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

1.1 Product identifier

Product name:	Kerosine
Synonym	Kerosine (all type)
CAS Number	not applicable (mixture)
EC Number	not applicable (mixture)
Index number	not applicable (mixture)
Registration number	not applicable (mixture)
Unique Formula Identifier (UFI)	2S00-G0PD-F00N-MPTJ

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

***Relevant identifies uses*:** Heating fuel, fuel for turbine engines, and other industrial uses.

Relevant uses identified in the chemical safety report:

Formulation or re-packing:Formulation & (re)packing of substances and mixtures.

Uses at industrial sites: Use in fuels.

Widespread uses by professional workers: Use in fuels.

Consumer uses: Use in fuels.

See the annex (Exposure scenarios) for list of the uses for which an exposure scenario is available.

Uses advised against: The Professional and or Consumer Uses of Kerosine substances in coatings, cleaning agents (some cases), lubricants, metal working fluids, binders and release agents, agrochemicals, road and construction applications, and explosives are advised against. Consumer Uses of Kerosine fuel for lighting

Reasons why uses advised against: While these uses have previously been supported, in 2011 ECHA's Committee for Risk Assessment (RAC) issued an Opinion stating that certain petroleum substances in the Naphtha and Kerosine categories presented a hazard of chronic toxicity to the central nervous system. The Opinion proposed more stringent exposure limits which are incompatible with the chemical safety assessments performed for these uses of Kerosine substances. As other Kerosine substances can have composition ranges significantly overlapping those of the substances specified in the Opinion, the advice is applied to all Kerosine substances. Therefore, for reasons of protection of human health, these uses are no longer supported in the registration dossier.

1.3 Details of the safety data sheet supplier

Company name: Q8 Quaser s.r.l.
Address: Via dell'Oceano Indiano, 13
City / Nation: 00144 – Roma (Italia)
Telephone: +39 06-520881
Competent Technician E-mail: schede@q8.it

1.4 Emergency number

For Appropriate National Emergency Information Services see the following link:

https://echa.europa.eu/support/helpdesks

SECTION 2 HAZARDS IDENTIFICATION

Physico-chemical hazards: Flammable Product

Human health hazard: Causes skin irritation, may be fatal if swallowed and enters airways, inhalation of vapors may cause drowsiness and dizziness. May cause cancer

Environmental hazard: Toxic to aquatic life with long lasting effects.

2.1 Classification of the substance or mixture

Flam. Liq. 3	H226
Skin Irrit. 2	H315
Asp. Tox. 1:	H304
STOT SE 3	H336 (NS inhalation)
Carc 1B	H350
Aquatic Chronic 2	H411

Full text of hazard statements see section 16.

2.2 Label elements

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.

H350: May cause cancer

H411: Toxic to aquatic life with long lasting effects.

Precautionary Statements

General precautionary statements

P102: Keep out of reach of children.

Prevention precautionary statements

P201: Obtain special instructions before use.

P210: keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

P273: Avoid release to the environment.

P280:Wear protective gloves/protective clothing/eye protection/face protection/hearing protection

Response precautionary statements

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

P331: Do NOT induce vomiting.

Disposal precautionary statements

P501: Dispose of contents/container in accordance with local/regional/national/international

Supplemental hazard information

Supplemental hazard statements: restricted to professional users due to the presence of cumene classified as carcinogenic Category 1B, except for fuel uses.

Authorization number: n.a.

2.3 Other hazards

In some circumstances, the product can accumulate static electricity in significant amounts, with the risk of shocks that may cause fire or explosions. The product does not meet the PBT or vPvB classification criteria set out in Annex XIII to REACH.

Vapors are heavier than air and can accumulate in enclosed spaces. No components identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 (3) or Commission Regulation (EU) 2018/605. See also sections 9 to 12.

SECTION 3 Composition/information on ingredients

3.2 Mixtures

Component	Identifier	Concentration	Classification accordig to Reg. (CE) 1272/2008
1. **Kerosine (petroleum), sweetened**: a complex combination of hydrocarbons obtained by subjecting a petroleum distillate to a sweetening process to convert mercaptans or to remove acidic impurities. It consists predominantly of hydrocarbons having carbon numbers predominantly in the range of C9 through C16 and boiling in the range of 130°C to 290°C (266°F to 554°F)	CAS Number: 91770-15-9 EINECS Number: 294-799-5 INDEX Number: 649-427-00-X Registration Number: 01-2119502385-46-XXXX	≤100	Flam. Liq. 3: H226 Asp. Tox. 1: H304 Skin Irrit. 2: H315 STOT SE 3: H336 (SNC, inalaz) Carc 1B; H350 Aquatic Chronic 2: H411
2. **UVCB SUBSTANCE: KEROSINE (PETROLEUM), HYDRODESULFURIZED** *("A complex combination of hydrocarbons obtained from a petroleum stock by treating with hydrogen to convert organic sulfur to hydrogen sulfide which is removed. It consists of hydrocarbons having carbon numbers predominantly in the range of C9 through C16 and boiling in the range of approximately 150°C to 290°C")*	CAS Number: 64742-81-0 EINECS Number: 265-184-9 INDEX Number: 649-423-00-8 Registration Number: 01-2119462828-25-XXXX	≤100	Flam. Liq. 3: H226 Asp. Tox. 1: H304 Skin Irrit. 2: H315 STOT SE 3: H336 (CNS, inhalation) Carc 1B; H350 Aquatic Chronic 2: H411
3. **UVCB SUBSTANCE: KEROSINE (PETROLEUM)** *("A complex combination of hydrocarbons produced by the distillation of crude oil. It consists of hydrocarbons having carbon numbers predominantly in the range of C9 through C16 and boiling in the range of approximately 150°C to 290°C")*	CAS Number: 8008-20-6 EINECS Number: 232-366-4 INDEX Number: 649-404-00-4 Registration Number: 01-2119485517-27-XXXX	≤100	Flam. Liq. 3: H226 Asp. Tox. 1: H304 Skin Irrit. 2: H315 STOT SE 3: H336 (CNS, inhalation) Carc 1B; H350 Aquatic Chronic 2: H411
4. **Hydrocarbons, C11-C16, nalkanes, isoalkanes, < 2% aromatics**	CAS Number: n.a. EINECS Number: 942-085-8 INDEX Number: n.a. Registration Number: 01-2120085325-55-XXXX	≤50	-
5. **Renewable hydrocarbons (kerosene type fraction)**	CAS Number: n.a. EINECS Number: 931-082-4 INDEX Number: n.a. Registration Number: 01-2119850115-46-XXXX	≤50	Flam. Liq. 3, H226 Asp. Tox. 1, H304 EUH066
Depending on the characteristics and origin of the components, 2-Phenylpropane (cumene) can be identified in the final chemical composition of kerosenes. This component is not added deliberately..			
6. **Cumene (2-Phenylpropan)**	CAS Number: 98-82-8 EINECS Number: 202-704-5 INDEX Number: 601-024-00-X	<1	Flam. Liq. 3, H226 Carc. 1B, H350 STOT SE 3, H335 Asp. Tox. 1, H304 Aquatic Chronic 2; H411

SECTION 4 First aid measures

4.1 Description of first aid measures

Eye contact: Rinse cautiously with water for several minutes, remove contact lenses, if present and easy to do so. Irrigate exposed eyes with 0.9% normal saline if available or water for at least 15 minutes. Irrigate before and after removing the lenses to prevent a carry-over of the substances to the shielded area of the lens

Skin contact: Remove contaminated clothing, contaminated footwear and dispose of safely. Wash area with soap and water for 10 to 15 minutes

Swallowing: Do not induce vomiting as there is high risk of aspiration. Do not give anything by mouth to an unconscious person. If vomiting occurs, the head should be kept low so that the vomit does not enter the lungs (aspiration)

Inhalation: If breathing is difficult, remove victim to fresh air. Monitor for respiratory distress, administer oxygen and assist ventilation as required. In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible). Check vital signs regularly and act accordingly. If there is any suspicion of inhalation of H2S (hydrogen sulphide) rescuers must wear breathing apparatus, belt and safety rope, and follow rescue procedures. Send patient to hospital. Immediately begin artificial respiration if breathing has ceased. Always assume that aspiration has occurred.

4.2 Most important symptoms and effects, both acute and delayed

Skin contact symptoms: may cause skin irritation.

Eye contact symptoms: may cause mild reversible eye irritation.

Inhalation symptoms of vapours: may cause headache, nausea, dizziness. Acute, high dose exposure may cause central nervous system depression, confusion, altered mental status, seizures, cardiac arrhythmias.

Ingestion (swallowing) symptoms: altered state of consciousness and loss of coordination.

4.3 Indication of any immediate medical attention and special treatment needed

In case of inhalation obtain medical attention if casualty has an altered state of consciousness or if symptoms do not resolve).

SECTION 5 Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media: small fires: sand or earth, carbon dioxide), foam, dry chemical powder. Large fires: foam, water fog (trained personnel only. Other inert gases (subject to regulations).

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

Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates, gases, including CO (carbon monoxide), H_2S (hydrogen sulphide), SOx (sulphur oxides), H_2SO_4 (sulfuric acid), H_2S (hydrogen sulphide) and other unidentified organic and inorganic compounds.

5.3 Advice for firefighters

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).

SECTION 6 ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

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. In those cases when the presence of dangerous amounts of H_2S in the leaked/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.

Spillages of limited amounts of product, especially in the open air when vapours will be usually quickly dispersed, are dynamic situations, which will presumably limit the exposure to dangerous concentrations.

6.1.2 For emergency personnel

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. Gloves made of PVA are not water-resistant, and are not suitable for emergency use. Wear work helmet, antistatic non-skid safety shoes or boots. 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 vapors (and when applicable for H_2S) 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. Concentration of H_2S 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.

6.2 Environmental precautions

Prevent product from entering sewers, rivers or other bodies of water.

6.3 Methods and material for containment and cleaning up

Spillages onto land: prevent product from entering sewers, rivers, waterways or other bodies of water. 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. Absorb spilled product with suitable non-combustible materials.3.6. 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 on 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 4.2. 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. 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. Additional information Note: 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.

6.4 Reference to other sections

For more information regarding protective equipment and operational conditions see Exposure scenarios.

SECTION 7 HANDLING AND STORAGE

7.1 Precautions for safe handling

7.1.1 Protective measures (containment and preventive measures)

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

Use and store only outdoors or in a well-ventilated area. Use adequate personal protective equipment as needed. Do not use compressed air for filling, discharging, or handling operations. The vapour is heavier than air. Beware of accumulation in pits and confined spaces. Avoid contact with skin and eyes. Do not ingest. Do not breathe vapours.

Product may release Hydrogen Sulphide: a specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances

For more information regarding protective equipment and operational conditions see Exposure scenarios. Prevent the risk of slipping. Avoid release to the environment.

7.1.2 General recommendations on 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 when using this product). Wash the hands thoroughly after handling. Do not reuse contaminated clothing.

7.2 Conditions for safe storage, including any incompatibilities

Storage area layout, tank design, equipment and operating procedures must comply with the relevant European, national or local legislation. 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, H_2S (Hydrogen sulphide), content and flammability. Store separately from oxidising agents.

Recommended materials for containers, or container linings use mild steel, stainless steel.). 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.

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 labelled.

These can cause flammability / explosion hazards. Open slowly in order to control possible pressure release. Keep only in the original container or in a suitable container for this kind of product.). Empty containers may contain combustible product residues. Do not weld, solder, drill, cut or incinerate empty containers, unless they have been properly cleaned.

7.3 Specific end uses

See attached exposure scenarios.

SECTION 8 Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values:

Nome Componente	Valore limite di esposizione professionale	Riferimento normativo
KEROSENE	TLV®-TWA: 200 mg/m³	ACGIH 2023
HYDROGEN SULPHIDE	TLV®-TWA: 1 ppm/1,4 mg/m³ TLV®-STEL: 5 ppm/7 mg/m³ 8 hours:: 5 ppm; 7 mg/m³ Short term (4 hours): 10 ppm; 14 mg/m³	ACGIH 2023 Dir 98/24/EC and further amendments
CUMENE (2-PHENYLPROPAN)	TLV®-TWA: 5 ppm *8 hours: 10ppm; 50 mg/m³ *Short term (4 hours): 50 ppm; 250 mg/m³	ACGIH 2024 * Dir 98/24/EC and further amendments

DNEL (Derived No Effect Level)

	DNEL for workes				DNEL for the general population			
Route	Systemic effects Long term	Systemic effects Acute	Local effects Long term	**Local effects Acute**	**Systemic effects Long term**	**Systemic effects Acute**	**Local effects Long term**	**Local effects Acute**
Oral	n.a.	n.a.	n.a.	n.a.	5 mg/kg (cumene)	No hazard identified	n.a.	n.a.
Dermal	7,7 mg/kg (cumene)	no hazard identified	Low hazard (no threshold derived)	Low hazard (no threshold derived)	1,64 mg/kg (cumene)	no hazard identified	Low hazard (no threshold derived)	Low hazard (no threshold derived)
Inhalation	50 mg/m³ (cumene)	250 mg/m³ (cumene)	no hazard identified	no hazard identified	10,66 mg/m³ (cumene)	no hazard identified	no hazard identified	no hazard identified
Eyes	n.a.	n.a.	n.a.	No hazard identified	n.a.	n.a.		No hazard identified

PNEC: Predicted No Effect Concentration

PNEC(S) Water and sediments and soil	
-	Substance is a hydrocarbon UVCB: The hydrocarbon block method is used for environmental risk assessment (see REACH guidance, R7, app.13-1). A PNEC cannot be derived for UVCBs, therefore, the risk assessment on the library of representative constituents uses HC5 from the Target Lipid Model (TLM). Following Final Decisions issued by

	ECHA, a review of the TLM has been conducted that led to a revised TLM-model and the new results are used in this dossier. For full details refer to the following Appendixes attached in IUCLID Section 13: PETRORISK ProductLibrary tab, PAH Phototoxicity, PNEC HC5, TLM Validation, PETROTOX Verification and NOS Heterocyclics.

