SAFETY DATA SHEET
PETROL

DATE OF EMISSION: 30/11/2010
DATE OF REVISION: 02/03/2018 Rev.4

SECTION 1. IDENTIFICATION OF THE SUBSTANCE OR PREPARED MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Substance name:	Panta Racing Gasoline
Synonyms:	PANTA STREAM - Ron 100, NS Ron 102, PANTA ONE Ron 102, NR Ron 102, PANTA MAX Ron 102, PANTA MAX WRC Ron 102, PANTA K4 RON 102, PANTA LEMS RON 102, PANTA WTCC RON 102, PANTA SUPERMAX, NS+ Ron 105, NR+ Ron 105, PANTA CX Ron 110, PANTA SIX RON 113, PANTA XS Ron 115, MTV 2T Ron 102, MTV 4T Ron 102, MTV 2T+ (Ron 105), K4 Ron 102, MTV 4T-01 Ron 102, MTV 4T+ (Ron 105), Kart Ron 102 *, E85R, F40, WTCC, Euro 6
CAS Number	n.a. (mixture)
CE Number	n.a. (mixture)
Index number	n.a. (mixture)
Registration number	n.a. (mixture)

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

Common uses: Fuel for motors and other industrial uses
Uses identified in the chemical safety report: General list of applications:

1. *Industrial Use:* production of the substance, use as intermediate product, distribution of the substance, formulation and (re)packaging of the substances and mixtures, use in coatings, use as fuel, use in cleaning products, production and working of rubber.
2. *Professional use:* Use as a fuel.
3. *Consumer:* Use as a fuel.

See section 16 for further information on the uses identified (Appendix 1) and on related exposure scenarios (Appendix 2).

USES ADVISED AGAINST: The pertinent uses are listed above. Other uses are advised against unless the use is evaluated before being implemented, and it is shown that the risks connected with that use are controlled.

1.3 Details of the supplier of the safety data sheet:

Company name	PANTA DISTRIBUZIONE S.p.A.
Address	S.S.235Km 47,980
City / Country	26010 BagnoloCremasco (CR) - Italy
Telephone	+39.0373.235111
E-mail Competent technician	info@panta.it

1.4 Emergency telephone number:

- **Bergamo**
  Centro antiveleni – 24/24 h
  USSA Tossicologia Clinica Ospedali Riuniti di Bergamo - Largo Barozzi, 1 Tel. 800 883300
- **Firenze**
  Centro antiveleni – 24/24 h
  Ospedale Careggi - Viale Pieraccini, 17 Tel.055 7947819
- Foggia
  Centro antiveleni – 24/24 h
  Azienda Ospedaliera Universitaria di Foggia – Viale Pinto, 1 Tel.0881 732326
- **Milano**
  Centro antiveleni – 24/24 h
  Ospedale Niguarda Ca'Granda - Piazza Ospedale Maggiore, 3 Tel.0266101029
- **Napoli**
  Centro antiveleni – 24/24 h
  Ospedale Cardarelli - Via Cardarelli, 9 Tel.0817472870
- **Pavia**
  Centro antiveleni – 24/24 h
  Centro Nazionale di Informazione Tossicologica Fondazione Salvatore Maugeri Clinica del Lavoro e della Riabilitazione IRCCS - Via Salvatore Maugeri, 10 Tel.038224444
- **Roma**
  Centro antiveleni – 24/24 h
  Policlinico A. Gemelli - Largo Agostino Gemelli, 8 Tel.063054343

Centro antiveleni – 24/24 h
Policlinico Umberto I - Via del Policlinico, 155 Tel. 0649978000

SECTION 2. HAZARDS IDENTIFICATION

Physical-chemical dangers: This mixture is extremely inflammable.

Health hazards: The mixture has irritating effects on the skin. Inhaling the vapours may cause drowsiness and dizziness. Due to its low viscosity the product can be inhaled into the lungs immediately after ingestion or later in case of spontaneous or provoked vomiting, and if this occurs chemical pneumonia may arise. It may cause neoplastic effects. It may reduce fertility and be harmful to to the foetus.

Dangers to the environment: The mixture has toxic effects on aquatic organisms and long-term effects on the aquatic environment.

2.1 Classification of the substance or mixture

Classifications in terms of (CE) Regulation 1272/2008 (CLP/GHS)

Flam. Liquid 1:-H224
Asp. Tox. 1: H304
Skin Irrit. 2: H315
STOT SE 3: H336
STOT RE 2 H373
Eye.Irrit.2 H319
Muta. 1B: H340
Carc. 1B: H350
Repr. 2: H361 d-f
Aquatic Acute 1: H400
Aquatic Chronic 2: H411

A list of the extended H phrases is given in Section 16.

2.2 Label elements

Warning: DANGER
Danger indications:

H224: Highly inflammable liquid and vapours
H304: Can be lethal in case of ingestion and penetration of the respiratory tracts
H315: Causes skin irritation
H319 Causes serious eye irritation
H336: Can cause drowsiness or dizziness
H373 May cause damage to organs through prolonged or repeated exposure
H340: Can cause genetic mutations
H350: Can cause cancer
H361 d: Suspected to be harmful to foetuses
H361 f: Suspected to be harmful to fertility
H400 Very toxic to aquatic life
H411: Toxic for aquatic organisms with long-term effects

Precautionary advice
Prevention:
P201: Obtain specific instructions before use

P210: Keep away from heat/sparks/open flames/hot surfaces - No smoking
P280: Wear gloves/protective clothing/Protect the eyes/face
Reaction
P301+310: IN CASE OF INGESTION: immediately contact a POISON UNIT or a physician
P331 Do not provoke vomiting
Conservation:
P403+233: Keep the container tightly closed in a well ventilated place
Disposal
P501: Dispose of the product/receptacle in conformity to Local Legislation

Other information: H P Notes

2.3 Other dangers

The vapours mix with air and become inflammable and explosive. The vapours are heavier than air: they can build up in confined spaces or depressions and spread at ground level, and can create risks of fire and explosion even at a distance. In some circumstances the product can accumulate significantly strong static electricity charges, with the risk of sparks that can ignite fires or explosions. The product does not satisfy the criteria for PBT or vPvB classification according to appendix XIII of REACH.

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

n.a.

3.2 Mixtures

Mixture that contains the following components:

1) UVCB substance: Naphtha (petrol) with a low boiling point ("Complex combination of hydrocarbons made up mainly of paraffin, cycloparaffin, aromatic and olefinic hydrocarbons, with a number of atoms of carbon, prevalently C3 - C12 and boiling point between 30°C and 260°C").
CAS 86290-81-5, INDEX N° 649-378-00-4, Registration n°: 01-2119471335-39-XXXX
Concentration: from 65% to 90% w/w

(CE) Regulation 1272/2008 Classification (CLP):
Flam. Liquid 1 H224
Asp. Tox. 1 H304
Skin Irrit. 2 H315
STOT Single Exp. 3 H336
Muta. 1B H340
Carc. 1B H350
Repr. 2 H361 d-f
Aquatic Acute 1: H400
Aquatic Chronic 2 H411

Various chemical compounds can be identified, depending on the characteristics and origin of the components, and the final chemical composition of the naphtha. These compounds are added deliberately. The most important for classification purposes are indicated below.
Note: the classification of the component "Naphtha (petrol) with a low boiling point" is attributed in relation to the worst case (content of the individual components all above the specific classification limits).

a) Benzene: CAS 71-43-2, INDEX N° 601-020-00-8. (concentration 0,1 < x < 1 % by weight)

(CE) Regulation 1272/2008 Classification (CLP):
Flam. Liq. 2 H225
Carc. 1A H350
Muta.1B H340
STOT RE 1 H372
Asp.Tox.1. H304
Eye.Irrit.2 H319

Skin.Irrit.2 H315

b) n-hexane CAS 110-54-3, INDEX N° 601-037-00-0, Registration n° 01-2119480412-44-XXXX (concentration from 3 % up to 5% by vol)

(CE) Regulation 1272/2008 Classification (CLP):
Flam.Liq.2 H225
Repr.2 H361f
Asp.Tox.1 H304
Skin Irrit.2 H315
STOT RE 3 Cat 2 H373
STOT SE 3 H336
Aquatic Chronic 1 H411

2) Compounds oxygenated 15 % max. by vol, overall

Can contain one or more of the following compounds:

a) ETBE ethyl tertiary butyl ether, CAS 637-92-3, Registration n° 01-2119452785-29-XXXX, Self-classification

(CE) Regulation 1272/2008 Classification (CLP):
Flamm.Liq.2 H225
STOT SE 3 H336

b) TAME tertiary amyl methyl ether, CAS 994-05-8, INDEX N° 603-213-00-2, Registration n° 01-2119457610-43-XXXX

(CE) Regulation 1272/2008 Classification (CLP):
STOT SE 3 H336
Acute Tox. 4 H302
Flam. Liq. 2 H225

3) Ethanol CAS 64-17-5, INDEX N° 603-002-00-5, Registration n° 01-2119457610-43-XXXX from 0 up to 15% by vol.

