



AVIATION FUEL (JET A-1, JP-5, JP-8, AN-8)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1. Product identifier

Commercial name:	AVIATION FUEL (JET A-1, JP-5, JP-8, AN-8)
Substance name:	n/a (mixture)
EINECS Number:	n/a (mixture)
Registration Number (EC Regulation 1907/2006):	n/a (mixture)
CAS Number:	n/a (mixture)

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

Intended use:	Manufacture (industrial), distribution (industrial), formulation and (re)packing (industrial). Use as a fuel (professional, consumer)
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1.3. Details of the supplier of the Safety Data Sheet

Manufacturer	MOTOR OIL (HELLAS), CORINTH REFINERIES S.A
Supplier:	Shell & MOH Aviation Fuels A.E.
Address:	151, Kifissias Ave, Maroussi, 151 24, Greece
Telephone number:	+30 210 6006 380-1
Fax number:	+30 210 6083 820
e-mail address:	info@shell-moh.com
e-mail contact for MSDS:	If you have any enquiries about the content of this MSDS, please email: ops@shell-moh.com

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) 1272 /2008 [CLP]

Flam. Liquid 3	H226
Skin Irrit. 2	H315
Asp.Tox. 1	H304
STOT Single Exp. 3	H336
Aquatic Chronic 2	H411

2.1.2. Additional information

No additional information available.

2.2. Label elements

2.2.1. Labelling according to Regulation (EC) 1272/2008 [CLP]

Hazard pictogram (CLP):



Signal word:

Danger

Hazard statements:

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

Precautionary statements:

P102 Keep out of reach of children.
P210 Keep away from heat/sparks/open flames/.../hot surfaces.
... No smoking.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/
face protection.
P331 Do NOT induce vomiting.
P301+ IF SWALLOWED: Immediately call a POISON CENTER or
P310 doctor/physician.

2.3. Other hazards

The substance is not considered to be PBT nor vPvB.

3. COMPOSITION INFORMATION ON INGREDIENTS

CAS No	EC No	Index No	REACH Registration No	% weight	Name	Classification according to Regulation EC 1272/2008 (CLP)
91770-15-9	294-799-5	649-427-00-X	01-2119502385-46-0057	99.85-100	Kerosine (petroleum), sweetened; Kerosine - unspecified	Flam. Liquid 3; H226 Skin Irrit. 2; H315 Asp. Tox. 1; H304 STOT Single Exp.3; H336 Aquatic Chronic 2; H411
111-77-3	203-906-6	603-107-00-6	01-2119475100-52-XXXX	0-0.15	2-(2-Methoxy ethoxy) ethanol	Repr. Cat. 2; H361d

May also contain additives at <0.1% v/v each.

4. FIRST AID MEASURES

4.1. Description of first aid measures

General notes:	<p>Spillages make surface 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 storage tanks and reach potentially hazardous concentrations.</p>
Inhalation:	<p>Inhalation is unlikely because of the low vapour pressure of the substance at ambient temperature. Exposure to vapours may however occur when the substance is handled at high temperatures with poor ventilation. If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If the casualty is unconscious and:</p> <ul style="list-style-type: none">* 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.* Breathing - place in the recovery position and keep the head below the level of the torso. Administer oxygen if necessary; <p>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:</p> <ul style="list-style-type: none">* Rescuers must wear breathing apparatus, belt and safety rope, and follow rescue procedures.* Remove casualty to fresh air as quickly as possible.* Immediately begin artificial respiration if breathing has ceased.* Provision of oxygen may help.* Obtain medical advice for further treatment.
Skin contact:	<p>Remove contaminated clothing and footwear, and dispose of safely. Wash affected area 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. However, body hypothermia must be avoided.</p>
Eye contact:	<p>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.</p>
Ingestion/Aspiration:	<p>In case of ingestion, always assume that aspiration has occurred. The casualty should be sent immediately to a 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.</p>
Self-protection of the first aider:	<p>First aid personnel must be aware of personal risk during rescue. Use personal protective equipment. See section 8 for more detail.</p>

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

Following inhalation:	Inhalation of vapours may cause headache, nausea, vomiting and an altered state of consciousness
Following skin contact:	Reddening, irritation
Following eye contact:	Slight irritation (unspecific)
Following ingestion/ aspiration:	Few or no symptoms expected. If any, nausea and diarrhea might occur.

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

Treat accordingly depending on the type of exposure.

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 Other inert gases (subject to regulations) Sand or earth
Unsuitable extinguishing media:	Do not use direct water jets on the burning product; they could cause splattering and spread the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

5.2. Special hazards arising from the substance or mixture

This substance 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 SO_x (sulfur oxides) or sulfuric acid.

5.3. Advice for fire-fighters

Protective equipment for fire fighters:

In case of a large fire or in confined or poorly ventilated spaces wear full fire resistant protective clothing and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. ACCIDENTAL RELEASE MEASURES

General information

Stop or contain leak at the source, if safe to do so. Avoid direct contact with released material. Stay upwind. In case of large spillages, alert occupants in downwind areas.

Keep non-involved personnel away from the area of spillage. Alert emergency personnel. Except in case of small spillages, the feasibility of any actions should always be assessed and advised, if possible, by a trained, competent person in charge of managing the emergency.

Eliminate all ignition sources, if safe to do so (e.g. electricity, sparks, fires, flares).

(Subject to applicability): In those cases when the presence of dangerous amounts of H₂S around the spilled product is suspected or proved, additional or special actions may be warranted, including access restrictions, use of special protection equipment, procedures and personnel training.

If required, notify relevant authorities according to all applicable regulations.

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel:

Wear Personal Protective Equipment (PPE) listed in Section 8. Stand upwind from the spill site. Ensure adequate ventilation. Eliminate all ignition sources (electricity, sparks, fires, flares, smoking). Avoid contact with skin, eye and clothing.

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.

Work gloves providing adequate chemical resistance, specifically to aromatic hydrocarbons. Note: gloves made of PVA are not water-resistant and are not suitable for emergency use.

Work helmet. Antistatic non-skid safety shoes or boots. Goggles or face shield, if splashes or contact with eyes is possible or anticipated.

Respiratory protection: A half or full-face respirator with filter(s) for organic vapours (and when applicable for 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 SCBAs should be used.

6.2. Environmental precautions

Spillages onto land: Prevent product from entering sewers, rivers, waterways or other bodies of water. Prevent product from contaminating soil or ground water system.

6.3. Methods and material for containment and cleaning up

6.3.1. For containment:

Spillages onto 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 fire risk. Do not use direct jets.

Spillages on water or at sea: In case of small spillages in closed waters (i.e. ports) contain product with floating barriers or other equipment. Large spillages in open waters should be contained with floating barriers or other mechanical means. Control the spreading of the spillage.

6.3.2. For cleaning up:

The use of dispersants should be advised by an expert and approved by local authorities.

REMARK: in case of interior space (e.g. inside buildings or confined spaces) ensure adequate ventilation.

