1 IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/ UNDERTAKING

· ***1.1 Product identifier***

· ***Trade name: Jet A-1***

· ***Main constituent:*** Kerosine (petroleum), sweetened
· ***CAS Number:***
91770-15-9
· ***EC number:***
294-799-5
· ***Registration number*** 01-2119502385-46-xxxx

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

· ***INDUSTRIAL USES***
Manufacture of substance
Use of substance as intermediate
Distribution of substance
Formulation and (re)packaging of substances and mixtures
Use as a fuel
· ***PROFESSIONAL USES*** Use as a fuel
· ***CONSUMER USES*** Use as a fuel

· ***1.3 Details of the supplier of the safety data sheet***
· ***Manufacturer/Supplier:***
HELLENIC PETROLEUM S.A.
8A, Chimarras Str, 151 25, Maroussi, Greece
Tel. +30 210 6302 000
Fax. +30 210 6302 510/511
· ***Further information obtainable from:*** reach@helpe.gr

· ***1.4 Emergency telephone number:***

National Emergency Centre: 166
National Poison Centre: (+30) 210 7793777

2 HAZARDS IDENTIFICATION

· ***2.1 Classification of the substance or mixture***

· ***2.1.1 Classification according to Regulation (EC) No 1272/2008***

GHS02 flame

Flam. Liq. 3 H226 Flammable liquid and vapour.

GHS08 health hazard

Asp. Tox. 1 H304 May be fatal if swallowed and enters airways.

GHS09 environment

Aquatic Chronic 2 H411 Toxic to aquatic life with long lasting effects.

(Contd. on page 2)

(Contd. of page 1)


GHS07

Skin Irrit. 2 H315 Causes skin irritation.
STOT SE 3 H336 May cause drowsiness or dizziness.

· ***2.1.2 Classification according to Directive 67/548/EEC or Directive 1999/45/EC***


Xn; Harmful

R65: Harmful: may cause lung damage if swallowed.

Xi; Irritant

R38: Irritating to skin.


N; Dangerous for the environment

R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R10: Flammable.

· ***2.1.3 Additional information:*** For full text of Hazard statements and R-phrases also refer to section 16.

· ***2.2 Label elements***

· ***Labelling according to Regulation (EC) No 1272/2008***
The substance is classified and labelled according to the CLP regulation.

· ***Hazard pictograms*** GHS02, GHS07, GHS08, GHS09

· ***Signal word*** Danger

· ***Hazard-determining components of labelling:***
Kerosine (petroleum), sweetened

· ***Hazard statements***
H226 Flammable liquid and vapour.
H315 Causes skin irritation.
H336 May cause drowsiness or dizziness.
H304 May be fatal if swallowed and enters airways.
H411 Toxic to aquatic life with long lasting effects.

· ***Precautionary statements***
P101 If medical advice is needed, have product container or label at hand.
P102 Keep out of reach of children.
P103 Read label before use.
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P273 Avoid release to the environment.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331 Do NOT induce vomiting.

· ***Additional information:***
The Precautionary Statements selected as the most appropriate (“Highly recommended”) to appear on the label, in line with the generic provisions set out in CLP Article 22 and 28 and with Part 1 of Annex IV to CLP, are:
P102, P210, P280, P301+P310, P331, P273.
The selection has taken into account the hazard statements used, the identified uses of the substance as well as the basic instructions specified in the “conditions for use” columns in tables 6.1 – 6.5 of Annex IV to the CLP Regulation. Normally, not more than six precautionary statements shall appear on the label, unless necessary to reflect the nature and the severity of the hazards.

(Contd. on page 3)

(Contd. of page 2)

· **Labelling according to Directive 67/548/EEC or Directive 1999/45/EC**
The product is classified according to Directive 67/548/EC.

· **Indication(s) of danger**
Harmful (Xn)
Dangerous for the environment (N)

· **Risk phrases**
Flammable.
Irritating to skin.
Harmful: may cause lung damage if swallowed.
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

· **Safety advice**
Keep out of the reach of children.
Avoid contact with skin.
In case of fire, use foam, dry chemical powder, carbon dioxide, other inert gases, sand or earth and water fog.
Use only in well-ventilated areas.
Avoid release to the environment. Refer to special instructions/safety data sheets.
If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

· **Labelling according to Directive 67/548/EEC or Directive 1999/45/EC**
The product is classified according to Directive 67/548/EC.

· **2.3 Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** The substance does not meet the criteria for PBT in accordance with Annex XIII.
· **vPvB:** The substance does not meet the criteria for vPvB in accordance with Annex XIII.

3 COMPOSITION/INFORMATION ON INGREDIENTS

· **3.1 Chemical characterization: Substances**
· **CAS No. Description**
91770-15-9 Kerosine (petroleum), sweetened
· **Identification number(s)**
· **EC number:** 294-799-5
· **Registration number:** 01-2119502385-46-xxxx
· **Concentration (%w/w):** 100
· **Impurities and stabilising additives:**
May contain trace concentrations of stabilisers to maintain product integrity (antioxidant, icing inhibitor, corrosion inhibitor, static dissipator).
Technical specification: MIL-DTL-83133G (NATO Code No. F-35) or ASTM D1655 or DEF STAN 91-91

· **Classification according to 67/548/EEC**
Flammable (OIN11), R10
Harmful (Xn), R65
Irritant (Xi), R38
Dangerous for the environment (N), R51/53
· **Classification according to Regulation (EC) No. 1272/2008**
Flam. Liq. 2, H226 (OIN12)
Skin Irrit. 2, H315
Asp. Tox. 1, H304
STOT Single Exp. 3, H336
Chronic Aquatic 2, H441

(Contd. on page 4)

(Contd. of page 3)

· ***Additional information:***
For the full text of R and H phrases refer to section 16.
Substance “kerosine (petroleum), sweetened” is a UVCB substance and member of the CONCAWE category “Kerosines”. The distillation range of kerosines is such that components of specific toxicological concern such as benzene and n-hexane are typically only present at trace concentrations.

· ***ACCORDING TO DIRECTIVE 67/548/EEC:***
The classification and label shown for this substance applies to the dangerous property(ies) indicated by the risk phrase(s) in combination with the category(ies) of danger shown. The manufacturers, distributors and importers of this substance shall be obliged to carry out an investigation to make themselves aware of the relevant and accessible data which exists for all other properties to classify and label the substance. The final label shall follow the requirements of section 7 of Annex VI of this Directive.

· ***ACCORDING TO REGULATION 1272/2008:***
Table 3.1: The classification and labelling shown for this substance applies to the hazardous property(ies) indicated by the hazard statement(s) in combination with the hazard class(es) and category(ies) shown. The requirements of Article 4 for manufacturers, importers or downstream users of this substance apply to all other hazard classes and categories.
Table 3.2: The classification and label shown for this substance applies to the dangerous property(ies) indicated by the risk phrase(s) in combination with the category(ies) of danger shown. Manufacturers, importers and downstream users of this substance shall be obliged to carry out an investigation to make themselves aware of the relevant and accessible data which exists for all other properties to classify and label the substance.

4 FIRST AID MEASURES

· ***4.1 Description of first aid measures***

· ***General information:***
WARNING BEFORE INTERVENTION:
Spillages make surfaces slippery.
Before attempting to rescue casualties, isolate area from all potential sources of ignition including disconnecting electrical supply.
Ensure adequate ventilation and check that a safe, breathable atmosphere is present before entry into confined spaces.
Drench contaminated clothing with water before removing to avoid risk of sparks from static electricity.
(Subject to applicability) Hydrogen sulphide (H2S) can accumulate in the headspace of product storage tanks and reach potentially hazardous concentrations.

· ***Following inhalation:***
Inhalation is unlikely because of the low vapour pressure of the substance at ambient temperature.
If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
If casualty is unconscious and:
(1) Not breathing – ensure that there is no obstruction to breathing and give artificial respiration by trained personnel. If necessary, give external cardiac massage and obtain medical assistance.
(2) Breathing – place in the recovery position. Administer oxygen if necessary.
Obtain medical attention if casualty has an altered state of consciousness or if symptoms do not resolve.
(Subject to applicability) If there is any suspicion of inhalation of H2S (hydrogen sulphide):
(1) Rescuers must wear breathing apparatus, belt and safety rope, and follow rescue procedures.
(2) Remove casualty to fresh air and keep at rest in a position comfortable for breathing.
(3) Immediately begin artificial respiration if breathing has ceased.
(4) Provision of oxygen may help.
(5) Obtain medical advice for further treatment.
In case of unconsciousness place patient stably in side position for transportation.

(Contd. on page 5)

(Contd. of page 4)

· ***Following skin contact:***
Remove contaminated clothing, contaminated footwear and dispose of safely.
Wash affected area thoroughly with soap and water.
Seek medical attention if skin irritation, swelling or redness develops and persists.
When using high-pressure equipment, injection of product can occur. If high-pressure injuries occur, immediately seek professional medical attention. Do not wait for symptoms to develop.
For minor thermal burns, cool the burn.
Hold the burned area under cold running water for at least five minutes, or until the pain subsides.
Body hypothermia must be avoided.
Immediately wash with water and soap and rinse thoroughly.

· ***Following eye contact:***
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so.
Continue rinsing.
If irritation, blurred vision or swelling occurs and persists, obtain medical advice from a specialist.

· ***Following ingestion/aspiration:***
In case of ingestion, always assume that aspiration has occurred. The casualty should be sent immediately to hospital. Do not wait for symptoms to develop.
Do not induce vomiting as there is high risk of aspiration.
Do not give anything by mouth to an unconscious person.