(CE) Regulation 1272/2008 Classification (CLP):
Flam. Liq. 2: H225

4) Toluene : CAS 108-88-3, INDEX N° 601-021-00-3, Registration n°01-2119471310-51-XXXX (concentration from 10 up to 20 % by vol)

(CE) Regulation 1272/2008 Classification (CLP):
Flam. Liq. 2 H225
Repr.2 H361d
STOT RE 2 H373
Asp.Tox.1. H304
Eye.Irrit.2 H319
Skin.Irrit.2 H315

5) MTBE methyl-tertiary-butyl ether, CAS 1634-04-4, INDEX N° 603-181-00-X, Registration n° 01-2119457610-43-XXXX

from 0 up to 15% by vol
(CE) Regulation 1272/2008 Classification (CLP):
Flamm.Liq.2 H225
Skin.Irrt. H315

6) Cyclohexane, CAS 110-82-7 N.INDEX 601-017-00-1, Registration n° 01-2119463273-41-XXXX

from 0 up to 10% by vol

(CE) Regulation 1272/2008 Classification (CLP):
Flam. Liq. 2: H225

Skin.Irrt.2: H315
Asp. Tox. 1: H304
STOT SE 3: H336
Aquatic Chronic 1: H410
Aquatic Acute 1: H400

6) Xylene - all isomers, CAS 1330-20-7 N.INDEX 601-022-00-9, Registration n° 01-2119488216-32-XXXX

from 0 up to 35% vol

(CE) Regulation 1272/2008 Classification (CLP):
Flam. Liq. 3: H226
Skin.Irrt.2: H315
Acute Tox. 4: H332
Acute Tox. 4: H312
Asp. Tox. 1: H304

A list of the extended H phrases is given in Section 16.

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures

Contact with the eyes: Rinse gently with water for a few minutes, if worn remove contact lenses if the situation makes it possible to do so easily. If irritation, blurred vision or swelling occurs and persists, obtain medical advice from a specialist.

Contact with the skin: Remove contaminated clothing, contaminated footwear and dispose of them safely. Wash affected area with soap and water. If irritation, swelling or flushing occurs, obtain medical advice from a specialist.
For minor thermal burns, cool the burnt part. Hold the burnt area under cold running water for at least five minutes, or until the pain subsides. Body hypothermia must be avoided.
When using high-pressure equipment, injection of the product can occur. If high-pressure injuries occur, immediately seek professional medical attention. Do not wait for symptoms to develop.

Ingestion / aspiration: Do not induce vomiting as there is high risk of aspiration. Do not give anything by mouth to an unconscious person.
If spontaneous vomiting occurs, keep the head down to avoid any risk of aspirating the vomit into the lungs.

Inhalation: If breathing is difficult, move the victim to the open air and keep at rest in a position comfortable for breathing.
If the victim is unconscious and is not breathing, check that there is nothing obstructing respiration and get a specialised person to apply artificial respiration. If necessary, give external cardiac massage and obtain medical advice.
If the victim is breathing, keep them on their side in a safe position. Administer oxygen if necessary.

4.2 Most important symptoms and effects, both acute and delayed

Can cause skin irritation and slight eye irritation. Inhalation of vapours may cause headache, nausea, vomiting and an altered state of consciousness. In case of ingestion few or no symptoms are expected. If any, nausea and diarrhoea might occur.

4.3 Indication of any immediate medical attention and special treatment needed

In case of ingestion, always assume that aspiration has occurred. Immediately transfer the victim to hospital. Do not wait for symptoms to develop.

SECTION 5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Small size fires: earth or sand, carbon dioxide, foam, or dry chemical powder.
Large size fires: foam, atomised water. Note: the use of a diffused water jet (atomised water) is reserved to specifically trained personnel. Other inert gases (subject to regulations).
Unsuitable extinguishing means Do not use water jets aimed at the product that is burning, as this may cause splashing 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 could generate a complex mixture of solid and liquid particles dispersed in the air and gas, including CO (carbon monoxide), SO_x (sulphur oxides), or H_2SO4 (sulphuric acid), and 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

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. Excepting for cases 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). If required, notify relevant authorities according to all applicable regulations.
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 (polyvinyl alcohol) are not water-resistant, and are not suitable for emergency use. Work helmet. Anti-static and non-slip safety shoes or boots that are resistant to the chemical agents. Goggles and /or face shield, if splashes or contact with eyes are possible or anticipated. Respiratory protection: A half or full-face respirator with an organic vapour filter(s), or a Self-Contained Breathing Apparatus (SCBA) can be used according to the extent of spill and foreseeable amount of exposure. If the situation cannot be completely assessed, or if an oxygen deficiency is possible, only SCBA's should be used.

6.2 Environmental precautions

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

6.3 Methods and materials for containment and cleaning up

Spilling on the ground: If necessary contain the product with dry earth, sand or similar non-combustible materials. Large spillages may be carefully covered with foam, if available, to limit fire risk. Do not use direct jets. When inside buildings or confined spaces, ensure adequate ventilation. Absorb spilled product with suitable non-combustible materials. If it is necessary to store any contaminated materials for safe disposal, only suitable containers (airtight, labelled, sealed, waterproof, earthed and bonded) should be used. In case of soil contamination, remove contaminated soil and treat in accordance with local regulations.
Spilling in water: In case of small spillages in closed waters (e.g. ports), contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbent materials. Large spillages: if possible, contain larger spillages in water using floating barriers or other mechanical means only if this is strictly necessary and if the risk or fire and explosion can be adequately controlled, otherwise leave the product to evaporate and disperse naturally. The use of dispersants should be advised by an expert, and, if required, approved by local authorities. If possible, collect the product and contaminated materials with mechanical means, and store/dispose of according to relevant regulations.
recommended measures are based on the most likely spillage scenarios for this material. Local conditions (wind, air temperature, wave/current direction and speed) may significantly influence the choice of appropriate actions.

6.4 Reference to other sections

For more information regarding personal protective equipment see section " Exposure control/personal protection".

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

7.1.1 Protective measures

Obtain special instructions before use. 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.
Take precautionary measures against static electricity. Ensure earthing of containers, tanks and transfer/receiving equipment. The vapour is heavier than air. Be particularly careful of accumulation in pits and confined spaces (1051). Keep away from

heat/sparks/open flames/hot surfaces. No smoking. Use only bottom loading of tanks, in compliance with European legislation. Do not use compressed air for filling, discharging, or handling operations. Avoid contact with skin and eyes. Do not ingest. Do not breathe vapours.
Use and store only outdoors or in a well-ventilated area. Avoid contact with the product. Use adequate personal protective equipment as needed.
Avoid releasing into the environment. For more information regarding personal protective equipment and operational conditions see Exposure scenarios.

7.1.2 Indications regarding health in the workplace

Do not inhale the mist / vapours / aerosols. Avoid contact with skin. Keep away from food and beverages (1096). Do not eat, drink or smoke when using this product. Wash the hands thoroughly after handling. Do not use contaminated clothing again.