Spillages onto land: Absorb spilled product with suitable non-combustible materials. Collect free product with suitable means and transfer collected product and other contaminated materials to suitable containers for recycle, recovery or safe disposal according to relevant regulations.

In case of soil contamination, remove contaminated soil and treat this in accordance with local regulations.

Spillages on water or at sea: In case of small spillages, contain spilled product and collect it by absorbing with specific floating absorbents. In case of large spillages in open waters collect the product by skimming or other suitable mechanical means, only if fire/explosion risks can be adequately prevented.

Collect recovered product and other materials in suitable tanks or containers for recovery or safe disposal according to relevant regulations.

6.3.3. Other information:

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.

(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.

6.4. Reference to other sections

Personal Protective Equipment: See Section 8 for more details.

Waste Treatment: See Section 13

7. HANDLING AND STORAGE

General information:

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.

The vapour is heavier than air. Beware of accumulation in pits and confined spaces.

7.1. Precautions for safe handling

Prevention of fire:

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.

Ground/bond containers, tanks and transfer/receiving equipment.

Use and store only outdoors or in a well-ventilated area.

Take precautionary measures against static electricity.

Use explosion-proof electrical/ventilating/lighting equipment

Use only non-sparking tools.

Keep away from heat/sparks/open flames/hot surfaces. – No smoking

Prevention of aerosol and dust generation:

Do not use compressed air for filling, discharging, or handling operations.

Protection of the

Avoid release to the environment

environment:

Hygiene measures:

Avoid contact with skin and eyes. Never siphon by mouth. Do not ingest. Avoid breathing vapours. Use personal protective equipment as required (see Section 8). For more information regarding protective equipment and operational conditions see Exposure Scenarios. Ensure that proper housekeeping measures are in place. Contaminated materials should not be allowed to accumulate in the workplace and should never be kept inside the pockets. Keep away from food and beverages. Do not eat, drink or smoke while using this product. Wash the hands thoroughly after handling. Change contaminated clothes at the end of working shift.

7.2. Conditions from safe storage, including any incompatibilities

Technical measures and storage conditions:

Storage installations should be designed with adequate bunds so as to prevent ground and water pollution in case of leaks or spills. 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 H₂S content. If the product is supplied in containers:

- * Keep only in the original container or in a suitable container for this kind of product.
- * Keep containers tightly closed and properly labeled. Protect from the sunlight.
- * Light hydrocarbon vapours can build up in the headspace of containers. These can cause flammability / explosion hazards. 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.

Packing materials:

Recommended materials: For containers, or container linings use mild steel, stainless steel.

Unsuitable materials: 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.

Requirements for storage:

Storage area layout, tank design, equipment and operating procedures must comply with the relevant European, national or local legislation.

Storage class:

Category II according to national legislation (Ministerial Decision 34458/1990)

Further information on storage conditions:

Store separately from oxidizing agents.

7.3. Specific end use(s)

See Exposure scenarios in the Annex

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

8.1.1. Limit values:

National occupational exposure limit values: Not reported

National biological limit values: Not reported

International occupational exposure limit values:

Since no occupational exposure limit values are reported for kerosine CAS No 91770-15-9, the limits below that have been published for kerosine CAS No 8008-20-6*, have been considered appropriate for kerosene CAS No 91770-15-9 streams as well.

Substance	Kerosine			
Cas No	8008-20-6			
	Limit value - Eight hours		Limit value - Short term	
	ppm	mg/m ³	ppm	mg/m ³
Belgium		200		
Canada - Ontario		200 (1) (2)		
Ireland		100		
South Korea		200		
USA-NIOSH		100		

Remarks:

Canada-Ontario: (1) Jet fuels, as total hydrocarbon vapour (2) Application restricted to conditions in which there are negligible aerosol exposures

*CAS No 8008-20-6: Kerosine (petroleum); straight run Kerosine; a complex of HC produced by the distillation of crude oil. It consists of HC having carbon numbers predominantly in the range of C9 through C16 and boiling in the range of 130 °C to 290 °C

Substance	2-(2-Methoxyethoxy)ethanol			
Cas No	111-77-3			
	Limit value - Eight hours		Limit value - Short term	
	ppm	mg/m ³	ppm	mg/m ³
Austria	10	50,1		
Belgium	10	50,1		
Denmark	25 provisional			
European Union	10	50,1		
Finland	10	50		
France	10	50,1		
Germany (AGS)	10 (1)	50 (1)		
Hungary		50,1		
Ireland	10	15,1		
Italy	10	50,1		
Latvia	20	100		
Poland		50		
Spain	10	50,1		
The Netherlands		45		
United Kingdom	10	50,1		

Remarks:

European Union: Bold-type: Indicative occupational exposure limit value and limit value for occupational exposure

France: *Italic type*: Indicative statutory limit values

Germany (AGS): (1) Inhalable aerosol and vapour

Italy: Skin

Spain: Skin

8.1.2. Monitoring procedures:

Monitoring of the air in confined places using gas detectors to detect and monitor presence of H₂S, oxygen deficient conditions and explosive atmospheres. Refer to BS EN 14042:2003 "Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents", BS EN 1127-1:2007 "Explosive atmospheres-explosion prevention and protection", ES EN 60079-0:2009 "Explosive atmospheres-equipment general requirements"

8.1.3. Exposure limit values for air contaminants formed when using the substance/mixture

Not reported

8.1.4. Derived No Effect Level (DNEL) and Predicted No Effect Concentration (PNEC)

DNEL Worker (industrial / professional)

Chemical name	Short term, systematic effects	Short term, local effects	Long term, systemic effects	Long term, local effects
Kerosines	Dermal (a)	Dermal (b)	Dermal (a)	Dermal (b)
	Inhalation (a)	Inhalation (a)	Inhalation (a)	Inhalation (a)

(a) No hazard identified for this route (data available)

(b) The data do not allow setting a DNEL

DNEL Consumer/General population

Chemical name	Short term, systematic effects	Short term, local effects	Long term, systemic effects	Long term, local effects
Kerosines	Dermal (a)	Dermal (b)	Dermal (a)	Dermal (b)
	Inhalation (a)	Inhalation (a)	Inhalation (a)	Inhalation (a)
			Oral: 19 mg/kg/24h	

(a) No hazard identified for this route (data available)

(b) The data do not allow setting a DNEL

PNEC

Substance is a hydrocarbon UVCB. Conventional methods of deriving PNECs are not appropriate for such complex substances.

8.1.5. Use of control banding approach

See Section 7 and 8.2

8.2. Exposure control

8.2.1. Appropriate engineering controls:

Storage and handling in closed systems. Use sealed systems as far as possible. Local exhaust ventilation is recommended.

Provide basic employee training to prevent/minimise exposure.

Hazard recognition and risk assessment should be conducted for each work. Confined space entry procedures should be followed (e.g. work permit, gas measurements etc). Do not enter empty storage tanks until measurements of available oxygen have been carried out.

Draining, flushing and/or purging of the equipment prior to any disassembly work.

