SAFETY DATA SHEET
Aviation Jet Fuel JET A-1 (JETA1)

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

1.1. Product identifier

Product name: Aviation Jet Fuel JET A-1 (JETA1)
Product number: ID 10505
Internal identification: 145163

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

Identified uses: Distribution of substance, (ES01a) Formulation & (re)packing of substances and mixtures, (ES02) Use as a fuel, (ES12a, ES12b)

1.3. Details of the supplier of the safety data sheet

Supplier: Neste Oyj
Keilaranta 21, Espoo, P.O.B. 95, FIN-00095 NESTE, FINLAND
Tel. +358 10 45811
SDS@neste.com (chemical safety)

1.4. Emergency telephone number

National emergency telephone: +358-9-471 977, +358-9-4711, Poison Information Centre number

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards: Flam. Liq. 3 - H226
Health hazards: Skin Irrit. 2 - H315 STOT SE 3 - H336 Asp. Tox. 1 - H304
Environmental hazards: Aquatic Chronic 2 - H411

2.2. Label elements

Pictogram:

Signal word: Danger

Hazard statements: H226 Flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H336 May cause drowsiness or dizziness.
H411 Toxic to aquatic life with long lasting effects.
Aviation Jet Fuel JET A-1 (JETA1)

Precautionary statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273 Avoid release to the environment.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P331 Do NOT induce vomiting.
P261 Avoid breathing vapours.
P280 Wear protective gloves.

Contains

Kerosine (petroleum), sweetened, Distillates (petroleum), hydrotreated light; Kerosine - unspecified

2.3. Other hazards

Other hazards

Evaporates slowly. May cause eye and respiratory system irritation. Risk of soil and ground water contamination.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

<table>
<thead>
<tr>
<th>Kerosine (petroleum), sweetened</th>
<th>0-100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number: 91770-15-9</td>
<td></td>
</tr>
<tr>
<td>EC number: 294-799-5</td>
<td></td>
</tr>
<tr>
<td>REACH registration number: 01-2119502385-46-XXXX</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flam. Liq. 3 - H226</td>
</tr>
<tr>
<td>Skin Irrit. 2 - H315</td>
</tr>
<tr>
<td>STOT SE 3 - H336</td>
</tr>
<tr>
<td>Asp. Tox. 1 - H304</td>
</tr>
<tr>
<td>Aquatic Chronic 2 - H411</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Distillates (petroleum), hydrotreated light; Kerosine - unspecified</th>
<th>0-100 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number: 64742-47-8</td>
<td></td>
</tr>
<tr>
<td>EC number: 265-149-8</td>
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<tr>
<td>REACH registration number: 01-2119484819-18-XXXX</td>
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</tr>
<tr>
<td>Aquatic Chronic 2 - H411</td>
</tr>
</tbody>
</table>

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Composition comments

Mixture of a petroleum product and additives. Total aromatics at maximum: 26,5 %.
Naphthalene (CAS 91-20-3) < 1 %. Toluene (CAS 108-88-3) < 1%. Benzene (CAS 71-43-2) < 0,1 %.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation
Remove person to fresh air and keep comfortable for breathing. Get medical attention if symptoms are severe or persist.

Ingestion
Do not induce vomiting. Get medical attention immediately.
Aviation Jet Fuel JET A-1 (JETA1)

Skin contact
Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if irritation persists after washing.

Eye contact
Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists after washing.

4.2. Most important symptoms and effects, both acute and delayed

General information
Irritating to skin. May irritate eyes. Vapours in high concentrations are narcotic. May cause nausea, headache, dizziness and intoxication. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.

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

Notes for the doctor
Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media
Water spray, foam, dry powder or carbon dioxide.

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards
Flammable liquid and vapour. Containers can burst violently or explode when heated, due to excessive pressure build-up.

Hazardous combustion products
Carbon dioxide (CO2). Carbon monoxide (CO).

5.3. Advice for firefighters

Protective actions during firefighting
Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Prevent fire extinguishing water from contaminating surface water or the ground water system.

Special protective equipment for firefighters
Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions
Avoid inhalation of vapours and contact with skin and eyes. Wear adequate protective equipment at all operations.

For emergency responders
Prevent unauthorized access. Vapours are heavier than air and may spread near ground and travel a considerable distance to a source of ignition and flash back. Eliminate all ignition sources if safe to do so. Take precautionary measures against static discharge.