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 means 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, only after cleaning up the tank. Before entering storage tanks and commencing any operation in a confined area, check the atmosphere for oxygen content and flammability. Store separately from oxidising agents.
Recommended materials: for containers, or container linings use mild steel or stainless steel. Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Check compatibility with the manufacturer in relation to usage conditions.
If the product is supplied in containers, only store it in the original container of a container that is suitable for the type of product. Store in a well-ventilated place.
Keep containers tightly closed and properly labelled. Protect from sunlight.
Light hydrocarbon vapours can build up in the headspace of containers. These can cause a danger of fire or explosion. Open slowly in order to control possible pressure release. 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 the enclosed exposure scenarios.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Limit exposure values (mixture components)
PETROL
ACGIH 2016:
TLV®-TWA: 300 ppm
TLV®-STEL: 500 ppm

ETHYL TERTIARY BUTYL ETHER (ETBE)
ACGIH 2016:
TLV®-TWA: 25 ppm

METHYL TERTIARY BUTYL ETHER (MTBE)
ACGIH 2016:
TLV®-TWA: 50 ppm

TERTIARY AMYL METHYL ETHER (TAME)
ACGIH 2016:
TLV®-TWA: 20 ppm

BENZENE
Legislative Decree 81/08 and subsequent amendments and additions (Italy)
Limit values (8 hours): 1 ppm-3,25 mg/m^3-(skin)
ACGIH 2016:
TLV®-TWA: 0.5 ppm
TLV®-STEL: 2.5 ppm

N-HEXANE
Legislative Decree 81/08 and subsequent amendments and additions (Italy)
Limit values (8 hours): 20 ppm-72 mg/m^3
ACGIH 2016:
TLV®-TWA: 50 ppm

TOLUENE

Legislative Decree 81/08 and subsequent amendments and additions (Italy)
Limit values (8 hours): 50 ppm-192 mg/m^3-(skin)
ACGIH 2016:
TLV®-TWA: 20 ppm

ETHANOL
ACGIH 2016:
TLV®-STEL : 1000 ppm.

XYLENE
Legislative Decree 81/08 and subsequent amendments and additions (Italy)
Limit values (8 hours): 50 ppm-221 mg/m^3-(skin)
ACGIH 2016:
TLV®-TWA: 434 mg/m^3
TLV®-STEL: 150 ppm

CICLOHEXANE
Legislative Decree 81/08 and subsequent amendments and additions (Italy)
Limit values (8 hours): 100 ppm-350 mg/m^3-(skin)
ACGIH 2016:
TLV®-TWA: 360 mg/m^3

Biological limit values (IBE)
BENZENE
IBE: Mercapturic S-Phenyl acid in the urine 25 µg/g creatinine; Trans acid, trans muconic in urine 500 µg/g creatinine

DNEL (Derived Non Effect Level)

PETROL:

	DNEL Workers				DNEL General population			
Means of exposure	**Chronic, local effects**	**Chronic, systemic effects**	**Acute, local effects**	**Acute, systemic effects**	**Chronic, local effects**	**Chronic, systemic effects**	**Acute, local effects**	**Acute, systemic effects**
oral	n.a.	n.a.	n.a.	n.a.	n.a.	Note (a) (c)	n.a.	n.a.
dermal	Note (c)	Note (a) (b)	Note (c)	Note (a) (b)	Note (c)	Note (a) (b)	Note (a)	Note (a) (b)
inhalation	840 mg/m^3/8 ore	Note (a) (b)	1100 mg/m^3/15 min	1300 mg/m^3/15 min	180 mg/m^3/8 ore	Note (a) (b)	640 mg/m^3/15 min	1200 mg/m^3/15min

Note (a): If the concentration of benzene in the air is sufficiently high, a DMEL-workers-inhalation for benzene of 1 ppm must be taken into consideration. If dermal exposure is suspected, a reference dermal value for workers of 23,4 mg of benzene / kg / day must be taken into consideration.
Note (b): No danger has been identified for this means of exposure.
Note (c): The data available does not make it possible to estimate a DNEL.

DMEL (Derived Minimum Effect Level)

Not identified because sufficient dosage describers are not available.

PNEC(S) (Predicted Non Effect Concentration)

See the enclosed exposure scenarios.

8.2 Exposure controls

8.2.1 Suitable technical checks

Minimise exposure to mists/vapours/aerosols. Before entering storage tanks and commencing any operation in a confined area, check the atmosphere for oxygen content and flammability.

8.2.2 Personal protection measures

(a) Eye / face protection

In the absence of containment systems and where there is a risk of contact with the eyes/face, wear protection for the head and face (visor and/or protective goggles (EN 166).

(b) Skin protection:

i) Hand protection

In the absence of containment systems and where there is a danger of contact with the skin, use gloves with wrist bands that are highly resistance to hydrocarbons and have felt on the inside. Presumably adequate materials: nitrile, PVC or PVA (polyvinyl alcohol) with a protective index for chemical agents of at least 5 (permeation time > 240 minutes). Use the gloves according to the conditions and within the limits set by the manufacturer. If necessary, refer to the UNI EN 374 standard. Gloves must be periodically inspected and changed in case of wear, perforations or contaminations.

ii) Other

If clothing gets contaminated change it and clean it immediately.

(c) Respiratory protection

In confined spaces: use appropriate protective devices for the respiratory tract: full-face masks fitted with an AX type filter cartridge (brown for organic vapours with a low boiling point). If exposure levels cannot be determined or estimated with adequate confidence, or an oxygen deficiency is possible, only SCBA's should be used (EN 529).
In the absence of containment systems: use appropriate protective devices for the respiratory tract: full-face masks fitted with an AX type filter cartridge (brown for organic vapours with a low boiling point).

(d) Thermal dangers: See letter b) above.

8.2.3 Environmental exposure checks

Avoid releasing into the environment. Storage installations should be designed with adequate means to prevent ground and water pollution in case of leaks or spills.
Treatment of waste water is required.
Prevent the release of undissolved substances or recover them from waste water.
Do not apply industrial sludge to natural soils.
Sludge generated by treating industrial waters must be incinerated, contained or treated. For further details, see the enclosed exposure scenarios.

8.3 Other

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

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) *Appearance*	clear, colorless liquid, pale yellow and violet
b) *Odour*	Of petrol
c) *Olfactory threshold*	n.d.
d) *pH*	n.a. because not inside water solution
e) *Melting point / freezing point*	< 60°C
f) *Initial boiling point and boiling interval*	Approximately 30 to 260°C (ISO 3405)
g) *Flash point*	< - 40°C (EN ISO 13736)
h) *Evaporation rate*	n.a.
i) *Inflammability (solids, gases)*	n.a.
j) *Upper / lower inflammability or explosiveness limits*	LEL 1,4%; UEL 7,6%
k) *Vapour tension*	4-240 kPa at 37,8°C (EN 13016-1)
l) *Vapour density*	n.a.

m) *Density*	720-780 kg/m3 at 15 ° C (EN ISO 12185)
n) *Solubility*	Solubility in water not applicable as this is a UVCB substance.
o) *N-octanol / water breakdown coefficient*	Not applicable because this is a UVCB substance
p) *Spontaneous ignition temperature*	>280°C
q) *Decomposition temperature*	n.a.
r) *Viscosity*	< 1 mm^2/s at 37,8°C
s) *Explosive properties*	No chemical group can be associated with the molecule with explosive properties
t) *Oxidant properties*	Not necessary (column 2 of REACH in appendix VII).

We wish to point out that the data given above refers to the principal component in the mixture (UVCB Substance: Petrol CAS 86290-81-5).

9.2 Other information

Not included.

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity

The mixture does not present further dangers related to reactivity other than those indicated in the sub-sections that follow.

10.2 Chemical stability

This mixture is stable in relation to its intrinsic properties.

10.3 Possibility of hazardous reactions

Contact with strong oxidants (such as peroxides or chromates) can cause a danger of fire. A mixture with nitrates or other strong oxidants (such as chlorates, perchlorates, and liquid oxygen) can generate an explosive mass. The sensitivity to heat, friction and shock cannot be evaluated beforehand.