8.2.2. Personal protection equipment:

	IF	PPE	STANDARD
Eye and face protection	Splashing is likely	Protective shield and /or safety goggles should be used	EN 166
Hand protection	There is potential for exposure	Impervious gloves	EN 374
Other skin protection	There is potential for exposure	Impervious protective clothing	EN 340
Respiratory protection	There is vapour formation	Full face masks with gas filters for organic vapours	EN 14387, EN 136, EN 137
Thermal Hazards	Large scale fires	Fire resistant coveralls with self-contained breathing apparatus	EN 340, EN 469, EN 1486, EN 137

8.2.3. Environmental exposure controls:

See sections 6, 7 and exposure scenarios in the Annex.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

- (a) Appearance : Low viscosity, liquid (at 20 °C and 101.3 Kpa)
- (b) Odour : Characteristic (hydrocarbon-like)
- (c) Odour threshold : Not available
- (d) pH : Not applicable
- (e) Melting point/freezing point : Freezing point is below -20°C
- (f) Initial boiling point and boiling range : 130-290 °C
- (g) Flash point : The flash point is 29 - 70°C (CONCAWE 2010a) (EN ISO 2719, 13736 and ASTM D 9302a)
- (h) Evaporation rate : Not available
- (i) Flammability (solid, gas) : Not applicable
Flammability (liquid) : Flammable liquid (cat.3)
- (j) Upper/lower flammability or explosive limits : Not applicable
- (k) Vapour pressure : The vapour pressure for kerosines ranges from <1 kPa to 3.7 kPa at 37.8 °C
- (l) Vapour density : Not available

(m) Density at 15oC

: The absolute density ranges from 0.77 to 0.85 g/cm³ at

	15 °C (CONCAWE, 2010a),(ASTM D-4052, EN ISO 12185)
(n) Solubility in water	: Not applicable
(o) Partition coefficient: n-octanol/water	: Not applicable
(p) Auto-ignition temperature	: 220°C to 550°C (ASTM E 659 test method)
(q) Decomposition temperature	: Not available
(r) Viscosity	: 1 to 2.4 cSt at 40°C
(s) Explosive properties	: Not applicable
(t) Oxidising properties	: Not applicable

9.2. Other information

No information available

10. STABILITY AND REACTIVITY

10.1. Reactivity

No information available

10.2. Chemical stability

Stable under recommended handling and storage conditions

10.3. Possibility of hazardous reactions

None when treated according to provisions

10.4. Conditions to avoid

Avoid flammability hazards and potential ignition and heat sources (extremely high temperatures, heat sources, open flames, static electricity, sparks)

10.5. Incompatible materials

Strong oxidizing agents. Strong acids. Strong bases. Halogens.

10.6. Hazardous decomposition products

Does not decompose when used for intended uses.

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Basis of assessment: Information given is based on product data, knowledge of the components and the toxicology of similar products. The results are based on the available studies and support the classification.

Acute toxicity	Method	Species	Route of exposure	Effective dose	Exposure time	Results
	Equiv. or similar to OECD 420	Rat (Sprague Dawley) male, female	Oral Gavage	5000mg/kg bw	single dose, 14days	LD50 >5000mg/kg bw
	Equiv. or similar to OECD 402	Rabbit (New Zealand White) male, female	Dermal Occlusive coverage	2000mg/kg bw	single dose, 24 hours to 10% of their body surface area	LD50 >2000mg/kg bw
	Equiv. or similar to OECD 403	Rat (Sprague-Dawley), male, female	Inhalation, Vapour, whole body	5.28 mg/L air	4 h	LC50 >5280 mg/m3 air
Based on evaluation of all the acute toxicity data discussed above, kerosine does not meet the criteria for classification as an acute oral, inhalation or dermal toxicant under the EU CLP Regulation (EC No. 1272/2008).						

Skin Irritation	Method	Species	Route of exposure	Effective dose	Exposure time	Results
	Equivalent or similar to OECD 404	Rabbit (New Zealand white)	Skin	Semi-occlusive coverage (saved) to 0.5mL of kerosene Test material: odourless kerosene	4 h	Not irritating
	EPA Guidelines in FR vol.44, No.145	"	"	Occlusive coverage (intact and abraded skin sites) to 0.5mL of kerosene Test material: kerosine/ heating oil	24 h	Irritating
Based on the overall weight of evidence of skin irritation scores, kerosines are classified as irritating to the skin as defined by EU CLP Regulation (EC No 1272/2008). They are classified as Skin Irritant, Category 2 (H315), irritating to the skin.						

Serious eye damage/irritation	Method	Species	Route of exposure	Effective dose	Exposure time	Results
	EPA OTS 798:4500	New Zealand Rabbit, white	Eye	0.1mL of was instilled in the conjunctival sac of the eye Test material: Kerosine, CAS No 68333-23-3	72 hours observation	Not irritating
Based on a lack of corneal, iridial, and conjunctival irritation, kerosines do not meet the criteria for classification as an eye irritant as defined by EU CLP Regulation.						

Corrosivity	Method	Species	Route of exposure	Effective dose	Exposure time	Results
No specific studies have been reported on corrosivity of these substances in this category. Considering the available studies, no corrosive action of these substances is expected.						

Respiratory or skin sensitisation	Method	Species	Route of exposure	Effective dose	Exposure time	Results
	Equiv. or similar to OECD 406	Guinea pig (Hartley), male	Skin Induction and Challenge: epicutaneous, occlusive	Induction: 1:4 dilution Challenge: 1:4 dilution or 0.2% DNCB Test material: Kerosine , CAS No 68333-23-3		Not sensitizing

Skin sensitisation: Based on test data, kerosines do not meet the criteria for classification as a dermal sensitizer under EU CLP Regulation (EC No. 1272/2008).
Respiratory sensitization: This endpoint is not a REACH requirement

Germ cell mutagenicity	Method	Species	Route of exposure	Effective dose	Exposure time	Results
	<u>IN VITRO</u> Modified Ames assay	S.Typhimurium 98		50 µl/ml Test material: CAS No 64742-81-0 and 8008-20-6		All in vitro assays were negative for genotoxicity, except for one assay done with straight run kerosine which was positive
	Equiv. or similar to OECD 471	S.Typhimurium TA 1535,1537, 1538, 98, 100 and S. Cerevisiae D4 (met. act. with and without		0.001-5.0 µl/plate Test material: CAS No 8008-20-6		
	Equiv. or similar to OECD 476	Mouse lymphoma L5178Y cells (met. act. with and without)		-3.91-6.25 nl/ml (with activation) and 6.25-37.5 nl/ml (without activation) -0.004-0.065 nl/ml (with activation) and 0.006-0.13 nl/ml (without activation) Test material: CAS No 8008-20-6		
	<u>IN VIVO</u> Equiv. or similar to OECD 475	Rat (Sprague-Dawley), m, f	Intraperitoneal	- 0, 0.3, 1.0, 3.0 g/kg Test material: CAS No 8008-20-6 -0.3, 1.0, 3.0 g/kg Test material: CAS No 64742-81-0		
	"	"	"	Sample1: 0.4, 0.13, 0.04 ml/rat Sample2: 0.18, 0.06, 0.02 ml/rat Test material: CAS No 8008-20-6		
	Equiv. or similar to OECD 478	Mouse (CD-1), male	Inhalation	Actual: 0, 98.4, 378.3 ppm Test material: JF-A		
	"	Mouse and rat, male	Intraperitoneal	Mouse: 1ml/kg (diluted 10% in corn oil), Rat: undiluted Test material: Deodorized kerosine		
Equiv. or similar to OECD 479	Mouse (B6C3F1) male, female	"	400, 2000, 4000 mg/kg Test material: CAS No 64742-81-0			
There were no studies located that described mutagenic or genotoxic effects of kerosine or jet fuels in humans. Because most studies were negative and the data on various individual components of kerosines and jet fuels were negative, the weight of evidence from in vitro and in vivo mutagenic studies indicates that kerosine and jet fuels are likely not mutagens and are not classified as mutagens under the EU CLP Regulation (EC No. 1272/2008).						