6.2. Environmental precautions

Environmental precautions
Avoid release to the environment. Stop leak if safe to do so. Avoid the spillage or runoff entering drains, sewers or watercourses. Contain spillage with sand, earth or other suitable non-combustible material. Inform the relevant authorities if environmental pollution occurs (sewers, waterways, soil or air). Risk of soil and ground water contamination.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up
Immediately start clean-up of the liquid and contaminated soil. Small Spillages: Absorb spillage with sand or other inert absorbent. Pay attention to the fire and health hazards caused by the product.
### Aviation Jet Fuel JET A-1 (JETA1)

#### 6.4. Reference to other sections

**Reference to other sections**

For personal protection, see Section 8.

#### SECTION 7: Handling and storage

**7.1. Precautions for safe handling**

**Usage precautions**

The product contains volatile substances which may spread in the atmosphere. Avoid heat, flames and other sources of ignition. Take precautionary measures against static discharges. All handling should only take place in well-ventilated areas. Avoid inhalation of vapours and contact with skin and eyes. Use personal protective equipment and/or local ventilation when needed. Do not eat, drink or smoke when using this product. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site. During tank operations follow special instructions (risk of oxygen displacement and hydrocarbons).

**7.2. Conditions for safe storage, including any incompatibilities**

**Storage precautions**

Flammable liquid storage. Store in accordance with local regulations. Store in a demarcated bunded area to prevent release to drains and/or watercourses. Take precautions against leakage by constructing collecting pools and sewerage systems as well as by surfacing the loading and unloading stations. Only store in correctly labelled containers. Use containers made of the following materials: Carbon steel. Stainless steel.

**7.3. Specific end use(s)**

**Specific end use(s)**

Not known.

#### SECTION 8: Exposure controls/Personal protection

**8.1. Control parameters**

**Occupational exposure limits**

Solvent naphtha, group 3: 100mg/m3 (8h), HTP 2018/FIN.

The individual limit values can be applied for the hydrocarbons.

**naphthalene**

Naphthalene: 1 ppm (8h), 5 mg/m3 (8h), 2 ppm (15min), 10mg/m3 (15min), HTP 2018/FIN.

Naphthalene: 10 ppm (8h), 50 mg/m3 (8h), EU OELV (EC/1991/322).

**toluene**

Toluene: 25 ppm (8h), 81 mg/m3 (8h), 100ppm (15min), 380 mg/m3 (15min), HTP 2016/FIN.

Toluene: 50 ppm (8h), 192 mg/m3 (8h), 100ppm (15min), 384 mg/m3 (15min), EU OELV (EC/2006/15)

May be absorbed through the skin.

**Benzene**

Benzene: 1 ppm (8h), 3,25 mg/m3, VNa 716/2000/FIN (binding limit value).

May be absorbed through the skin.

**DNEL**

Consumer - Oral; Long term systemic effects: 19 mg/kg/day

**PNEC**

Not available.

**Kerosine (petroleum), sweetened (CAS: 91770-15-9)**

**DNEL**

Consumer - Oral; Long term systemic effects: 19 mg/kg, (24h)

**8.2. Exposure controls**

**Appropriate engineering controls**

All handling should only take place in well-ventilated areas. Use personal protective equipment and/or local ventilation when needed. Handle in accordance with good industrial hygiene and safety practice. During tank operations follow special instructions (risk of oxygen displacement and hydrocarbons).
Aviation Jet Fuel JET A-1 (JETA1)

Eye/face protection  
Tight-fitting safety glasses.

Hand protection  
Wear protective gloves. It is recommended that gloves are made of the following material: Nitrile rubber. Neoprene. Polyvinyl chloride (PVC). The selected gloves should have a breakthrough time of at least 8 hours. Protection class 6. Protective gloves according to standards EN 420 and EN 374. Change protective gloves regularly.

Other skin and body protection  
Protective clothing when needed. Wear anti-static protective clothing if there is a risk of ignition from static electricity.

Respiratory protection  
Filter device/half mask Gas filter, type A2. Filter device could be used maximum 2 hours at a time. Filter devices must not be used in conditions where the oxygen level is low (< 19 vol.-%). At high concentrations a breathing apparatus must be used (self-contained or fresh air hose breathing apparatus). Filter must be changed often enough. Respirator according to standard EN 140.