Recommended Monitoring procedures: refer to Dir 98/24/EC. Good industrial heath practices in the work place

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Minimize exposure dusts/vapours/aerosols Before entering storage tanks and commencing any operation in a confined area, check the atmosphere for oxygen, hydrogen sulphide content, and flammability. Provide showers and eyewash fountains at the workplace.

8.2.2 Individual protection measures, such as personal protective equipment

(a) **Eye/face protection**: If splashing is likely, full head and face protection (protective shield and/or safety goggles) should be used. (EN 166)

(b) **Skin protection:**

i) **Hand protection:** In the case of possible contact with the skin use gloves with long cuffs resistant to hydrocarbons, internally plush Presumably adequate materials: nitrile, PVC or PVA (polyvinyl alcohol) with protection from chemical agents at least 5 (breakthrough time> 240 min). Compatibility should be checked with the manufacturer. In the case, refer to UNI EN 374-1:2018. Gloves must be periodically inspected and changed in case of wear, perforations or contaminations. Gloves must be periodically inspected and changed in case of wear, perforations or contaminations.

ii) **other:** In the case of product handling, use antistatic working clothes with long sleeves in relation to the risks related to the classification of work areas. In the case, refer to UNI EN 14605:2009. Wash contaminated clothing and clean shoes before reuse.

(c) **Respiratory protection:**

Open or well-ventilated spaces: wear approved respiratory protection devices: full face masks equipped with type A filter cartridge (for organic vapors) (UNI EN14387: 2021) In the absence of containment systems

• in case of suspected presence of hydrogen sulphide, wear full masks equipped with a type B filter/cartridge (grey for inorganic vapors, H_2S included) (UNI EN14387: 2021)

• If exposure levels cannot be determined or estimated with adequate confidence, or an oxygen deficiency is possible, only SCBA's should be used (UNI EN 11719: 2018)

(d) **Thermal hazards:** see point b

8.2.3 Environmental exposure controls

Avoid release to the environment. Storage installations should be designed with adequate bunds so as to prevent ground and water pollution in case of leaks or spills.

If discharging to domestic sewage treatment plant, no onsite wastewater treatment required. Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils Sludge should be incinerated, contained or reclaimed. For more information on personal protective equipment and operating conditions, refer to "exposure scenarios".

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Data for the components EC 265-184-9 and EC 232-366-4

a) Physical state	Liquid low viscosity
b) Color	Claear
c) Odor	Petroleum odor
d) Melting point/freezing point	< -20 °C (Concawe 1994)
e) Boiling point or initial point and boiling range	90°C Boiling range: 90-320 °C EN ISO 3405 and ASTM D-86 Concawe 2010)
f) Flammability	Liquid and vapors flammable
g) Lower and upper explosion limit	study scientifically not necessary /
h) Flash point	29 - 70 °C (EN ISO 2719, 13736, ASTM D 93-02a, Concawe 2010a)
i) Auto-ignition temperature	220 -250 °C (ASTM E659, Concawe 2010a)
j) Decomposition temperature	Not applicable
k) pH	Not applicable
l) Kinematic Viscosity	1 -2.4 mm^2/s at 40 °C (ISO 3104 e ASTM D445 Concawe 2010)
m) Solubility	Not applicable: substance is a hydrocarbon UVCB.
n) Partition coefficient: *n*-octanol/water (log value)	Not applicable: substance is a hydrocarbon UVCB.
o) Vapor pressure	<1 – 3,7 kPa a 37,8°C (EN 13016-1, Concawe 2010a)
p) Density and/or relative density	Absolute density ranges from 0.77 to 0.85 g/cm3 at 15 deg C ASTM D-4052 and EN ISO 12185 methods, Concawe 2010)
q) Relative vapor density	Not available
r) Particle characteristics	Not applicable

9.2 Other information

The methods of analysis for the characteristics, which correspond to those recognized nationally and internationally, are set mostly in the technical specifications of the product.

9.2.1 Information with regard to physical hazard classes

The product is classified as flammable liquid

9.2.2 Other safety characteristics

Vapors may form explosive mixtures with air.

SECTION 10 STABILITY AND REACTIVITY

10.1 Reactivity

The product e does not present additional dangers of reactivity than those reported in the next subtitle.

10.2 Chemical stability

This product is stable in relation to its intrinsic properties.

10.3 Possibility of hazardous reactions

Contact with strong oxidizers (peroxides, chromates, etc.) may cause a fire hazard. A mixture with nitrates or other strong oxidisers (e.g. chlorates, perchlorates, liquid oxygen) may create an explosive mass. Sensitivity to heat, friction or shock cannot be assessed in advance.

10.4 Conditions to avoid

Store separately from oxidising agents. Keep away from heat/sparks/open flames/hot surfaces. Do not smoke. Avoid Static Electricity.

10.5 Incompatible materials

Strong oxidizing agents.

10.6 Hazardous decomposition products

The product does not decompose when used for its intended uses.

SECTION 11 TOXICOLOGICAL INFORMATION

Toxicokinetics, metabolism and distribution

The studies of the pharmacokinetics (i. e. absorption, distribution, metabolism and excretion) of kerosine are scarce, but the toxicokinetic behaviour of components of the category has been studied and reported. There are three ways in which humans are exposed to kerosine: by inhalation; ingestion; and dermal contact. Due to the relatively low volatility of kerosine and jet fuels, dermal exposure can be a more important route of exposure than exposure via inhalation. Dermal application of kerosine or jet fuel generally shows that the aromatics and aliphatics are well absorbed into the skin. Subsequently, the aromatics penetrate the skin at a higher rate than the alkanes. After absorption, the kerosine constituents are distributed via the blood circulation to the fat tissue and various organs.

The inhalation studies demonstrate that the volatile kerosine constituents are well absorbed (31 –54%) and are distributed mainly in the fat tissue. Aromatics were metabolised at a higher rate than naphthenes, n-alkanes, isoalkanes and 1-alkenes.

Studies with oral exposure to kerosine indicate that gastrointestinal absorption of kerosine is slow and incomplete, resulting in low bioavailability.

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Data for the components EC 265-184-9 and EC 232-366-4

(a) Acute toxicity:

Kerosine is of low acute toxicity, with an oral LD50 greater than 5000 mg/kg (rat), a dermal LD50 greater than 2000 mg/kg (rabbit), and an inhalation LC50 greater than 5.28 mg/L (rat). The most important effects in animals following very high oral doses were slight irritation of the stomach and the gastrointestinal tract. The only adverse effects observed in acute inhalation studies were decreased activity and breathing frequency at very high doses. Dermal application of kerosine did not lead to acute toxic systemic effects. Clinical effects observed were related to dermal irritation rather than to systemic toxicity. There is therefore no classification of the product required in the legislation on hazardous substances.

The following is a summary of the most representative studies reported in the Registration dossier.

Method	Results	Remarks	Reference
Oral			
RAT male/female oral: gavage EPA OTS 798.1175 equivalent or similar to OECD Guideline 420	LD50: > 5000 mg/kg bw (male/female) (Based on lack of mortality and systemic effects)	Key study CAS 68333-23-3 reliable without restriction	ARCO (Atlantic Richfield Company) 1992a
Inhalation			
RAT male/female inhalation: vapour OECD Guideline 403	LC50: > 5.28 mg/L/4h air (male/female) (Based on lack of mortality and systemic effects)	Key study Straight run kerosene CAS 8008-20-6 reliable without restriction	American Petroleum Institute (API) 1987a
Dermal			
RABBIT male/female Coverage: occlusive EPA OTS 798.1100 equivalent or similar to OECD Guideline 402	LD50: > 2000 mg/kg bw (male/female)	Key study CAS 68333-23-3 reliable without restriction	ARCO (Atlantic Richfield Company) 1992g

(b) Skin corrosion/irritation:

Animal studies (rabbits) demonstrate that kerosine may act as a skin irritant. Most of the studies and the overall weight of evidence indicates that kerosines are irritating to skin. Kerosines are classified as irritating to the skin (Skin Irrit 2; H315: Causes skin irritation).

The following is the study taken as a key for the purposes of the classification of the registration dossier.

Method	Results	Remarks	Reference
RABBIT Coverage: occlusive (intact skin) EPA Guidelines in FR Vol. 44, No. 145, pgs. 44054-44093	Irritating Erythema score: 3.46 of max. 4 (not fully reversible within: 10 days) Edema score: 2.33 of max. 4 (not fully reversible within: 10 days)	Key study Kerosene reliable with restrictions	ARCO (1986d)

(c) Serious eye damage/irritation:

Animal studies (rabbits) demonstrate that kerosine are not irritating to eyes. None of the hazard assessments of kerosine and jet fuel constituents have resulted in classification for eye irritation.

The following is a summary of the most representative studies reported in the Registration dossier.

Method	Results	Remarks	Reference
RABBIT EPA OTS 798.4500 (Acute Eye Irritation)	Not irritating Cornea score: 0 of max. 80 Iris score: 0 of max. 10 Conjunctivae score: 0 of max. 20	Key study CAS 68333-23-3 reliable without restriction	ARCO (1992n)

(d) Respiratory or skin sensitization

Respiratory system:

This endpoint is not a REACH requirement. Furthermore, no data was available for this endpoint.

Skin:

Based on test data, there was no evidence of skin sensitisation; therefore, kerosine is not classified for skin sensitization.

The following is a summary of the most representative studies reported in the Registration dossier.

Method	Results	Remarks	Reference
GUINEA PIG EPA OTS 798.4100 (Skin Sensitisation) equivalent or similar to OECD Guideline 406	Not sensitising	Key study CAS 68333-23-3 reliable without restriction	ARCO (1992q)

(e) Germ cell mutagenicity:

The weight of evidence from in vitro and in vivo mutagenic studies indicates that kerosine and jet fuels are likely not mutagens, therefore, no classification is required.

The following is a summary of the most representative studies reported in the Registration dossier.

Method	Results	Remarks	Reference
In vitro data			

Method	Results	Remarks	Reference
Modified Ames assay (gene mutation) S. typhimurium TA98 Doses: 50 µl/Ml (ASTM E1687).	Negative	Key study CAS8008-20-6 reliable without restriction	Mobil (1991)
Sister chromatid exchange assay in mammalian cells Chinese hamster Ovary Doses: Without metabolic activation: 0.007, 0.013, 0.025, and 0.05 µl/ml With metabolic activation: 0.05, 0.1, 0.2, and 0.4 µl/ml equivalent or similar to OECD Guideline 479	Negative	Key study CAS 64742-81-0 reliable without restriction	API (1988a)
In vivo data			
Chromosome aberration assay RAT male/female Intraperitoneal route Doses: 0, 0.3, 1.0 and 3.0 g/kg OECD Guideline 475	Negative	Key study CAS 8008-20-6 reliable without restriction	API (1985c)
Chromosome aberration assay RAT male/female Intraperitoneal route Single dose: 0,8 mg/kg OECD Guideline 475	Negativo	supporting study CAS 64742-81-0 reliable without restriction	American Petroleum Institute (API) 1984

f) Carcinogenicity

Kerosine is not carcinogenic when animals are exposed via the oral or inhalation route. Studies in animals do not show any evidence for a carcinogenic response following oral exposure to jet fuel. Dermal exposure to jet fuel and kerosine, however, resulted in skin tumour formation depending on the exposure conditions. Jet fuels and kerosines were not found to be mutagenic or genotoxic, and the observations from animal studies confirm the non-genotoxic nature of the skin tumour formation. Although dermal irritation alone seems not sufficient to cause dermal tumourigenicity, studies clearly show that dermal irritation and inflammation are prerequisites for dermal carcinogenicity. kerosine is not classified as a carcinogen, but assume the Carc 1B classification; may cause cancer due the presence of cumene in concentrations equal to or greater than 0.1%

The following is a summary of the most representative studies reported in the Registration dossier.

Method	Results	Remarks	Reference
Dermal administration			
MOUSE (male/female) Exposure: lifetime (twice per week) Doses / Concentrations: 50 µl OECD Guideline 451 (Carcinogenicity Studies)	Effect type: carcinogenicity	Supporting study CAS 64742-81-0 Reliable witH restriction	StudyAmerican Petroleum Institute (API) 1989b

g) Reproductive toxicity

Effects on fertility

The following is a summary of the study most representative of the registration dossier. Most studies have not shown consistent evidence of toxicity to fertility, therefore, no classification is required.

The following is a summary of the most representative studies reported in the Registration dossier.