Carcinogenicity	Method	Species	Route of exposure	Effective dose	Exposure time	Results
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	Equiv. or similar to OECD 451	Mouse (C3H/HeNCrIBR), male	Dermal	37.5 µl Test material: JF-A	2 years, twice each week	Neoplastic effects: Yes
	"	Mouse (C3H), male, female	"	25 mg Test material: JF-A	105 weeks, 3 times weekly	"
	"	Mouse (C3H), male	"	50 µl Test material: CAS No 8008-20-6	24 months, twice weekly	"
	"	Mouse (C3H/HeJ), m,f	"	50 µl Test material: CAS No 64742-81-0	lifetime, twice per week	"
	"	Mouse (B6C3F1), m,f	"	0, 250 or 500 mg/kg Test material: JP-5	103 w, except high dose- females were only exposed for 90 weeks (5 d/w)	"
	"	Mouse (C3H), male	"	0, 28.5, 50, 100% Test material: CAS No 64742-81-0	2 years (low dose 7d/w, mild dose 4d/w, high dose 2d/w)	"
	"	"	"	50 gr/mouse Test material: CAS No 8008-20-6, 64742-47-8	2 years, twice per week	"

Kerosine is not carcinogenic when animals are exposed via the oral or inhalation route. However, chronic skin contact with kerosines and jet fuel may lead to tumour formation as a consequence of repeated cycles of irritation, skin damage and repair.
LOAEL: 200 mg/ kg bw/day - Target organs: other: skin
In studies where dermal irritation and/or inflammation were prevented, but other factors, such as dermal uptake of polycyclic aromatic compounds, were kept identical, no skin tumours were observed.
Based on this data, kerosines are classified as non-carcinogenic according to the EU CLP Regulation (EC No.1272/2008).

Reproductive and developmental toxicity	Method	Species	Route of exposure	Effective dose	Exposure time	Results
	OECD 421	Rat (Sprague-Dawley), male, female	Dermal	165(20%), 330 (40%) 494(60%) mg/kg/d. Different concentrations in solution and amount applied Test material: CAS No 64742-81-0	14 d pre mating to day 20 of gestation with males treated an additional week	NOAEL (P, reprod.toxicity): ≥494 mg/kg bw/day NOAEL (F1, develop. offspring toxicity): ≥494 mg/kg bw/day
	No specific guidelines mentioned	Rat (Sprague-Dawley), male, female	Oral (gavage)	Males: 750, 1500,3000 mg/kg/d Females: 325, 750, 1500 mg/kg/d Test material: JP-8	Males: 70 to 90 days Females: 21 weeks	NOAEL (P): 750 mg/kg bw/day NOAEL (P, reprod.toxicity, male): ≥3000 mg/kg bw/day NOAEL (P, reprod.toxicity, female): ≥1500 mg/kg bw/day NOAEL (F1): 750 mg/kg bw/day

OECD 414	Rat (Sprague-Dawley)	Oral (gavage)	500, 1000, 1500, 2000 mg/kg/day (actually ingested) Test material: JP-8	10 days	NOAEL (embryotoxicity): 1000 mg /Kg bw/day LOAEL (embryotoxicity): 1500 mg /Kg bw/day NOAEL (maternal toxicity): 500 mg /Kg bw/day LOAEL (maternal toxicity): 1000 mg /Kg bw/day
OECD 414	Rat (Sprague-Dawley)	Inhalation Whole body	106 or 364 ppm Test material: CAS No 8008-20-6	Six hours each day (daily) Days 6 through 15 of gestation	NOAEC (maternal toxicity): ≥364ppm NOAEC (teratogenicity): ≥364ppm

- Kerosine does not cause fertility effects (OECD 421)
NOAEL (oral route): ≥3000 mg/kg bw/day
NOAEL (dermal route): ≥ 494 mg/kg bw/day
NOAEL (inhalation): ≥ 1000 mg/kg bw/day
- All animal studies show that kerosine and jet fuel have no effects on developmental (OECD 414)
NOAEL (oral route): 1000 mg/kg bw/day
NOAEL (dermal route): ≥ 494 mg/kg bw/day
NOAEL (inhalation): ≥ 364 ppm

Therefore, there is insufficient data to classify kerosines as toxic for reproduction under the EU CLP Regulation (EC No. 1272/2008).
Developmental studies did not provide sufficient evidence to cause a strong suspicion of developmental toxicity in the absence of signs of marked maternal toxicity, therefore kerosines are not classified as a developmental toxicant according to EU CLP Regulation (EC No. 1272/2008).

Specific Target Organ Exposure (STOT) – repeated exposure	Method	Species	Route of exposure	Effective dose	Exposure time	Results
	Equiv. or similar to OECD 412	Rat (Sprague-Dawley), male, female	Inhalation Subacute, Vapour, whole body	24mg/m ³ (vapour) Test material: Kerosine, CAS No 64742-81-0	6h/d, 5d/w for 4w	NOAEC: ≥24 mg/m ³ air No treatment related effects observed
	Equiv. or similar to OECD 413	Rat (Fischer 344), male, female	Inhalation Subchronic Vapour, whole body	0, 500, 1000 mg/m ³ (vapour) Test material: JP-8	24h/d for 90 d	NOAEL: ≥1000mg/m ³ air LOAEL: 500 mg/m ³ (male, body and organ weights)
	"	Mouse (C57 BL) male, female	"	"	"	NOAEL: ≥1000mg/m ³ air
	OECD 410	Rat (Sprague-Dawley), male, female	Dermal Subacute	0.01, 0.05, 0.5 ml/kg/d Test material: Kerosine, CAS No 68333-23-3	6h/d, 5d/w for 4w	NOAEL: ≥0.5 ml/kgbw (male, female) Skin LOAEL: 0.01 ml/kgbw (male, female)
	Study (no specific guidelines)	Rat (Sprague-Dawley), male, female	Oral Subchronic, gavage	Males: 0, 750, 1500, 3000 mg/kg/d Females: 0, 325, 750, 1500 mg/kg/d Test material: JP-8	Males: 70 to 90 days Females: 21 w (daily)	NOAEL: 750 mg/kgbw/d

- NOAEL (oral): 750 mg /Kg bw /day
 - NOAEL (dermal): ≥400 mg /Kg bw /day
 - NOAEC (inhalation): ≥1000 mg /Kg bw /day
- Based on the lack of adverse systemic effects even with the highest doses administered, kerosines are not classified for repeated dose toxicity under the EU CLP Regulation (EC No. 1272/2008).