· ***Notes for the doctor:***
INHALATION
If there is any suspicion of over exposure to H2S (hydrogen sulphide) the casualty must be treated for poisoning.
Individuals with pre-existing lung disorders may have increased susceptibility of the effects of exposure.
SKIN CONTACT
High-pressure injection may drive fluid into the skin even through gloves or overalls. Diagnostic examination (e.g. radiographic or ultrasound) of the affected area may help to determine the distance of spread from the injection site. Primary treatment consists of surgical decompression and debridement.
INGESTION/ASPIRATION
Induction of vomiting is contraindicated. Activated charcoal is ineffective.
In cases of known or suspected aspiration, continuous monitoring of the patient for pulmonary oedema and/or aspiration for at least 48-72 hours following ingestion/aspiration is highly recommended.
Aspiration is commonly initially asymptomatic and may occur without any signs of vomiting. In most cases, the effects of aspiration are often muted, slow and insidious in onset during the early stages. In a minority of cases, aspiration may be recognized from the history of events, by a smell of hydrocarbons on the breath, signs of vomiting or symptoms such as choking or coughing.

· ***4.2 Most important symptoms and effects, both acute and delayed***
INHALATION
Headache
Nausea
Vomiting
Altered state of consciousness
SKIN CONTACT
Reddening
Irritation
EYE CONTACT
Slight eye irritation (unspecific)
INGESTION
Few or no symptoms expected. If any, nausea and diarrhoea might occur.

· ***4.3 Indication of any immediate medical attention and special treatment needed***
Treat accordingly depending on the type of exposure.

(Contd. on page 6)

(Contd. of page 5)

5 FIREFIGHTING MEASURES

· **5.1 Extinguishing media**
· **Suitable extinguishing media:**
Foam (specifically trained personnel only)
Water fog (specifically trained personnel only)
Dry chemical powder
Carbon dioxide (CO2)
Other inert gases (subject to regulations)
Sand or earth
· **Unsuitable extinguishing media:**
Do not use direct water jets on the burning product
Simultaneous use of foam and water on the same surface is to be avoided

· **5.2 Special hazards arising from the substance or mixture**
This product will float and can be reignited on surface water.
· **Hazardous combustion products:**
Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates and gases, including carbon monoxide and unidentified organic and inorganic compounds. If sulfur compounds are present in appreciable amounts, combustion products may include also H2S and SOx (sulfur oxides) or sulfuric acid.

· **5.3 Advice for fire-fighters**
In case of a large fire or in confined or poorly ventilated spaces wear full fire resistant protective clothing.
· **Other protective equipment for fire-fighters:**
Wear self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

· **Specific fire-fighting methods:** None mentioned.

6 ACCIDENTAL RELEASE MEASURES

· **GENERAL INFORMATION**
Risk of explosive mixtures of vapour and air. Ensure that all relevant regulations regarding explosive atmospheres, and handling and storage facilities of flammable products, are followed.
Use and store only outdoors or in a well-ventilated area.
Avoid contact with the product.
(Subject to applicability) A specific assessment of inhalation risks from the presence of H2S in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases must be made to help determine controls appropriate to local circumstances.

· **6.1 Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.

· **6.1.1 For non-emergency personnel**
Keep away from ignition sources.
Ensure adequate ventilation.
Need to evacuate the danger area or to consult an expert.

· **6.1.2 For emergency responders**
Small spillages: Normal antistatic working clothes are usually adequate.
Large spillages: Full body suit of chemically resistant and antistatic material.
PERSONAL PROTECTIVE EQUIPMENT
Work gloves providing adequate chemical resistance, specifically to aromatic hydrocarbons. Gloves made of PVA are not water-resistant, and are not suitable for emergency use.
Work helmet. Antistatic non-skid safety shoes or boots.

(Contd. on page 7)

(Contd. of page 6)

Goggles and /or face shield, if splashes or contact with eyes is possible or anticipated.
A half or full-face respirator with filter(s) for organic vapours/H2S, or a Self-contained Breathing Apparatus (SCBA) can be used according to the extent of spill and predictable amount of exposure. If the situation cannot be completely assessed, or if an oxygen deficiency is possible, only SCBA's should be used.

· ***6.2 Environmental precautions***
Avoid release to the environment.
Stop or contain leak at the source, if safe to do so.
SPILLAGES ON TO LAND
Prevent product from entering sewers, rivers or other bodies of water.
When inside buildings or confined spaces, ensure adequate ventilation.
Recommended measures are based on the most likely spillage scenarios for this material; however, local conditions (wind, air temperature, wave/current direction and speed) may significantly influence the choice of appropriate actions. For this reason, local experts should be consulted when necessary.
Local regulations may also prescribe or limit actions to be taken.
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.

· ***6.3 Methods and material for containment and cleaning up***
(Subject to applicability): Concentration of H2S in tank headspaces may reach hazardous values, especially in case of prolonged storage. This situation is especially relevant for those operations which involve direct exposure to the vapours in the tank.
(Subject to applicability): Spillages of limited amounts of products, especially in the open air when vapours will be usually quickly dispersed, are dynamic situations, which are unlikely to entail exposure to dangerous concentrations. As H2S has a density greater than ambient air, a possible exception may regard the build-up of dangerous concentrations in specific spots, like trenches, depressions or confined spaces. In all these circumstances, however, the correct actions should be assessed on a case-by-case basis.

· ***6.3.1 For containment***
SPILLAGES ON TO LAND
If necessary dike the product with dry earth, sand or similar non-combustible materials.
Large spillages may be cautiously covered with foam, if available, to limit vapour cloud formation.
Do not use direct jets.
When inside buildings or confined spaces, ensure adequate ventilation.
SPILLAGES IN WATER OR AT SEA
In case of small spillages in closed waters (i.e. ports), contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents.
If possible, large spillages in open waters should be contained with floating barriers or other mechanical means.
Control the spreading of the spillage.
Collect the product by skimming or other suitable mechanical means, only if fire/explosion risks can be adequately prevented.

· ***6.3.2 For cleaning up***
SPILLAGES ON TO LAND
Absorb spilled product with suitable non-combustible materials.
Collect free product with suitable means. Transfer collected product and other contaminated materials to suitable containers for recycle, recovery or safe disposal.
In case of soil contamination, remove contaminated soil and treat in accordance with local regulations.
SPILLAGES IN WATER OR AT SEA
The use of dispersants should be advised by an expert, and, if required, approved by local authorities.
Collect recovered product and other materials in suitable tanks or containers for recovery or safe disposal.

· ***6.3.3 Other information*** Not available.

(Contd. on page 8)

(Contd. of page 7)

· **6.4 Reference to other sections**
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 HANDLING AND STORAGE

· **7.1 Precautions for safe handling**
GENERAL INFORMATION
Risk of explosive mixtures of vapour and air. Ensure that all relevant regulations regarding explosive atmospheres, and handling and storage facilities of flammable products, are followed.
(Subject to applicability) A specific assessment of inhalation risks from the presence of H2S in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases must be made to help determine controls appropriate to local circumstances.
Keep away from heat/sparks/open flames/hot surfaces.
No smoking.
Use and store only outdoors or in a well-ventilated area.

· **7.1.1 Protective measures**
The vapour is heavier than air. Beware of accumulation in pits and confined spaces.
Do not use compressed air for filling, discharging, or handling operations.
Avoid contact with skin and eyes. Do not ingest. Avoid breathing vapours.
Use personal protective equipment as required.
Take precautionary measures against static electricity.
Ground/bond containers, tanks and transfer/receiving equipment.
Use only non-sparking tools.
· **Measures to protect the environment:**
Storage installations should be designed with adequate bunds to prevent ground and water pollution in case of leaks and spills.

· **7.1.2 Advice on general occupational hygiene**
Ensure that proper housekeeping measures are in place.
Contaminated materials should not be allowed to accumulate in the workplaces and should never be kept inside the pockets.
Keep away from food and beverages.
Do not eat, drink or smoke while using the product.
Wash the hands thoroughly after handling.
Change contaminated clothes at the end of working shift.

· **7.2 Conditions for safe storage, including any incompatibilities**
· **Technical measures and storage conditions:**
Cleaning, inspection and maintenance of internal structure of storage tanks must be done only by properly equipped and qualified personnel as defined by national, local or company regulations.
Before entering storage tanks and commencing any operation in a confined area, check the atmosphere for oxygen content and flammability.
If sulphur compounds are suspected to be present in the product, check the atmosphere for hydrogen sulfide (H2S) content.
Storage area layout, tank design, equipment and operating procedures must comply with the relevant European, national or local legislation.
PACKAGING MATERIALS (FOR STORAGE):
Recommended: For containers, or container linings use mild steel, stainless steel.
Unsuitable: Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Compatibility should be checked with the manufacturer.
· **Information about storage in one common storage facility:** Store separately from oxidising agents.
· **Further information about storage conditions:**
IF THE PRODUCT IS SUPPLIED IN CONTAINERS:

(Contd. on page 9)

(Contd. of page 8)

Keep only in the original container, or in a suitable container for this kind of product.
Keep containers tightly closed and properly labelled.
Protect from the sunlight.
Light hydrocarbon vapours can build up in the headspace of containers. These can cause flammability / explosion hazard. Open slowly in order to control possible pressure release.
Empty containers may contain flammable product residues.
Do not weld, solder, drill, cut or incinerate empty containers, unless they have been properly cleaned.

· ***Storage class:*** 3

· ***7.3 Specific end use(s)*** Refer to Exposure Scenarios, attached as Annex.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

· ***8.1 Control parameters***
In any case, it is advisable to reduce occupational exposure to mist or vapour to a minimum.

· ***8.1.1 Occupational Exposure /Biological Limit Values***
National Occupational Exposure Limit Values are not reported.
European Occupational Exposure Limits are not reported.
Biological Limit Values (BLVs) are not allocated.