Environmental exposure controls  
Take precautions against leakage by constructing collecting pools and sewerage systems as well as by surfacing the loading and unloading stations.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance  
Liquid.

Colour  
Clear.

Odour  
Hydrocarbons.

Odour threshold  
-

pH  
-

Melting point  
≤ -47°C (ASTM D2386, D5972, IP 529)

Initial boiling point and range  
170 - 300°C (ASTM D 86)

Flash point  
≥ 40°C (IP 170)

Upper/lower flammability or explosive limits  
Upper flammable/explosive limit: 0,6 % Lower flammable/explosive limit: 6 %

Vapour pressure  
~ 2 kPa @ 38°C

Vapour density  
> 3 (Air = 1.0)

Relative density  
0,775 - 0,840 @ 15°C (ASTM D4052)

Solubility(ies)  
The product has poor water-solubility. < 50 mg/l @ 20°C

Partition coefficient  
log Kow: > 3

Auto-ignition temperature  
~ 250°C

Decomposition Temperature  
-

Viscosity  
Kinematic viscosity < 7 mm2/s @ 40°C

Explosive properties  
Not considered to be explosive.

Oxidising properties  
Does not meet the criteria for classification as oxidising.

9.2. Other information  
Other information  
Not known.

SECTION 10: Stability and reactivity
Aviation Jet Fuel JET A-1 (JETA1)

10.1. Reactivity
Reactivity
There are no known reactivity hazards associated with this product.

10.2. Chemical stability
Stability
Stable at normal ambient temperatures and when used as recommended.

10.3. Possibility of hazardous reactions
Possibility of hazardous reactions
No potentially hazardous reactions known.

10.4. Conditions to avoid
Conditions to avoid
Keep away from heat, sparks and open flame.

10.5. Incompatible materials
Materials to avoid
Oxidising agents.

10.6. Hazardous decomposition products
Hazardous decomposition products
Does not decompose when used and stored as recommended.

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Toxicological effects
Based on available data the classification criteria are not met.

Skin corrosion/Irritation
Skin corrosion/irritation

Serious eye damage/Irritation
Serious eye damage/irritation
Based on available data the classification criteria are not met. (EPA OTS 798.4500)

Skin sensitisation
Skin sensitisation
Based on available data the classification criteria are not met. (OECD 406, EPA OTS 798.4100)

Germ cell mutagenicity
Genotoxicity - in vitro
Based on available data the classification criteria are not met. (OECD 471, 476, modified Ames test)

Genotoxicity - in vivo
Based on available data the classification criteria are not met. (OECD 475, 478, 479)

Carcinogenicity
Carcinogenicity
Based on available data the classification criteria are not met.

Reproductive toxicity
Reproductive toxicity - fertility
Based on available data the classification criteria are not met. (OECD 421)

Reproductive toxicity - development
Based on available data the classification criteria are not met. (OECD 414)

Specific target organ toxicity - single exposure
STOT - single exposure
May cause nausea, headache, dizziness and intoxication. Anaesthetic in high concentrations.

Specific target organ toxicity - repeated exposure
STOT - repeated exposure
Based on available data the classification criteria are not met. (OECD 410, 412, 413)
Aviation Jet Fuel JET A-1 (JETA1)

Aspiration hazard

May be fatal if swallowed and enters airways. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.

Toxicological information on ingredients.

Kerosine (petroleum), sweetened

Acute toxicity - oral
Notes (oral LD₅₀) \( LD₅₀ > 5000 \text{ mg/kg}, \text{ Oral, Rat (OECD 420, EPA OTS 798.1175)} \)

Acute toxicity - dermal
Notes (dermal LD₅₀) \( LD₅₀ > 2000 \text{ mg/kg}, \text{ Dermal, Rabbit (OECD 402, EPA OTS 798.1100)} \)

Acute toxicity - inhalation
Notes (inhalation LC₅₀) \( LC₅₀ > 5.28 \text{ mg/l}, \text{ Inhalation, Rat (4h) (OECD 403)} \)

Skin corrosion/irritation

Skin corrosion/irritation
Irritating to skin. (EPA Guidelines in FR Vol. 44, No. 145, p. 44054-44093)

Serious eye damage/irritation

Serious eye damage/irritation
Based on available data the classification criteria are not met. (EPA OTS 798.4500)

Skin sensitisation

Skin sensitisation
Not sensitising. (OECD 406, EPA OTS 798.4100)

Aspiration hazard

Aspiration hazard
Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.