STOT – single dose	Method	Species	Route of exposure	Effective dose	NOAEL	Exposure time
Affected organs: Central Nervous System Route of exposure: Inhalation						
Aspiration Hazard	Due to low viscosity of kerosines aspiration is expected to occur only during ingestion or in case of vomiting after ingestion					

12. ECOLOGICAL INFORMATION

Basis of assessment Information given is based on a knowledge of the components and the ecotoxicology of similar products.

12.1. Toxicity

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

Acute (short-term) Aquatic toxicity:

Fish LL50 (96h): 2 to 5 mg/L, NOEL(96h): 2.0 mg/L (Oncorhynchus mykiss, OECD 203; KS = 1)

Aquatic invertebrates EL50 (48h): 1.4 mg/L, NOEL(48h): 0.3 mg/L (Daphnia magna, OECD 202; KS = 1)

Chronic (long-term) Aquatic toxicity:

Fish NOEL: 0.098 mg/L (freshwater fish, PETROTOX computer model)

Aquatic invertebrates NOEL (21d): 0.48 mg/L, LOEL (21d): 1,2 mg/L, EL50(21d): 0.89 mg/L (Daphnia magna, OECD 211; KS = 1)

Toxicity to aquatic algae: NOEL (72h): 1.0 mg/L, EL50(72h): 1-3 mg/L (OECD 201; KS = 1)

Toxicity to microorganisms: LL50(72h): 677.9mg/L (Tetrahymena pyriformis, PETROTOX computer model)

Sediment and terrestrial toxicity: Substance is a hydrocarbon UVCB. Standard tests for this endpoint are intended for single substances and are not appropriate for the risk assessment of this complex substance.

Toxicity to birds: In accordance with Column 2 of REACH Annex X, studies on long-term or reproductive toxicity to birds studies do not need to be conducted due to the existence of a large mammalian dataset.

12.2. Persistence and degradability

**Abiotic Degradation:
Physical/photo-chemical**

Hydrolysis

Kerosines are resistant to hydrolysis because they lack a

elimination

functional group that is hydrolytically reactive.

Phototransformation in air:

Standard tests for atmospheric oxidation half-lives are intended for single substances and are not appropriate for this complex substance.

Phototransformation in water and soil:

The substance does not have the potential to undergo photolysis in water and soil.

Biodegradation:

Kerosines are not readily biodegradable, but as they can be degraded by micro-organisms, they are regarded as being inherently biodegradable.

12.3. Bio accumulative potential

The substance is a hydrocarbon UVCB. Standard tests for this endpoint are intended for single substances and are not appropriate for the risk assessment of this complex substance.

12.4. Mobility

Known or predicted distribution to environmental compartments:

The distribution of the substance in the environmental compartments, air, water, soil, and sediment, has been calculated using the PETRORISK Model. Based on the regional scale exposure assessment, the multimedia distribution of the substance is 91.57 % to air, 1.54 % to water, 2.07 % to sediment and 4.82 % to soil.

Adsorption/Desorption:

The substance is a hydrocarbon UVCB. Standard tests for this endpoint are intended for single substances and are not appropriate for this complex substance.

12.5. Results of PBT and vPvB assessment

The substance is not considered to be PBT nor vPvB.

12.6. Other adverse effects

No information available

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Recover if possible. Dispose of in accordance with the European Directives on waste and hazardous waste. The waste producer is responsible for determining the proper EWC code, classification of the waste and disposal methods, based on the application for which the product was used.

13.1.1 Product / Packaging disposal:

Dispose empty containers via an authorized person/licensed waste disposal contractor in accordance with local and European regulations.

13.1.2 Waste treatment-relevant information:

Empty containers may retain product residue including flammable or explosive vapours. Empty and drain the container thoroughly, including all internal piping, traps, and standpipes. Removal of flammable material from vessels and/or containers may be done by steaming out. Do not perform any work (welding, cutting, drilling,, soldering) on an "empty" container unless they have been cleaned and declared safe. Do not pollute the soil, water or environment with the waste container.

13.1.3 Sewage disposal-relevant information:

DON'T pour the substance down the drain, down the storm sewer or on the ground. Product should not be disposed of by release to sewers.

13.1.4 Other disposal recommendations:

Where possible (e.g. in the absence of relevant contamination), recycling of used substance is feasible and recommended. Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Land Transport (ADR/RID)

14.1. UN No:

UN 1863

14.2. UN Proper Shipping Name:

FUEL, AVIATION, TURBINE ENGINE

14.3. Transport Hazard class:

3 Flammable liquids

14.4. Packing Group:

I or II or III

The correct choice of packaging group, hazard identification number (HIN) and UK emergency action code (EAC) will depend upon the closed flash point and initial boiling point of the low boiling point of the liquid being transported. The criteria are published in the transport regulations, but are summarised below. Initial boiling point $\leq 35^{\circ}\text{C}$ requires packaging group I, HIN 33, UK EAC 3YE. Flash point (closed cup) $< 23^{\circ}\text{C}$ and Initial boiling point $> 35^{\circ}\text{C}$ requires packaging group II, HIN 33, UK EAC 3YE.

Flash point (closed cup) ≥ 23 to $\leq 60^{\circ}\text{C}$ and Initial boiling point $> 35^{\circ}\text{C}$ requires packaging group III, HIN 30, UK EAC 3Y.

For UN 1863 substances belonging to packing group II, the special provisions in ADR, RID and ADN(R) differ depending upon whether the vapour pressure of the substance at 50°C is more than 110 kPa or not more than 110 kPa.

14.5. Environmental hazard:

This product is classified as dangerous to the environment

Remarks:

Hazard identification number (HIN) 30 or 33. UK Emergency action code (EAC) 3YE or 3Y. Tunnel restriction code: D/E (Note: ADR requirement only).

Inland waterways Transport (ADN)

14.1. UN No:

UN1863

14.2. UN Proper Shipping Name:

FUEL, AVIATION, TURBINE ENGINE

14.3. Transport Hazard class:

3 Flammable liquids

14.4. Packing Group:

I or II or III

The correct choice of packaging group, hazard identification number (HIN) and UK emergency action code (EAC) will depend upon the closed flash point and initial boiling point of the low boiling point of the liquid being transported. The criteria are published in the transport regulations, but are summarised below. Initial boiling point $\leq 35^{\circ}\text{C}$ requires packaging group I, HIN 33, UK EAC 3YE. Flash point (closed cup) $< 23^{\circ}\text{C}$ and Initial boiling point $> 35^{\circ}\text{C}$ requires packaging group II, HIN 33, UK EAC 3YE.