· ***8.1.2 Information on currently recommended monitoring procedures***
Air testing in confined spaces: monitoring of the air using gas detectors (single or multiple) to detect and monitor presence of H2S, oxygen deficient conditions and explosive atmospheres.
National Institute of Occupational Safety and Health (NIOSH): Method 1550 - NAPHTHAS
BS EN 1127-1:2011: Explosive atmospheres. Explosion prevention and protection. Basic concepts and methodology
BS EN 60079-0:2009: Explosive atmospheres. Equipment. General requirements
BS EN 14042:2003: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents

· ***8.1.3 Applicable occupational exposure limit values and/or biological limit values for air contaminants (if formed when using the substance/mixture as intended)***
Subject to applicability:
HYDROGEN SULFIDE (CAS No. 7783-06-4)

GR (GREECE) TWA: 7mg/m³, 5ppm, STEL: 14mg/m³, 10ppm
EU TWA: 7mg/m³, 5ppm, STEL: 14mg/m³, 10ppm
USA/ACGIH TWA: 1ppm, STEL: 5ppm

OSHA, Part Number: 1910, Part Title: Occupational Safety and Health Standards, Subpart: Z, Subpart Title: Toxic and Hazardous Substances, Standard Number: 1910.1000, Title: AIR CONTAMINANTS, Table Z-2
Acceptable ceiling concentration: 20ppm
Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift: 50ppm, Maximum duration: 10 min once only, if no other meas. exp. occurs.

· ***8.1.4 DNEL/PNEC values***

· ***DNELs:***

Oral	DN(M)EL - Chronic effects systemic	19 mg/kg/24h (GENERAL POPULATION) Dose descriptor: 750mg/kg Assessment factor: 40
Dermal	DN(M)EL - Acute effects local	(WORKERS/GENERAL POPULATION) The data do not allow setting a DNEL.

(Contd. on page 10)

(Contd. of page 9)

	DN(M)EL - Acute effects systemic	(WORKERS/GENERAL POPULATION) No hazard identified for this route (data available).
	DN(M)EL - Chronic effects local	(WORKERS/GENERAL POPULATION) The data do not allow setting a DNEL.
	DN(M)EL - Chronic effects systemic	(WORKERS/GENERAL POPULATION) No hazard identified for this route (data available).
Inhalative	DN(M)EL - Acute effect local	(WORKERS/GENERAL POPULATION) No hazard identified for this route (data available).
	DN(M)EL - Acute effect systemic	(WORKERS/GENERAL POPULATION) No hazard identified for this route (data available).
	DN(M)EL - Chronic effects local	(WORKERS/GENERAL POPULATION) No hazard identified for this route (data available).
	DN(M)EL - Chronic effects systemic	(WORKERS/GENERAL POPULATION) No hazard identified for this route (data available).

· ***PNECs:***
Substance is a hydrocarbon UVCB (with a complex, unknown or variable composition).Therefore conventional methods of deriving PNECs are not appropriate and it is not possible to identify a single representative PNEC for such substances.

· ***8.2 Exposure controls***

· ***8.2.1 Appropriate engineering controls / Technical measures to prevent exposure***
Product is stored and handled in closed systems involving the use of insulated storage tanks and lagged and trace heated transfer lines.
Exposure to kerosine is limited except on tank filling and during maintenance operations.
It is recommended to follow the following advice:
Use process enclosures, local exhaust ventilation or other engineering controls to maintain airborne levels at the minimum.
Cleaning, inspection and maintenance of storage tanks require the implementation of strict confined space entry procedures. These include issuing of permits, gas freeing of tanks.
Do not enter empty storage tanks until measurements of available oxygen and hydrogen sulphide concentration and have been carried out.

· ***Organisational measures to prevent exposure:***
Conduct Risk Assessment for each task related to the product.
Before a worker is placed in a job with a potential for exposure to the substance, a licensed health care professional should evaluate and document the worker's baseline health status.

· ***8.2.2 Personal Protective Equipment***

· ***Respiratory protection:***

Use full face mask with filter for organic vapours.

CSN EN 136 - Respiratory protective devices - Full face masks - Requiremets, testing, marking
EN 148-3:1999 - Respiratory protective devices: threads for facepieces. Thread connection M 45 x 3
In spaces where hydrogen sulphide may accumulate and/or oxygen deficiency is possible:
Self-contained breathing apparatus (SCBA).
DIN EN 137 - Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking

· ***Protection of hands:***
EN 374: 2003 - Gloves giving protection from chemicals and micro-organisms
If repeated and/or prolonged skin exposure is likely, wear:
Impervious gloves

(Contd. on page 11)

(Contd. of page 10)

Provide employee skin care programmes
Gloves must be periodically inspected and changed in case of wear, perforations or contaminations.


Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

· ***Material of gloves***
Nitrile rubber, NBR
Neoprene gloves
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· ***Penetration time of glove material***
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· ***Eye protection:***
EN 166:2001 - Personal eye protection - specifications
If splashing is likely, wear:


Protective shield and/or Safety goggles

An eyewash station / safety shower should be located near the workplace


Tightly sealed goggles

· ***Body protection:***
Impervious protective clothing
For loading/unloading operations:


Safety helmet with integrated full face visor and neck protection

CSN EN 340 - Protective clothing - General requirements
BS EN 465:1995 - Protective clothing. Protection against liquid chemicals. Performance requirements for chemical protective clothing with spray-tight connections between different parts of the clothing (type 4 equipment)
BS EN 466-1:1995 Protective clothing. Protection against liquid chemicals. Performance requirements for chemical protective clothing with liquid-tight connections between different parts of the clothing (type 3 equipment)
BS EN 467:1995 Protective clothing. Protection against liquid chemicals. Performance requirements for garments providing protection to parts of the body
CSN EN 397 - Industrial safety helmets
Coveralls should be changed at the end of the work shift and cleaned as necessary to avoid transfer of product to clothes or underwear.
IN CASE OF LARGE SCALE FIRES:
Fire resistant coveralls.
DIN EN 137 - Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking

(Contd. on page 12)

(Contd. of page 11)

EN 469 - Protective clothing for fire fighting
BS EN 1486:2007 - Protective clothing for fire-fighters. Test methods and requirements for reflective clothing for specialized fire-fighting

· ***8.2.3 Environmental exposure controls***
Container contents should be completely used and containers should be emptied prior to discard.
Consult local regulations.
In case of product spill, an Emergency Response Plan should be followed, to minimise negative consequenses.
Define appropriate site specific measures on a case by case basis.
Onsite waste water treatment required.

9 PHYSICAL AND CHEMICAL PROPERTIES

· ***Information on basic physical and chemical properties***

· ***General Information***	
· ***Appearance:***	
Form:	Liquid
Colour:	Transparent
· ***Odour:***	Characteristic
· ***Odour threshold:***	Not determined.
· ***pH-value:***	Not determined.
· ***Change in condition***	
Melting point/Melting range:	max -47 °C (max -53 °F)
Boiling point/Boiling range:	10% v/v recovery at max 205°C Final b.p. at max 300°C
· ***Flash point:***	min 38 °C (min 100 °F)
· ***Flammability (solid, gaseous):***	Not applicable.
· ***Ignition temperature:***	>220°C (>428 °F)
· ***Decomposition temperature:***	Not determined.
· ***Self-igniting:***	Refer to auto-ignition temperature
· ***Danger of explosion:***	Product does not present an explosion hazard.
· ***Explosion limits:***	
Lower:	LEL: Not determined.
Upper:	UEL: Not determined.
· ***Vapour pressure at 37°C (99 °F):***	10-210 hPa (8-158 mm Hg) (EN13016-1)
· ***Density:***	Not determined.
· ***Relative density at 15°C (59 °F)***	0.775-0.840 g/cm³ (6.467-7.01 lbs/gal)
· ***Evaporation rate***	Not determined.
· ***Solubility in / Miscibility with water:***	Not determined (UVCB).
· ***Partition coefficient (n-octanol/water):***	Not determined (UVCB).
· ***Viscosity:***	
Dynamic:	Not determined.
Kinematic at -20°C (-4 °F):	8 cSt (ASTM D445)
· ***Other information***	Does not meet the criteria for corrosion of metal. Does not meet the definition of a peroxide.

(Contd. on page 13)

(Contd. of page 12)

10 STABILITY AND REACTIVITY

· **10.1 Reactivity**
Not self-reactive.
Does not undergo exothermic decomposition when heated.
Does not react with water.

· **10.2 Chemical stability**
· **Conditions to avoid** No decomposition if used according to specifications.

· **10.3 Possibility of hazardous reactions** Product does not react exothermically.

· **10.4 Conditions to avoid**
Extremely high temperatures.
Heat sources, sparks, open flames and ignition sources.

· **10.5 Incompatible materials** Halogens, strong acids and oxidizers, alkalis.

· **10.6 Hazardous decomposition products**
It does not decompose under ambient temperatures.
Hazardous products of thermal cracking: Carbon monoxide and dioxide, nitrogen oxides, sulfur dioxide, hydrogen sulfide, unburned hydrocarbons, polynuclear aromatic hydrocarbons, particulates.

11 TOXICOLOGICAL INFORMATION

· **11.1 Information on toxicological effects**
Information below, for all key studies, applies to all category members.

· **A) Acute toxicity:**

Oral	LD50	>5000 mg/kg bw (rat) ((Equivalent) OECD 420) Concentration applied: Sinlge dose of 5000mg/kg bw (thermo cracked kerosine , CAS No.68333-23-3) Duration of exposure: 14 days
Dermal	LD50	>2000 mg/kg (rabbit) ((Equivalent) OECD 402) Concentration applied: 2000 mg/kg (thermo cracked kerosine, CAS No. 68333-23-3) Duration of exposure: 24 hours exposure (observed for 14 days)
Inhalative	LC50	>5.28 mg/L (rat) ((Equivalent) OECD 403) Concentration applied: Single dose of 5.28 mg/L (straight run kerosine CAS.No: 8008-20-6) Duration of exposure: 4 hours

· **B) Skin corrosion/irritation:**

Irritation of skin	Ερεθιστικό	(rabbit) (OECD 404) Concentration applied: 0.5 mL of undiluted odourless kerosine Duration of exposure: 4 hours (observed for 7 days)

· **C) Serious eye damage/irritation:**

Irritation of eyes	Μη ερεθιστικό	(rabbit) (EPA OTS 798:4500) Concentration applied: 0.1mL undiluted thermo cracked kerosine Duration of exposure: 72 hours observation

· **D) Respiratory or skin sensitisation:**

Sensitisation	Αρνητικό	(guinea pig) ((Equivalent) OECD 406) Concentration applied: Induction phase : 1/4 dilution of thermocracked kerosine Challenge phase : exposure of 0.2% Dinitrochlorobenzene (DNCB) Duration of exposure: 6 hours application

(Contd. on page 14)

(Contd. of page 13)

· ***E) Germ cell mutagenicity (Genetic toxicity in vitro/in vivo)***
Substance in not mutagenic or genotoxic.