10.4 Conditions to avoid

Store separately from oxidising agents.
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Avoid static electrical charges forming.

10.5 Incompatible materials

Strong oxidants.

10.6 Hazardous decomposition products

The mixture does not decompose when used for the intended purposes.

SECTION 11. TOXICOLOGICAL INFORMATION

We wish to point out that the information given in this section relates to the mixture's principal component (UVCB Substance: Petrol CAS 86290-81-5).

11.1 Information on toxicological effects

No experimental data is available on absorption, distribution, metabolism and elimination of the product as a whole, but numerous toxicokinetic studies are available on the principal constituents. Most of the constituents are absorbed by inhalation. Absorption by inhalation is directly proportional to the molecular weight of the constituents, and so the n-paraffins are absorbed more than the iso paraffins, and the aromatics are absorbed more that the corresponding paraffins. The constituents with a low molecular weight (butane and pentane) are poorly absorbed because they are exhaled. The metabolism of the molecules absorbed is similar to that of the alcohols, with excretion via the kidneys. Cutaneous absorption of the components in the vapour phase is limited and is around 1% of total absorption by inhalation. Cutaneous absorption of liquid components is also very low because they evaporate quickly.
Most of the components are absorbed by the gastrointestinal tract.

a) Acute toxicity:

Although the product is dangerous if inhaled into the lungs and causes a serious drop in the SNC in case of prolonged exposure, studies on the acute toxicity of naphtha orally, cutaneously, and by inhalation did not highlight effects in the conditions defined by the test protocols according to the regulation on hazardous substances. Therefore the results do not point to any classification in terms of the standard on hazardous substances.
A summary of the most representative studies in the registration dossier is given below.

Method	Result	Comments	Source
By mouth			
RAT Oral (gavage) OECD Guideline 401	DL50:>5000 mg/kg (M/F)	Key study Reliable without restrictions CAS 86290-81-5	UBTL Inc (1986a)
By inhalation			
RAT Inhalation of vapours OECD Guideline 403	LC50:>5610 mg/m^3 (M/F)	Key study Reliable without restrictions CAS 86290-81-5	UBTL Inc (1992g)
Via the skin			
RABBIT OECD Guideline 402	DL50: >2000 (M/F)	Key study Reliable with restrictions CAS 86290-81-5	UBTL Inc (1986d)

b) Skin corrosion / irritation

The potential for skin irritation of the samples that belong to this product's category was tested in a large number of studies, generally carried out on rabbits. The conclusions of these studies indicate that petrol is a skin irritant without evidence of deep injuries (corrosion). These results therefore indicate classification of the substance as Xi; R38 (Irritant for the skin) and Skin Irrit. 2 H315 (Causes skin irritation).
A summary of the most representative studies in the registration dossier is given below.

Method	Result	Comments	Source
RABBIT Occlusive treatment for 24/48/72 hours OECD Guideline 404	Irritant Average erythema score: 2,56	Key study Reliable without restrictions CAS 86290-81-5	American Petroleum Institute (API) 1995

c) Serious eye damage / irritation

The potential for skin irritation of the samples that belong to this product's category was tested in a large number of studies, generally carried out on rabbits. The conclusions of these studies indicate a potential for moderate eye irritation associated with exposure to vapours at a concentration exceeding 200 ppm, however, the dosage-response information is not conclusive.
These results do not point to any classification in terms of the standard on hazardous substances.
A summary of the most representative studies in the registration dossier is given below.

Method	Result	Comments	Source
RABBIT Occlusive treatment for 24/48/72 hours OECD Guideline 405	Non irritant Average conjunctival score: 0,06	Key study Reliable without restrictions CAS 86290-81-5	UBTL Inc (1985a)

d) Respiratory or skin sensitisation

Respiratory sensitisation

This endpoint is not a REACH requirement. The products that belong to the naphtha category do not cause sensitisation of the respiratory tract and so no classification of the substance is necessary.

Skin sensitisation

Various skin sensitisation studes have been carried out on naphtha (appendix V method B.6 (sensitisation of the skin); Buehler method).
The results obtained from these studies indicate the absence of potential skin sensitisation and so no classification of the substance is necessary.
A summary of the most representative studies in the registration dossier is given below.

Method	Result	Comments	Source
GUINEA PIG Guideline 406	Non sensitising	Key study Reliable without restrictions CAS 86290-81-5	UBTL Inc (1990i)

e) Germ cells mutagenicity

The mutagen potential of naphtha has been amply studied in a series of live and in vitro tests. Most of the studies did not show coherent proof of mutagen activity. The classification as a mutagen is attributed due to the presence of benzene in c>0,1%. Muta Cat 2; R46 (can cause hereditary genetic alterations) and Muta 1 B H340 (can cause hereditary genetic alterations).
A summary of the most representative studies in the registration dossier is given below.

Method	Result	Comments	Source
In vitro gene mutation in Salmonella thyphimurium OECD TG 471	Negative	Key study Reliable without restrictions CAS 86290-81-5	American Petroleum Institute (API) 1977
In vivo, chromosome aberration RAT OECD TG 471	Negative	Key study Reliable without restrictions CAS 86290-81-5	American Petroleum Institute (API) 1977

f) Cancerogenicity

Most of the studies carried out on animals with the vaporised product showed an increased incidence of tumour at a hepatic level. However, the vapourised product contains the most heavy aromatic components, responsible for tumours arising that are not present in the vapour phase to which man is normally exposed. Carcinogenesis studies carried out on naphtha are not sufficient to support classification as a carcinogenic, which is however attributed due to the presence of benzene in C>0,1%. Cl Carc. Cat. 2; R45(can cause cancer) and Carc. 1B H350 (can cause cancer).
A summary of the most representative studies in the registration dossier is given below.

Method	Result	Comments	Source
Via the skin			
MOUSE OECD Guideline 451 Exposure for 102 weeks (3 times a week)	NOAEL (carcinogenicity) 0,05 ml male No neoplastic effect observed	Key study Reliable without restrictions CAS 86290-81-5	American Petroleum Institute (1983b)

NOTE: Cancerogenicity orally is not an endpoint required by REACH.

g) Reproductive toxicity

Toxicity for reproduction

Most of the studies did not show coherent proof of toxicity for fertility. Classification as a danger to fertility is attributed due to the presence of the n-hexane in C>3% (Repr. Cat. 3.; R62 - possible risk of reduced fertility and Repr. 2: H361 (suspected of harming fertility or the foetus).
A summary of the most representative studies in the registration dossier is given below.

Method	Result	Comments	Source
RAT Doses: 5090, 12490, 24690 mg/m^3 OECD Guideline 421 Inhalation of vapours	NOAEL 24700 mg/m^3 (M/F)	Key study Reliable without restrictions CAS 64741-66-8	Bui Q.Q., Burnett D.M.,Breglia R.J., Koschier F.J.,Lapadula E.S. (1998)

Toxicity for development / teratogenesis

Most of the studies did not show coherent proof of toxicity for a foetus. Classification as a teratogen (Repr. Cat. 3.; R63-possible risk of damage to unborn children and Repr. 2: H361 - suspected of harming fertility or the foetus) is attributed due to the presence of the toluene in C>3 %.
A summary of the most representative studies in the registration dossier is given below.

Method	Result	Comments	Source
RAT Doses: 2653, 7960, 23900 mg/m^3 OECD Guideline 414 (Prenatal developmental toxicity study) Inhalation of vapours	NOAEL 23900 mg/m^3 no adverse effect	Key study Reliable without restrictions	L.Roberts, R White, Q. Bui. W.Daughtrey, F.Koschier, S.Rodney (2001)

h) Specific toxicity for target organs (STOT) - single exposure

Petrol is classified STOT SE 3 H336 (can cause drowsiness and dizziness).

i) Specific toxicity for target organs (STOT) - repeated exposure

Oral: No information in the registration dossier

Inhalation: At very high doses 20,000 -30,000 mg/m3, only some studies showed some slight effect such as variations in body weight, variation in the weight of organs, and variations in haematological parameters.
Cutaneous: The studies show a low potential for systemic toxicity.
No classification envisaged by the standard for hazardous substances.
A summary of the most representative studies in the registration dossier is given below.