Method	Results	Remarks	Reference
RAT male/female fertility Oral route: gavage Males: 750, 1500, or 3000 mg/kg/day (actual ingested) Females: 325, 750, or 1500 mg/kg/day (actual ingested) Exposure: Males were treated for 70 to 90 days. Females were treated for 21 weeks. (Daily)	NOAEL (P): 750 mg/kg bw/day (actual dose received) Female: body weight. NOAEL (reproduction) (P): >= 3000 mg/kg bw/day (actual dose received) Male: pregnancy rate; sperm characterization. NOAEL (reproduction) (P): >= 1500 mg/kg bw/day (actual dose received) Female: duration of pregnancy; live birth index; pregnancy rate; litter size; litter weight. NOAEL (F1): 750 mg/kg bw/day (actual dose received) Male/female: pup weight.	Key study JP-8 jet fuel reliable without restriction	Mattie, D.R.; Marit, G.B.; Cooper, J.R.; Sterner, T.R.; Flemming, C.D. (2000)

Effects on fetal development/teratologenicity

The following is a summary of the study most representative of the registration dossier. Most studies have not shown consistent evidence of developmental toxicity/teratogenicity major components of the product, therefore, no classification is required.

The following is a summary of the most representative studies reported in the Registration dossier.

Method	Results	Remarks	Reference
RAT oral: gavage Doses: 500, 1000, 1500, or 2000 mg/kg/day (actual ingested) Exposure: 10 days (daily) OECD Guideline 414 (Prenatal Developmental Toxicity Study)	NOAEL (embryotoxicity): 1000 mg/kg bw/day Effects: foetal weights. LOAEL (embryotoxicity): 1500 mg/kg bw/day Effects: foetal weights. NOAEL (maternal toxicity): 500 mg/kg bw/day Effects: body weight. LOAEL (maternal toxicity): 1000 mg/kg bw/day Effects: body weights.	Key study JP-8 jet fuel reliable without restriction	Cooper, J.R.; Mattie, D.R. (1996)

Method	Results	Remarks	Reference
RAT Inhalation Doses: 106 or 364 ppm (analytical conc.) Exposure: Six hours each day (Daily) OECD Guideline 414 (Prenatal Developmental Toxicity Study)	NOAEC (maternal toxicity): >= 364 ppm NOAEC (teratogenicity): >= 364 ppm	Key study CAS 8008-20-6 reliable without restriction	API (1979b)

h) Specific Target Organ Toxicity (STOT) - Single Exposure

Kerosenes are classified as STOT SE 3, H336 (May cause drowsiness or dizziness).

i) Specific Target Organ Toxicity (STOT) - Repeated Exposure

A number of subacute and subchronic studies with kerosines and jet fuels are available. The repeated inhalation and oral studies of kerosine in rats produced no consistent toxicological effects. Based on the lack of adverse systemic effects even with the highest doses administered, kerosines are not classified as hazardous for specifi organ toxicity.

The following is a summary of the most representative studies reported in the Registration dossier.

Method	Results	Remarks	Reference
Oral			
RAT oral: gavage Subchronic: male 70-90 days; Female 21 weeks. Males: 750, 1500, or 3000 mg/kg/day (actual ingested) Females: 325, 750, or 1500 mg/kg/day (actual ingested)	NOAEL: 750 mg/kg bw/day (female) Effects: body weight.	Key study JP-8 jet fuel reliable without restriction	Mattie, D.R.; Marit, G.B.; Cooper, J.R.; Sterner, T.R.; Flemming, C.D. (2000)
Inhalation			
RAT male/female subacute Inhalation: vapour Exposure: Four weeks (6 hours/day, 5 days/week for four consecutive weeks) Dose: 24 mg/m³ Equivalent or similar to OECD Guideline 412	NOAEC: >= 24 mg/m³ (male/female) (No treatment-related effects observed)	Key study CAS 64742-81-0 reliable without restriction	API (1986)
RAT male/female subchronic Inhalation: vapour Exposure: 90 days (Constant (24 hours a day)) Doses: 0, 500, or 1000 mg/m3 Vehicle: air Equivalent or similar to OECD Guideline 413	NOAEL: >= 1000 mg/m³ Female: overall effects. LOAEL: 500 mg/m³ Male: Body weight; organ weights; and histopathology. (These effects were due to alpha-2u globulin-mediated nephropathy)	Key study JP-8 jet fuel reliable without restriction	Mattie, D.R.; Alden, C.L.; Newell, T.K.; Gaworski, C.L.; Flemming, C.D. (1991)
Dermal			
Rat (male/female) sub-chronic toxicity: six hours each day (Daily, five days per week for 13 weeks) OECD	NOAEL: >=495 mg/kg (male/female) LOEL: ca.165 mg/kg (male/female)	key study CAS 64742-81-0 Reliable without restriction)	Battelle 1997

Method	Results	Remarks	Reference
Guideline 411 (Subchronic Dermal Toxicity: 90-Day Study)			

j) **aspiration hazard:** the low viscosity of kerosines (< 20.5mm^2 at 40 °C) may cause risk of aspiration into the lungs during swallowing or subsequent vomiting with lung inflammation (chemical pneumonitis). Kerosines are classified in according to EU regulations: Asp. Tox. 1 H304 (May be fatal if swallowed and enters airways.)

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

No components have endocrine disrupting properties with effects for human health with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

11.2.2 Other information

In the studies of exposure to kerosine vapour did not affect basic sensory, motor, or inhibitory functions. Nor did exposure affect the capacity of rats to learn and recall tasks of minimum complexity. In the key skin photoirritation study, the irritation index was 4.8 for Jet fuel A-1 exposed to UV A light and 4.1 for Jet fuel A-1 not exposed to UV A light. Therefore, the photoirritation is 0.7 and the test substance is not considered a photoirritant.

SECTION 12 ECOLOGICAL INFORMATION

According to the information below Kerosines are classified as: Aquatic Chronic 2; H411 (Toxic to aquatic life with long lasting effects).

12.1 Toxicity

Data for the components EC 265-184-9 and EC 232-366-4

Endpoint	Results	Remarks
Aquatic Toxicity		
Daphnia magna Aquatic invertebrates Short-term	EL50 (48 h): 1.4 mg/L - based on: mobility EL50 (24 h): 4.6 mg/L - based on: mobility NOEL (48 h): 0.3 mg/L - based on: mobility	Key study CAS 64742-81-0 reliable without restriction OECD Guideline 202 Exxon (1995d)
Daphnia magna Aquatic invertebrates Long-term	EL50 (21 d): 0.89 mg/L (reproduction) EL50 (21 d): 0.81 mg/L (immobilization) NOEL (21 d): 0.48 mg/L (reproduction) LOEL (21 d): 1.2 mg/L (reproduction) NOEL (21 d): 1.2 mg/L (adult length) LOEL (21 d): 0.48 mg/L (adult length)	Key study CAS64742-81-0 reliable without restriction OECD211 ExxonMobil (2010)
Algae Pseudokirchnerella subcapitata Growth Inhibition Test	EL50 (24 h): 1 — 3 mg/L (cell Number) EL50 (48 h): 1 — 3 mg/L (cell Number) EL50 (72 h): 1 — 3 mg/L (cell Number) NOEL (24 h): 1 mg/L test (cell Number) NOEL (48 h): 1 mg/L test (cell Number) LOEL (72 h): 1 mg/L test (cell Number)	Key study CAS 64742-94-5 reliable without restriction OECD 201 Shell (1994)
Algae Pseudokirchnerella subcapitata) Growth Inhibition Test	EL50 (72 h): 10 — 30 mg/L (growth rate) EL50 (48 h): > 30 mg/L (growth rate) EL50 (24 h): > 30 mg/L (growth rate) NOEL (72 h): 10 mg/L (growth rate) NOEL (48 h): 10 mg/L (growth rate) NOEL (24 h): 10 mg/L (growth rate)	Supporting study CAS 64742-81-0 reliable without restriction Shell (1995)
Fish Oncorhynchus mykiss Short-term	LL50 (96 h): 2 — 5 mg/L LL50 (72 h): 2 — 5 mg/L LL50 (48 h): 2 — 5 mg/L LL50 (24 h): 5 — 17 mg/L NOEL (96 h): 2 mg/L	Key study CAS 64742-94-5 reliable without restriction OECD Guideline 203 Shell (1994)
Fish Oncorhynchus mykiss Long-term	NOEL (28d): 0.098 mg/l (mortality)	Kerosine [QSAR], (full information in Annex II). Reference Redman, A. et al. 2010

12.2 Persistence and degradability

Abiotic degradation

Hydrolysis: the available data and available weight of evidence demonstrate that kerosines are resistant to hydrolysis because they lack a functional group that is hydrolytically reactive. Therefore, this fate process will not contribute to a measurable degradative loss of these substances from the environment.

Biotic degradation

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

12.3 Bioaccumulative potential

Standard tests for this endpoint are intended for single substances and are not appropriate for this complex substance.

12.4 Mobility in soil

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 UVCB substance does not contain any PBT / vPvB constituents included in the SVHC Candidate List at concentrations above 0.1%. No other representative hydrocarbon structures were found to meet the PBT / vPvB (Evaluation of PBT for Petroleum Hydrocarbons criteria. "Concawe, 2019). In conclusion, the substance does not meet the PBT or vPvB classification criteria set out in Annex XIII of REACH.

12.6 Endocrine disrupting properties

No components identified have endocrine disrupting properties with effects on the aquatic environment with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

12.7 Other adverse effects

This product may contribute to ozone formation in the near surface atmosphere.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Do not dispose the product, either new or used, by discharging into sewers, tunnels, lakes or water courses. Dispose wastes and contaminated packaging according to official regulations. European Waste Catalogue code(s) (Decision 2001/118/CE): 13 07 03*. These codes can be given only as a suggestion, according to the original composition of the product, and its intended (foreseeable) use(s). The final user has the responsibility for the attribution of the most suitable code, according to the actual use(s) of the material, contaminations or alterations. The product does not contain halogenated compounds. Disposal of emptied containers: dispose of in accordance with local regulations. Do not cut, weld, bore, burn or incinerate emptied containers, unless they have been cleaned and declared safe.

SECTION 14 TRANSPORT INFORMATION

Regulations applicable to road transport
ADR Agreement, Annexes A and B

Regulations applicable to rail transport
COTIF Convention, Appendix C, RID Regulation

Regulations applicable to inland waterway transport
ADN Agreement, Annex

Regulations applicable to maritime transport
IMDG Code

Regulations applicable to air transport
ICAO Technical Instructions
IATA DGR Manual

14.1 UN number or ID Number

UN 1223

14.2 UN proper shipping name

Italian: CHEROSENE
English: KEROSINE

14.3 Transport hazard class(es)

Road transport (ADR):	Class: 3
	Subsidiary hazards: -
Railway transport (RID):	Class: 3
	Subsidiary hazards: -
Inland waterways transport (ADN):	Class: 3
	Subsidiary hazards: N2, F
Sea transport (IMDG):	Class: 3
	Subsidiary hazards: -
Air transport (IATA):	Class: 3
	Subsidiary hazards: -

14.4 Packing group

PG: III

14.5 Environmental hazards

Road transport (ADR):	Environmentally hazardous
Railway transport (RID):	Environmentally hazardous
Inland waterways transport (ADN):	Environmentally hazardous
Sea transport (IMDG):	Marine Pollutant (MP)
Air transport (IATA):	Environmentally hazardous

14.6 Special precautions for user

Carriage, including loading and unloading, must be performed by personnel who have received the necessary training required by the relevant modal regulations concerning the transport of dangerous goods.

During loading and unloading apply safety measures required by section 7.1 and individual protection measures required by section 8.2.2 of this SDS.

Further requirements can be found in the applicable regulations.

General additional information

Mark and labeling:	MODEL No. 3 HAZARD LABEL + ENVIRONMENTALLY HAZARDOUS
(except packaging or carriage in exemption)	SUBSTANCE MARK

Additional information on raod transport (ADR)

Transport category according to ADR 1.1.3.6	3
Tunnel restriction code:	(D/E)
Hazard Identification Number (tank):	30
High Consequence Dangerous Goods (HCDG):	NO

Additional information on railway transport (RID)

Hazard Identification Number (tank):	30
High Consequence Dangerous Goods (HCDG):	NO

Additional information on internal waterways transport (ADN)

Hazard Identification Number (tank):	30
High Consequence Dangerous Goods (HCDG):	NO

Additional information on sea transport (IMDG)

Emergency Schedules	EmS F-E, S-E

Additional information on air transport (IATA)

Emergency measures in case of aircraft accidents:	ERG Code 3L

14.7 Maritime transport in bulk according to IMO instruments

Not applicable (refer to Annex I of MARPOL Convention).

SECTION 15 REGULATORY INFORMATION

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

- *Authorisations according to Regulation 1907/2006/EC (REACH) Title VII:* This product is not subject to authorization
- *Restrictions according to Regulation 1907/2006/EC (REACH) Title VIII*: Items *3, 28*[1]*, 40, 75.*

Other UE:

- *The substance is dangerous under the Seveso Regulation (Dir. 2012/18/UE):*

  Annex 1 part 1:

  Category P5c: Flammable liquid

  Category E2: Hazardous to the Aquatic Environment in Category Chronic 2

  Annex 1 part 2*:*

  Category 34: Petroleum products and alternative fuels
- *Directive 98/24/EC and f.a. (chemical agents):* mixture subject
- *Directive 2004/37/EC and f.a. (Carcinogens, mutagens or reprotoxic substances):* mixture subject

Dispose wastes and contaminated packaging according to official regulations.