· ***F) Carcinogenicity***

Αρνητικό (καρκ.)	(mouse) ((Equivalent) OECD 451) Concentration applied: 37.5µl (JET Fuel A) Duration of exposure: 2 years (twice a week) (mouse) ((Equivalent) OECD 451) Concentration applied: 25mg (JET Fuel A) Duration of exposure: 105 weeks (3 times per week)
LOAEL (toxicity)	250 mg/kg bw/day (mouse) ((Equivalent) OECD 451) Concentration applied: 0, 250, 500 mg/kg (nominal concentration, JP-5) Duration of exposure: 103 weeks

· ***G) Toxicity to reproduction***
The information available currently on reproduction toxicity parameters is insufficient to determine the impact on human fertility.

LOAEL (embryotoxicity)	1500 mg/kg/day (rat) (OECD 414) Concentration applied: 500,1000,1500,2000 mg/kg/day (actual ingested, JP-8) Duration of exposure: 10 days
LOAEL (maternal toxicity)	1000 mg/kg bw/day (rat) (OECD 414) Concentration applied: 500,1000,1500,2000 mg/kg/day (actual ingested, JP-8) Duration of exposure: 10 days
NOAEC (maternal toxicity)	≥364 ppm (rat) (OECD 414) Concentration applied: 106 or 364ppm kerosine, CAS No. 8008-20-6 Duration of exposure: 6 hours daily (9 days)
NOAEC (teratogenicity)	≥364 ppm (rat) (OECD 414) Concentration applied: 106 or 364ppm kerosine, CAS No. 8008-20-6 Duration of exposure: 6 hours daily (9 days)
NOAEL (developmental toxicity)	≥494 mg/kg bw/day (rat) Concentration applied: 165,330,494 mg/kg/day (hydrodesulfurised kerosine, CAS No. 64742-81-0) Duration of exposure: 14 days
NOAEL (embryotoxicity)	1000 mg/kg/day (rat) (OECD 414) Concentration applied: 500,1000,1500,2000 mg/kg/day (actual ingested, JP-8) Duration of exposure: 10 days
NOAEL (maternal toxicity)	500 mg/kg bw/day (rat) (OECD 414) Concentration applied: 500,1000,1500,2000 mg/kg/day (actual ingested, JP-8) Duration of exposure: 10 days
NOAEL (reproduction)	≥494 mg/kg bw/day (rat) (OECD 421) Concentration applied: 165,330,494 mg/kg/day (hydrodesulfurised kerosine, CAS No. 64742-81-0) Duration of exposure: 14 days

(Contd. on page 15)

(Contd. of page 14)

	≥1500 mg/kg bw/day (rat) (OECD 414) FEMALE: Concentration applied: males: 750,1500,3000 mg/kg/day (actual ingested, JP-8) females: 325,750,1500 mg/kg/day (actual ingested, JP-8) Duration of exposure: males: 70 to 90 days, females: 21 weeks ≥3000 mg/kg bw/day (rat) (OECD 414) MALE: Concentration applied: males: 750,1500,3000 mg/kg/day (actual ingested, JP-8) females: 325,750,1500 mg/kg/day (actual ingested, JP-8) Duration of exposure: males: 70 to 90 days, females: 21 weeks 750 mg/kg bw/day (rat) (OECD 414) MALE/FEMALE: Concentration applied: males: 750,1500,3000 mg/kg/day (actual ingested, JP-8) females: 325,750,1500 mg/kg/day (actual ingested, JP-8) Duration of exposure: males: 70 to 90 days, females: 21 weeks

· ***H) STOT single exposure***
Affected organs: Central nervous system.
Route of exposure: Inhalation.

· ***I) STOT repeated exposure***
Based on available data, no organs are affected.

LOAEL	500 mg/m3 (rat) Concentration applied: 0,500,1000 mg/m3 vapour, JP-8 Duration of exposure: 90 days (24hrs/day) 0.01 ml/kg bw (rat) (OECD 410) Concentration applied: 0.01,0.05,0.5 ml/kg/day thermocracked kerosine, CAS No. 68333-23-3 Duration of exposure: 4 weeks(6hrs/day,5d/week)
NOAEC	≥24 mg/m3 (rat) ((Equivalent) OECD 412) Concentration applied: 24mg/m3 vapour, hydrodesulfurised kerosine, CAS NO. 64742-81-0 Duration of exposure: 4 weeks (6hrs/day, 5days/week)
NOAEL	750 mg/kg bw/day (rat) Concentration applied: Males 750,1500,3000 mg/kg/day, JP-8 Females: 325,750,1500 mg/kg/day, JP-8 Duration of exposure: Males treated for 70 to 90 days, females treated for 21 weeks ≥1000 mg/m3 (rat) (OECD 413) Concentration applied: 0,500,1000 mg/m3 vapour, JP-8 Duration of exposure: 90 days (24hrs/day) ≥0.5 ml/kg bw (rat) Concentration applied: 0.01,0.05,0.5 ml/kg/day thermocracked kerosine, CAS No. 68333-23-3 Duration of exposure: 4 weeks(6hrs/day,5d/week)

· ***J) Aspiration hazard:***
The R65/H304 risk/hazard phrase relates to potential for aspiration, a non- quantifiable hazard that can occur during ingestion and also if it is vomited following ingestion.

(Contd. on page 16)

(Contd. of page 15)

12 ECOLOGICAL INFORMATION

· **12.1 Toxicity**

· **12.1.1 Aquatic toxicity**
LONG-TERM TOXICITY TO FISH:
The aquatic toxicity was estimated using the PETROTOX computer model. The estimated freshwater fish NOEL = 0.098 mg/L.
TOXICITY TO MICROORGANISMS:
Estimated (using PETROTOX computer model) LL50(72h)=677.9mg/l for "Tetrahymena pyriformis".

EL50	1-3 mg/L (AQUATIC ALGAE AND CYANOBACTERIA) (OECD 201) 72h, static Concentrations applied: 0 - 0.1 - 0.4 - 1 - 3 and 10mg/L NOEL=1mg/L
	1.4 mg/L (Daphnia magna) (OECD 202) 48h, acute test Concentrations applied: 0 - 0.1 - 0.3 - 1.4 - 6.8 and 34mg/L NOEL=0.3 mg/L
	0.89 mg/L (Daphnia magna) (OECD 211) 21-day, semi-static Loading rates: 0 - 0.08 - 0.19 - 0.48 - 1.2 and 3mg/L NOEL=0.48mg/L LOEL=1.2mg/L
LL50	2-5 mg/L (FISH) (OECD 203) 96h, semi-static test Concentrations applied: 0 - 0.2 - 0.7 - 2 - 5 - 17 and 50mg/L NOEL=2 mg/L

· **12.1.2 Sediment toxicity**
Substance is complex (UVCB). Standard tests for sediment toxicity cannot be applied.

· **12.1.3 Terrestrial toxicity**
Substance is complex (UVCB). Standard tests for terrestrialt toxicity cannot be applied.
According to REACH Annex X, studies on long-term or reproductive toxicity to birds do not need to be conducted due to the existence of a large mammalian dataset.

· **12.2 Persistence and degradability**

· **12.2.1 Persistence Assessment**
An evaluation of representative hydrocarbon structures, indicate some structures meet the Persistent (P) or very Persistent (vP) criteria.

· **12.2.2 Stability**
-- Hydrolysis:
Substance is resistant to hydrolysis because it lacks a functional group that is hydrolytically reactive. Therefore, this fate process will not contribute to a measurable degradative loss of this substance from the environment.
-- Phototransformation in water/soil:
It does not have the potential to undergo photolysis in water and soil, and this fate process will not contribute to a measurable degradative loss of this substance from the environment.

· **12.2.3 Biodegradation**
Substance is a hydrocarbon UVCB. Standard tests for this endpoint are intended for single substances and are not appropriate for this complex substance.

(Contd. on page 17)

(Contd. of page 16)

· **12.3 Bioaccumulative potential**
An evaluation of representative hydrocarbon structures indicate no structures meet the very Bioaccumulative (vB) criterion but some structures meet the Bioaccumulative (B) criterion.

· **12.4 Mobility in soil** No further relevant information available.

· **12.5 Results of PBT and vPvB assessment**
Anthracene is not present in this substance at greater than 0.1%.
· **PBT:** Substance does not fulfil the criteria.
· **vPvB:** Substance does not fulfil the criteria.

· **Other adverse effects**
Emission characterization is not required because the substance does not fulfill the PBT/vPvB criteria.

13 DISPOSAL CONSIDERATIONS

· **13.1 Waste treatment methods**

· **13.1.1 Product / Packaging disposal**
When it is required to dispose of this product - for example following a spillage or tank cleaning operations - this should be done through a recognised waste contractor.

· **Recommendation** Prevent from entering sewers.

· **Recommendation:** Dispose according to local regulations.

· **13.1.2 Waste treatment - relevant information**
Do not apply industrial sludge to natural soils. Follow local regulations.

· **13.1.3 Sewage disposal - relevant information** Prevent from entering sewers.

· **13.2 additional information** Not available.

