipal sewage treatment plant | Assumed domestic sewage treatment plant flow (m ³ /d): | 2000 |
| 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. | |

3. Exposure estimation and reference to its source

3.1. Health

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.

Fuel oil, no. 2

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3.2.Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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

4.1.Health

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

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

Fuel oil, no. 2

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006



Exposure scenario

| 1. Title: Formulation & (re)packing of substances and mixtures | |
|--|---|
| Use descriptors | PROC1, PROC2, PROC3, PROC4, PROC5, PROC8A, PROC8B, PROC9, PROC14, PROC15 SU3, SU10 ERC2 ESVOC SPERC 2.2.v1 |
| Processes, tasks activities covered | 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. Industrial use |
| Assessment method | ECETOC TRA The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. |

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC8A, PROC8B, PROC9, PROC14, PROC15)

| |
|---|
| PROC1: Use in closed process, no likelihood of exposure |
| PROC2: Use in closed, continuous process with occasional controlled exposure |
| PROC3: Use in closed batch process (synthesis or formulation) |
| PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises |
| PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) |
| PROC8A: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| PROC8B: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities |
| PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing) |
| PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation |
| PROC15: Use as laboratory reagent |

Product characteristics

| | |
|---|---|
| Physical form | Liquid |
| Concentration of the Substance in Mixture/Article | Covers percentage substance in the product up to 100 % (unless stated differently). |
| Vapour pressure | Liquid, vapour pressure < 0,5 kPa at STP. |

Operational conditions

| | | |
|---|--|--|
| Frequency and duration of use | Covers daily exposures up to 8 hours (unless stated differently). | |
| Other given operational conditions affecting workers exposure | Assumes use at not more than 20°C above ambient temperature. Assumes a good basic standard of occupational hygiene is implemented. | |

Risk management measures

| | | |
|--------------------------------|---|--|
| Other risk management measures | General measures applicable to all activities | Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are |
|--------------------------------|---|--|

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| | | |
|--------------------------------|---|--|
| | | informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions. |
| Other risk management measures | General measures (skin irritants) | Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. wash off any skin contamination immediately. provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. |
| Other risk management measures | General exposures (closed systems) | E47 - Handle substance within a closed system. |
| Other risk management measures | CS16 - General exposures (open systems) | PPE15 - Wear suitable gloves tested to EN374. |
| Other risk management measures | CS2 - Process sampling | No other specific measures identified. |
| Other risk management measures | CS8 - Drum/batch transfers | E64 - Use drum pumps or carefully pour from container. PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Other risk management measures | CS14 - Bulk transfers | E47 - Handle substance within a closed system. PPE15 - Wear suitable gloves tested to EN374. |
| Other risk management measures | CS30 - Mixing operations (open systems) | E54 - Provide extraction ventilation at points where emissions occur. PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Other risk management measures | CS100 - Production or preparation of articles by tableting, compression, extrusion or pelletisation | PPE15 - Wear suitable gloves tested to EN374. |
| Other risk management measures | CS6 - Drum and small package filling | PPE15 - Wear suitable gloves tested to EN374. |
| Other risk management measures | CS36 - Laboratory activities | No other specific measures identified. |
| Other risk management measures | CS39 - Equipment cleaning and maintenance | E65 - Drain down system prior to equipment opening or maintenance. PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Other risk management measures | Storage | E84 - Store substance within a closed system. |

2.2 Contributing scenario controlling environmental exposure (ERC2)

ERC2:Formulation of preparations

Product characteristics

Other product characteristics Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

| | | |
|-------------|--|----------|
| Amount used | Fraction of EU tonnage used in region: | 0,1 |
| Amount used | Regional use tonnage (tons/year): | 28000000 |
| Amount used | Fraction of Regional tonnage used locally: | 0,0011 |

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| | | |
|---|---|---------|
| Amount used | Annual site tonnage (tons/year): | 30000 |
| Amount used | Maximum daily site tonnage (kg/day): | 100000 |
| Frequency and duration of use | Continuous use/release. | |
| Frequency and duration of use | Number of emission days per year | 300 |
| Environmental factors not influenced by risk management | Local freshwater dilution factor: | 10 |
| Environmental factors not influenced by risk management | Local marine water dilution factor: | 100 |
| Other given operational conditions affecting environmental exposure | Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements): | 0,01 |
| Other given operational conditions affecting environmental exposure | Release fraction to wastewater from process (initial release prior to RMM): | 0,00002 |
| Other given operational conditions affecting environmental exposure | Release fraction to soil from process (initial release prior to RMM): | 0,0001 |