Distillates (petroleum), hydrotreated light; Kerosine - unspecified

Acute toxicity - oral
Notes (oral LD₅₀) \( LD₅₀ > 5000 \text{ mg/kg}, \text{ Oral, Rat (OECD 420, EPA OTS 798.1175)} \)

Acute toxicity - dermal
Notes (dermal LD₅₀) \( LD₅₀ > 2000 \text{ mg/kg}, \text{ Dermal, Rabbit (OECD 402, EPA OTS 798.1100)} \)

Acute toxicity - inhalation
Notes (inhalation LC₅₀) \( LC₅₀ > 5.28 \text{ mg/l}, \text{ Inhalation, Rat (4h) (OECD 403)} \)

SECTION 12: Ecological information

12.1. Toxicity

Toxic to aquatic life with long lasting effects.

Ecological information on ingredients.

Kerosine (petroleum), sweetened

Acute aquatic toxicity

Acute toxicity - fish
\( LL₅₀, 24 \text{ hours: } 5-17 \text{ mg/l}, \)
\( LL₅₀, 48 \text{ hours: } 2-5 \text{ mg/l}, \)
\( \text{WAF (OECD 203)} \)
Aviation Jet Fuel JET A-1 (JETA1)

Acute toxicity - aquatic invertebrates
EL50, 24 hours: 4.6 mg/l,
EL50, 48 hours: 1.4 mg/l,
NOEL, 48 hours: 0.3 mg/l,
WAF (OECD 202)

Acute toxicity - aquatic plants
EL50, 24 hours: 1-3 mg/l,
NOEL, 24 hours: 1 mg/l,
WAF (OECD 201)

Chronic toxicity - aquatic invertebrates
NOEL, 28 days: 0.1 mg/l, Fish (QSAR)

Chronic toxicity - aquatic invertebrates
EL50, 21 days: 0.81 mg/l,
NOEL, 21 days: 0.48 mg/l,
WAF (OECD 211)

Distillates (petroleum), hydrotreated light; Kerosine - unspecified

Acute toxicity - fish
LL₅₀, 24 hours: 5-17 mg/l,
LL₅₀, 48 hours: 2-5 mg/l,
WAF (OECD 203)

Acute toxicity - aquatic invertebrates
EL50, 24 hours: 4.6 mg/l,
EL50, 48 hours: 1.4 mg/l,
NOEL, 48 hours: 0.3 mg/l,
WAF (OECD 202)

Acute toxicity - aquatic plants
EL50, 24 hours: 1-3 mg/l,
NOEL, 24 hours: 1 mg/l,
WAF (OECD 201)

Chronic toxicity - aquatic invertebrates
EL50, 21 days: 0.81 mg/l,
NOEL, 21 days: 0.48 mg/l,
WAF (OECD 211)

12.2. Persistence and degradability

Persistence and degradability
The product contains volatile substances which may spread in the atmosphere. Can be photodegraded in the atmosphere.

Stability (hydrolysis)
No significant reaction in water.

Biodegradation
Inherently biodegradable.
(OECD 301F)

12.3. Bioaccumulative potential

Bioaccumulative potential
Possibly bioaccumulative.

Partition coefficient
log Kow: > 3

12.4. Mobility in soil

Mobility
Evaporates slowly. The product has poor water-solubility. Product can penetrate soil until reaching the surface of ground water. The product contains substances which are bound to particulate matter and are retained in soil.

12.5. Results of PBT and vPvB assessment
Aviation Jet Fuel JET A-1 (JETA1)

Results of PBT and vPvB assessment

This product does not contain any substances classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects

Product causes fouling, and direct contact produces harmful effects e.g. to birds and vegetation. Adsorbed hydrocarbon residues can be harmful to sediment organisms.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal methods

Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. When handling waste, the safety precautions applying to handling of the product should be considered. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out.