Method	Result	Comments	Source
Oral			
RAT, Subacute (gavage) 500 mg/kg/day 500 mg/kg/day 28 days / 1 time per day for 5 days a week	NOAEL< 500mg/kg (male): specific renal effects in male rats not considered of biological relevance for man.	Support study Reliable with restrictions CAS 64741-63-5	Halder CA et al. 1985
Inhalation			
RAT systemic effects (M/F) Inhalation (vapour) Doses repeated 28 days OECD 412	NOAEC: 9840 mg/m^3 specific renal effects in male rats not considered of biological relevance for man.	Key study Reliable without restrictions CAS 86290-81-5	ARCO 1993 (Atlantic Richfield Company)
RAT local/systemic effects (M/F) Inhalation (vapour) Doses repeated 90 days OECD TG 413	NOAEC (local effects): 10000mg/kg: reddy nasal secretions (male / female) specific renal effects in male rats not considered of biological relevance for man. NOAEC (systemic effects): 20000 mg/m^3 specific renal effects in male rats not considered of biological relevance for man.	Key study Reliable without restrictions	EPA 2005
Cutaneous			
OECD Guideline 410 (21/28 days)	NOAEL (systemic effects): 3750 mg/m3	Key study Reliable with restrictions CAS 86290-81-5	UBTL, Inc. 1985

j) Aspiration hazard

Since petrol has a viscosity of less than 1 mm2/sec at 37,8°C it is possible that the product could be aspirated into the lungs, according to the classification contained in appendix I, part 3 of Regulation 1272/2008.
The product can therefore be classified Xn R65 (Harmful: may cause lung damage in case of ingestion) and Asp. Tox. 1 H304 (Can be lethal in case of ingestion and penetration of the respiratory tracts).

SECTION 12. ECOLOGICAL INFORMATION

We wish to point out that the information given in this section relates to the mixture's principal component (UVCB Substance: Petrol CAS 86290-81-5).
On the basis of the ecological information given below, for toxicity for invertebrates and algae and in terms of the criteria indicated in the standard for hazardous substances, naphtha is classified as dangerous for the environment Aquatic Chronic 2 H411.

12.1 Toxicity

A summary of the most representative studies in the registration dossier is given below.

Endpoint	Result	Comments
Aquatic toxicity		
Invertebrates Daphnia magna Short-term	EL50 48/hours: 4,5 mg/lit NOELR 48/hours: 0,5 mg/lit	Key study Exxon Biomedical Sciences, Inc. 1995 Reliable without restrictions OECD Guideline 202
Invertebrates Daphnia magna Long-term	NOELR 21/days: 2,6 mg/lit LL50 21/days: 10 mg/lit	Key study Exxon Biomedical Sciences, Inc., East Millstone, NJ 1995 Reliable without restrictions OECD Guideline 211

Endpoint	Result	Comments
Aquatic toxicity		
Algae Short-term Selenastrum capricornutum	EL50 72/hours: 3,1 mg/lit EC50 96/hours: 3,7 mg/lit NOELR 72/hours: 0,5 mg/lit	Key study Exxon Biomedical Sciences, Inc., East Millstone, NJ 1995 Reliable without restrictions OECD Guideline 201
Fish Short-term	LC50 48/hours: 5,4 mg/lit	Support study CAS 86290-81-5 Lockhart WL, Danell RW and Murray DAJ 1987 Reliable with restrictions OECD Guideline 203
Fish Short-term Pimephales promelas	LL50 96/hours: 8.2	Key study CAS 64741-66-8 Petroleum Product Stewardship Council (PPSC) 1995 Reliable without restrictions Method ASTM ET29-88a
Fish Long-term Pimephales promelas	NOELR 14/days: 2,6 mg/lit LL50 14/days: 5.2	Support study CAS 64741-55-5 Springborn Laboratories, Inc. 1999 Reliable with restrictions OECD Guideline 204
Micro-organisms Tetrahymena pyriformis	EC50 40/hours: 15,41 mg/lit	Key study Redman, A. et al. 2010 Reliable with restrictions QSAR modelled data

12.2 Persistence and degradability

Abiotic degradability
Hydrolysis: Naphtha is resistant to hydrolysis due to a lack of a functional group that is hydrolytically reactive. Therefore, this process will not contribute to a measurable loss of degradation of the substance in the environment.
Photolysis in the air: Endpoint not required by REACH
Photolysis in water and soil: Endpoint not required by REACH

Biotic degradability
Water / sediment / soil: The standard tests for this endpoint are not applicable to UVCB substances.

12.3 Bioaccumulative potential

The standard tests for this endpoint are not applicable to UVCB substances.

12.4 Mobility in soil

Koc absorption: The standard tests for this endpoint are not applicable to UVCB substances.

12.5 Results of PBT and vPvB assessment

Comparison with the criteria laid down in appendix XIII of the REACH Regulation.
Persistence evaluation: some hydrocarbon structures included in this category present P (persistent) or vP (very Persistent) characteristics.
Evaluation of bioaccumulation potential: the structure of most of the hydrocarbons included in this category DO NOT present vB (very Bioaccumulative) characteristics, although some components do present B (Bioaccumulative) characteristics.
Evaluation of toxicity: for the structures that showed P and B characteristics, the toxicity was evaluated but no relevant component satisfies the toxicity criteria with the exception of antracene which was confirmed to be a PBT. Since the antracene is included in concentrations < 0,1% the product is not PBT/vPvB.

12.6 Other adverse effects

Not included.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Do not discharge onto the ground, into sewers, culverts, or water courses.
For disposal of the waste derived from this product, including non depolluted empty containers, comply with Local Legislation.
European Waste Catalogue Code: 13 07 03 (Ref: 2001/118/CE and Dir. of the Min. of the Environment 9/04/2002). The code indication only provides a general indication based in the original composition of the product and the intended uses).
The user (waste producer) is responsible for choosing the most adequate code on the basis of the effective use of the product, any alterations, and pollution. The product as is does not contain halogenated compounds.
Disposal of containers: Do not throw the containers away in the environment. Dispose of them according to local regulations.
Do not puncture, grind, weld, braze, burn, or incinerate the containers or empty drums that have not bee depolluted.

SECTION 14. TRANSPORT INFORMATION

14.1 UN Number

1203

14.2 UN proper shipping name

PETROL

14.3 Transport hazard class(es)

Road / rail transport (ADR/RID/ADN): Class 3
Classification code: F1
Danger labels: 3 + material dangerous for the environment
Danger identification number: 33
Sea transport (IMDG): Class 3
Air transport (IATA): Class 3, flammable liquid
Tunnel restriction code (ADR): D/E

14.4 Packing group

II, Label 3 + Environmental danger mark

14.5 Environmental hazards

Substances dangerous to the environment in terms of codes ADR, RID, ADN and IMDG.

14.6 Special precautions for user

Ensure material transfers are under containment or extract ventilation (E66).

14.7 Transport in bulk according to annex II of MARPOL and the IBC code

If you intend effecting bulk transportation, comply with appendix II of MARPOL 73/78 and the IBC code, where applicable.

SECTION 15. INFORMATION ON REGULATION

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

Authorisation in terms of the REACH Regulation (CE Regulation n° 1907/2006 and subsequent amendments and additions):
Product not included in the list of extremely worrying substances (SVHC) subject to authorisation
Restrictions in terms of the REACH Regulation (CE Regulation n° 1907/2006 and subsequent amendments and additions):
Substance subject to Restrictions in terms of Heading VIII (Appendix XVII, Appendix 2, point 28).
Other EU norms and national implementations:
Seveso Category (Dir 2012/18/UE Seveso III): appendix I, part 1.
For waste disposal see Local Legislation.