| Risk management measures | | |
|--|---|--------|
| Technical conditions and measures at process level to prevent release | Common practices vary across sites thus conservative process release estimates used. | |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. | |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | Treat air emission to provide a typical removal efficiency of (%): | 0 |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): | 59,9 |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%): | 0 |
| Organizational measures to prevent/limit release from the site | Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. | |
| Conditions and measures related to municipal sewage treatment plant | Estimated substance removal from wastewater via on-site sewage treatment (%): | 94,1 |
| Conditions and measures related to municipal sewage treatment plant | Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%): | 94,1 |
| Conditions and measures related to municipal sewage treatment plant | Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): | 680000 |
| Conditions and measures related to municipal sewage treatment plant | Assumed domestic sewage treatment plant flow (m ³ /d): | 2000 |
| 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. | |

Fuel oil, no. 2

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3. Exposure estimation and reference to its source

3.1. Health

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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

4.1. Health

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

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

Fuel oil, no. 2

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Exposure scenario

| 1. Title: Use as a fuel | |
|-------------------------------------|--|
| Use descriptors | PROC1, PROC2, PROC3, PROC8A, PROC8B, PROC16 SU3 ERC7 ESVOC SPERC 7.12a.v1 |
| Processes, tasks activities covered | Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste. Industrial use |
| Assessment method | ECETOC TRA The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. |

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8A, PROC8B, PROC16)

PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC8A: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8B: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16: Using material as fuel sources, limited exposure to unburned product to be expected

Product characteristics

| | |
|---|---|
| Physical form | Liquid |
| Concentration of the Substance in Mixture/Article | Covers percentage substance in the product up to 100 % (unless stated differently). |
| Vapour pressure | Liquid, vapour pressure < 0,5 kPa at STP. |

Operational conditions

| | | |
|---|--|--|
| Frequency and duration of use | Covers daily exposures up to 8 hours (unless stated differently). | |
| Other given operational conditions affecting workers exposure | Assumes use at not more than 20°C above ambient temperature. Assumes a good basic standard of occupational hygiene is implemented. | |

Risk management measures

| | | |
|--------------------------------|---|---|
| Other risk management measures | General measures applicable to all activities | Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions. |
|--------------------------------|---|---|

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| | | |
|--------------------------------|---|--|
| Other risk management measures | General measures (skin irritants) | Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. wash off any skin contamination immediately. provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. |
| Other risk management measures | CS14 - Bulk transfers | PPE15 - Wear suitable gloves tested to EN374. |
| Other risk management measures | CS8 - Drum/batch transfers | PPE15 - Wear suitable gloves tested to EN374. |
| Other risk management measures | Use as a fuel CS107 - (closed systems) | No other specific measures identified. |
| Other risk management measures | CS39 - Equipment cleaning and maintenance | E65 - Drain down system prior to equipment opening or maintenance. PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Other risk management measures | Storage | E84 - Store substance within a closed system. |

2.2 Contributing scenario controlling environmental exposure (ERC7)

ERC7:Industrial use of substances in closed systems

Product characteristics

Other product characteristics Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

| | | |
|---|---|---------|
| Amount used | Fraction of EU tonnage used in region: | 0,1 |
| Amount used | Regional use tonnage (tons/year): | 4500000 |
| Amount used | Fraction of Regional tonnage used locally: | 0,34 |
| Amount used | Annual site tonnage (tons/year): | 1500000 |
| Amount used | Maximum daily site tonnage (kg/day): | 5000000 |
| Frequency and duration of use | Continuous use/release. | |
| Frequency and duration of use | Number of emission days per year | 300 |
| Environmental factors not influenced by risk management | Local freshwater dilution factor: | 10 |
| Environmental factors not influenced by risk management | Local marine water dilution factor: | 100 |
| Other given operational conditions affecting environmental exposure | Release fraction to air from process (initial release prior to RMM): | 0,005 |
| Other given operational conditions affecting environmental exposure | Release fraction to wastewater from process (initial release prior to RMM): | 0,00001 |
| Other given operational conditions affecting environmental exposure | Release fraction to soil from process (initial release prior to RMM): | 0 |

Risk management measures

| | | |
|---|--|--|
| Technical conditions and measures at process level to prevent release | Common practices vary across sites thus conservative process release estimates used. | |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and | Risk from environmental exposure is driven by freshwater sediment. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. | |

Fuel oil, no. 2

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| | | |
|--|---|---------|
| releases to soil | | |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | Treat air emission to provide a typical removal efficiency of (%): | 95 |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): | 97,7 |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%): | 60,4 |
| Organizational measures to prevent/limit release from the site | Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. | |
| Conditions and measures related to municipal sewage treatment plant | Estimated substance removal from wastewater via on-site sewage treatment (%): | 94,1 |
| Conditions and measures related to municipal sewage treatment plant | Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%): | 97,7 |
| Conditions and measures related to municipal sewage treatment plant | Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): | 5000000 |
| Conditions and measures related to municipal sewage treatment plant | Assumed domestic sewage treatment plant flow (m ³ /d): | 2000 |
| Conditions and measures related to external treatment of waste for disposal | Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. | |

3.Exposure estimation and reference to its source

3.1.Health

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.