15.2 Chemical safety assessment

Chemical safety assessment has been carried out for the components with EC 265-184-9 and EC 232-366-4

SECTION 16 OTHER INFORMATION

List of relevant hazard statements:

H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

[1] Entry 28: substances which are classified as carcinogen category 1A or 1B in Part 3 of Annex VI to Regulation (EC) No 1272/2008 and are listed in Appendix 1 or Appendix 2, respectively. Shall not be placed on the market, or used, as substances, as constituents of other substances, or, in mixtures for supply to the general public when the individual concentration in the substance or mixture is equal to or greater than either the relevant specific concentration limit specified in Part 3 of Annex VI to Regulation (EC) No 1272/2008, or the relevant generic concentration limit specified in Part 3 of Annex I of Regulation (EC) No 1272/2008. By way of derogation, paragraph 1 shall not apply to the following fuels and oil products: motor fuels which are covered by Directive 98/70/EC, mineral oil products intended for use as fuel in mobile or fixed combustion plants, fuels sold in closed systems (e.g. liquid gas bottles);

H336: May cause drowsiness or dizziness.

H350: May cause cancer

H411: Toxic to aquatic life with long lasting effects.

Advice on any training appropriate for workers:

Propely train all workers potentially exposed to this substance on the basis of the contents of this safety data sheet.

Key literature references and sources for data:

EC 265-184-9 and EC 232-366-4

Registration dossier,

CSR 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023

ECHA's dissemination database, HSDB, CONCAWE

Legend to abbreviations and acronyms:

ACGIH: American Conference of Governmental Industrial Hygienists

CSR: Chemical Safety Report

DNEL: Derived No effect Level

DMEL: Derived Minimal Effect Level

EC50: Half maximal effective concentration

IC50: Half maximal inhibitory concentration

LC50: Lethal concentration, 50%

LD50: Median lethal dose

PNEC: Predicted No Effect Concentration

PBT: Persistent, Bioaccumulative and Toxic substance

STOT: Specific Target Organ Toxicity

(STOT) RE: Repeated Exposure

(STOT) SE: Single Exposure

TDL0: Lowest published toxic dose

TLV: Threshold Limit Values

vPvB: Very Persistent and Very Bioaccumulative

Safety Data Sheet in according to Annex II of EC Regulation no. 1907/2006 and subsequent amendments (amended by Reg.878/2020)

First issue date:	01/12/2010
Revision Number:	01
Revision Date:	20/05/2016
Grounds for review:	Deletion of classification according to Directive 67/548/CEE and related references Precautionary statement P210 modified; addition of new precautionary statement P273 Deletion of Note H Section 8 updated Section 14 updated Section 15, subsection 15.1 updated
Revision Number:	02
Revision Date:	27/10/2017
Grounds for review:	Section 1.2 updated
Revision Number:	03
Revision Date:	15/02/2018
Grounds for review:	Section 14 updated
Revision Number:	*04*
Revision Date:	*29/07/2019*
Grounds for review:	Section 1 updated Section 3 updated Section 8 updated Scenarios exposure updated
Revision Number:	*05*
Revision Date:	*24/05/2021*
Grounds for review:	Section 14 updated
Revision Number:	*06*
Revision Date:	*30/01/2023*
Grounds for review:	update of sections 1, 2, 3, 4, 8, 9, 11, 12, 14, 15, 16 updated the format as the latest update Regulation CE n. 1907/2006 and f.a.
Revision Number:	*07*
Revision Date:	*19/06/2023*
Grounds for review:	update of sections 2, 8, 15, 16
Revision Number:	08
Revision Date:	09/02/2024
Grounds for review:	Update of sections 1, 2, 3, 8, 11, 15, 16 and exposure scenarios as CSR 2023

To the best of our knowledge, the information contained herein is accurate. This information is intended to describe the product for the purposes of health, safety and environmental requirements only and it should not therefore be construed as guaranteeing any specific property of the product. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. Uses not listed in this document are not recommended unless an assessment is completed.

ANNEX - Exposure Scenarios
EC 265-184-9 and EC 232-366-4

List of common uses for which were developed the exposure scenarios for the EC 265-184-9 and EC 232-366-4

Identified Use	Life Cycle	Sector of Use (SU)	Product Category (PC)	Process Category (PROC)	Environmental Release Category (ERC)	Specific Environmental Release Category (SpERC)
02 - Formulation & (re)packing of substances and mixtures (classified) (classified)	Formulation	n.a.	n.a	1, 2, 3, 8a, 8b, 9, 15, 28	2	ESVOC SpERC 2.2.v1
12a - Use in fuel: Industrial	Industrial	n.a	n.a	1, 2, 8a, 8b, 16, 28	7	ESVOC SpERC 7.12a.v1
12b - Use in fuel: Professional	Industrial	n.a	n.a	1, 2, 8a, 8b, 16, 28	9a, 9b	ESVOC SpERC 8,12b.v1
12c - Use in fuel: Consumer	Consumer	n.a	13	n.a.	9a, 9b	ESVOC SpERC 9.12c.v1

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02 Formulation & (re)packing of substances and mixtures (classified as H350) closed systems; Level I EC 265-184-9

Section 1	
Title	
02 - Formulation & (re)packing of substances and mixtures	
Use Descriptor	
Sector(s) of Use	
Process Categories	1, 2, 3, 8a, 8b, 9, 15, 28
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, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, 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	-
Concentration of substance in product	Covers percentage substance in the product up to 100 %. (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Store substance within a closed system. Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants)	General Measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.
General measures (flammability)	General measures (flammability): Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice
General measures (aspiration hazard)	Do not ingest. If swallowed then seek immediate medical assistance.
General measures (drowsiness or dizziness)	Store substance within a closed system. Covers indoor and outdoor use.; Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorised persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent

	exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of this material and its container at hazardous or special waste collection point. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.
CS1 General exposures; Closed systems (PROC_2, PROC_1)	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure.
CS2 Storage (PROC_2, PROC_1)	Store substance within a closed system.
CS3 General exposures; Batch process; Closed systems (PROC_3)	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure.
CS4 Equipment cleaning and maintenance (PROC_8a, PROC_28)	Unload and wash the system before using or maintaining the equipment. Wear chemical-resistant gloves (tested according to EN374) in combination with "basic" employee training. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS. More advice on good practices. The obligations laid down in Article 37(4) of the REACH Regulation does not apply. Wear suitable overalls to prevent exposure to the skin. Immediately collect spills.
CS5 Bulk transfers; Drum/batch transfers; Closed systems (PROC_8b)	Ensure materiale transfers have been performed within a contained systems or provide ventilation by extraction at the points where emissions occur. Handle the substance within a closed system. Wear chemical-resistant gloves (tested according to EN374) in combination with "basic" employee training. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS.
CS6 Drum and small package filling (PROC_9)	Wear suitable gloves tested according to EN374. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS.
CS7 Process sampling (PROC_9)	Wear suitable gloves tested according to EN374. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS.
CS8 Laboratory activities (PROC_15)	Covers use at room temperature (unless otherwise indicated)

Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	1
Regional use tonnage (tonnes/year)	6.2E+07
Fraction of Regional tonnage used locally	4.9E-04
Annual site tonnage (tonnes/year)	3.0E+04
Maximum daily site tonnage (kg/day)	1.0E+02
Frequency and duration of use	
Continuous release.	
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+00
Release fraction to wastewater from process (initial release prior to RMM)	2.0E-02
Release fraction to soil from process (initial release prior to RMM)	0.01
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment.	
Prevent discharge of undissolved substance to or recover from onsite wastewater.	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required	
Treat air emission to provide a typical removal efficiency of (%)	0,0E+00
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%)	98.3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%)	98.3
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater. [STP1]	
Estimated substance removal from wastewater via domestic sewage treatment (%)	0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	0
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	1.0E+05
Assumed domestic sewage treatment plant flow (m^3/d)	2.0E+03
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.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1. Health	
-	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	

The projected exposures are not expected to exceed DN(M)EL when the risk management measures/operating conditions set out in Section 2 are implemented.; Where other risk management measures/operating conditions are taken, users should ensure that risks are managed at at least equivalent levels.; The available hazard data do not allow the derivation of a DNEL for skin irritant effects.; The available hazard data do not support the need to establish a DNEL for other health effects; The available hazard data do not allow the derivation of a DNEL for aspiration effects.; Risk management measures are based on qualitative risk characterisation.

RCR CS1 General exposures; Closed systems RCR (PROC_2, PROC_1)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	2.504 mg/m³ (TRA Workers) RCR = 0. 05	Final RCR = 0.05
Inhalation, systemic, acute	Cumene	10.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	2.504 mg/kg bw/day(TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	10.01 mg/cm² (TRA Workers) RCR = 0. 04	Final RCR = 0. 04
Dermal, systemic, long-term	Cumene	0.014 mg/kg (TRA Workers) RCR = 1.78E-3	Final RCR < 0.01
Dermal, local, long-term	Registered substance as such	0.02 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2E-3 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0.02 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2E-3 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0.0502

CS2 RCR PROC 1 PROC2 (Storage)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	2.504 mg/m³ (TRA Workers) RCR = 0. 05	Final RCR = 0. 05
Inhalation, systemic, acute	Cumene	10.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	2.504 mg/kg bw/day(TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	10.01 mg/cm² (TRA Workers) RCR = 0.04	Final RCR = 0. 04
Dermal, systemic, long-term	Cumene	0.137 mg/kg (TRA Workers) RCR = 0.018	Final RCR = 0. 018
Dermal, local, long-term	Registered substance as such	0.2 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	0.02 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0.2 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	0.02 mg/cm² (TRA Workers)	

Combined exposure routes, systemic, lungo termine			Final RCR = 0. 068

CS3 RCR PROC 3 (General exposures; Batch process; Closed systems (PROC_3)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	5.008 mg/m³ (TRA Workers) RCR = 0.1	Final RCR = 0. 1
Inhalation, systemic, acute	Cumene	20.03 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	5.008 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	20.03 mg/m³ (TRA Workers) RCR = 0.08	Final RCR = 0. 08
Dermal, systemic, long-term	Cumene	6.9E-3 mg/kg (TRA Workers) RCR = 8.96E-4	RCR < 0.01
Dermal, local, long-term	Registered substance as such	2.01E-3 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	0.02 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,2 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2.01E-3 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 101

CS4 Equipment cleaning and maintenance (PROC_8a, PROC_28)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/kg bw/day(TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.01 mg/cm² (TRA Workers) RCR = 0.04	Final RCR = 0. 401
Dermal, systemic, long-term	Cumene	0.137 mg/kg (TRA Workers) RCR = 0.018	Final RCR = 0. 018
Dermal, local, long-term	Registered substance as such	0.1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0.1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 519

CS5 Bulk transfers; Drum/batch transfers; Closed systems (PROC_8b)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	12.52 mg/m³ (TRA Workers) RCR = 0.25	Final RCR = 0.25
Inhalation, systemic, acute	Cumene	50.8 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	12.52 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	50.08 mg/m³ (TRA Workers) RCR = 0.2	Final RCR = 0.2
Dermal, systemic, long-term	Cumene	0.137 mg/kg (TRA Workers) RCR = 0.018	Final RCR = 0. 018
Dermal, local, long-term	Registered substance as such Cumene	0.1 mg/cm² (TRA Workers) 1E-2mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	0,1 mg/cm² ((TRA Workers) 1E-2mg/cm² (TRA Workers))	Qualitative Risk
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 268

RCR CS6 (PROC_9) Drum and small package filling.