15.2 Chemical safety assessment

Chemical safety was evaluation.

SECTION 16. OTHER INFORMATION

List of pertinent phrases

These phrases are given for information and do not necessarily correspond to the classification of the product.

H Hazard indications

H224: Highly flammable liquid and vapours
H225: Easily flammable liquid and vapours
H302: Harmful if swallowed
H304: Can be lethal in case of ingestion and penetration of the respiratory tracts
H315: Causes skin irritation
H319: Causes serious eye irritation
H336: Can cause drowsiness or dizziness
H340: Can cause genetic changes
H361d: Suspected to be harmful to foetuses
H361f: Suspected to be harmful to fertility
H372: Causes damage to organs in case of prolonged or repeated exposure
H373: Can cause damage to organs in case of prolonged or repeated exposure
H400 Very toxic to aquatic life
H411: Toxic for aquatic organisms with long-term effects

Indications on training:

Adequately train workers that will potentially be exposed to these substances, based on the contents of this safety data sheet.

Principal biological references and data sources

Registration Dossier

Legend for abbreviations and acronyms

ACGIH = American Conference of Governmental Industrial Hygienists
CSR = Report on Chemical Safety
DNEL = Derived Non-Effect Level
DMEL = Derived Minimum Effect Level
EC50 = Mean effective concentration
IC50 = Inhibition concentration, 50%
Klimisch = Evaluation criteria for the reliability of the method used.
LC50 = Lethal concentration, 50%
LD50 = Mean lethal dosage
PNEC = Envisaged Non-Effect Concentration
n.a. = not applicable
n.d. = not available
PBT = Persistent, Bioaccumulable, and Toxic Substance
SNC = Central Nervous System
STOT = Specific Toxicity for Organs Targeted
(STOT) RE = Repeated exposure
(STOT) SE = Single exposure
Key study = Most pertinent study
TLV®TWA = Threshold Limit Value – mean pondered over time
TLV®STEL = Threshold Limit Value - limit for short exposure time
UVCB = Substances of Unknown or Variable composition
vPvB = very Persistent and very Bioaccumulable

note P = Classification as a carcinogen or mutagen is not necessary if it can be shown that the substance contains a percentage of benzene of less than 0,1 % by weight
If the substance is not classified as being carcinogenic, at least warning tips (P102) -P260-P262-P301 + P310-P331 (table 3.1) or the S phrase (2-)23-24-62 (table 3.2) must appear.

Date of emission: 30/11/2010
Date of Revision 4: 02/03/2018
Reason for the revision: sect. 9 "Appearance" update (color)

APPENDIX 1

LIST OF USES IDENTIFIED
In relation to the petrol component

Name of use identified	Sector	Usage sector SU	Process categories PROC	Environmental release categories ERC	Specific environmental release categories ERC
01- Production of the substance	Industrial (G26)	3,8, 9	1, 2, 3., 8a, 8b, 15	1,4, 0	ESVOC SpERC 1.1.v1
01b- Use as intermediate	Industrial	3,8, 9	1, 2, 3., 8a, 8b, 15	6a	ESVOC SpERC 6.1a.v1
01a- Distribution of the substance	Industrial	3	1, 2, 3., 8a, 8b, 15	1,2,3,4,5,6a,6b,6c,6d,7	ESVOC SpERC 1.1b.v1
02- Formulation & (re)packing of substances and mixtures	Industrial	3,10	1, 2, 3., 8a, 8b, 15	2	ESVOC SpERC 2.2.v1
03a-Use in coatings	Industrial	3	1, 2, 3., 8a, 8b, 15	4	ESVOC SpERC 4.3a.v1
04a-Use in cleaning products	Industrial	3	1, 2, 3., 8a, 8b.	4	ESVOC SpERC 4.4a.v1
12a- Use as a fuel	Industrial	3	1, 2, 3., 8a, 8b, 16	7	ESVOC SpERC 7.12a.v1
12b- Use as a fuel	Professional	22	1, 2, 3., 8a, 8b, 16	9a,9b	ESVOC SpERC 9.12b.v1
12c- Use as a fuel	Consumer	21	13	9a,9b	ESVOC SpERC 9.12c.v1
19- Rubber production and processing	Industrial	3,10, 11	1,2,3, 8b,9,15	1,4,6d	ESVOC SpERC4.19.v1

APPENDIX 2

EXPOSURE SCENARIOS
Related to petrol compounds, ETBE, MTBE, TAME, Ethanol

Index

PETROL
(Low boiling point naphtas containing between 0% and 1% benzene)
1. Production of the substance

Section 1	
Title	
Production of the substance	
Usage descriptors	
Sector of Use	3, 8, 9
Process category	1, 2, 3, 8a, 8b, 15
Environmental Release Category	1, 4
Specific Environmental Release Category	ESVOC SpERC 1.1.v1
Processes, Assignments, Covered Activities	
Processing of the substance or its use as a process chemical or extraction agent within closed or containment systems. It includes accidental exposure during recycling / recovery, material transfer, storage, sampling, associated lab activities, maintenance and loading (included on boats / barges, tank wagons on a wheel or rail, and containers for bulk goods).	
Evaluation method	
See section 3.	
Section 2 Operative conditions and risk management measures	
Section 2.1 Workers'exposure control	
Product characteristics	
Product physical state	Liquid, vapor pressure > 10 kPa in standard conditions.
Substance concentration in the product	It covers a percentage of substance in the product up to 100% (unless otherwise indicated).
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure up to 8 hours (unless otherwise indicated).
Human factors not influenced by risk management	n.a.
Other operating conditions affecting exposure	The operation is carried out at high temperatures (> 20 ° C above room temperature). It requires the application of a suitable basic hygiene standards in the workplace.
Exposure scenarios	**Specific measures for risk management and operational conditions**
General measures (skin irritants)	Avoid direct skin contact with the product. Identify potential indirect contact areas with the skin. Wear protective gloves (tested according to EN374) if there is a probability that the substance will come into contact with your hands. Eliminate contamination / spillage as soon as they occur. Immediately remove any contamination with the skin. Provide basic training to personnel aimed at preventing / limiting exposures and notifying any dermatological problems.
General measures (carcinogenic agents)	Consider technical progress and process updates (including automation) to eliminate dispersions. Limit exposure by taking measurements such as closed systems, dedicated equipment and special suction / local exhaust ventilation systems. Drain the systems and clean the transfer lines before interrupting the containment. Clean / purge the equipment, if possible, before maintenance. Where exposure is available: limit access to authorized personnel only, provide operators with specific training on activities and operations to minimize exposure risk, wear gloves and protective suits to prevent skin contamination , use a respiratory protective device when required for certain exposure scenarios, immediately discard any leaks and dispose of the waste under safe conditions. Ensure the adoption of safe work systems or equivalent risk management solutions. Inspect, monitor, and maintain all devices and control measures. Take into account the need for a risk-based health surveillance system.
General Exposure (closed systems) + with sampling	Manipulate the substance in a closed system. Sampling via a closed loop or a system designed to prevent exposure. Wear protective gloves conforming to EN374.
General Exposure (Closed Systems) + Continuous Process	Manipulate the substance in a closed system.

General Exposure (closed systems) + Discontinuous process	Manipulate the substance in a closed system. Make sure the operation is done outside.
Lab activities	Handle only under a chemical hood or use equivalent methods to minimize exposure hazards.
Bulk products transfer	Ensure that the transfer of the material takes place in containment or with extract ventilation.
Cleaning and maintenance of equipment	Drain and purge the system before opening or maintaining the equipment. Store drains in sealed containers until disposal or subsequent recycling. Immediately remove spills. Wear chemical protection gloves (conforming to EN374), together with a basic training course.
Storage	Make sure the operation is done outside. Store the substance inside a closed system.