3.2.Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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

4.1.Health

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

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

Fuel oil, no. 2

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Exposure scenario

| 1. Title: Use as a fuel | |
|-------------------------------------|--|
| Use descriptors | PROC1, PROC2, PROC3, PROC8A, PROC8B, PROC16 SU22 ERC9a, ERC9b ESVOC SPERC 9.12b.v1 |
| Processes, tasks activities covered | Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste. Professional use |
| Assessment method | ECETOC TRA The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrорisk model. |

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8A, PROC8B, PROC16)

PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC8A: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8B: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16: Using material as fuel sources, limited exposure to unburned product to be expected

Product characteristics

| | |
|---|---|
| Physical form | Liquid |
| Concentration of the Substance in Mixture/Article | Covers percentage substance in the product up to 100 % (unless stated differently). |
| Vapour pressure | Liquid, vapour pressure < 0,5 kPa at STP. |

Operational conditions

| | | |
|---|--|--|
| Frequency and duration of use | Covers daily exposures up to 8 hours (unless stated differently). | |
| Other given operational conditions affecting workers exposure | Assumes use at not more than 20°C above ambient temperature. Assumes a good basic standard of occupational hygiene is implemented. | |

Risk management measures

| | | |
|--------------------------------|---|---|
| Other risk management measures | General measures applicable to all activities | Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and clear transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: Ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; Ensure suitable personal protective equipment is available; Clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions. |
|--------------------------------|---|---|

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| | | |
|--------------------------------|---|--|
| Other risk management measures | General measures (skin irritants) | Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. wash off any skin contamination immediately. provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. |
| Other risk management measures | CS14 - Bulk transfers | PPE15 - Wear suitable gloves tested to EN374. |
| Other risk management measures | CS8 - Drum/batch transfers | E64 - Use drum pumps or carefully pour from container. PPE15 - Wear suitable gloves tested to EN374. |
| Other risk management measures | refuelling | PPE15 - Wear suitable gloves tested to EN374. |
| Other risk management measures | Use as a fuel CS107 - (closed systems) | Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). or E69 - Ensure operation is undertaken outdoors. |
| Other risk management measures | CS39 - Equipment cleaning and maintenance | E65 - Drain down system prior to equipment opening or maintenance. PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. |
| Other risk management measures | Storage | E84 - Store substance within a closed system. |

2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b)

ERC9a: Wide dispersive indoor use of substances in closed systems

ERC9b: Wide dispersive outdoor use of substances in closed systems

Product characteristics

Other product characteristics Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

| | | |
|---|---|---------|
| Amount used | Fraction of EU tonnage used in region: | 0,1 |
| Amount used | Regional use tonnage (tons/year): | 6700000 |
| Amount used | Fraction of Regional tonnage used locally: | 0,0005 |
| Amount used | Annual site tonnage (tons/year): | 3300 |
| Amount used | Maximum daily site tonnage (kg/day): | 9200 |
| Frequency and duration of use | Continuous use/release. | |
| Frequency and duration of use | Number of emission days per year | 365 |
| Environmental factors not influenced by risk management | Local freshwater dilution factor: | 10 |
| Environmental factors not influenced by risk management | Local marine water dilution factor: | 100 |
| Other given operational conditions affecting environmental exposure | Release fraction to air from process (initial release prior to RMM): | 0,0001 |
| Other given operational conditions affecting environmental exposure | Release fraction to wastewater from process (initial release prior to RMM): | 0,00001 |
| Other given operational conditions affecting environmental exposure | Release fraction to soil from process (initial release prior to RMM): | 0,00001 |

Risk management measures

Technical conditions and measures Common practices vary across sites thus conservative process

Fuel oil, no. 2

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| | | |
|--|---|----------------|
| at process level to prevent release | release estimates used. | |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. | |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | Treat air emission to provide a typical removal efficiency of (%): | not applicable |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%): | 0 |
| Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil | If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%): | 0 |
| Organizational measures to prevent/limit release from the site | Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. | |
| Conditions and measures related to municipal sewage treatment plant | Estimated substance removal from wastewater via on-site sewage treatment (%): | 94,1 |
| Conditions and measures related to municipal sewage treatment plant | Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%): | 94,1 |
| Conditions and measures related to municipal sewage treatment plant | Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): | 140000 |
| Conditions and measures related to municipal sewage treatment plant | Assumed domestic sewage treatment plant flow (m ³ /d): | 2000 |
| Conditions and measures related to external treatment of waste for disposal | Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. | |

3.Exposure estimation and reference to its source

3.1.Health

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.