14 TRANSPORT INFORMATION

· **UN-Number**	
· **ADR, ADN, IMDG, IATA**	UN1863
· **UN proper shipping name**	
· **ADR, ADN**	1863 FUEL, AVIATION, TURBINE ENGINE, ENVIRONMENTALLY HAZARDOUS
· **IMDG, IATA**	FUEL, AVIATION, TURBINE ENGINE
· **Transport hazard class(es)**	
· **ADR/RID**	
· **Class**	3 Flammable liquids.
· **Label**	3

(Contd. on page 18)

(Contd. of page 17)

· **AND(R)**	
· **ADN/R Class:**	3
· **IMDG, IATA**	
	
· **Class**	3 Flammable liquids.
· **Label**	3
· **Packing group**	
· **ADR, IMDG, IATA**	I, II, III
· **Packing Instructions: ICAO-TI/IATA-DGR**	PACKING GROUP I: New LTD Qty / Net Qty: F/F New PAX PI / Net Qty: 351/1.0L New CAO PI / Net Qty: 361/30.0L PACKING GROUP II: New LTD Qty / Net Qty: Y341/1.0L New PAX PI / Net Qty: 353/5.0L New CAO PI / Net Qty: 364/60.0L PACKING GROUP III: New LTD Qty / Net Qty: Y344/10.0L New PAX PI / Net Qty: 355/60.0L New CAO PI / Net Qty: 366/220.0L
· **Environmental Hazards**	
· **ADR/RID, AND(R): Recommendations on the Transport of Dangerous Goods, UN Model Regulations:**	
· **Limited and excepted quantities**	PACKING GROUP I: 500ml, E3 PACKING GROUP II: 1L, E2 PACKING GROUP III: 5L, E1
· **Packagings and IBCs**	PACKING GROUP I: P001 PACKING GROUP II: P001, IBC02 PACKING GROUP III: P001, IBC03, LP01
· **Portable tanks and bulk containers**	PACKING GROUP I: T11, TP1,TP8, TP28 PACKING GROUP II: T4, TP1, TP8 PACKING GROUP III: T2, TP1
· **IMO/Pollution prevention: Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:**	No available information.
· **IMDG Code Environmental Hazards: Marine pollutant:**	Yes
· **Special marking (ADR/RID):**	Symbol (fish and tree)
· **Special precautions for user**	Warning: Flammable liquids.
· **Danger code (Kemler):**	30
· **EMS Number:**	F-E,S-E
· **14.1 Transport/Additional information:**	Kerosine substances are used to produce mixtures that are placed on the market as products, some of which are fuels for aviation use. Products placed on the market include Jet A-1, Avcat/FSII, Avtur/FSII, Avtag/FSII. The transport classification of these

(Contd. on page 19)

(Contd. of page 18)

·	products will depend upon the properties and end use of the products concerned. UN 1863: If a substance is being transported for use as an aviation turbine fuel the proper shipping name "UN 1863 FUEL, AVIATION, TURBINE ENGINE" will apply. The substance must have a closed flash point that is less than or equal to 60°C. The correct choice of Packaging Group will depend upon the closed flash point and initial boiling point of the product being transported.
· ***Special provisions***	-- When transport is by inland waterway (ADNR) the use of UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. will apply to substances that are being transported in packages. UN 3082 can be used provided the substance cannot be assigned to other entries in classes 1 – 8, and provided the substance cannot be assigned to other entries in class 9. UN 3082 belongs to Class 9 Miscellaneous dangerous substances and articles and Classification code M6 applies. -- For transport by inland waterway (ADNR) in bulk in a tank vessel UN 3082 can be used provided the substance does not meet the classification criteria of any other class or substance within Class 9. -- If transported in tank vessels, ADN ID number 9001 or 9003 can be used, if the product meets the relevant criteria. -- The proper shipping name UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. is applied to substances with a closed flash point of greater than 60°C for transport by land (ADR/RID), marine (IMDG) and air (ICAO/ IATA). UN 3082 can be used provided the substance cannot be assigned to other entries in classes 1 – 8, and provided the substance cannot be assigned to other entries in class 9.
· ***Legislative Issues***	-- Directive 2008/68/EC: Derogation from the safety requirements for fixed tanks (tank-vehicles), registered before 31 December 2001, for the local transport or small quantities of some categories of dangerous goods. Transitional provision: Fixed tanks (tank-vehicles), removable tanks and tank containers first registered in Greece between 1 January 1985 and 31 December 2001 may be used until 31 December 2010. This transitional provision concerns vehicles for the transport of the following dangerous materials (UN: 1202, 1268, 1223, 1863, 2614, 1212, 1203, 1170, 1090, 1193, 1245, 1294, 1208, 1230, 3262, 3257). It is intended to cover small quantities or local transport for vehicles registered during the aforementioned period. Expiry date: 30 June 2015. -- Directive 2008/68/EC: Derogation from the safety

(Contd. on page 20)

(Contd. of page 19)

·	requirements for fixed tanks (tank-vehicles), registered before 31 December 2001, for the local transport or small quantities of some categories of dangerous goods. Transitional provision: Fixed tanks (tank-vehicles), removable tanks and tank containers first registered in Greece between 1 January 1985 and 31 December 2001 may be used until 31 December 2010. This transitional provision concerns vehicles for the transport of the following dangerous materials (UN: 1202, 1268, 1223, 1863, 2614, 1212, 1203, 1170, 1090, 1193, 1245, 1294, 1208, 1230, 3262, 3257). It is intended to cover small quantities or local transport for vehicles registered during the aforementioned period.
· ***Additional information:***	-- Special provision 274 applies to UN 3082. Special provision 274 does not apply to UN 1223, UN 1863, ID 9001 or ID 9003. -- ADN(R) will only applied until end 2010 and from 1.1.2011 ADN annexed regulations (ADN 2011) entered into force also on the Rhine.
· ***Transport category***	3
· ***Tunnel restriction code***	D/E

15 REGULATORY INFORMATION

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

· ***National Regulations***
Greek Presidential Decree 338/2001: Protection of Occupational Health and Safety of Workers exposed to chemical agents.

· ***European regulations***
Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control.
Directive 2001/81/EC of the European Parliament and of the council of 23 October 2001on national emission ceilings for certain atmospheric pollutants.
Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances (Seveso II).
Directive 2010/75/EU of the European Parliament and of the council of 24 November 2010 on industrial emissions (integrated pollution prevention and control).
Directive 2009/161/EU of 17 December 2009 establishing a third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC.
European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) including the Annexed Regulations, applicable as from 1 January 2011.

· ***15.2 Chemical safety assessment:*** A Chemical Safety Assessment has been carried out.

(Contd. on page 21)

(Contd. of page 20)

16 OTHER INFORMATION

· **A) Indication of changes**
The previous version of this Safety Data Sheet has been completely revised according to Regulations (EC) 1907/2006, 1272/2008, 453/2010.

· **B) Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)

· **Additional abbreviations and acronyms**
ADR: European agreement concerning the international carriage of dangerous goods by road
AF: Assessment Factor
CAS: Chemical Abstracts Service
CLP: Classification, Labelling and Packaging
CONCAWE: CONservation of Clean Air and Water Europe
DNEL: Derived No Effect Level
DMEL: Derived Minimal Effect Level
DT50: Degradation half time
ECHA: European Chemicals Agency
EINECS: European Inventory of Existing Commercial chemical Substances
ES: Exposure Scenario
GHS: Gloabal Harmonized System
LOAEL: Lowest Observed Adverse Effect Level
LOEL: Lowest Observed Effect Level
NOAEL: No Observed Adverse Effect Level
NOEC: No Effect Concentration
NOEL: No Observed Effect Level
OECD: Organisation for Economic Co-Operation and Development
PBT : Persistent, Bioaccumulative and Toxic
PNEC: Predicted No Effect Concentration
RID: European agreement concerning the international carriage of dangerous goods by rail
UVCB: Unknown or Variable composition, Complex reaction products or Biological materials
vPvB: Very Persistent and Very Bioaccumulative

· **C) Key literature references and sources of data**
CONCAWE Report 11/10 “Hazard classification and labelling of petroleum substances in the EEA-2010"
CONCAWE Report 6/10 “Compilation of selected physical-chemical properties of petroleum substances and sulfur”
UN Recommendations on the Transport of Dangerous Goods - Model Regulations 17th revised edition, 2011. Part 3: “Dangerous goods list, special provisions and exceptions” - http://www.unece.org/trans/danger/publi/unrec/rev17/17files e.html
IBC Code Chapters 17 and 18.
IATA, DG list by PI, Oct.2008 – http://www.iata.org
OSHA, Occupational Safety & Health Administration, http://osha.gov

· **D) Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]**
Flam. Liq.3, H226
Asp. Tox.1, H304
Skin Irrit.2, H315
Acute Tox. 4, H336
Aquatic Chronic 2, H411

(Contd. on page 22)

(Contd. of page 21)

· ***E) Relevant R-phrases and /or H-statements (number and full text)***
R10: Flammable
R38: Irritating to skin
R65: Harmful: may cause lung damage if swallowed
R51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
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
· ***F) Training advice*** The information of the present document may be used for training purposes.
· ***G) Further information***

DISCLAIMER OF LIABILITY The information provided only concerns the specific product and may not apply for the same material if used in combination with any other material(s) or in any process. This information is accurate and reliable according to data which Hellenic Petroleum SA has available on the above date and is given in good faith but without any warranty. The present e-SDS is supplied to customers, for them to consider and judge that the information is appropriate and complete for their particular use of the product. It is their own obligation to pass on relevant exposure scenarios and to use the relevant information to compile their own e-SDSs.