Section 2.2 Envirnomental exposure control	
Product characteristics	
The substance is a UVCB complex. Mostly hydrophobic	
Quantity used	
EU tons fraction used locally	0.1
Regional tons (tons / year)	1.87e7
Regional tons fraction used locally	0.03
Site annual tons (tons/year)	6.0e5
Maximum site daily tons (kg/day)	2.0e6
Frequency and duration of use	
Continuous release	
Days of emission (days/year)	300
Environmental factors not influenced by risk management	
Local dilution factor in fresh water	10
Local dilution factor in sea water	100
Other operating conditions affecting environmental exposure	
Fraction released in the air by the process (initial release before the application of risk management measures)	0.05
Fraction released in wastewater by the process (initial release before the application of risk management measures)	0.003
Fraction released in the ground by the process (initial release before the application of risk management measures)	0.0001
Technical measures and conditions at the process level (source) to prevent releases	
Procedures vary from site to site, so conservative process emissions estimates are used	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Prevent the release of undissolved substances or recover them from wastewater. Environmental risk is related to the indirect exposure of humans by ingestion. Sewage treatment on site is required.	
Handle emissions in such a way as to ensure a typical removal efficiency of (%).	99.0
Handle the waste water on site (before starting the unloading operation) to ensure the required removal efficiency ≥ (%):	95.2
In case of drainage to an urban wastewater treatment plant, ensure the effective removal required on site ≥ (%)	80.4
Organizational measures to prevent / limit the release from the site	
Do not distribute the sludge generated by the treatment of industrial waters on natural soils. Sludges generated by industrial water treatment must be incinerated, kept under containment or treated (OMS3)	
Conditions and measures for the municipal wastewater treatment plant	
Estimated removal of waste water by means of an urban treatment plant (%).	95.5
Total efficiency of wastewater removal, after adoption of RMMs in the site and offsite (urban treatment plant) (%)	99.1
Maximum allowed tons of site (MSafe) on the basis of the next release after total waste removal (kg/g).	2.0e6
Supposed flow for the urban wastewater treatment plant (m^3 / d)	10000
Conditions and measures related to the external treatment of waste for disposal	

During production, no waste is generated on the substance, to be disposed of.
Conditions and measures for the external recovery of waste
During production, no rejection of the substance is to be recovered.
Section 3 Extimation of exposure
3.1 Health
For the purpose of assessing the exposure level at the workplace, where not expressly indicated, the ECETOC TRA method has been used.
3.2 Environment
The Hydrocarbon Block Method (HBM) was used to calculate the environmental exposure with the Petrorisk model.
Section 4
4.1 Health
It is expected that exposures will not exceed DN (M) EL when the Risk Management / Operating Conditions Measures described in Section 3 are applied. Where different Risk Management / Operating Conditions Measures are adopted, users are required to ensure that the risks are managed at least equivalent. Data on hazard characteristics do not allow the derivation of a DNEL for skin irritant effects. Data on hazard characteristics do not support the need to establish a DNEL for other health effects. Risk Management Measures are based on qualitative risk characterization.
4.2 Environment
The guide line is based on assumed conditions of use that may not apply to all sites; so you may need a scaling operation to define appropriate risk management measures for each site. The required efficiency of wastewater removal can be achieved by using onsite / offsite technologies, either individually or in combination. The required air removal efficiency can be achieved by using onsite technologies, either individually or in combination. Further information on scaling activities and control technologies is provided by the SpERC Technical Data Sheet (http://cefic.org/en/reach-for-industries-libraries.html). Local evaluations on EU refineries were carried out using site-specific data and they are attached to the PETRORISK - "Specific site site" worksheet.

2. Use of the Substance as Intermediate

Section 1	
Title	
Use of the Substance as Intermediate	
Usage descriptors	
Sector of Use	3, 8, 9
Process category	1, 2, 3, 8a, 8b, 15
Environmental Release Category	6a
Specific Environmental Release Category	ESVOC SpERC 6.1a.v1
Processes, Assignments, Covered Activities	
Use of the substance as an intermediate agent in closed or containment systems (not in strictly controlled conditions). Includes accidental exposure during recycling / recovery operations, material transfer, storage, sampling, associated laboratory activities, maintenance and loading (on boats / barges, tank wagons or rail and containers for bulk goods).	
Evaluation method	
See section 3.	
Section 2 Operative conditions and risk management measures	
Section 2.1 Workers'exposure control	
Product characteristics	
Product physical state	Liquid, vapor pressure > 10 kPa in standard conditions.
Substance concentration in the product	It covers a percentage of substance in the product up to 100% (unless otherwise indicated).
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure up to 8 hours (unless otherwise indicated).
Human factors not influenced by risk management	n.a.
Other operating conditions affecting exposure	The operation is carried out at high temperatures (> 20 ° C above room temperature). It requires the application of a suitable basic hygiene standards in the workplace.
Caratteristiche dello scenario	**Misure specifiche per la gestione dei rischi e condizioni operative**
General measures (skin irritants)	Avoid direct skin contact with the product. Identify potential indirect contact areas with the skin. Wear protective gloves (tested according to EN374) if there is a probability that the substance will come into contact with your hands. Eliminate contamination / spillage as soon as they occur. Immediately remove any contamination with the skin. Provide basic training to personnel aimed at preventing / limiting exposures and notifying any dermatological problems.
General measures (carcinogenic agents)	Consider technical progress and process updates (including automation) to eliminate dispersions. Limit exposure by taking measurements such as closed systems, dedicated equipment and special suction / local exhaust ventilation systems. Drain the systems and clean the transfer lines before interrupting the containment. Clean / purge the equipment, if possible, before maintenance. Where exposure is available: limit access to authorized personnel only, provide operators with specific training on activities and operations to minimize exposure risk, wear gloves and protective suits to prevent skin contamination , use a respiratory protective device when required for certain exposure scenarios, immediately discard any leaks and dispose of the waste under safe conditions. Ensure the adoption of safe work systems or equivalent risk management solutions. Inspect, monitor, and maintain all devices and control measures. Take into account the need for a risk-based health surveillance system.
General Exposure (closed systems) + with sampling	Manipulate the substance in a closed system. Sampling via a closed loop or a system designed to prevent exposure. Wear protective gloves conforming to EN374.
General Exposure (closed systems)	Manipulate the substance in a closed system. Make sure the operation is done outside.
Storage	Make sure the operation is done outside. Store the substance inside a closed system.
Lab activities	Handle only under a chemical hood or use equivalent methods to minimize exposure hazards.

Bulk products transfer	Ensure that the transfer of the material takes place in containment or with extract ventilation.
Cleaning and maintenance of equipment	Drain and purge the system before opening or maintaining the equipment. Store drains in sealed containers until disposal or subsequent recycling. Immediately remove spills. Wear chemical protection gloves (conforming to EN374), together with a basic training course.

Section 2.2 Envirnomental exposure control	
Product characteristics	
The substance is a UVCB complex. Mostly hydrophobic	
Quantity used	
EU tons fraction used locally	0.1
Regional tons (tons / year)	2.21e6
Regional tons fraction used locally	0.0068
Site annual tons (tons/year)	1.5e4
Maximum site daily tons (kg/day)	5.0e4
Frequency and duration of use	
Continuous release	
Days of emission (days/year)	300
Environmental factors not influenced by risk management	
Local dilution factor in fresh water	10
Local dilution factor in sea water	100
Other operating conditions affecting environmental exposure	
Fraction released in the air by the process (initial release before the application of risk management measures)	0.025
Fraction released in wastewater by the process (initial release before the application of risk management measures)	0.003
Fraction released in the ground by the process (initial release before the application of risk management measures)	0.001
Technical measures and conditions at the process level (source) to prevent releases	
Procedures vary from site to site, so conservative process emissions estimates are used	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Prevent the release of undissolved substances or recover them from wastewater. The risk associated with an environmental exposure is induced by the freshwater sediment compartment. In case of drainage to a sewage treatment plant, no treatment is required.	
Handle emissions in such a way as to ensure a typical removal efficiency of (%).	80
Handle the waste water on site (before starting the unloading operation) to ensure the required removal efficiency ≥ (%):	92.9
In case of drainage to an urban wastewater treatment plant, ensure the effective removal required on site ≥ (%)	0
Organizational measures to prevent / limit the release from the site	
Do not distribute the sludge generated by the treatment of industrial waters on natural soils. Sludges generated by industrial water treatment must be incinerated, kept under containment or treated	
Conditions and measures for the municipal wastewater treatment plant	
Estimated removal of waste water by means of an urban treatment plant (%).	95.5
Total efficiency of wastewater removal, after adoption of RMMs in the site and offsite (urban treatment plant) (%)	95.5
Maximum allowed tons of site (MSafe) on the basis of the next release after total waste removal (kg/g).	7.8e4
Supposed flow for the urban wastewater treatment plant (m^3 / d)	2000
Conditions and measures related to the external treatment of waste for disposal	
During production, no waste is generated on the substance, to be disposed of.	
Conditions and measures for the external recovery of waste	
During production, no rejection of the substance is to be recovered.	
Section 3 Extimation of exposure	
3.1 Health	
For the purpose of assessing the exposure level at the workplace, where not expressly indicated, the ECETOC TRA method has	