SECTION 14: Transport information

14.1. UN number

UN No. (ADR/RID) 1863

14.2. UN proper shipping name

Proper shipping name (ADR/RID) UN 1863 FUEL, AVIATION, TURBINE ENGINE

14.3. Transport hazard class(es)

ADR/RID class 3

14.4. Packing group

ADR/RID packing group III

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant MARINE POLLUTANT

14.6. Special precautions for user

Hazard Identification Number (ADR/RID) 30

Tunnel restriction code (D/E)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

SECTION 15: Regulatory information

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

EU legislation


Aviation Jet Fuel JET A-1 (JETA1)

15.2. Chemical safety assessment
A chemical safety assessment has been carried out.

SECTION 16: Other information

<table>
<thead>
<tr>
<th>Abbreviations and acronyms used in the safety data sheet</th>
<th>EU OELV = European Occupational Exposure Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training advice</td>
<td>DO NOT SIPHON PRODUCT BY MOUTH SUCTION.</td>
</tr>
<tr>
<td>Revision comments</td>
<td>Updated, sections: Exposure scenarios</td>
</tr>
<tr>
<td>Revision date</td>
<td>14/08/2018</td>
</tr>
<tr>
<td>Supersedes date</td>
<td>03/09/2015</td>
</tr>
<tr>
<td>SDS number</td>
<td>5306</td>
</tr>
<tr>
<td>Hazard statements in full</td>
<td>H226 Flammable liquid and vapour.</td>
</tr>
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<td>H304 May be fatal if swallowed and enters airways.</td>
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# Exposure scenario

## Distribution of Substance - Industrial

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<th>Identification</th>
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<tbody>
<tr>
<td><strong>Product name</strong></td>
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<tr>
<td><strong>Version number</strong></td>
</tr>
<tr>
<td><strong>Es reference</strong></td>
</tr>
</tbody>
</table>

## 1. Title of exposure scenario

**Main title**
Distribution of Substance - Industrial

**Process scope**
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.

## Environment

<table>
<thead>
<tr>
<th>Environmental release category</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)</td>
</tr>
<tr>
<td>ERC5 Use at industrial site leading to inclusion into/onto article</td>
</tr>
<tr>
<td>ERC6a Use of intermediate</td>
</tr>
<tr>
<td>ERC6b Use of reactive processing aid at industrial site (no inclusion into or onto article)</td>
</tr>
<tr>
<td>ERC6c Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)</td>
</tr>
<tr>
<td>ERC6d Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)</td>
</tr>
<tr>
<td>ERC7 Use of functional fluid at industrial site</td>
</tr>
</tbody>
</table>

**SPERC**
ESVOC SPERC 1.1b.v1

## Worker

<table>
<thead>
<tr>
<th>Process category</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</td>
</tr>
<tr>
<td>PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions</td>
</tr>
<tr>
<td>PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</td>
</tr>
<tr>
<td>PROC4 Chemical production where opportunity for exposure arises</td>
</tr>
<tr>
<td>PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities</td>
</tr>
<tr>
<td>PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities</td>
</tr>
<tr>
<td>PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)</td>
</tr>
<tr>
<td>PROC15 Use as laboratory reagent.</td>
</tr>
</tbody>
</table>

## 2. Conditions of use affecting exposure (industrial - Environment 1)

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

<table>
<thead>
<tr>
<th>Amounts used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fraction of EU tonnage used in region: 0.1</td>
</tr>
<tr>
<td>Regional use tonnage: 8,700,000 tonnes/year</td>
</tr>
<tr>
<td>Fraction of Regional tonnage used locally: 1</td>
</tr>
<tr>
<td>Annual site tonnage: 17,000 tonnes</td>
</tr>
<tr>
<td>Maximum daily site tonnage: 58 tonnes</td>
</tr>
</tbody>
</table>
Distribution of Substance - Industrial

**Frequency and duration of use**
- Continuous release.
- Emission days: 300 days/year

**Other given operational conditions affecting environmental exposure**

**Emission factor - air**
- Release fraction to air from process (initial release prior to RMM): 1.0E-03

**Emission factor - water**
- Release fraction to wastewater from process (initial release prior to RMM): 1.0E-05

**Emission factor - soil**
- Release fraction to soil from process (initial release prior to RMM): 1.0E-05

**Environmental factors not influenced by risk management measures**

**Dilution**
- Local freshwater dilution factor: 10
- Local marine water dilution factor: 100

**Risk management measures**

**Good practice**
- Common practices vary across sites, thus conservative process release estimates used.
- Risk from environmental exposure is driven by freshwater sediment.