EXPOSURE SCENARIO 1 of 7

Worker in Industrial Settings

Jet A-1

SECTION 1: EXPOSURE SCENARIO TITLE	
ES1	**Manufacture of substance "Kerosine (petroleum), sweetened" - CAS No. 91770-15-9**
Use descriptors	
Sector of use category (SU): Main user Groups	
SU3	Industrial uses: Uses of substances as such or in preparations* at industrial sites
Sector of use category (SU): Supplementary descriptor: Sectors of end-use	
SU8	Manufacture of bulk, large scale chemicals (including petroleum products)
SU9	Manufacture of fine chemicals
Chemical product category (PC)	
Process category (PROC)	
PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8A	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8B	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15	Use as laboratory reagent
Environmental Release Category (ERC)	
ERC1	Manufacture of substances
ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
SpERC	ESVOC SpERC 1.1v1
Processes, tasks, activities covered	Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling /recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).
SECTION 2: OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
Section 2.1: Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure < 0.5 kPa at STP [OC3].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	*Not applicable.*

Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2].
Human factors not influenced by risk management	*Not applicable.*
Other Operational Conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented [G1].
	Operation is carried out at elevated temperature (> 20°C above ambient temperature) [OC7].
Contributing Scenario	**Risk Management Measures**
General measures (skin irritants) [G19].	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 [E3].
General exposures (closed systems) [CS15].	No other specific measures identified [EI20].
General exposures (open systems) [CS16].	No other specific measures identified [EI20].
Bulk transfers [CS14].	No other specific measures identified [EI20].
Process sampling [CS2].	No other specific measures identified [EI20].
Laboratory activities [CS36].	No other specific measures identified [EI20].
Equipment cleaning and maintenance [CS39].	No other specific measures identified [EI20].
Bulk product storage [CS85].	No other specific measures identified [EI20].

Section 2.2: Control of environmental exposure

Product characteristics	
	Substance is complex UVCB [PrC3].
	Predominantly hydrophobic [PrC4a].
Amounts used	
[A1] Fraction of EU tonnage used in region:	0,1
[A2] Regional use tonnage (tonnes/year):	5,40E+06
[A3] Fraction of regional tonnage used locally:	0,11
[A4] Maximum daily site tonnage (kg/day):	2,00E+06
[A5] Annual site tonnage (tonnes/year):	6,00E+05

Frequency and duration of use	
Continuous release [FD2].	
[FD4] Emission Days (days/year):	300
Environmental factors not influenced by risk management	
[EF1] Local freshwater dilution factor:	10
[EF2] Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
[OOC4] Release fraction to air from process (initial release prior to RMM):	1,00E-02
[OOC5] Release fraction to wastewater from process (initial release prior to RMM):	3,00E-04
[OOC6] Release fraction to soil from process (initial release prior to RMM):	0,0001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion) [STP7k/TCR1j].	
Onsite wastewater treatment required [TCR13].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
[TCR8] Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	≥97,7
[TCR10] If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥56,1

[TCR17] Treat air emission to provide the required removal efficiency of (%):	90
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2].	
Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
[STP3] Estimated substance removal from wastewater via domestic sewage treatment (%):	94,7
[STP4] Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	97,7
[STP5] Assumed domestic sewage treatment plant flow (m3/d):	10000
[STP6] Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	2,00E+06
Conditions and measures related to external treatment of waste for disposal	
During manufacturing no waste of the substance is generated [ETW4].	
Conditions and measures related to external recovery of waste	
During manufacturing no waste of the substance is generated [ERW2].	
Additional environmental control measures	
Not applicable.	

SECTION 3: EXPOSURE ESTIMATION

3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21].

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

SECTION 4: GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO

4.1 Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels [G23].

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects [G32].

Available hazard data do not support the need for a DNEL to be established for other health effects [G36].
Risk Management Measures are based on qualitative risk characterisation [G37].
Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38].

4.2 Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1].
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2].
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination [DSU3].
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].
Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file – “Site-Specific Production” worksheet [DSU6].

EXPOSURE SCENARIO 2 of 7

Worker in Industrial Settings

Jet A-1

SECTION 1: EXPOSURE SCENARIO TITLE	
ES2	**Use of substance "Kerosine (petroleum), sweetened" as intermediate - CAS No. 91770-15-9**
Use descriptors	
Sector of use category (SU): Main user Groups	
SU3	Industrial uses: Uses of substances as such or in preparations* at industrial sites
Sector of use category (SU): Supplementary descriptor: Sectors of end-use	
SU8	Manufacture of bulk, large scale chemicals (including petroleum products)
SU9	Manufacture of fine chemicals
Chemical product category (PC)	
Process category (PROC)	
PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8A	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8B	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15	Use as laboratory reagent
Environmental Release Category (ERC)	
ERC6A	Industrial use resulting in manufacture of another substance (use of intermediates)
SpERC	ESVOC SpERC 6.1a.v1
Processes, tasks, activities covered	Use of substance as an intermediate (not related to strictly controlled conditions) within closed or contained systems. Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

SECTION 2: OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
Section 2.1: Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	*Not applicable.*

Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2].
Human factors not influenced by risk management	*Not applicable.*
Other Operational Conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented [G1].
	Operation is carried out at elevated temperature (> 20°C above ambient temperature) [OC7].
Contributing Scenario	**Risk Management Measures**
General measures (skin irritants) [G19].	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 [E3].
General exposures (closed systems) [CS15].	No other specific measures identified [EI20].
General exposures (open systems) [CS16].	No other specific measures identified [EI20].
Bulk transfers [CS14].	No other specific measures identified [EI20].
Process sampling [CS2].	No other specific measures identified [EI20].
Laboratory activities [CS36].	No other specific measures identified [EI20].
Bulk product storage [CS85].	No other specific measures identified [EI20].

Section 2.2: Control of environmental exposure

Product characteristics	
	Substance is complex UVCB [PrC3].
	Predominantly hydrophobic [PrC4a].
Amounts used	
[A1] Fraction of EU tonnage used in region:	0,1
[A2] Regional use tonnage (tonnes/year):	1,80E+05
[A3] Fraction of regional tonnage used locally:	0,083
[A4] Maximum daily site tonnage (kg/day):	5,00E+04
[A5] Annual site tonnage (tonnes/year):	1,50E+04
Frequency and duration of use	
Continuous release [FD2].	

[FD4] Emission Days (days/year):	300
Environmental factors not influenced by risk management	
[EF1] Local freshwater dilution factor:	10
[EF2] Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
[OOC4] Release fraction to air from process (initial release prior to RMM):	1,00E-03
[OOC5] Release fraction to wastewater from process (initial release prior to RMM):	3,00E-04
[OOC6] Release fraction to soil from process (initial release prior to RMM):	0,001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR9].	
Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
[TCR8] Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	≥81,4
[TCR10] If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥0
[TCR17] Treat air emission to provide the required removal efficiency of (%):	80

Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2].	
Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
[STP3] Estimated substance removal from wastewater via domestic sewage treatment (%):	94,7
[STP4] Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,7
[STP5] Assumed domestic sewage treatment plant flow (m3/d):	2,00E+03
[STP6] Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	1,80E+05
Conditions and measures related to external treatment of waste for disposal	
This substance is consumed during use and no waste of the substance is generated [ETW5].	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated [ERW3].	
Additional environmental control measures	
Not applicable.	

SECTION 3: EXPOSURE ESTIMATION

3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21].

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

SECTION 4: GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO

4.1 Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels [G23].

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects [G32].

Available hazard data do not support the need for a DNEL to be established for other health effects [G36].

Risk Management Measures are based on qualitative risk characterisation [G37].

Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38].
4.2 Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1].
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2].
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination [DSU3].
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

EXPOSURE SCENARIO 3 of 7

Worker in Industrial Settings

Jet A-1

SECTION 1: EXPOSURE SCENARIO TITLE	
ES3	**Distribution of substance "Kerosine (petroleum), sweetened" - CAS No. 91770-15-9**
Use descriptors	
Sector of use category (SU): Main user Groups	
SU3	Industrial uses: Uses of substances as such or in preparations* at industrial sites
Sector of use category (SU): Supplementary descriptor: Sectors of end-use	
Chemical product category (PC)	
Process category (PROC)	
PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8A	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8B	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC15	Use as laboratory reagent
Environmental Release Category (ERC)	
ERC1	Manufacture of substances
ERC2	Formulation of preparations*
ERC3	Formulation in materials
ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC5	Industrial use resulting in inclusion into or onto a matrix
ERC6A	Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6B	Industrial use of reactive processing aids
ERC6C	Industrial use of monomers for manufacture of thermo-plastics
ERC6D	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ERC7	Industrial use of substances in closed systems
SpERC	ESVOC SpERC 1.1b.v1

Processes, tasks, activities covered	Bulk 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, maintenance and associated laboratory activities.

SECTION 2: OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES

Section 2.1: Control of worker exposure

Product characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	*Not applicable.*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2].
Human factors not influenced by risk management	*Not applicable.*
Other Operational Conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented [G1].
	Assumes use at not more than 20°C above ambient temperature, unless stated differently [G15].

Contributing Scenario	**Risk Management Measures**
General measures (skin irritants) [G19].	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 [E3].
General exposures (closed systems) [CS15].	No other specific measures identified [EI20].
General exposures (open systems) [CS16].	No other specific measures identified [EI20].
Process sampling [CS2].	No other specific measures identified [EI20].
Laboratory activities [CS36].	No other specific measures identified [EI20].
Bulk transfers [CS14].	No other specific measures identified [EI20].
Drum and small package filling [CS6].	No other specific measures identified [EI20].
Equipment cleaning and maintenance [CS39].	No other specific measures identified [EI20].
Bulk product storage [CS85].	No other specific measures identified [EI20].

Section 2.2: Control of environmental exposure

Product characteristics	
	Substance is complex UVCB [PrC3].

	Predominantly hydrophobic [PrC4a].
Amounts used	
[A1] Fraction of EU tonnage used in region:	0,1
[A2] Regional use tonnage (tonnes/year):	5,40E+06
[A3] Fraction of regional tonnage used locally:	2,00E-03
[A4] Maximum daily site tonnage (kg/day):	3,60E+04
[A5] Annual site tonnage (tonnes/year):	1,10E+04
Frequency and duration of use	
Continuous release [FD2].	
[FD4] Emission Days (days/year):	300
Environmental factors not influenced by risk management	
[EF1] Local freshwater dilution factor:	10
[EF2] Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
[OOC4] Release fraction to air from process (initial release prior to RMM):	1,00E-03
[OOC5] Release fraction to wastewater from process (initial release prior to RMM):	1,00E-05
[OOC6] Release fraction to soil from process (initial release prior to RMM):	1,00E-05
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater [TCR1a].	
No wastewater treatment required [TCR6].	