Flash point (closed cup) ≥ 23 to $\leq 60^{\circ}\text{C}$ and Initial boiling point $> 35^{\circ}\text{C}$ requires packaging group III, HIN 30, UK EAC 3Y.

For UN 1863 substances belonging to packing group II, the special provisions in ADR, RID and ADN(R) differ depending upon whether the vapour pressure of the substance at 50°C is more than 110 kPa or not more than 110 kPa.

14.5. Environmental hazard:

This product is classified as dangerous to the environment

Remarks:

Substance transported by inland waterway in a tank vessel may have a different classification to substance being transported in packaging by inland waterway.

Sea transport (IMDG Code)

14.1. UN No:

UN 1863

14.2. UN Proper Shipping Name:

FUEL, AVIATION, TURBINE ENGINE

14.3. Transport Hazard class:

3 Flammable liquids

14.4. Packing Group:

I or II or III

The correct choice of packaging group, hazard identification number (HIN) and UK emergency action code (EAC) will depend upon the closed flash point and initial boiling point of the low boiling point naphtha being transported. The criteria are published in the transport regulations, but are summarised below.

Initial boiling point $\leq 35^{\circ}\text{C}$ requires packaging group I, HIN 33, UK EAC 3YE.

Flash point (closed cup) $< 23^{\circ}\text{C}$ and Initial boiling point $> 35^{\circ}\text{C}$ requires packaging group II, HIN 33, UK EAC 3YE.

Flash point (closed cup) ≥ 23 to $\leq 60^{\circ}\text{C}$ and Initial boiling point $> 35^{\circ}\text{C}$ requires packaging group III, HIN 30, UK EAC 3Y.

For UN 1863 substances belonging to packing group II, the special provisions in ADR, RID and ADN(R) differ depending upon whether the vapour pressure of the substance at 50°C is more than 110 kPa or not more than 110 kPa.

14.5. Environmental hazard:

Marine pollutant

Air Transport (IATA)

14.1. UN No:

UN 1863

14.2. UN Proper Shipping Name:

FUEL, AVIATION, TURBINE ENGINE

14.3. Transport Hazard class:

3 Flammable liquids

14.4. Packing Group:

I or II or III

The correct choice of packaging group, hazard identification number (HIN) and UK emergency action code (EAC) will depend upon the closed flash point and initial boiling point of the low boiling point of the liquid being transported. The criteria are published in the transport regulations, but are summarised below.

Initial boiling point $\leq 35^{\circ}\text{C}$ requires packaging group I, HIN 33, UK EAC 3YE.

Flash point (closed cup) $< 23^{\circ}\text{C}$ and Initial boiling point $> 35^{\circ}\text{C}$ requires packaging group II, HIN 33, UK EAC 3YE.

Flash point (closed cup) ≥ 23 to $\leq 60^{\circ}\text{C}$ and Initial boiling point $> 35^{\circ}\text{C}$ requires packaging group III, HIN 30, UK EAC 3Y.

For UN 1863 substances belonging to packing group II, the special provisions in ADR, RID and ADN(R) differ depending upon whether the vapour pressure of the substance at 50°C is more than 110 kPa or not more than 110 kPa.

14.5. Environmental hazard:

This product is classified as dangerous to the environment

14.6. Special precautions for user

Refer to Section 7, Handling and Storage

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

For bulk transport follow Annex II of MARPOL 73/78 and the IBC Code

15. REGULATORY INFORMATION

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

EU Regulations

- Regulation (EC) No 1907/2006 of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC
- Regulation (EC) No 1272/2008 of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006
- Regulation (EC) No 453/2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- Regulation (EC) No 830/2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Authorisations and/or restrictions on use

- Authorisations: REACH Regulation Annex XIV – List of substances subject to authorisation
- Restrictions on use: REACH Regulation Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Other EU regulations

- Directive 2008/98/EC of 19 November 2008 on waste and repealing certain Directives
- Directive 2012/18/EK of 4 July 2012 on the control of major accident hazards involving dangerous substances, amending and consequently repealing Directive 96/82/EC.
- Directive 2001/7/EC of 29 January 2001 adapting for the third time to technical progress Council Directive 94/55/EC on the approximation of the laws of the Member States with regard to the transport of dangerous goods by road
- Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage
- Directive 2004/37/EC of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work.
- Directive 2009/161 establishing a third list of indicative exposure limit values in implementation of Directive 98/24/EK and amending Directive 2000/39/EK

National regulations

- Ministerial Decree 13588/725/2006 «Measures, terms and restrictions for handling hazardous wastes according to the Directive 91/689/EEC for hazardous waste» Replacement of the Ministerial Decree 19396/1546/1997 «Measures and terms for handling hazardous waste»
- Presidential Decree 307/1986 «Protection of Workers from the Risks Related to Exposure to Certain Chemical Agents at Work», as it has been amended by:
 - P.D. 77/1993 «Protection of workers from physical, chemical and biological agents at work and amendments and additions to P.D. 307/86 according to Directive 88/642/EEC»
 - P.D. 90/1999 «Establishment of exposure limit values and upper exposure limit values for workers exposed to certain chemical agents at work according to Directives 91/322/EEC and 96/94/EC and amendments and additions to P.D. 307/86, as it has been amended by P.D. 77/93»
 - P.D. 339/2001 «Amendments to P.D. 307/86 "Protection of workers from the risks related to exposure to certain chemical agents at work" »
 - P.D. 162/2007 «Protection of workers from the risks related to exposure to certain chemical agents at work, amending last version of P.D. 307/86 according to Directive 2006/15/EC»
 - P.D. 12/2012 «Amendments to P.D. 307/86 "Protection of workers from the risks related to exposure to certain chemical agents at work» according to Directive 2009/161/EU»
- Presidential Decree 395/1994, «Minimum Safety and Health Requirements for the Use of Work Equipment by Workers at Work (relevant to Directive 89/655/EEC)», as it has been amended by:
 - P.D. 89/99 «Amendments to P.D.395/94 according to Directive 95/63/EC»
 - P.D. 304/00 «Amendments to P.D.395/94, as it has been amended by P.D. 89/99»
 - P.D. 155/04 «Amendments to the last version of P.D.395/94 according to Directive 2001/45/EC»
- Presidential Decree 396/1994 «Minimum Health and Safety Requirements for the Use by Workers of Personal Protective Equipment at the Workplace (relevant to Directive 89/656/EEC)», as it has been amended
- Presidential Decree 338/2001 «Protection of the health and safety of workers from hazards caused by chemical agents at work»

- Ministerial Decision 34458/1990 "Technical specifications for the configuration, design, construction, safe operation and fire protection of refineries and other petroleum industries"