**STP details**
- Estimated substance removal from wastewater via domestic sewage treatment: 95%
- Removal efficiency (total): 95%
- Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 2.1E+06 kg/day
- Assumed domestic sewage treatment plant flow (m³/day): 2000.

**Technical onsite conditions and measures to reduce or limit discharges to air, water and soil**

**Air**
- Treat air emission to provide a typical removal efficiency of 90%.

**Water**
- Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 0.0
- If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

**Soil**
- Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

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

**Waste treatment**
- External treatment and disposal of waste should comply with applicable local and/or national regulations.

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

**Recovery method**
- External recovery and recycling of waste should comply with applicable local and/or national regulations.

---

**2. Conditions of use affecting exposure (Workers - Health 1)***

**Product characteristics**

**Physical state**
- Liquid

**Vapour pressure**
- Vapour pressure 0.5 - 10 kPa at STP.

**Concentration details**
- Covers percentage substance in the product up to 100% (unless stated differently).

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

**Other given operational conditions affecting workers exposure**
Distribution of Substance - Industrial

Setting
Assumes a good basic standard of occupational hygiene is implemented.

Temperature
Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational 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.

Risk management measures
General exposures (closed systems)
No other specific measures identified.

General exposures (open systems)
No other specific measures identified.

Process sampling
No other specific measures identified.

Laboratory activities
No other specific measures identified.

Bulk transfers
No other specific measures identified.

Drum and small package filling
No other specific measures identified.

Equipment cleaning and maintenance
No other specific measures identified.

Bulk product storage
No other specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method
Used Petrorisk model. (Hydrocarbon Block Method)

Maximum Risk Characterisation Ratios for air emissions 2.3E-04 Maximum Risk Characterisation Ratios for wastewater emissions 1.3E-02

4. Guidance to check compliance with the exposure scenario (Environment 1)

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 onsite 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).

3. Exposure estimation (Health 1)

Assessment method
The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Distribution of Substance - Industrial

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Qualitative approach used to conclude safe use. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

4. Guidance to check compliance with the exposure scenario (Health 1)

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

**Main title**
Formulation & (Re)packing of Substances and Mixtures - Industrial

**Process scope**
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.

**Environment**

<table>
<thead>
<tr>
<th>Environmental release category</th>
<th>SPERC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERC2 Formulation into mixture</td>
<td>ESVOC SPERC 2.2.v1</td>
</tr>
</tbody>
</table>

**Worker Process category**
PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC4 Chemical production where opportunity for exposure arises
PROC5 Mixing or blending in batch processes
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC14 Tabletting, compression, extrusion, pelletisation, granulation
PROC15 Use as laboratory reagent.

## 2. Conditions of use affecting exposure (Industrial - Environment 1)

### Product characteristics
Substance is complex UVCB. Predominantly hydrophobic.

### Amounts used
- Fraction of EU tonnage used in region: 0.1
- Regional use tonnage: 6,800,000 tonnes/year
- Fraction of Regional tonnage used locally: 1
- Annual site tonnage: 30,000 tonnes
- Maximum daily site tonnage: 100 tonnes

### Frequency and duration of use
- Continuous release.
- Emission days: 300 days/year
Formulation & (Re)packing of Substances and Mixtures - Industrial

Other given operational conditions affecting environmental exposure

<table>
<thead>
<tr>
<th>Emission factor - air</th>
<th>Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements): 2.5E-02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission factor - water</td>
<td>Release fraction to wastewater from process (initial release prior to RMM): 2.0E-04</td>
</tr>
<tr>
<td>Emission factor - soil</td>
<td>Release fraction to soil from process (initial release prior to RMM): 1.0E-04</td>
</tr>
</tbody>
</table>

Environmental factors not influenced by risk management measures

Dilution
- Local freshwater dilution factor: 10
- Local marine water dilution factor: 100

Risk management measures

Good practice
- Common practices vary across sites, thus conservative process release estimates used.
- Risk from environmental exposure is driven by freshwater sediment.

STP type
- Municipal STP.

