



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)
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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)
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1.4. Emergency telephone number

National emergency telephone number	+358-9-471 977, +358-9-4711, Poison Information Centre
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SECTION 2: Hazards identification

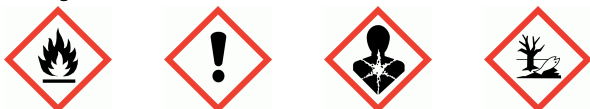
2.1. Classification of the substance or mixture

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
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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.
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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

Kerosine (petroleum), sweetened	0-100%
CAS number: 91770-15-9	EC number: 294-799-5
	REACH registration number: 01-2119502385-46-XXXX

Classification

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

Distillates (petroleum), hydrotreated light; Kerosine - unspecified	0-100 %
CAS number: 64742-47-8	EC number: 265-149-8
	REACH registration number: 01-2119484819-18-XXXX

Classification

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

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.

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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.

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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).

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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 mm ² /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.
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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 Irritating to skin. (EPA Guidelines in FR Vol. 44, No. 145, p. 44054-44093) The product irritates mucous membranes and may cause abdominal discomfort if swallowed. May cause respiratory 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

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 mg/kg, Oral, Rat (OECD 420, EPA OTS 798.1175)

Acute toxicity - dermal

Notes (dermal LD₅₀) LD₅₀ > 2000 mg/kg, Dermal, Rabbit (OECD 402, EPA OTS 798.1100)

Acute toxicity - inhalation

Notes (inhalation LC₅₀) LC₅₀ > 5,28 mg/l, 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 mg/kg, Oral, Rat (OECD 420, EPA OTS 798.1175)

Acute toxicity - dermal

Notes (dermal LD₅₀) LD₅₀ > 2000 mg/kg, Dermal, Rabbit (OECD 402, EPA OTS 798.1100)

Acute toxicity - inhalation

Notes (inhalation LC₅₀) LC₅₀ > 5,28 mg/l, Inhalation, Rat (4h) (OECD 403)

SECTION 12: Ecological information

12.1. Toxicity

Toxicity Toxic to aquatic life with long lasting effects.

Ecological information on ingredients.

Kerosine (petroleum), sweetened

Acute aquatic toxicity

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

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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 aquatic toxicity

Chronic toxicity - fish early life stage 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 aquatic toxicity

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 aquatic toxicity

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 Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).
Commission Regulation (EU) No 2015/830 of 28 May 2015.
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

Aviation Jet Fuel JET A-1 (JETA1)

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

SECTION 16: Other information

Abbreviations and acronyms used in the safety data sheet	EU OELV = European Occupational Exposure Limit Value
Key literature references and sources for data	Regulations, databases, literature, own research. Concawe Report No 11/10, 10/14. Chemical Safety Report Kerosines, 2010.
Training advice	DO NOT SIPHON PRODUCT BY MOUTH SUCTION.
Revision comments	Updated, sections: Exposure scenarios
Revision date	14/08/2018
Supersedes date	03/09/2015
SDS number	5306
Hazard statements in full	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.

Exposure scenario

Distribution of Substance - Industrial

Identification

Product name	Kerosines
Version number	2018
Es reference	ES01a

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

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article) ERC5 Use at industrial site leading to inclusion into/onto article ERC6a Use of intermediate ERC6b Use of reactive processing aid at industrial site (no inclusion into or onto article) ERC6c Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) ERC6d Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) ERC7 Use of functional fluid at industrial site
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SPERC	ESVOC SPERC 1.1b.v1
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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 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) PROC15 Use as laboratory reagent.
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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: 8,700,000 tonnes/year
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 17,000 tonnes
Maximum daily site tonnage: 58 tonnes

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 (M_{safe}), 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.
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Risk management measures

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

Exposure scenario

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

Identification

Product name	Kerosines
Version number	2018
Es reference	ES02

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

Environmental release category ERC2 Formulation into mixture

SPERC ESVOC SPERC 2.2.v1

Worker

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

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

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100
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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.
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STP type	Municipal STP.
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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 (m ³ /day): 2000.
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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.
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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.
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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.
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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.

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

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Process sampling
No other specific measures identified.

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Laboratory activities
No other specific measures identified.

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Bulk transfers
No other specific measures identified.

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Mixing operations
No other specific measures identified.

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

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Drum/batch transfers
No other specific measures identified.

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

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Drum and small package filling
No other specific measures identified.

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Equipment cleaning and maintenance
No other specific measures identified.

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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 ESVOC SPERC 7.12a.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.

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

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Bulk transfers
No other specific measures identified.

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Drum/batch transfers
No other specific measures identified.

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Equipment cleaning and maintenance
No other specific measures identified.

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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

Product name	Kerosines
Version number	2018
Es reference	ES12b

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) ERC9b Widespread use of functional fluid (outdoor)
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SPERC	ESVOC SPERC 9.12b.v1
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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
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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.

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

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Bulk transfers
No other specific measures identified.

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

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Equipment cleaning and maintenance
No other specific measures identified.

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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.