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.1 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.1 mg/m³ (TRA Workers) RCR = 0.401	Final RCR = 0.401
Dermal, systemic, long-term	Cumene	0.069 mg/kg (TRA Workers) RCR = 8.91E-3	Final RCR < 0. 01
Dermal, local, long-term	Registered substance as such Cumene	0.1 mg/cm² (TRA Workers) 0.01 mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	0,1 mg/cm² (TRA Workers) 0.01 mg/cm² (TRA Workers)	Qualitative Risk
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 501

RCR CS7 (PROC_9) Process sampling

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification

Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/kg bw/day(TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.01 mg/cm² (TRA Workers) RCR = 0.04	Final RCR = 0. 401
Dermal, systemic, long-term	Cumene	0.069 mg/kg (TRA Workers) RCR = 8.91E-3	Final RCR =<0. 01
Dermal, local, long-term	Registered substance as such	0.1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	0.01 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	0.01 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			**Final RCR = 0. 51**

RCR CS8 (PROC_15) Laboratory activities

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	5.008 mg/m³ (TRA Workers) RCR = 0.1	Final RCR = 0. 1
Inhalation, systemic, acute	Cumene	20.03 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	5.008 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	20.03 mg/m³ (TRA Workers) RCR = 0.08	Final RCR = 0. 08
Dermal, systemic, long-term	Cumene	3.4E-3 mg/kg ((TRA Workers)	RCR < 0.01
Dermal, local, long-term	Registered substance as such	9.92E-3 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	9.92E-3 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	9.92E-3 mg/cm²(TRA Workers)	Qualitative Risk
	Cumene	9.92E-3 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 101

4.2. Environment

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

Maximum Risk Characterisation Ratio for Air Emissions RCRair	9,6E-04
Maximum Risk Characterisation Ratio for Wastewater Emissions RCRwater	2,4E-01

12a Use in fuel: Industrial (classified as H350) closed systems; Level I EC 265-184-9

Section 1	
Title	
12a - Use in fuel: Industrial	
Use Descriptor	
Sector(s) of Use	
Process Categories	1, 2, 8a, 8b, 16, 28
Environmental Release Categories	7
Specific Environmental Release Category	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
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	-
Concentration of substance in product	Covers percentage substance in the product up to 100 %. (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Store substance within a closed system. Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants)	General Measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.
General measures (flammability)	General measures (flammability): Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice
General measures (aspiration hazard)	Do not ingest. If swallowed then seek immediate medical assistance.
General measures (drowsiness or dizziness)	Store substance within a closed system. Covers indoor and outdoor use.; Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorised persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of

	this material and its container at hazardous or special waste collection point. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.
CS1 General exposures; Closed systems (PROC 2, PROC 1)	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure.
CS2 Storage (PROC 2, PROC 1)	Store substance within a closed system.
CS3 Equipment cleaning and maintenance (PROC 8a, PROC 28)	Unload and wash the system before using or maintaining the equipment. Wear chemical-resistant gloves (tested according to EN374) in combination with "basic" employee training. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS. More advice on good practices. The obligations laid down in Article 37(4) of the REACH Regulation does not apply. Wear suitable overalls to prevent exposure to the skin. Immediately collect spills.
CS4 Bulk transfers; Dedicated facility (PROC 8b)	Wear suitable gloves tested according to EN374. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS. Other specific measures identified: the obligations laid down in Article 37(4) of the REACH Regulation does not apply. Wear suitable overalls to prevent exposure to the skin. Immediately collect spills. Avoid splash filling during activities associated with its transfer.
CS5 Drum/batch transfers; Dedicated facility (PROC 8b)	Ensure materiale transfers have been performed within a contained systems or provide ventilation by extraction at the points where emissions occur. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS.
CS6 Use of fuels; Closed systems PROC 16	Handle substance within a closed system

Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	1,0
Regional use tonnage (tonnes/year)	3,8E+06
Fraction of Regional tonnage used locally	3,9E-01
Annual site tonnage (tonnes/year)	1,5E+06
Maximum daily site tonnage (kg/day)	5,0E+03
Frequency and duration of use	
Continuous release.	
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)	5,0E-01
Release fraction to wastewater from process (initial release prior to RMM)	1,0E-03
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment.	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required	
Treat air emission to provide a typical removal efficiency of (%)	7,9E+01
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%)	99,3
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%)	99,3
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater.	
Estimated substance removal from wastewater via domestic sewage treatment (%)	0,0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	0,0
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	5,5E+06
Assumed domestic sewage treatment plant flow (m^3/d)	2,0E+03
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1. Health	
-	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
The projected exposures are not expected to exceed DN(M)EL when the risk management measures/operating conditions set out in Section 2 are implemented.; Where other risk management measures/operating conditions are taken, users should ensure that risks are managed at at least equivalent levels.; The available hazard data do not allow the derivation of a DNEL for skin irritant effects.; The available hazard data do not support the need to establish a DNEL for other health effects; The available hazard data do not allow the derivation of a DNEL for aspiration effects.; Risk management measures are based on qualitative risk characterisation.	

RCR CS1 General exposures; Closed systems RCR (PROC_2, PROC_1)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	2.504 mg/m^3 (TRA Workers) RCR = 0.05	Final RCR = 0.05
Inhalation, systemic, acute	Cumene	10.01 mg/m^3 (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	2.504 mg/m^3 (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	10.01 mg/m^3 (TRA Workers) RCR = 0.04	Final RCR = 0.04
Dermal, systemic, long-term	Cumene	0.014 mg/kg bw/day (TRA Workers) RCR = 1.78E-3	Final RCR<0,01

Dermal, local, long-term	Registered substance as such Cumene	0,02 mg/cm² (TRA Workers) 2E-3 mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	0,02 mg/cm² (TRA Workers) 2E-3 mg/cm² (TRA Workers)	Qualitative Risk
Combined exposure routes, systemic, lungo termine			Final RCR = 0.052

RCR CS2 Storage (PROC 2, PROC 1)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	2.504 mg/m³ (TRA Workers) RCR = 0.05	Final RCR = 0.05
Inhalation, systemic, acute	Cumene	10.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	2.504 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	10.01 mg/m³ (TRA Workers) RCR = 0.04	Final RCR = 0. 04
Dermal, systemic, long-term	Cumene	0.014 mg/kg bw/day (TRA Workers) RCR = 1.78E-3	Final RCR<0,01
Dermal, local, long-term	Registered substance as such Cumene	0,02 mg/cm² (TRA Workers) 2E-3 mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	0,02 mg/cm² (TRA Workers) 2E-3 mg/cm² (TRA Workers)	Qualitative Risk
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 052

RCR CS3 Equipment cleaning and maintenance (PROC 8a, PROC 28)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.1 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.1 mg/m³ (TRA Workers) RCR = 0.401	Final RCR = 0.401
Dermal, systemic, long-term	Cumene	0.137 mg/kg bw/day (TRA Workers) RCR = 0.018	RCR = 0.018
Dermal, local, long-term	Registered substance as such Cumene	0,1 mg/cm² (TRA Workers) 1E-2 mg/cm² (TRA Workers)	Qualitative Risk

Dermal, local, acute	Registered substance as such Cumene	0,1 mg/cm² (TRA Workers) 1E-2 mg/cm² (TRA Workers)	Qualitative Risk
Combined exposure routes, systemic, lungo termine			Final RCR = 0,519

RCR CS4 Bulk transfers; Dedicated facility (PROC 8b)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	12.52 mg/m³ (TRA Workers) RCR = 0.25	Final RCR = 0.25
Inhalation, systemic, acute	Cumene	50.8 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	12.52 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	50.08 mg/m³ (TRA Workers) RCR = 0.2	Final RCR = 0.2
Dermal, systemic, long-term	Cumene	0.069 mg/kg (TRA Workers) RCR = 8.9E-3	Final RCR <0.01
Dermal, local, long-term	Registered substance as such Cumene	0.05 mg/cm² (TRA Workers) 5E-3 mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	0,05 mg/cm² (TRA Workers) 5E-3 mg/cm² (TRA Workers)	Qualitative Risk
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 259

RCR CS5 Drum/batch transfers; Dedicated facility (PROC 8b)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	12.52 mg/m³ (TRA Workers) RCR = 0.25	Final RCR = 0.25
Inhalation, systemic, acute	Cumene	50.8 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	12.52 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	50.08 mg/m³ (TRA Workers) RCR = 0.2	Final RCR = 0.2
Dermal, systemic, long-term	Cumene	0.069 mg/kg (TRA Workers) RCR = 8.9E-3	Final RCR <0,01
Dermal, local, long-term	Registered substance as such Cumene	0.05 mg/cm² (TRA Workers) 5E-3 mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	0,05 mg/cm² (TRA Workers) 5E-3 mg/cm² (TRA Workers)	Qualitative Risk

Combined exposure routes, systemic, lungo termine			Final RCR = 0.259

RCR CS6 Use of fuels; Closed systems (PROC 16)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	2.504 mg/m³ (TRA Workers) RCR = 0.05	Final RCR = 0.05
Inhalation, systemic, acute	Cumene	100.1 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	2. 504 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	10.01 mg/m³ (TRA Workers) RCR = 0.04	Final RCR = 0.04
Dermal, systemic, long-term	Cumene	3.4E-3 mg/kg bw/day (TRA Workers) RCR = 4.42E-4	Final RCR =<0,01
Dermal, local, long-term	Registered substance as such	9.92E-3 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	9.92E-4 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	9.92E-3 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	9.92E-4 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 519

4.2. Environment

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

Maximum Risk Characterisation Ratio for Air Emissions RCRair	2,0E-04
Maximum Risk Characterisation Ratio for Wastewater Emissions RCRwater	1,6E-02

12b Use in fuel: Professional (classified as H350) closed systems; Level I EC 265-184-9

Section 1	
Title	
12b - Use in fuel: Professional	
Use Descriptor	
Sector(s) of Use	
Process Categories	1, 2, 8a, 8b, 16, 28
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 additive) 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	-
Concentration of substance in product	Covers percentage substance in the product up to 100 %. (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Store substance within a closed system. Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants)	General Measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.
General measures (flammability)	General measures (flammability): Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice
General measures (aspiration hazard)	Do not ingest. If swallowed then seek immediate medical assistance.
General measures (drowsiness or dizziness)	Store substance within a closed system. Covers indoor and outdoor use.; Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorised persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of

	this material and its container at hazardous or special waste collection point. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.
CS1 General exposures; Closed systems (PROC 2, PROC 1)	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure.
CS2 Storage (PROC 2, PROC 1)	Store substance within a closed system.
CS3 Equipment cleaning and maintenance (PROC 8a, PROC 28)	Unload and wash the system before using or maintaining the equipment. Wear chemical-resistant gloves (tested according to EN374) in combination with "basic" employee training. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS. More advice on good practices. The obligations laid down in Article 37(4) of the REACH Regulation does not apply. Wear suitable overalls to prevent exposure to the skin. Immediately collect spills.
CS4 Bulk transfers; Dedicated facility (PROC 8b)	Wear suitable gloves tested according to EN374. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS. Other specific measures identified: the obligations laid down in Article 37(4) of the REACH Regulation does not apply. Wear suitable overalls to prevent exposure to the skin. Immediately collect spills. Avoid splash filling during activities associated with its transfer..
CS5 Drum/batch transfers; Dedicated facility (PROC 8b)	Ensure materiale transfers have been performed within a contained systems or provide ventilation by extraction at the points where emissions occur. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS.
CS6 Refulling (PROC 8b)	Wear suitable gloves tested according to EN374. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS. Other specific measures identified: the obligations laid down in Article 37(4) of the REACH Regulation does not apply. Wear suitable overalls to prevent exposure to the skin. Immediately collect spills. Avoid splash filling during activities associated with its transfer.
CS7 Use as fuels Closed systems (PROC 16)	Handle substance within a closed system.

Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0,1
Regional use tonnage (tonnes/year)	1,4E+06
Fraction of Regional tonnage used locally	5,0E-04
Annual site tonnage (tonnes/year)	6,9E+02
Maximum daily site tonnage (kg/day)	1,9E+00
Frequency and duration of use	
Continuous release.	
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 use only)	5,0E-01

Release fraction to wastewater from wide dispersive use	1,0E-04
Release fraction to soil from wide dispersive use (regional use only)	0,025
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater.	
No wastewater treatment required	
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 >= (%)	0,0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%)	0,0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater.	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95,6
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	95,6
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	5,7E+04
Assumed domestic sewage treatment plant flow (m^3/d)	2,0E+03
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1. Health	
-	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
The projected exposures are not expected to exceed DN(M)EL when the risk management measures/operating conditions set out in Section 2 are implemented.; Where other risk management measures/operating conditions are taken, users should ensure that risks are managed at at least equivalent levels.; The available hazard data do not allow the derivation of a DNEL for skin irritant effects.; The available hazard data do not support the need to establish a DNEL for other health effects; The available hazard data do not allow the derivation of a DNEL for aspiration effects.; Risk management measures are based on qualitative risk characterisation.	