STP details
- Estimated substance removal from wastewater via domestic sewage treatment: 95.0%
- Removal efficiency (total): 95.0%
- Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 100 tonne/day
- Assumed domestic sewage treatment plant flow (m³/day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air
- Treat air emission to provide a typical removal efficiency of 0%.

Water
- Prevent leaks and prevent soil/water pollution caused by leaks. Onsite wastewater treatment required. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 94.8 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0.0

Soil
- Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment
- External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

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

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state
- Liquid

Vapour pressure
- Vapour pressure 0.5 - 10 kPa at STP.

Concentration details
- Covers percentage substance in the product up to 100% (unless stated differently).

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

Other given operational conditions affecting workers exposure

Setting
- Assumes a good basic standard of occupational hygiene is implemented.
Formulation & (Re)packing of Substances and Mixtures - Industrial

**Temperature**

Assumes use at not more than 20°C above ambient temperature, unless stated differently.

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

**Organisational 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.

**Risk management measures**

General exposures (closed systems)
No other specific measures identified.

- General exposures (open systems)
No other specific measures identified.

- Process sampling
No other specific measures identified.

- Laboratory activities
No other specific measures identified.

- Bulk transfers
No other specific measures identified.

- Mixing operations
No other specific measures identified.

- Manual
Transfer from/pouring from containers
No other specific measures identified.

- Drum/batch transfers
No other specific measures identified.

- Tabletting, compression, extrusion or pelletisation
No other specific measures identified.

- Drum and small package filling
No other specific measures identified.

- Equipment cleaning and maintenance
No other specific measures identified.

- Bulk product storage
No other specific measures identified.

3. Exposure estimation (Environment 1)

**Assessment method**

Used Petrorisk model. (Hydrocarbon Block Method)

Maximum Risk Characterisation Ratios for air emissions 1.6E-02 Maximum Risk Characterisation Ratios for wastewater emissions 9.7E-01

4. Guidance to check compliance with the exposure scenario (Environment 1)
Formulation & (Re)packing of Substances and Mixtures - Industrial

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 onsite 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).

3. Exposure estimation (Health 1)

**Assessment method**

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

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Qualitative approach used to conclude safe use. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

4. Guidance to check compliance with the exposure scenario (Health 1)

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Exposure scenario
Use as a Fuel - Industrial

Identification

Product name  Kerosines
Version number  2018
Es reference  ES12a

1. Title of exposure scenario

Main title  Use as a Fuel - Industrial
Process scope  Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

Environment

Environmental release category  ERC7 Use of functional fluid at industrial site
SPERC  ESVOCSPERC 7.12.a.v1

Worker

Process category  PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC16 Use of fuels

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 1,600,000 tonnes/year
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 1,500,000 tonnes
Maximum daily site tonnage: 5000 tonnes

Frequency and duration of use

Continuous release.
Emission days: 300 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air  Release fraction to air from process (initial release prior to RMM): 5.0E-02
Emission factor - water  Release fraction to wastewater from process (initial release prior to RMM): 1.0E-05
Emission factor - soil  Release fraction to soil from process (initial release prior to RMM): 0

Environmental factors not influenced by risk management measures
Use as a Fuel - Industrial

Dilution  
Local freshwater dilution factor: 10  
Local marine water dilution factor: 100

Risk management measures  
Good practice  
Common practices vary across sites, thus conservative process release estimates used.  
Risk from environmental exposure is driven by freshwater sediment.

STP type  
Municipal STP.

STP details  
Estimated substance removal from wastewater via domestic sewage treatment: 95.0%  
Removal efficiency (total): 95%  
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 2.1E+06 tonne/day  
Assumed domestic sewage treatment plant flow (m³/day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air  
Treat air emission to provide a typical removal efficiency of 95%.

Water  
Prevent leaks and prevent soil/water pollution caused by leaks. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 94.4 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0.0

Soil  
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment  
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.

Conditions and measures related to external recovery of waste

Recovery method  
This substance is consumed during use and no waste of the substance is generated.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state  
Liquid

Vapour pressure  
Vapour pressure 0.5 - 10 kPa at STP.

Concentration details  
Covers percentage substance in the product up to 100% (unless stated differently).

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

Other given operational conditions affecting workers exposure

Setting  
Assumes a good basic standard of occupational hygiene is implemented.

Temperature  
Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational 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.
Use as a Fuel - Industrial

Risk management measures

General exposures (closed systems)
No other specific measures identified.