[TCR8] Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	≥0
[TCR10] If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥0
[TCR17] Treat air emission to provide the required removal efficiency of (%):	90
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from wastewater [OMS1].	
Do not apply industrial sludge to natural soils [OMS2].	
Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
[STP3] Estimated substance removal from wastewater via domestic sewage treatment (%):	94,7
[STP4] Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,7
[STP5] Assumed domestic sewage treatment plant flow (m3/d):	2000
[STP6] Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	2,60E+06
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].	
Additional environmental control measures	

Not applicable.

SECTION 3: EXPOSURE ESTIMATION

3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21].

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

SECTION 4: GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO

4.1 Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels [G23].

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects [G32].

Available hazard data do not support the need for a DNEL to be established for other health effects [G36].

Risk Management Measures are based on qualitative risk characterisation [G37].

Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38].

4.2 Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1].

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2].

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination [DSU3].

Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

EXPOSURE SCENARIO 4 of 7

Worker in Industrial Settings

Jet A-1

SECTION 1: EXPOSURE SCENARIO TITLE	
ES4	**Formulation and (re)packing of substance "Kerosine (petroleum), sweetened" - CAS No. 91770-15-9**
Use descriptors	
Sector of use category (SU): Main user Groups	
SU3	Industrial uses: Uses of substances as such or in preparations* at industrial sites
Sector of use category (SU): Supplementary descriptor: Sectors of end-use	
SU10	Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
Chemical product category (PC) ***Process category (PROC)***	
PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5	Mixing or blending in batch processes for formulation of preparations* and articles (multistage and/or significant con-tact)
PROC8A	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8B	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC14	Production of preparations* or articles by tabletting, compression, extrusion, pelletisation
PROC15	Use as laboratory reagent
Environmental Release Category (ERC)	
ERC2	Formulation of preparations*
SpERC	ESVOC SpERC 2.2v1
Processes, tasks, activities covered	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, maintenance, sampling and associated laboratory activities.

SECTION 2: OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
Section 2.1: Control of worker exposure	
Product characteristics	

Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	*Not applicable.*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2].
Human factors not influenced by risk management	*Not applicable.*
Other Operational Conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented [G1].
	Assumes use at not more than 20°C above ambient temperature, unless stated differently [G15].
Contributing Scenario	**Risk Management Measures**
General measures (skin irritants) [G19].	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 [E3].
General exposures (closed systems) [CS15].	No other specific measures identified [EI20].
General exposures (open systems) [CS16].	No other specific measures identified [EI20].
Process sampling [CS2].	No other specific measures identified [EI20].
Laboratory activities [CS36].	No other specific measures identified [EI20].
Bulk transfers [CS14].	No other specific measures identified [EI20].
Mixing operations (open systems) [CS30].	No other specific measures identified [EI20].
Manual [CS34].	No other specific measures identified [EI20].
Manual [CS34].	No other specific measures identified [EI20].
Transfer from/pouring from containers [CS22].	
Production or preparation or articles by tabletting, compression, extrusion or pelletisation [CS100].	No other specific measures identified [EI20].
Drum and small package filling [CS6].	No other specific measures identified [EI20].
Equipment cleaning and maintenance [CS39].	No other specific measures identified [EI20].
Equipment cleaning and maintenance [CS39].	No other specific measures identified [EI20].
Bulk product storage [CS85].	No other specific measures identified [EI20].

Section 2.2: Control of environmental exposure

Product characteristics

	Substance is complex UVCB [PrC3].
	Predominantly hydrophobic [PrC4a].
Amounts used	
[A1] Fraction of EU tonnage used in region:	1,00E-01
[A2] Regional use tonnage (tonnes/year):	5,20E+06
[A3] Fraction of regional tonnage used locally:	5,80E-03
[A4] Maximum daily site tonnage (kg/day):	1,00E+05
[A5] Annual site tonnage (tonnes/year):	3,00E+04
Frequency and duration of use	
Continuous release [FD2].	
[FD4] Emission Days (days/year):	300
Environmental factors not influenced by risk management	
[EF1] Local freshwater dilution factor:	10
[EF2] Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
[OOC4] Release fraction to air from process (initial release prior to RMM):	1,00E-02
[OOC5] Release fraction to wastewater from process (initial release prior to RMM):	2,00E-04
[OOC6] Release fraction to soil from process (initial release prior to RMM):	1,00E-04
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR9].	

Prevent discharge of undissolved substance to or recover from onsite wastewater [TCR14].	
[TCR8] Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	≥86
[TCR10] If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥0
[TCR17] Treat air emission to provide the required removal efficiency of (%):	0
Organisation measures to prevent/limit release from site	
Prevent discharge of undissolved substance to or recover from wastewater [OMS1].	
Do not apply industrial sludge to natural soils [OMS2].	
Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	
[STP3] Estimated substance removal from wastewater via domestic sewage treatment (%):	94,7
[STP4] Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,7
[STP5] Assumed domestic sewage treatment plant flow (m3/d):	2000
[STP6] Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	2,60E+05
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	

External recovery and recycling of waste should comply with applicable local and/or national regulations [ERW1].

Additional environmental control measures

Not applicable.

SECTION 3: EXPOSURE ESTIMATION

3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21].

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

SECTION 4: GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE SCENARIO

4.1 Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels [G23].

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects [G32].

Available hazard data do not support the need for a DNEL to be established for other health effects [G36].

Risk Management Measures are based on qualitative risk characterisation [G37].

Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38].

4.2 Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1].

Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2].

Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination [DSU3].

Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

EXPOSURE SCENARIO 5 of 7

Worker in Industrial Settings

Jet A-1

SECTION 1: EXPOSURE SCENARIO TITLE	
ES22	**Use of substance "Kerosine (petroleum), sweetened" as a fuel - CAS No. 91770-15-9**
Use descriptors	
Sector of use category (SU): Main user Groups	
SU3	Industrial uses: Uses of substances as such or in preparations* at industrial sites
Sector of use category (SU): Supplementary descriptor: Sectors of end-use ***Chemical product category (PC)*** ***Process category (PROC)***	
PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8A	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8B	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected
Environmental Release Category (ERC)	
ERC7	Industrial use of substances in closed systems
SpERC	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	Covers the use as a fuel (or fuel additives and additive components) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

SECTION 2: OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
Section 2.1: Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	*Not applicable.*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2].
Human factors not influenced by risk management	*Not applicable.*
Other Operational Conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented [G1].

	Assumes use at not more than 20°C above ambient temperature, unless stated differently [G15].
Contributing Scenario	**Risk Management Measures**
General measures (skin irritants) [G19].	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 [E3].
General exposures (closed systems) [CS15].	No other specific measures identified [EI20].
Use as a fuel [GEST12_I].	No other specific measures identified [EI20].
(closed systems) [CS107].	
Bulk transfers [CS14].	No other specific measures identified [EI20].
Drum/batch transfers [CS8].	No other specific measures identified [EI20].
Equipment cleaning and maintenance [CS39].	No other specific measures identified [EI20].
Bulk product storage [CS85].	No other specific measures identified [EI20].
Section 2.2: Control of environmental exposure	
Product characteristics	
	Substance is complex UVCB [PrC3].
	Predominantly hydrophobic [PrC4a].
Amounts used	
[A1] Fraction of EU tonnage used in region:	1,00E-01
[A2] Regional use tonnage (tonnes/year):	5,50E+05
[A3] Fraction of regional tonnage used locally:	1,00E+00
[A4] Maximum daily site tonnage (kg/day):	1,80E+06
[A5] Annual site tonnage (tonnes/year):	5,50E+05
Frequency and duration of use	
Continuous release [FD2].	
[FD4] Emission Days (days/year):	300
Environmental factors not influenced by risk management	

[EF1] Local freshwater dilution factor:	10
[EF2] Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
[OOC4] Release fraction to air from process (initial release prior to RMM):	5,00E+03
[OOC5] Release fraction to wastewater from process (initial release prior to RMM):	1,00E-05
[OOC6] Release fraction to soil from process (initial release prior to RMM):	0,00E+00
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment [TCR1b].	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR9].	
[TCR8] Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	≥84,6
[TCR10] If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥0
[TCR17] Treat air emission to provide the required removal efficiency of (%):	95
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2].	
Sludge should be incinerated, contained or reclaimed [OMS3].	
Conditions and measures related to municipal sewage treatment plant	

[STP3] Estimated substance removal from wastewater via domestic sewage treatment (%):	94,7
[STP4] Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,7
[STP5] Assumed domestic sewage treatment plant flow (m3/d):	2000
[STP6] Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	5,30E+06

Conditions and measures related to external treatment of waste for disposal

Combustion emissions limited by required exhaust emission controls [ETW1].

Combustion emissions considered in regional exposure assessment [ETW2].

Conditions and measures related to external recovery of waste

This substance is consumed during use and no waste of the substance is generated [ERW3].

Additional environmental control measures

Not applicable.

SECTION 3: EXPOSURE ESTIMATION

3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21].

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

SECTION 4: GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE

4.1 Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels [G23].

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects [G32].

Available hazard data do not support the need for a DNEL to be established for other health effects [G36].

Risk Management Measures are based on qualitative risk characterisation [G37].

Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38].