15.2. Chemical Safety Assessment

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

16. ABBREVIATIONS

Abbreviations, acronyms

CAS	Chemical Abstracts Service
DSD	Directive 67/548/EEC
CLP	Regulation 1272/2008
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterway
IMDG	International Maritime Dangerous Goods Code
ICAO-TI	International Civil Aviation Organization-Technical Instructions
RID	Regulations concerning the International Carriage Dangerous Goods by Rail
DMEL	Derived Minimum Effect Level
DNEL	Derived No Effect Level
PNEC	Predicted No Effect Concentration
LOAEC	Lowest Observed Adverse Effect Concentration
LOAEL	Lowest Observed Adverse Effect Level
LOEL	Lowest Observed Effect Level
NOAEC	No Observed Adverse Effect Concentration
NOAEL	No Observed Adverse Effect Level
NOEC	No Observed Effect Concentration
NOEL	No Observed Effect Level
NOELR	No Observed Effect Loading Rate
LD50	Lethal Dose 50%
LC50	Lethal Concentration 50%
EL50	Effective Level 50%
ErL50	Effective Level 50% Reduction Growth Rate
LL50	Lethal Level 50%
PBT	Persistent, Bioaccumulative and Toxic
vPvB	very Persistent and very Bioaccumulative
SCC	Strictly Controlled Conditions
SCOEL	Scientific Committee on Occupational Exposure Limits
STOT	Specific Target Organ Toxicity
bw	Body weight
bw/day	Body weight/day
IARC	International Agency for Research on Cancer

References	IUCLID Chemical Safety Report Οριακές τιμές έκθεσης GESTIS (http://www.dguv.de/ifa/en/gestis/limit_values/index.jsp)
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Issue date

Revision Date 15-12-2015

Reason for revision Update due to new occupational exposure limit values from GESTIS (section 8) and to the repeal of Directives 67/548/EEC and 1999/45/EC (section 2 and 3)

Additional information

Disclaimer

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EXPOSURE SCENARIOS

- ES 1:** Manufacture of Kerosine - Industrial
- ES 2:** Distribution of Kerosine - Industrial
- ES 3:** Formulation & (Re)packing of Kerosine - Industrial
- ES 4:** Use of Kerosine as a Fuel - Professional
- ES 5:** Use of Kerosine as a Fuel - Consumer

ES.1. Manufacture of Kerosine - Industrial

Section 1 Exposure Scenario Title Kerosine	
Title	
Manufacture of Substance	
Use Descriptor	
Sector(s) of Use	3, 8, 9
Process Categories	1, 2, 3, 4, 8a, 8b, 15
Environmental Release Categories	1, 4
Specific Environmental Release Category	ESVOC SpERC 1.1.v1
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).	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	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
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Operation is carried out at elevated temperature (> 20°C above ambient temperature). OC7. Assumes a good basic standard of occupational hygiene is implemented G1.
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
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 skin contamination immediately. Provide basic employee training to prevent/ minimise exposures and to report any skin effects that may develop. E3
CS15 General exposures (closed systems)	No other specific measures identified. EI20
CS16 General exposures (open systems)	No other specific measures identified. EI20
CS14 Bulk transfers	No other specific measures identified. EI20
CS2 Process sampling	No other specific measures identified. EI20
CS36 Laboratory activities	No other specific measures identified. EI20

CS39 Equipment cleaning and maintenance	No other specific measures identified. EI20
CS85 Bulk Product Storage	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	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	5.4e6
Fraction of Regional tonnage used locally	0.11
Annual site tonnage (tonnes/year)	6.0e5
Maximum daily site tonnage (kg/day)	2.0e6
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	3.0e-4
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 freshwater sediment [TCR1b]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TRC14]. Onsite wastewater treatment required [TCR13].	
Treat air emission to provide a typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency \geq (%)	97.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	56.1
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	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	97.7
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	2.0e6
Assumed domestic sewage treatment plant flow (m ³ /d)	10000
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].	
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	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterization. G37.	
Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38.	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.	
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 onsite 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 assessments for EU refineries have been performed using site-specific data and are attached in Petrorisk file in IUCLID Section 13-"Site-Specific Production" worksheet [DSU6].	

ES.2. Distribution of Kerosine - Industrial

Section 1 Exposure Scenario Title Kerosine	
Title	
Distribution of Substance	
Use Descriptor	
Sector(s) of Use	3
Process Categories	1, 2, 3, 4, 8a, 8b, 9, 15
Environmental Release Categories	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	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.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	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
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Assumes use at not more than 20 °C above ambient temperatures, unless stated differently G15 . Assumes a good basic standard of occupational hygiene is implemented G1 .
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
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 skin contamination immediately. Provide basic employee training to prevent/ minimise exposures and to report any skin effects that may develop. E3
CS15 General exposures (closed systems)	No other specific measures identified. EI20
CS16 General exposures (open systems)	No other specific measures identified. EI20
CS2 Process sampling	No other specific measures identified. EI20
CS36 Laboratory activities	No other specific measures identified. EI20

CS14 Bulk transfers	No other specific measures identified. EI20
CS6 Drum and small package filling	No other specific measures identified. EI20
CS39 Equipment cleaning and maintenance	No other specific measures identified. EI20
CS85 Bulk Product Storage	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	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	5.4e6
Fraction of Regional tonnage used locally	2.0e-3
Annual site tonnage (tonnes/year)	1.1e4
Maximum daily site tonnage (kg/day)	3.6e4
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (initial release prior to RMM)	1.0e-3
Release fraction to wastewater from process (initial release prior to RMM)	1.0e-5
Release fraction to soil from process (initial release prior to RMM)	0.00001
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used [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].	
Treat air emission to provide a typical removal efficiency of (%)	90
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency \geq (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	0
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	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.7
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	2.6e6
Assumed domestic sewage treatment plant flow (m ³ /d)	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [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].	
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	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32. Risk Management Measures are based on qualitative risk characterization. G37.	
Available hazard data do not support the need for a DNEL to be established for other health effects. G36. Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38.	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23.	
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 onsite 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].	

ES.3. Formulation & (Re)packing of Kerosine - Industrial

Section 1 Exposure Scenario Title Kerosine	
Title	
Formulation & (Re)packing of Substances and Mixtures	
Use Descriptor	
Sector(s) of Use	3, 10
Process Categories	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15
Environmental Release Categories	2
Specific Environmental Release Category	ESVOC SpERC 2.2.v1
Processes, tasks, activities covered	
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, maintenance, sampling and associated laboratory activities.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	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
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Assumes use at not more than 20 ^o C above ambient temperatures, unless stated differently G15 . Assumes a good basic standard of occupational hygiene is implemented G1 .
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
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 skin contamination immediately. Provide basic employee training to prevent/ minimise exposures and to report any skin effects that may develop. E3
CS15 General exposures (closed systems)	No other specific measures identified. EI20
CS16 General exposures (open systems)	No other specific measures identified. EI20
CS2 Process sampling	No other specific measures identified. EI20
CS36 Laboratory activities	No other specific measures identified. EI20
CS14 Bulk transfers	No other specific measures identified. EI20

CS30 Mixing operations (open systems)	No other specific measures identified. EI20
CS34 Manual / CS22 Transfer from/pouring from containers	No other specific measures identified. EI20
CS8 Drum/batch transfers	No other specific measures identified. EI20
CS100 Tableting, compression, extrusion or pelletisation	No other specific measures identified. EI20
CS6 Drum and small package filling	No other specific measures identified. EI20
CS39 Equipment cleaning and maintenance	No other specific measures identified. EI20
CS85 Bulk Product Storage	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	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	5.2e6
Fraction of Regional tonnage used locally	5.8e-3
Annual site tonnage (tonnes/year)	3.0e4
Maximum daily site tonnage (kg/day)	1.0e5
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from process (after typical onsite RMMs, consistent with EU Solvent Emissions Directive Requirements)	1.0e-2
Release fraction to wastewater from process (initial release prior to RMM)	2.0e-4
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 freshwater sediment [TCR1b]. Prevent discharge of undissolved substance to or recover from onsite wastewater [TRC14].	