- Use as a fuel
  (closed systems)
No other specific measures identified.

- Bulk transfers
  No other specific measures identified.

- Drum/batch transfers
  No other specific measures identified.

- Equipment cleaning and maintenance
  No other specific measures identified.

- Bulk product storage
  No other specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method

Used Petrorisk model. (Hydrocarbon Block Method)

Maximum Risk Characterisation Ratios for air emissions 2.9E-02
Maximum Risk Characterisation Ratios for wastewater emissions 9.0E-01

4. Guidance to check compliance with the exposure scenario (Environment 1)

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 onsite 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).

3. Exposure estimation (Health 1)

Assessment method

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

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Qualitative approach used to conclude safe use. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

4. Guidance to check compliance with the exposure scenario (Health 1)

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
Exposure scenario
Use as a Fuel - Professional

Identification

<table>
<thead>
<tr>
<th>Product name</th>
<th>Kerosines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version number</td>
<td>2018</td>
</tr>
<tr>
<td>Es reference</td>
<td>ES12b</td>
</tr>
</tbody>
</table>

1. Title of exposure scenario

| Main title | Use as a Fuel - Professional |
| Process scope | Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste. |

Environment

| Environmental release category | ERC9a Widespread use of functional fluid (indoor) |
| SPERC | ESVOC SPERC 9.12b.v1 |

Worker

| Process category | PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions |
| PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions |
| PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition |
| PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities |
| PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities |
| PROC16 Use of fuels |

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

| Substance is complex UVCB. Predominantly hydrophobic. |

Amounts used

| Fraction of EU tonnage used in region: 0.1 |
| Regional use tonnage: 4,600,000 tonnes/year |
| Fraction of Regional tonnage used locally: 1 |
| Annual site tonnage: 2300 tonnes |
| Maximum daily site tonnage: 6.4 tonnes |

Frequency and duration of use

| Continuous release. |
| Emission days: 365 days/year |

Other given operational conditions affecting environmental exposure

| Emission factor - air | Release fraction to air from wide dispersive use (regional only): 1.0E-03 |
| Emission factor - water | Release fraction to wastewater from wide dispersive use: 1.0E-05 |
| Emission factor - soil | Release fraction to soil from wide dispersive use (regional only): 1.0E-05 |

Environmental factors not influenced by risk management measures
Use as a Fuel - Professional

Dilution
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice
Common practices vary across sites, thus conservative process release estimates used.
Risk from environmental exposure is driven by fresh water.

STP type
Municipal STP.

STP details
Estimated substance removal from wastewater via domestic sewage treatment: 95.0%
Removal efficiency (total): 95.0%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 2.9E+05 kg/day
Assumed domestic sewage treatment plant flow (m³/day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air
Treat air emission to provide a typical removal efficiency of N/A%.

Water
Prevent leaks and prevent soil/water pollution caused by leaks. Onsite wastewater treatment required. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 0.0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0.0

Soil
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.

Conditions and measures related to external recovery of waste

Recovery method
This substance is consumed during use and no waste of the substance is generated.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state
Liquid

Vapour pressure
Vapour pressure 0.5 - 10 kPa at STP.

Concentration details
Covers percentage substance in the product up to 100% (unless stated differently).

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

Other given operational conditions affecting workers exposure

Setting
Assumes a good basic standard of occupational hygiene is implemented.

Temperature
Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational 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.
Use as a Fuel - Professional

Risk management measures

General exposures (closed systems)
No other specific measures identified.

- Use as a fuel
  (closed systems)
  No other specific measures identified.

- Bulk transfers
  No other specific measures identified.

- Transfer from/pouring from containers
  No other specific measures identified.

- Equipment cleaning and maintenance
  No other specific measures identified.

- Bulk product storage
  No other specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method

Used Petrorisk model. (Hydrocarbon Block Method)

Maximum Risk Characterisation Ratios for air emissions 4.4E-04
Maximum Risk Characterisation Ratios for wastewater emissions 3.4E-03

4. Guidance to check compliance with the exposure scenario (Environment 1)

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 onsite 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).

3. Exposure estimation (Health 1)

Assessment method

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

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Qualitative approach used to conclude safe use. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

4. Guidance to check compliance with the exposure scenario (Health 1)

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