RCR CS1 General exposures; Closed systems RCR (PROC_2, PROC_1)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	10.01 mg/m^3 ((TRA Workers) RCR = 0.2	Final RCR = 0.2
Inhalation, systemic, acute	Cumene	40.06 mg/m^3 (TRA Workers)	Qualitative Risk

Inhalation, local long-term	Cumene	10.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	40.06 mg/m³ (TRA Workers) RCR = 0.16	Final RCR = 0.16
Dermal, systemic, long-term	Cumene	0.014 mg/kg (TRA Workers) RCR = 1.78E-3	Final RCR<0,01
Dermal, local, long-term	Registered substance as such	0,02 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2E-3 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,02 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2E-3 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0.202

RCR CS2 Storage (PROC 2, PROC 1)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	10.01 mg/m³ (TRA Workers) RCR = 0.2	Final RCR = 0. 2
Inhalation, systemic, acute	Cumene	40.06 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	10.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	40.06 mg/m³ (TRA Workers) RCR = 0.16	Final RCR = 0. 04
Dermal, systemic, long-term	Cumene	0.014 mg/kg bw/day (TRA Workers) RCR = 1.78E-3	Final RCR<0,01
Dermal, local, long-term	Registered substance as such	0,02 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2E-3 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,02 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2E-3 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 202

RCR CS3 Equipment cleaning and maintenance (PROC 8a, PROC 28)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	35.05 mg/m³ (TRA Workers) RCR = 0.701	Final RCR = 0.701
Inhalation, systemic, acute	Cumene	140.2 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	35.05 mg/m³ (TRA Workers)	Qualitative Risk

Inhalation, local, acute	Cumene	140.2 mg/m³ (TRA Workers) RCR = 0.561	Final RCR = 0.561
Dermal, systemic, long-term	Cumene	0.137 mg/kg bw/day (TRA Workers) RCR = 0.018	RCR = 0.018
Dermal, local, long-term	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0,719

RCR CS4 Bulk transfers; Dedicated facility (PROC 8b)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.1 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.1 mg/m³ (TRA Workers) RCR = 0.401	Final RCR = 0. 401
Dermal, systemic, long-term	Cumene	0.137 mg/kg (TRA Workers) RCR = 0.018	Final RCR = 0. 018
Dermal, local, long-term	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 519

RCR CS5 Drum/batch transfers; Dedicated facility (PROC 8b)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.1 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.1 mg/m³ (TRA Workers) RCR = 0.401	Final RCR = 0.401

Dermal, systemic, long-term	Cumene	0.137 mg/kg bw/day (TRA Workers) RCR = 0.018	Final RCR = 0. 018
Dermal, local, long-term	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0.519

RCR CS6 Refuelling (PROC 16)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.1 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.1 mg/m³ (TRA Workers) RCR = 0.401	Final RCR = 0.401
Dermal, systemic, long-term	Cumene	0.137 mg/kg bw/day (TRA Workers) RCR = 0.018	Final RCR = 0. 018
Dermal, local, long-term	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 519

RCR CS7 Use of fuels; Closed systems (PROC 16)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	5.008 mg/m³ (TRA Workers) RCR = 0.1	Final RCR = 0.1
Inhalation, systemic, acute	Cumene	20.03 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	5.008 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	20.03 mg/m³ (TRA Workers) RCR = 0.08	Final RCR = 0.08
Dermal, systemic, long-term	Cumene	3.4E-3 mg/kg (TRA Workers) RCR = 4.42E-4	Final RCR < 0.01
Dermal, local, long-term	Registered substance as such	9.92E-3 mg/cm² (TRA Workers)	Qualitative Risk

	Cumene	9.92 -4 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	9.92E-3 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	9.92E-4 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 101

4.2. Environment

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

Maximum Risk Characterisation Ratio for Air Emissions RCRair	7,2E-04
Maximum Risk Characterisation Ratio for Wastewater Emissions RCRwater	1,0E-02

12c Use in fuel; Consumer EC 265-184-9

Section 1	
Title	
12c - Use in fuel; Consumer	
Use Descriptor	
Sector(s) of Use	
Product Categories	13
Environmental Release Categories	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12c.v1
Processes, tasks, activities covered	
Covers consumer uses in liquid 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	-
Concentration of substance in product	Covers concentrations up to 100.0 %
Frequency and duration of use/exposure	-
Other Operational Conditions affecting exposure	Covers indoor and outdoor use. Open windows during application to ensure natural ventilation. Store substance within a closed system.
Product Category	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants)	General Measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.
General measures (flammability)	General measures (flammability): Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice
General measures (aspiration hazard)	Do not ingest. If swallowed then seek immediate medical assistance.
General measures (drowsiness or dizziness)	Store substance within a closed system. Covers indoor and outdoor use.; Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorised persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of this material and its container at hazardous or special waste collection point. Ensure safe systems of

	work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.
CS 1 Fuels; Liquid; Automotive refuelling; Level I PC 13 Concawe_SCED_13_1_a)	Covers concentrations up to 100.0 % Cover percentage (w/w) of cumene in final product: <1% Amount of product used per application: <= 3.75E4 g/event Exposure time per event: = 0.05 h/event Place of use: Outdoor Body parts potentially exposed: Palm of one hand
CS 2 Fuels; Liquid: home space heater fuel; Level I PC 13 Concawe_SCED_13_5_a	Covers concentrations up to 100.0 % Cover percentage (w/w) of cumene in final product: <1% Amount of product used per application: < = 3.32E3 g/event Exposure time per event = 0.033 h/event. Place of use: Outdoor Body parts potentially exposed: Palm of one hand
CS 3 Fuels; Liquid; Garden equipment; Level I PC 13 Concawe_SCED_13_4_a	Covers concentrations up to 100.0 % Cover percentage (w/w) of cumene in final product: <1% Amount of product used per application: 750.0 g/event Exposure time per event = 0.033 h/event Place of use: Outdoor Body parts potentially exposed: Palm of one hand

Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0,1
Regional use tonnage (tonnes/year)	4,4E+06
Fraction of Regional tonnage used locally	5,0E-04
Annual site tonnage (tonnes/year)	2,2E+03
Maximum daily site tonnage (kg/day)	6,1E+00
Frequency and duration of use	
Continuous release.	
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 use only)	1,0E-02
Release fraction to wastewater from wide dispersive use	2,0E-05
Release fraction to soil from wide dispersive use (regional use only)	0,005
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater.	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95,6
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	1,8E+05
Assumed domestic sewage treatment plant flow (m3/d)	2,0E+03
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.	

Conditions and measures related to external recovery of waste

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

Section 3 Exposure Estimation

3.1. Health

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3.2. Environment

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

Section 4 Guidance to check compliance with the Exposure Scenario

4.1. Health

Risk management measures are based on qualitative risk characterisation.; Available hazard data do not enable the derivation of a DNEL for aspiration effects.; Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
The tables describing the quantification of the risk for the various exposure routes have not been elaborated, due to the lack of derivation of the DNELs, furthermore all the PROCs have been reported together and only a qualitative assessment has been carried out for them. The qualitative risk management measures are described above (General measures)

RCR CS 1 Fuels; Liquid; Automotive refuelling; Level I PC 13 Concawe_SCED_13_1_a)

Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	Cumene	1.481 mg/m³ (TRA Consumers) RCR = 0.139	Final RCR = 0.139
Inhalation, local, long term	Cumene	1.481 mg/m³ (TRA Consumers)	Qualitative risk
Dermal, systemic, long term	Cumene	7E-4 mg/kg bw/day (TRA Consumers) RCR = 4.27E-4	Final RCR < 0.01
Oral, systemic, long term	Cumene	0 mg/kg bw/day (TRA Consumers) RCR = 0	Final RCR < 0.01
Combined routes, systemic, long-term	Cumene		Final RCR = 0.139

RCR CS 2 Fuels; Liquid: home space heater fuel; Level I PC 13 Concawe_SCED_13_5_a

Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	Cumene	7.235 mg/m³ (TRA Consumers) RCR = 0.679	Final RCR = 0.679
Inhalation, local, long term	Cumene	7.235 mg/m³ (TRA Consumers)	Qualitative risk
Dermal, systemic, long term	Cumene	3.5E-4 mg/kg bw/day (TRA Consumers) RCR = 2.13E-4	Final RCR < 0.01
Oral, systemic, long term	Cumene	0 mg/kg bw/day (TRA Consumers) RCR = 0	Final RCR < 0.01
Combined routes, systemic, long-term	Cumene		Final RCR = 0.679

CS 3 Fuels; Liquid; Garden equipment; Level I PC 13 Concawe_SCED_13_4_a

Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	Cumene	2.451 mg/m³ (TRA Consumers) RCR = 0.23	Final RCR = 0.23

	Inhalation, local, long term	Cumene	2.451 mg/m³ (TRA Consumers)	Qualitative risk	
	Dermal, systemic, long term	Cumene	7.15E-4 mg/kg bw/day (TRA Consumers) RCR = 4.36E-4	Final RCR < 0.01	
	Oral, systemic, long term	Cumene	0 mg/kg bw/day (TRA Consumers) RCR = 0	Final RCR < 0.01	
	Combined routes, systemic, long-term	Cumene		Final RCR = 0.23	

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.

Maximum Risk Characterisation Ratio for Air Emissions RCRair	2,1E-04
Maximum Risk Characterisation Ratio for Wastewater Emissions RCRwater	9,6E-03

02 Formulation & (re)packing of substances and mixtures (classified as H350) closed systems; Level I EC 232-366-4

Section 1	
Title	
02 - Formulation & (re)packing of substances and mixtures	
Use Descriptor	
Sector(s) of Use	
Process Categories	1, 2, 3, 4, 5, 8a, 8b, 9, 14, 15, 28
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, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, 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	-
Concentration of substance in product	Covers percentage substance in the product up to 100 %. (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Store substance within a closed system. Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants)	General Measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.
General measures (flammability)	General measures (flammability): Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice
General measures (aspiration hazard)	Do not ingest. If swallowed then seek immediate medical assistance.
General measures (drowsiness or dizziness)	Store substance within a closed system. Covers indoor and outdoor use.; Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorised persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent

	exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of this material and its container at hazardous or special waste collection point. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.
CS1 General exposures; Closed systems (PROC_2, PROC_1)	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure.
CS2 Storage (PROC_2, PROC_1)	Store substance within a closed system.
CS3 General exposures; Batch process; Closed systems (PROC_3)	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure.
CS4 Equipment cleaning and maintenance (PROC_8a, PROC_28)	Unload and wash the system before using or maintaining the equipment. Wear chemical-resistant gloves (tested according to EN374) in combination with "basic" employee training. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS. More advice on good practices. The obligations laid down in Article 37(4) of the REACH Regulation does not apply. Wear suitable overalls to prevent exposure to the skin. Immediately collect spills.
CS5 Bulk transfers; Drum/batch transfers; Closed systems (PROC_8b)	Ensure materiale transfers have been performed within a contained systems or provide ventilation by extraction at the points where emissions occur. Handle the substance within a closed system. Wear chemical-resistant gloves (tested according to EN374) in combination with "basic" employee training. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS.
CS6 Drum and small package filling (PROC_9)	Wear suitable gloves tested according to EN374. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS.
CS7 Process sampling (PROC_9)	Wear suitable gloves tested according to EN374. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS.
CS8 Laboratory activities (PROC_15)	Covers use at room temperature (unless otherwise indicated)

Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	1,0
Regional use tonnage (tonnes/year)	5,1E+07
Fraction of Regional tonnage used locally	5,9E-04
Annual site tonnage (tonnes/year)	3,0E+04
Maximum daily site tonnage (kg/day)	1,0E+02
Frequency and duration of use	
Continuous release.	
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+00
Release fraction to wastewater from process (initial release prior to RMM)	2,0E-03
Release fraction to soil from process (initial release prior to RMM)	0,01
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment.	
Prevent discharge of undissolved substance to or recover from onsite wastewater.	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required	
Treat air emission to provide a typical removal efficiency of (%)	0,0E+00
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%)	96,9
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%)	96,9
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater.	
Estimated substance removal from wastewater via domestic sewage treatment (%)	0,0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	0,0
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	4,1E+05
Assumed domestic sewage treatment plant flow (m^3/d)	2,0E+03
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.	
Conditions and measures related to external recovery of waste	
External recovery and recycling of waste should comply with applicable local and/or national regulations.	
Section 3 Exposure Estimation	
3.1. Health	
-	
3.2. Environment	
The Hydrocarbon Block Method has been used to calculate environmental exposure with the PETRORISK model.	
Section 4 Guidance to check compliance with the Exposure Scenario	
4.1. Health	
The projected exposures are not expected to exceed DN(M)EL when the risk management measures/operating conditions set out in Section 2 are implemented.; Where other risk management measures/operating conditions are taken, users should ensure that risks are managed at at least equivalent levels.; The available hazard data do not allow the derivation of a DNEL for skin irritant effects.; The available hazard data do not support the need to establish a DNEL for other health effects; The available hazard data do not allow the derivation of a DNEL for aspiration effects.; Risk management measures are based on qualitative risk characterisation.	

RCR CS1 General exposures; Closed systems RCR (PROC_2, PROC_1)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	2.504 mg/m^3 (TRA Workers) RCR = 0. 05	Final RCR = 0.05

Inhalation, systemic, acute	Cumene	10.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	2.504 mg/kg bw/day(TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	10.01 mg/cm² (TRA Workers) RCR = 0. 04	Final RCR = 0. 04
Dermal, systemic, long-term	Cumene	0.014 mg/kg (TRA Workers) RCR = 1.78E-3	Final RCR < 0.01
Dermal, local, long-term	Registered substance as such	0.02 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2E-3 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0.02 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2E-3 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0.0502

CS2 RCR PROC 1 PROC2 (Storage)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	2.504 mg/m³ (TRA Workers) RCR = 0. 05	Final RCR = 0. 05
Inhalation, systemic, acute	Cumene	10.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	2.504 mg/kg bw/day(TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	10.01 mg/cm² (TRA Workers) RCR = 0.04	Final RCR = 0. 04
Dermal, systemic, long-term	Cumene	0.137 mg/kg (TRA Workers) RCR = 0.018	Final RCR = 0. 018
Dermal, local, long-term	Registered substance as such	0.2 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	0.02 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0.2 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	0.02 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 068

CS3 RCR PROC 3 (General exposures; Batch process; Closed systems (PROC_3)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	5.008 mg/m³ (TRA Workers) RCR = 0.1	Final RCR = 0. 1
Inhalation, systemic, acute	Cumene	20.03 mg/m³ (TRA Workers)	Qualitative Risk

Inhalation, local long-term	Cumene	5.008 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	20.03 mg/m³ (TRA Workers) RCR = 0.08	Final RCR = 0. 08
Dermal, systemic, long-term	Cumene	6.9E-3 mg/kg (TRA Workers) RCR = 8.96E-4	RCR < 0.01
Dermal, local, long-term	Registered substance as such	2.01E-3 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	0.02 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,2 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2.01E-3 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 101

CS4 Equipment cleaning and maintenance (PROC_8a, PROC_28)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/kg bw/day(TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.1 mg/cm² (TRA Workers) RCR = 0.401	Final RCR = 0. 401
Dermal, systemic, long-term	Cumene	0.137 mg/kg (TRA Workers) RCR = 0.018	Final RCR = 0. 018
Dermal, local, long-term	Registered substance as such	0.1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0.1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 519

CS5 Bulk transfers; Drum/batch transfers; Closed systems (PROC_8b)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	12.52 mg/m³ (TRA Workers) RCR = 0.25	Final RCR = 0.25
Inhalation, systemic, acute	Cumene	50.8 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	12.52 mg/m³ (TRA Workers)	Qualitative Risk

Inhalation, local, acute	Cumene	50.08 mg/m³ (TRA Workers) RCR = 0.2	Final RCR = 0.2
Dermal, systemic, long-term	Cumene	0.137 mg/kg (TRA Workers) RCR = 0.018	Final RCR = 0. 018
Dermal, local, long-term	Registered substance as such Cumene	0.1 mg/cm² (TRA Workers) 1E-2mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	0,1 mg/cm² ((TRA Workers) 1E-2mg/cm² (TRA Workers))	Qualitative Risk
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 268

RCR CS6 (PROC_9) Drum and small package filling.