3.2.Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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

4.1.Health

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

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

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Exposure scenario

| 1. Title: Use as a fuel | |
|-------------------------------------|--|
| Use descriptors | PC13 SU21 ERC9a, ERC9b ESVOC SPERC 9.12c.v1 |
| Processes, tasks activities covered | Covers consumer uses in liquid fuels. Consumer use |
| Assessment method | ECETOC TRA The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model. |

2. Operational conditions and risk management measures

| 2.1 Contributing scenario consumer end-use (PC13) |
|---|
| PC13:Fuels |

| Product characteristics | |
|---|---|
| Physical form | Liquid |
| Concentration of the Substance in Mixture/Article | Covers percentage substance in the product up to 100 % (unless stated differently). |
| Vapour pressure | OC15 - Liquid, vapour pressure > 10 Pa |

| Operational conditions | | |
|---|--|-----------------------|
| Frequency and duration of use | unless stated differently. Covers use up to (g) | 37500 |
| Frequency and duration of use | Covers skin contact area up to (cm ²) | 420 |
| Other given operational conditions affecting consumers exposure | Unless otherwise stated Covers use up to | 0,143 Uses per day |
| Other given operational conditions affecting consumers exposure | for each use event, covers exposure up to | 2 Hours/event |
| Other given operational conditions affecting consumers exposure | PC13 - Fuels Liquid: Automotive Refuelling | |
| Other given operational conditions affecting consumers exposure | PC13 - Fuels Liquid Garden Equipment - Use | |
| Other given operational conditions affecting consumers exposure | PC13 - Fuels Liquid: Garden Equipment - Refuelling | |

| Risk management measures | | |
|--------------------------------|--|--|
| Other risk management measures | PC13 - Fuels Liquid: Automotive Refuelling | No specific risk management measure identified beyond those operational conditions stated. |
| Other risk management measures | PC13 - Fuels Liquid Garden Equipment - Use | No specific risk management measure identified beyond those operational conditions stated. |
| Other risk management measures | PC13 - Fuels Liquid: Garden Equipment - Refuelling | No specific risk management measure identified beyond those operational conditions stated. |

| 2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b) |
|---|
| ERC9a:Wide dispersive indoor use of substances in closed systems |

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ERC9b:Wide dispersive outdoor use of substances in closed systems

Product characteristics

Other product characteristics Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

| | | |
|---|---|----------|
| Amount used | Fraction of EU tonnage used in region: | 0,1 |
| Amount used | Regional use tonnage (tons/year): | 16000000 |
| Amount used | Fraction of Regional tonnage used locally: | 0,0005 |
| Amount used | Annual site tonnage (tons/year): | 8200 |
| Amount used | Maximum daily site tonnage (kg/day): | 23000 |
| Frequency and duration of use | Continuous use/release. | |
| Frequency and duration of use | Emission days (days/year): | 365 |
| Environmental factors not influenced by risk management | Local freshwater dilution factor: | 10 |
| Environmental factors not influenced by risk management | Local marine water dilution factor: | 100 |
| Other given operational conditions affecting environmental exposure | Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). | |
| Other given operational conditions affecting environmental exposure | Release fraction to air from wide dispersive use (regional only): | 0,0001 |
| Other given operational conditions affecting environmental exposure | Release fraction to wastewater from wide dispersive use: | 0,00001 |
| Other given operational conditions affecting environmental exposure | Release fraction to soil from wide dispersive use (regional only): | 0,00001 |

Risk management measures

| | | |
|---|--|--------|
| Conditions and measures related to municipal sewage treatment plant | Estimated substance removal from wastewater via on-site sewage treatment (%): | 94,1 |
| Conditions and measures related to municipal sewage treatment plant | Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): | 350000 |
| Conditions and measures related to municipal sewage treatment plant | Assumed domestic sewage treatment plant flow (m3/d): | 2000 |
| Conditions and measures related to external treatment of waste for disposal | Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. | |

3.Exposure estimation and reference to its source

3.1.Health

The ECETOC TRA tool has been used to estimate consumer exposures unless otherwise indicated.

3.2.Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

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

4.1. Health

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

4.2. Environment

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

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