If discharging to domestic sewage treatment plant, no onsite wastewater treatment required [TCR9].	
Treat air emission to provide a typical removal efficiency of (%)	0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency \geq (%)	86.0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	0
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	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.7
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	2.6e5
Assumed domestic sewage treatment plant flow (m ³ /d)	2000
Conditions and measures related to external treatment of waste for disposal	
External treatment and disposal of waste should comply with applicable local and/or national regulations [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].	
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	

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. **G32**. Risk Management Measures are based on qualitative risk characterization. **G37**.

Available hazard data do not support the need for a DNEL to be established for other health effects. **G36**. Users are advised to consider national Occupational Exposure Limits or other equivalent values. **G38**.

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

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 onsite 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].



ES.4. Use of Kerosine as a Fuel – Professional

Section 1 Exposure Scenario Title Kerosine	
Title	
Use as a Fuel	
Use Descriptor	
Sector(s) of Use	22
Process Categories	1, 2, 3, 8a, 8b, 16
Environmental Release Categories	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12b.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.	
Assessment Method	
See Section 3.	
Section 2 Operational conditions and risk management measures	
Section 2.1 Control of worker exposure	
Product characteristics	
Physical form of product	Liquid
Vapour pressure (kPa)	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
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently) G2
Other Operational Conditions affecting exposure	Assumes use at not more than 20 ⁰ C above ambient temperatures, unless stated differently G15 . Assumes a good basic standard of occupational hygiene is implemented G1 .
Contributing Scenarios	Specific Risk Management Measures and Operating Conditions
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 skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin effects that may develop. E3
CS15 General exposures (closed systems).	No other specific measures identified. EI20
GEST_12I Use as a fuel. CS 107 (closed system)	No other specific measures identified. EI20
CS14 Bulk transfers	No other specific measures identified. EI20
CS22 Transfer from/pouring from containers	No other specific measures identified. EI20
CS39 Equipment cleaning and maintenance	No other specific measures identified. EI20

CS85 Bulk Product Storage	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	
Fraction of EU tonnage used in region	0.1
Regional use tonnage (tonnes/year)	4.4e6
Fraction of Regional tonnage used locally	5.0e-4
Annual site tonnage (tonnes/year)	2.2e3
Maximum daily site tonnage (kg/day)	6.1e3
Frequency and duration of use	
Continuous release [FD2].	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only)	1.0e-3
Release fraction to wastewater from wide dispersive use	0.00001
Release fraction to soil from wide dispersive use (regional only)	0.00001
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].	
Treat air emission to provide a typical removal efficiency of (%)	N/A
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency \geq (%)	0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%)	0
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	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.7

Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	94.7
Maximum allowable site tonnage (M_{safe}) based on release following total wastewater treatment removal (kg/d)	6.9e5
Assumed domestic sewage treatment plant flow (m^3/d)	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [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].	
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	
Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. G32 . Risk Management Measures are based on qualitative risk characterisation. G37 .	
Available hazard data do not support the need for a DNEL to be established for other health effects. G36 . Users are advised to consider national Occupational Exposure Limits or other equivalent values. G38 .	
Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23 .	
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 onsite 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].	

ES.5. Use of Kerosine as a Fuel - Consumer

Section 1 Exposure Scenario Title Kerosine		
Title		
Use as a Fuel		
Use Descriptor		
Sector(s) of Use	21	
Product Categories	13	
Environmental Release Categories	9a, 9b	
Specific Environmental Release Category	ESVOC SpERC9.12c.v1	
Processes, tasks, activities covered		
Covers consumer uses in fuels.		
Assessment Method		
See Section 3.		
Section 2 Operational conditions and risk management measures		
Section 2.1 Control of consumer exposure		
Product characteristics		
Physical form of product	liquid	
Vapour pressure	Liquid, vapour pressure > 10 Pa (STP)[OC15]	
Concentration of substance in product	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]	
Amounts used	Unless otherwise stated, covers use amounts up to 50000g [ConsOC2]; covers skin contact area up to 420cm ² [ConsOC5]	
Frequency and duration of use/exposure	Unless otherwise stated, covers use frequency up to 0.143 times per day [ConsOC4]; covers exposure up to 2 hours per event [ConsOC1 4]	
Other Operational Conditions affecting exposure	Unless otherwise stated, assumes use at ambient temperatures [ConsOC15]; assumes use in a 20 m ³ room [ConsOC11]; assumes use with typical ventilation [ConsOC8]	
Product Category	Specific Risk Management Measures and Operating Conditions	
PC13: Fuels-Liquid -: Refueling	OC	Unless otherwise stated, covers concentrations up to 100% [ConsOC1]; covers use up to 52 days/year [ConsOC3]; covers use up to 1 time/on day of use[ConsOC4]; covers skin contact area up to 210.00 cm ² [ConsOC5]; for each use event, covers use amounts up to 50000g [ConsOC2]; covers outdoor use [ConsOC12]; covers use in room size of 100m ³ [ConsOC11]; for each use event, covers exposure up to 0.05hr/event [ConsOC14];
	RMM	No specific RMMs developed beyond those OCs stated
Section 2.2 Control of environmental exposure		
Product characteristics		
Substance is complex UVCB [PrC3]. Predominantly hydrophobic [PrC4a].		
Amounts used		
Fraction of EU tonnage used in region	0.1	
Regional use tonnage (tonnes/year)	1.8e5	
Fraction of Regional tonnage used locally	0.0005	
Annual site tonnage (tonnes/year)	89	
Maximum daily site tonnage (kg/day)	245	
Frequency and duration of use		

Continuous release [FD2].	
Emission days (days/year)	365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	
Release fraction to air from wide dispersive use (regional only)	1.0e-3
Release fraction to wastewater from wide dispersive use	0.00001
Release fraction to soil from wide dispersive use (regional only)	0.00001
Conditions and measures related to municipal sewage treatment plant	
Risk from environmental exposure is driven by freshwater [STP7a]	
Estimated substance removal from wastewater via domestic sewage treatment (%)	94.7
Maximum allowable site tonnage (M _{Safe}) based on release following total wastewater treatment removal (kg/d)	3.1e4
Assumed domestic sewage treatment plant flow (m ³ /d)	2000
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls [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].	
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&CSATGD. 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 Scenario	
4.1. Health	
Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in Section 2 are implemented. G39 . Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. G23 .	
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].	