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.1 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.1 mg/m³ (TRA Workers) RCR = 0.401	Final RCR = 0.401
Dermal, systemic, long-term	Cumene	0.069 mg/kg (TRA Workers) RCR = 8.91E-3	Final RCR < 0. 01
Dermal, local, long-term	Registered substance as such Cumene	0.1 mg/cm² (TRA Workers) 0.01 mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	0,1 mg/cm² (TRA Workers) 0.01 mg/cm² (TRA Workers)	Qualitative Risk
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 501

RCR CS7 (PROC_9) Process sampling

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/kg bw/day(TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.01 mg/cm² (TRA Workers) RCR = 0.04	Final RCR = 0. 401
Dermal, systemic, long-term	Cumene	0.069 mg/kg (TRA Workers) RCR = 8.91E-3	Final RCR =<0. 01

Dermal, local, long-term	Registered substance as such Cumene	0.1 mg/cm² (TRA Workers) 0.01 mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	0,1 mg/cm² (TRA Workers) 0.01 mg/cm² (TRA Workers)	Qualitative Risk
Combined exposure routes, systemic, lungo termine			**Final RCR = 0.51**

RCR CS8 (PROC_15) Laboratory activities

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	5.008 mg/m³ (TRA Workers) RCR = 0.1	Final RCR = 0. 1
Inhalation, systemic, acute	Cumene	20.03 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	5.008 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	20.03 mg/m³ (TRA Workers) RCR = 0.08	Final RCR = 0. 08
Dermal, systemic, long-term	Cumene	3.4E-3 mg/kg ((TRA Workers)	RCR < 0.01
Dermal, local, long-term	Registered substance as such Cumene	9.92E-3 mg/cm² (TRA Workers) 9.92E-3 mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	9.92E-3 mg/cm²(TRA Workers) 9.92E-3 mg/cm² (TRA Workers)	Qualitative Risk
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 101

4.2. Environment

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

Maximum Risk Characterisation Ratio for Air Emissions RCRair	1,5E-03
Maximum Risk Characterisation Ratio for Wastewater Emissions RCRwater	4,4E-01

12a Use in fuel: Industrial (classified as H350) closed systems; Level I EC 232-366-4

Section 1	
Title	
12a - Use in fuel: Industrial	
Use Descriptor	
Sector(s) of Use	
Process Categories	1, 2, 8a, 8b, 16, 28
Environmental Release Categories	7
Specific Environmental Release Category	ESVOC SpERC 7.12a.v1
Processes, tasks, activities covered	
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
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	-
Concentration of substance in product	Covers percentage substance in the product up to 100 %. (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Store substance within a closed system. Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants)	General Measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.
General measures (flammability)	General measures (flammability): Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice
General measures (aspiration hazard)	Do not ingest. If swallowed then seek immediate medical assistance.
General measures (drowsiness or dizziness)	Store substance within a closed system. Covers indoor and outdoor use.; Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorised persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of

	this material and its container at hazardous or special waste collection point. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.
CS1 General exposures; Closed systems (PROC 2, PROC 1)	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure.
CS2 Storage (PROC 2, PROC 1)	Store substance within a closed system.
CS3 Equipment cleaning and maintenance (PROC 8a, PROC 28)	Unload and wash the system before using or maintaining the equipment. Wear chemical-resistant gloves (tested according to EN374) in combination with "basic" employee training. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS. More advice on good practices. The obligations laid down in Article 37(4) of the REACH Regulation does not apply. Wear suitable overalls to prevent exposure to the skin. Immediately collect spills.
CS4 Bulk transfers; Dedicated facility (PROC 8b)	Wear suitable gloves tested according to EN374. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS. Other specific measures identified: the obligations laid down in Article 37(4) of the REACH Regulation does not apply. Wear suitable overalls to prevent exposure to the skin. Immediately collect spills. Avoid splash filling during activities associated with its transfer.
CS5 Drum/batch transfers; Dedicated facility (PROC 8b)	Ensure materiale transfers have been performed within a contained systems or provide ventilation by extraction at the points where emissions occur. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS.
CS6 Use of fuels; Closed systems PROC 16	Handle substance within a closed system

Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	1,0
Regional use tonnage (tonnes/year)	6,2E+06
Fraction of Regional tonnage used locally	2,4E-01
Annual site tonnage (tonnes/year)	1,5E+06
Maximum daily site tonnage (kg/day)	5,0E+03
Frequency and duration of use	
Continuous release.	
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)	5,0E-01
Release fraction to wastewater from process (initial release prior to RMM)	1,0E-03
Release fraction to soil from process (initial release prior to RMM)	0
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater sediment.	
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required	
Treat air emission to provide a typical removal efficiency of (%)	7,9E+01
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency >= (%)	99,4
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%)	99,4
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater.	
Estimated substance removal from wastewater via domestic sewage treatment (%)	0,0
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	0,0
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	5,1E+06
Assumed domestic sewage treatment plant flow (m^3/d)	2,0E+03
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	
Section 3 Exposure Estimation	
3.1. Health	
-	
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	
The projected exposures are not expected to exceed DN(M)EL when the risk management measures/operating conditions set out in Section 2 are implemented.; Where other risk management measures/operating conditions are taken, users should ensure that risks are managed at at least equivalent levels.; The available hazard data do not allow the derivation of a DNEL for skin irritant effects.; The available hazard data do not support the need to establish a DNEL for other health effects; The available hazard data do not allow the derivation of a DNEL for aspiration effects.; Risk management measures are based on qualitative risk characterisation.	

RCR CS1 General exposures; Closed systems RCR (PROC_2, PROC_1)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	2.504 mg/m^3 (TRA Workers) RCR = 0.05	Final RCR = 0.05
Inhalation, systemic, acute	Cumene	10.01 mg/m^3 (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	2.504 mg/m^3 (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	10.01 mg/m^3 (TRA Workers) RCR = 0.04	Final RCR = 0.04
Dermal, systemic, long-term	Cumene	0.014 mg/kg bw/day (TRA Workers) RCR = 1.78E-3	Final RCR<0,01

Dermal, local, long-term	Registered substance as such Cumene	0,02 mg/cm² (TRA Workers) 2E-3 mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	0,02 mg/cm² (TRA Workers) 2E-3 mg/cm² (TRA Workers)	Qualitative Risk
Combined exposure routes, systemic, lungo termine			Final RCR = 0.052

RCR CS2 Storage (PROC 2, PROC 1)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	2.504 mg/m³ (TRA Workers) RCR = 0.05	Final RCR = 0.05
Inhalation, systemic, acute	Cumene	10.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	2.504 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	10.01 mg/m³ (TRA Workers) RCR = 0.04	Final RCR = 0. 04
Dermal, systemic, long-term	Cumene	0.014 mg/kg bw/day (TRA Workers) RCR = 1.78E-3	Final RCR<0,01
Dermal, local, long-term	Registered substance as such Cumene	0,02 mg/cm² (TRA Workers) 2E-3 mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	0,02 mg/cm² (TRA Workers) 2E-3 mg/cm² (TRA Workers)	Qualitative Risk
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 052

RCR CS3 Equipment cleaning and maintenance (PROC 8a, PROC 28)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.1 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.1 mg/m³ (TRA Workers) RCR = 0.401	Final RCR = 0.401
Dermal, systemic, long-term	Cumene	0.137 mg/kg bw/day (TRA Workers) RCR = 0.018	RCR = 0.018
Dermal, local, long-term	Registered substance as such Cumene	0,1 mg/cm² (TRA Workers) 1E-2 mg/cm² (TRA Workers)	Qualitative Risk

Dermal, local, acute	Registered substance as such Cumene	0,1 mg/cm² (TRA Workers) 1E-2 mg/cm² (TRA Workers)	Qualitative Risk
Combined exposure routes, systemic, lungo termine			Final RCR = 0,519

RCR CS4 Bulk transfers; Dedicated facility (PROC 8b)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	12.52 mg/m³ (TRA Workers) RCR = 0.25	Final RCR = 0.25
Inhalation, systemic, acute	Cumene	50.8 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	12.52 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	50.08 mg/m³ (TRA Workers) RCR = 0.2	Final RCR = 0.2
Dermal, systemic, long-term	Cumene	0.069 mg/kg (TRA Workers) RCR = 8.9E-3	Final RCR <0.01
Dermal, local, long-term	Registered substance as such Cumene	0.05 mg/cm² (TRA Workers) 5E-3 mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	0,05 mg/cm² (TRA Workers) 5E-3 mg/cm² (TRA Workers)	Qualitative Risk
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 259

RCR CS5 Drum/batch transfers; Dedicated facility (PROC 8b)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	12.52 mg/m³ (TRA Workers) RCR = 0.25	Final RCR = 0.25
Inhalation, systemic, acute	Cumene	50.8 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	12.52 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	50.08 mg/m³ (TRA Workers) RCR = 0.2	Final RCR = 0.2
Dermal, systemic, long-term	Cumene	0.069 mg/kg (TRA Workers) RCR = 8.9E-3	Final RCR <0,01
Dermal, local, long-term	Registered substance as such Cumene	0.05 mg/cm² (TRA Workers) 5E-3 mg/cm² (TRA Workers)	Qualitative Risk
Dermal, local, acute	Registered substance as such Cumene	0,05 mg/cm² (TRA Workers) 5E-3 mg/cm² (TRA Workers)	Qualitative Risk

Combined exposure routes, systemic, lungo termine			Final RCR = 0.259

RCR CS6 Use of fuels; Closed systems (PROC 16)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	2.504 mg/m³ (TRA Workers) RCR = 0.05	Final RCR = 0.05
Inhalation, systemic, acute	Cumene	100.1 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	2. 504 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	10.01 mg/m³ (TRA Workers) RCR = 0.04	Final RCR = 0.04
Dermal, systemic, long-term	Cumene	3.4E-3 mg/kg bw/day (TRA Workers) RCR = 4.42E-4	Final RCR =<0,01
Dermal, local, long-term	Registered substance as such	9.92E-3 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	9.92E-4 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	9.92E-3 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	9.92E-4 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 519

4.2. Environment

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

Maximum Risk Characterisation Ratio for Air Emissions RCRair	4,3E-04
Maximum Risk Characterisation Ratio for Wastewater Emissions RCRwater	3,9E-02

12b Use in fuel: Professional (classified as H350) closed systems; Level I EC 232-366-4

Section 1	
Title	
12b - Use in fuel: Professional	
Use Descriptor	
Sector(s) of Use	
Process Categories	1, 2, 8a, 8b, 16, 28
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 additive) 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	-
Concentration of substance in product	Covers percentage substance in the product up to 100 %. (unless stated differently)
Frequency and duration of use/exposure	Covers daily exposures up to 8 hours (unless stated differently)
Other Operational Conditions affecting exposure	Store substance within a closed system. Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants)	General Measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.
General measures (flammability)	General measures (flammability): Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice
General measures (aspiration hazard)	Do not ingest. If swallowed then seek immediate medical assistance.
General measures (drowsiness or dizziness)	Store substance within a closed system. Covers indoor and outdoor use.; Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorised persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of

	this material and its container at hazardous or special waste collection point. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.
CS1 General exposures; Closed systems (PROC 2, PROC 1)	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure.
CS2 Storage (PROC 2, PROC 1)	Store substance within a closed system.
CS3 Equipment cleaning and maintenance (PROC 8a, PROC 28)	Unload and wash the system before using or maintaining the equipment. Wear chemical-resistant gloves (tested according to EN374) in combination with "basic" employee training. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS. More advice on good practices. The obligations laid down in Article 37(4) of the REACH Regulation does not apply. Wear suitable overalls to prevent exposure to the skin. Immediately collect spills.
CS4 Bulk transfers; Dedicated facility (PROC 8b)	Wear suitable gloves tested according to EN374. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS. Other specific measures identified: the obligations laid down in Article 37(4) of the REACH Regulation does not apply. Wear suitable overalls to prevent exposure to the skin. Immediately collect spills. Avoid splash filling during activities associated with its transfer..
CS5 Drum/batch transfers; Dedicated facility (PROC 8b)	Ensure materiale transfers have been performed within a contained systems or provide ventilation by extraction at the points where emissions occur. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS.
CS6 Refulling (PROC 8b)	Wear suitable gloves tested according to EN374. If skin contamination is expected to extend to other parts of the body, these parts of the body should also be protected with waterproof clothing equivalent to those described for the hands. For further specifications, refer to section 8 of the SDS. Other specific measures identified: the obligations laid down in Article 37(4) of the REACH Regulation does not apply. Wear suitable overalls to prevent exposure to the skin. Immediately collect spills. Avoid splash filling during activities associated with its transfer.
CS7 Use as fuels Closed systems (PROC 16)	Handle substance within a closed system.

Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0,1
Regional use tonnage (tonnes/year)	4,3E+06
Fraction of Regional tonnage used locally	5,0E-04
Annual site tonnage (tonnes/year)	2,2E+03
Maximum daily site tonnage (kg/day)	5,9E+00
Frequency and duration of use	
Continuous release.	
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 use only)	5,0E-01
Release fraction to wastewater from wide dispersive use	1,0E-04
Release fraction to soil from wide dispersive use (regional use only)	0,025
Technical conditions and measures at process level (source) to prevent release	
Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Risk from environmental exposure is driven by freshwater.	
No wastewater treatment required	
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 >= (%)	0,0
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of >= (%)	0,0
Organisation measures to prevent/limit release from site	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater.	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95,7
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%)	95,7
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	2,2E+05
Assumed domestic sewage treatment plant flow (m^3/d)	2,0E+03
Conditions and measures related to external treatment of waste for disposal	
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	
This substance is consumed during use and no waste of the substance is generated.	

Section 3 Exposure Estimation

3.1. Health

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3.2. Environment

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

Section 4 Guidance to check compliance with the Exposure Scenario

4.1. Health

The projected exposures are not expected to exceed DN(M)EL when the risk management measures/operating conditions set out in Section 2 are implemented.; Where other risk management measures/operating conditions are taken, users should ensure that risks are managed at at least equivalent levels.; The available hazard data do not allow the derivation of a DNEL for skin irritant effects.; The available hazard data do not support the need to establish a DNEL for other health effects; The available hazard data do not allow the derivation of a DNEL for aspiration effects.; Risk management measures are based on qualitative risk characterisation.

RCR CS1 General exposures; Closed systems RCR (PROC_2, PROC_1)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	10.01 mg/m^3 ((TRA Workers) RCR = 0.2	Final RCR = 0.2

Inhalation, systemic, acute	Cumene	40.06 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	10.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	40.06 mg/m³ (TRA Workers) RCR = 0.16	Final RCR = 0.16
Dermal, systemic, long-term	Cumene	0.014 mg/kg (TRA Workers) RCR = 1.78E-3	Final RCR<0,01
Dermal, local, long-term	Registered substance as such	0,02 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2E-3 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,02 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2E-3 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0.202

RCR CS2 Storage (PROC 2, PROC 1)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	10.01 mg/m³ (TRA Workers) RCR = 0.2	Final RCR = 0. 2
Inhalation, systemic, acute	Cumene	40.06 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	10.01 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	40.06 mg/m³ (TRA Workers) RCR = 0.16	Final RCR = 0. 04
Dermal, systemic, long-term	Cumene	0.014 mg/kg bw/day (TRA Workers) RCR = 1.78E-3	Final RCR<0,01
Dermal, local, long-term	Registered substance as such	0,02 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2E-3 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,02 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	2E-3 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 202

RCR CS3 Equipment cleaning and maintenance (PROC 8a, PROC 28)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	35.05 mg/m³ (TRA Workers) RCR = 0.701	Final RCR = 0.701
Inhalation, systemic, acute	Cumene	140.2 mg/m³ (TRA Workers)	Qualitative Risk

Inhalation, local long-term	Cumene	35.05 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	140.2 mg/m³ (TRA Workers) RCR = 0.561	Final RCR = 0.561
Dermal, systemic, long-term	Cumene	0.137 mg/kg bw/day (TRA Workers) RCR = 0.018	RCR = 0.018
Dermal, local, long-term	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0,719

RCR CS4 Bulk transfers; Dedicated facility (PROC 8b)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.1 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.1 mg/m³ (TRA Workers) RCR = 0.401	Final RCR = 0. 401
Dermal, systemic, long-term	Cumene	0.137 mg/kg (TRA Workers) RCR = 0.018	Final RCR = 0. 018
Dermal, local, long-term	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 519

RCR CS5 Drum/batch transfers; Dedicated facility (PROC 8b)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.1 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.1 mg/m³ (TRA Workers) RCR = 0.401	Final RCR = 0.401

Dermal, systemic, long-term	Cumene	0.137 mg/kg bw/day (TRA Workers) RCR = 0.018	Final RCR = 0. 018
Dermal, local, long-term	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0.519

RCR CS6 Refuelling (PROC 16).

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	25.04 mg/m³ (TRA Workers) RCR = 0.501	Final RCR = 0.501
Inhalation, systemic, acute	Cumene	100.1 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	25.04 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	100.1 mg/m³ (TRA Workers) RCR = 0.401	Final RCR = 0.401
Dermal, systemic, long-term	Cumene	0.137 mg/kg bw/day (TRA Workers) RCR = 0.018	Final RCR = 0. 018
Dermal, local, long-term	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Dermal, local, acute	Registered substance as such	0,1 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	1E-2 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 519

RCR CS7 Use of fuels; Closed systems (PROC 16)

Route of exposure and type of effect	Rated entity	Exposure concentration	Risk quantification
Inhalation, systemic, long-term	Cumene	5.008 mg/m³ (TRA Workers) RCR = 0.1	Final RCR = 0.1
Inhalation, systemic, acute	Cumene	20.03 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local long-term	Cumene	5.008 mg/m³ (TRA Workers)	Qualitative Risk
Inhalation, local, acute	Cumene	20.03 mg/m³ (TRA Workers) RCR = 0.08	Final RCR = 0.08
Dermal, systemic, long-term	Cumene	3.4E-3 mg/kg (TRA Workers) RCR = 4.42E-4	Final RCR < 0.01
Dermal, local, long-term	Registered substance as such	9.92E-3 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	9.92 -4 mg/cm² (TRA Workers)	

Dermal, local, acute	Registered substance as such	9.92E-3 mg/cm² (TRA Workers)	Qualitative Risk
	Cumene	9.92E-4 mg/cm² (TRA Workers)	
Combined exposure routes, systemic, lungo termine			Final RCR = 0. 101

4.2. Environment

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

Maximum Risk Characterisation Ratio for Air Emissions RCRair	1,2E-03
Maximum Risk Characterisation Ratio for Wastewater Emissions RCRwater	2,5E-02

12c Use in fuel; Consumer EC 232-366-4

Section 1	
Title	
12c - Use in fuel; Consumer	
Use Descriptor	
Sector(s) of Use	
Product Categories	13
Environmental Release Categories	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12c.v1
Processes, tasks, activities covered	
Covers consumer uses in liquid 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	-
Concentration of substance in product	Covers concentrations up to 100.0 %
Frequency and duration of use/exposure	-
Other Operational Conditions affecting exposure	Covers indoor and outdoor use. Open windows during application to ensure natural ventilation. Store substance within a closed system.
Product Category	**Specific Risk Management Measures and Operating Conditions**
General measures (skin irritants)	General Measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.
General measures (flammability)	General measures (flammability): Use in contained systems. Avoid ignition sources – No Smoking. Handle in well ventilated area to prevent formation of explosive atmosphere. Use equipment and protective systems approved for flammable substances. Restrict line velocity during pumping to avoid generation of electrostatic discharge. Ground/bond container and receiving equipment. Use non-sparking tools. Comply with relevant EU/national regulations. Review SDS for additional advice
General measures (aspiration hazard)	Do not ingest. If swallowed then seek immediate medical assistance.
General measures (drowsiness or dizziness)	Store substance within a closed system. Covers indoor and outdoor use.; Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorised persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing

	scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of this material and its container at hazardous or special waste collection point. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.
CS 1 Fuels; Liquid; Automotive refuelling; Level I PC 13 Concawe_SCED_13_1_a)	Covers concentrations up to 100.0 % Cover percentage (w/w) of cumene in final product: <1% Amount of product used per application: <= 3.75E4 g/event Exposure time per event: = 0.05 h/event Place of use: Outdoor Body parts potentially exposed: Palm of one hand
CS 2 Fuels; Liquid: home space heater fuel; Level I PC 13 Concawe_SCED_13_5_a	Covers concentrations up to 100.0 % Cover percentage (w/w) of cumene in final product: <1% Amount of product used per application: < = 3.32E3 g/event Exposure time per event = 0.033 h/event. Place of use: Outdoor Body parts potentially exposed: Palm of one hand
CS 3 Fuels; Liquid; Garden equipment; Level I PC 13 Concawe_SCED_13_4_a	Covers concentrations up to 100.0 % Cover percentage (w/w) of cumene in final product: <1% Amount of product used per application: 750.0 g/event Exposure time per event = 0.033 h/event Place of use: Outdoor Body parts potentially exposed: Palm of one hand

Section 2.2 Control of environmental exposure	
Product characteristics	
Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	
Fraction of EU tonnage used in region	0,1
Regional use tonnage (tonnes/year)	1,4E+05
Fraction of Regional tonnage used locally	5,0E-04
Annual site tonnage (tonnes/year)	7,2E+01
Maximum daily site tonnage (kg/day)	2,0E-01
Frequency and duration of use	
Continuous release.	
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 use only)	1,0E-02
Release fraction to wastewater from wide dispersive use	2,0E-05
Release fraction to soil from wide dispersive use (regional use only)	0,005
Conditions and measures related to municipal sewage treatment plant	
Not applicable as there is no release to wastewater.	
Estimated substance removal from wastewater via domestic sewage treatment (%)	95,7
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d)	7,7E+03
Assumed domestic sewage treatment plant flow (m3/d)	2,0E+03
Conditions and measures related to external treatment of waste for disposal	

Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

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

Section 3 Exposure Estimation

3.1. Health

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3.2. Environment

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

Section 4 Guidance to check compliance with the Exposure Scenario

4.1. Health

Risk management measures are based on qualitative risk characterisation.; Available hazard data do not enable the derivation of a DNEL for aspiration effects.; Available hazard data do not enable the derivation of a DNEL for dermal irritant effects.
The tables describing the quantification of the risk for the various exposure routes have not been elaborated, due to the lack of derivation of the DNELs, furthermore all the PROCs have been reported together and only a qualitative assessment has been carried out for them. The qualitative risk management measures are described above (General measures)

RCR CS 1 Fuels; Liquid; Automotive refuelling; Level I PC 13 Concawe_SCED_13_1_a)

Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	Cumene	1.481 mg/m³ (TRA Consumers) RCR = 0.139	Final RCR = 0.139
Inhalation, local, long term	Cumene	1.481 mg/m³ (TRA Consumers)	Qualitative risk
Dermal, systemic, long term	Cumene	7E-4 mg/kg bw/day (TRA Consumers) RCR = 4.27E-4	Final RCR < 0.01
Oral, systemic, long term	Cumene	0 mg/kg bw/day (TRA Consumers) RCR = 0	Final RCR < 0.01
Combined routes, systemic, long-term	Cumene		Final RCR = 0.139

RCR CS 2 Fuels; Liquid: home space heater fuel; Level I PC 13 Concawe_SCED_13_5_a

Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	Cumene	7.235 mg/m³ (TRA Consumers) RCR = 0.679	Final RCR = 0.679
Inhalation, local, long term	Cumene	7.235 mg/m³ (TRA Consumers)	Qualitative risk
Dermal, systemic, long term	Cumene	3.5E-4 mg/kg bw/day (TRA Consumers) RCR = 2.13E-4	Final RCR < 0.01
Oral, systemic, long term	Cumene	0 mg/kg bw/day (TRA Consumers) RCR = 0	Final RCR < 0.01
Combined routes, systemic, long-term	Cumene		Final RCR = 0.679

CS 3 Fuels; Liquid; Garden equipment; Level I PC 13 Concawe_SCED_13_4_a

Route of exposure and type of effects	Assessment entity	Exposure concentration	Risk quantification
Inhalation, systemic, long term	Cumene	2.451 mg/m³ (TRA Consumers) RCR = 0.23	Final RCR = 0.23
Inhalation, local, long term	Cumene	2.451 mg/m³ (TRA Consumers)	Qualitative risk
Dermal, systemic, long term	Cumene	7.15E-4 mg/kg bw/day (TRA Consumers) RCR = 4.36E-4	Final RCR < 0.01
Oral, systemic, long term	Cumene	0 mg/kg bw/day (TRA Consumers) RCR = 0	Final RCR < 0.01
Combined routes, systemic, long-term	Cumene		Final RCR = 0.23

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.

Maximum Risk Characterisation Ratio for Air Emissions RCRair	4,5E-04
Maximum Risk Characterisation Ratio for Wastewater Emissions RCRwater	2,4E-02