4.2 Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1].
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2].
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination [DSU3].
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

EXPOSURE SCENARIO 6 of 7

Worker in Professional Settings

Jet A-1

SECTION 1: EXPOSURE SCENARIO TITLE	
ES23	**Use of substance "Kerosine (petroleum), sweetened" as a fuel - CAS No. 91770-15-9**
Use descriptors	
Sector of use category (SU): Main user Groups	
SU22	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Sector of use category (SU): Supplementary descriptor: Sectors of end-use	
Chemical product category (PC)	
Process category (PROC)	
PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8A	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8B	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected
Environmental Release Category (ERC)	
ERC9A	Wide dispersive indoor use of substances in closed systems
ERC9B	Wide dispersive outdoor use of substances in closed systems
SpERC	ESVOC SpERC 9.12b.v1
Processes, tasks, activities covered	Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste.

SECTION 2: OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES

Section 2.1: Control of worker exposure

Product characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP [OC4].
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) [G13].
Amounts used	*Not applicable.*
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently) [G2].

Human factors not influenced by risk management	*Not applicable.*
Other Operational Conditions affecting worker exposure	Assumes a good basic standard of occupational hygiene is implemented [G1].
	Assumes use at not more than 20°C above ambient temperature, unless stated differently [G15].
Contributing Scenario	**Risk Management Measures**
General measures (skin irritants) [G19].	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 [E3].
General exposures (closed systems) [CS15].	No other specific measures identified [EI20].
Bulk transfers [CS14].	No other specific measures identified [EI20].
Use as a fuel [GEST12_I].	No other specific measures identified [EI20].
(closed systems) [CS107].	
Transfer from/pouring from containers [CS22].	No other specific measures identified [EI20].
Equipment cleaning and maintenance [CS39].	No other specific measures identified [EI20].
Bulk product storage [CS85].	No other specific measures identified [EI20].
Section 2.2: Control of environmental exposure	
Product characteristics	
	Substance is complex UVCB [PrC3].
	Predominantly hydrophobic [PrC4a].
Amounts used	
[A1] Fraction of EU tonnage used in region:	1,00E-01
[A2] Regional use tonnage (tonnes/year):	4,40E+06
[A3] Fraction of regional tonnage used locally:	5,00E-04
[A4] Maximum daily site tonnage (kg/day):	6,10E+03
[A5] Annual site tonnage (tonnes/year):	2,20E+03
Frequency and duration of use	

Continuous release [FD2].	
[FD4] Emission Days (days/year):	365
Environmental factors not influenced by risk management	
[EF1] Local freshwater dilution factor:	10
[EF2] Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
[OOC7] Release fraction to air from wide dispersive use (regional only):	1,00E-03
[OOC8] Release fraction to wastewater from wide dispersive use (regional only):	1,00E-05
[OOC9] Release fraction to soil from wide dispersive use (regional only):	1,00E-05
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [TCS1].	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater [TCR1a].	
No wastewater treatment required [TCR6].	
[TCR8] Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	≥0
[TCR10] If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%):	≥0
[TCR17] Treat air emission to provide the required removal efficiency of (%):	*Not applicable*
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils [OMS2].	
Sludge should be incinerated, contained or reclaimed [OMS3].	

Conditions and measures related to municipal sewage treatment plant	
[STP3] Estimated substance removal from wastewater via domestic sewage treatment (%):	94,7
[STP4] Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	94,7
[STP5] Assumed domestic sewage treatment plant flow (m3/d):	2000
[STP6] Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	6,90E+05
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1].	
Combustion emissions considered in regional exposure assessment [ETW2].	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated [ERW3].	
Additional environmental control measures	
Not applicable.	

SECTION 3: EXPOSURE ESTIMATION

3.1. Health

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated [G21].

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

SECTION 4: GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE

4.1 Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels [G23].

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects [G32].

Available hazard data do not support the need for a DNEL to be established for other health effects [G36].

Risk Management Measures are based on qualitative risk characterisation [G37].

Users are advised to consider national Occupational Exposure Limits or other equivalent values [G38].

4.2 Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1].
Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination [DSU2].
Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination [DSU3].
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].

EXPOSURE SCENARIO 7 of 7

Consumers

Jet A-1

SECTION 1: EXPOSURE SCENARIO TITLE	
ES24	**Use of substance "Kerosine (petroleum), sweetened" as a fuel - CAS No. 91770-15-9**
Use descriptors	
Sector of use category (SU): Main user Groups	
SU21	Consumer uses: Private households (= general public = consumers)
Sector of use category (SU): Supplementary descriptor: Sectors of end-use	
Chemical product category (PC)	
PC13	Fuels
Process category (PROC)	
Environmental Release Category (ERC)	
ERC9A	Wide dispersive indoor use of substances in closed systems
ERC9B	Wide dispersive outdoor use of substances in closed systems
SpERC	ESVOC SpERC 9.12c.v1
Processes, tasks, activities covered	Covers the consumer uses in liquid fuels.

SECTION 2: OPERATIONAL CONDITIONS AND RISK MANAGEMENT MEASURES	
Section 2.1: Control of worker exposure	
Product characteristics	
Physical form of product	Liquid, vapour pressure 0.5 - 10 kPa at STP [OC4].
Concentration of substance in product	
[ConsOC1] Covers concentrations up to …	100%
Amounts used	
[ConsOC2] For each use event, covers use amounts up to	50000g
[ConsOC5] Covers skin contact area up to (cm2):	420
Frequency and duration of use	
[ConsOC4] Covers use up to (times/day of use):	1
[ConsOC14] Covers exposure up to (hours/event):	2
Human factors not influenced by risk management	
Not applicable.	
Other Operational Conditions affecting worker exposure	
[ConsOC8] Covers use under typical household ventilation.	
[ConsOC15] Covers use at ambient temperatures.	

[ConsOC11] Covers use in room size of (m3):	20
Chemical product category	**Risk Management Measures**
PC13: Fuels - Liquid: Automotive refuelling	
[ConsOC1] Covers concentrations up to …	100%
[ConsOC2] For each use event, covers use amounts up to	1000g
[ConsOC3] Covers use up to (days/year):	26
[ConsOC4] Covers use up to (times/day of use):	1
[ConsOC11] Covers use in room size of (m3):	100
[ConsOC12] Covers outdoor use.	
[ConsOC14] Covers exposure up to (hours/event):	2
No specific risk management measure identified beyond those operational conditions stated [ConsRMM15].	
PC13: Fuels - Liquid: Garden equipment use	
[ConsOC1] Covers concentrations up to …	100%
[ConsOC2] For each use event, covers use amounts up to	1000g
[ConsOC3] Covers use up to (days/year):	26
[ConsOC4] Covers use up to (times/day of use):	1
[ConsOC11] Covers use in room size of (m3):	100
[ConsOC12] Covers outdoor use.	
[ConsOC14] Covers exposure up to (hours/event):	2
No specific risk management measure identified beyond those operational conditions stated [ConsRMM15].	
PC13: Fuels - Liquid: Garden equipment refuelling	
[ConsOC1] Covers concentrations up to …	100%
[ConsOC2] For each use event, covers use amounts up to	1000g
[ConsOC3] Covers use up to (days/year):	26
[ConsOC4] Covers use up to (times/day of use):	4
[ConsOC5] Covers skin contact area up to (cm2):	420
[ConsOC10] Covers use in a one car garage (34 m3) under typical ventilation.	

[ConsOC11] Covers use in room size of (m3):	34
[ConsOC14] Covers exposure up to (hours/event):	0,03
No specific risk management measure identified beyond those operational conditions stated [ConsRMM15].	
PC13: Fuels - Liquid: Home heating fuel	
[ConsOC1] Covers concentrations up to …	100%
[ConsOC2] For each use event, covers use amounts up to	15000g
[ConsOC3] Covers use up to (days/year):	365
[ConsOC4] Covers use up to (times/day of use):	1
[ConsOC5] Covers skin contact area up to (cm2):	210
[ConsOC8] Covers use under typical household ventilation.	
[ConsOC11] Covers use in room size of (m3):	20
[ConsOC14] Covers exposure up to (hours/event):	0,03
No specific risk management measure identified beyond those operational conditions stated [ConsRMM15].	
Section 2.2: Control of environmental exposure	
Product characteristics	
	Substance is complex UVCB [PrC3].
	Predominantly hydrophobic [PrC4a].
Amounts used	
[A1] Fraction of EU tonnage used in region:	0,1
[A2] Regional use tonnage (tonnes/year):	180000
[A3] Fraction of regional tonnage used locally:	0,0005
[A4] Maximum daily site tonnage (kg/day):	245
[A5] Annual site tonnage (tonnes/year):	89
Frequency and duration of use	
Continuous release [FD2].	
[FD4] Emission Days (days/year):	365
Environmental factors not influenced by risk management	

[EF1] Local freshwater dilution factor:	10
[EF2] Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	
[OOC7] Release fraction to air from wide dispersive use (regional only):	0,00103
[OOC8] Release fraction to wastewater from wide dispersive use (regional only):	1,00E-05
[OOC9] Release fraction to soil from wide dispersive use (regional only):	1,00E-05
Technical conditions and measures at process level (source) to prevent release	
Not applicable.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Not applicable.	
Organisation measures to prevent/limit release from site	
Not applicable.	
Conditions and measures related to municipal sewage treatment plant	
[STP3] Estimated substance removal from wastewater via domestic sewage treatment (%):	94,7
[STP5] Assumed domestic sewage treatment plant flow (m3/d):	2000
[STP6] Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	31000
Risk from environmental exposure is driven by freshwater [STP7a].	
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [ETW1].	
Combustion emissions considered in regional exposure assessment [ETW2].	
External treatment and disposal of waste should comply with applicable local and/or national regulations [ETW3].	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated [ERW3].	
Additional environmental control measures	

Not applicable.

SECTION 3: EXPOSURE ESTIMATION

3.1. Health

The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of ECETOC report #107 and the Chapter R15 of the IR&CSA TGD. Where exposure determinants differ to these sources, then they are indicated.

3.2. Environment

The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model [EE2].

SECTION 4: GUIDANCE TO CHECK COMPLIANCE WITH THE EXPOSURE

4.1 Health

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels [G23].

No exposure assessment presented for human health [G39].

4.2 Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures [DSU1].

Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html) [DSU4].