been used.
3.2 Environment
The Hydrocarbon Block Method (HBM) was used to calculate the environmental exposure with the Petrorisk model.
Section 4
4.1 Health
It is expected that exposures will not exceed DN (M) EL when the Risk Management / Operating Conditions Measures described in Section 3 are applied. Where different Risk Management / Operating Conditions Measures are adopted, users are required to ensure that the risks are managed at least equivalent. Data on hazard characteristics do not allow the derivation of a DNEL for skin irritant effects. Data on hazard characteristics do not support the need to establish a DNEL for other health effects. Risk Management Measures are based on qualitative risk characterization.
4.2 Environment
The guide line is based on assumed conditions of use that may not apply to all sites; so you may need a scaling operation to define appropriate risk management measures for each site. The required efficiency of wastewater removal can be achieved by using onsite / offsite technologies, either individually or in combination. The required air removal efficiency can be achieved by using onsite technologies, either individually or in combination. Further information on scaling activities and control technologies is provided by the SpERC Technical Data Sheet (http://cefic.org/en/reach-for-industries-libraries.html). Local evaluations on EU refineries were carried out using site-specific data and they are attached to the PETRORISK - "Specific site site" worksheet.

3. Distribution of substance

Section 1	
Title	
Distribution of substance	
Usage descriptors	
Sector of Use	3
Process category	1, 2, 3, 8a, 8b, 15
Environmental Release Category	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7
Specific Environmental Release Category	ESVOC SpERC 1.1b.v1
Processes, Assignments, Covered Activities	
Load of bulk substances (on boats / barges, wheeled or rail tank wagons and IBCs) inside closed or containment systems, including accidental exposure during sampling, storage, unloading, maintenance and associated lab activities.	
Evaluation method	
See section 3.	
Section 2 Operative conditions and risk management measures	
Section 2.1 Workers'exposure control	
Product characteristics	
Product physical state	Liquid, vapor pressure > 10 kPa in standard conditions.
Substance concentration in the product	It covers a percentage of substance in the product up to 100% (unless otherwise indicated).
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure up to 8 hours (unless otherwise indicated).
Human factors not influenced by risk management	n.a.
Other operating conditions affecting exposure	It requires the use of the product at a temperature not exceeding 20 ° C compared to room temperature, unless otherwise specified. It requires the application of a suitable basic hygiene standards in the workplace.
Exposure scenarios	**Specific measures for risk management and operational conditions**
General measures (skin irritants)	Avoid direct skin contact with the product. Identify potential indirect contact areas with the skin. Wear protective gloves (tested according to EN374) if there is a probability that the substance will come into contact with your hands. Eliminate contamination / spillage as soon as they occur. Immediately remove any contamination with the skin. Provide basic training to personnel aimed at preventing / limiting exposures and notifying any dermatological problems.
General measures (carcinogenic agents)	Consider technical progress and process updates (including automation) to eliminate dispersions. Limit exposure by taking measurements such as closed systems, dedicated equipment and special suction / local exhaust ventilation systems. Drain the systems and clean the transfer lines before interrupting the containment. Clean / purge the equipment, if possible, before maintenance. Where exposure is available: limit access to authorized personnel only, provide operators with specific training on activities and operations to minimize exposure risk, wear gloves and protective suits to prevent skin contamination , use a respiratory protective device when required for certain exposure scenarios, immediately discard any leaks and dispose of the waste under safe conditions. Ensure the adoption of safe work systems or equivalent risk management solutions. Inspect, monitor, and maintain all devices and control measures. Take into account the need for a risk-based health surveillance system.
General Exposure (closed systems) + with sampling	Manipulate the substance in a closed system. Sampling via a closed loop or a system designed to prevent exposure. Wear protective gloves conforming to EN374.
General Exposure (closed systems) + outside	Manipulate the substance in a closed system. .
Sampling during the process.	Sampling via a closed loop or a system designed to prevent exposure.
Lab activities	Handle only under a chemical hood or use equivalent methods to minimize exposure hazards.
Closed loading and unloading of bulk	Ensure that the transfer of the material takes place in containment or with extract

products	ventilation.
Cleaning and maintenance of equipment	Drain and purge the system before opening or maintaining the equipment. Store drains in sealed containers until disposal or subsequent recycling. Immediately remove spills. Wear chemical protection gloves (conforming to EN374), together with a basic training course.
Storage	Make sure the operation is done outside. Store the substance inside a closed system.

Section 2.2 Envirnomental exposure control	
Product characteristics	
The substance is a UVCB complex. Mostly hydrophobic	
Quantity used	
EU tons fraction used locally	0.1
Regional tons (tons / year)	1.87e7
Regional tons fraction used locally	0.002
Site annual tons (tons/year)	3.75e4
Maximum site daily tons (kg/day)	1.2e5
Frequency and duration of use	
Continuous release	
Days of emission (days/year)	300
Environmental factors not influenced by risk management	
Local dilution factor in fresh water	10
Local dilution factor in sea water	100
Other operating conditions affecting environmental exposure	
Fraction released in the air by the process (initial release before the application of risk management measures)	0.001
Fraction released in wastewater by the process (initial release before the application of risk management measures)	0.00001
Fraction released in the ground by the process (initial release before the application of risk management measures)	0.00001
Technical measures and conditions at the process level (source) to prevent releases	
Procedures vary from site to site, so conservative process emissions estimates are used	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Environmental risk is related to the indirect exposure of humans by ingestion. In case of drainage to a sewage treatment plant, no treatment is required.	
Handle emissions in such a way as to ensure a typical removal efficiency of (%).	90
Handle the waste water on site (before starting the unloading operation) to ensure the required removal efficiency ≥ (%):	12
In case of drainage to an urban wastewater treatment plant, ensure the effective removal required on site ≥ (%)	0
Organizational measures to prevent / limit the release from the site	
Do not distribute the sludge generated by the treatment of industrial waters on natural soils. Sludges generated by industrial water treatment must be incinerated, kept under containment or treated	
Conditions and measures for the municipal wastewater treatment plant	
Estimated removal of waste water by means of an urban treatment plant (%).	95.5
Total efficiency of wastewater removal, after adoption of RMMs in the site and offsite (urban treatment plant) (%)	95.5
Maximum allowed tons of site (MSafe) on the basis of the next release after total waste removal (kg/g).	1.1e6
Supposed flow for the urban wastewater treatment plant (m^3 / d)	2000
Conditions and measures related to the external treatment of waste for disposal	
The external treatment and disposal of waste must comply with applicable local and / or national legislation	
Conditions and measures for the external recovery of waste	
Waste collection and recycling must comply with applicable local and / or national legislation	
Section 3 Extimation of exposure	
3.1 Health	
For the purpose of assessing the exposure level at the workplace, where not expressly indicated, the ECETOC TRA method has	

been used.
3.2 Environment
The Hydrocarbon Block Method (HBM) was used to calculate the environmental exposure with the Petrorisk model.
Section 4
4.1 Health
It is expected that exposures will not exceed DN (M) EL when the Risk Management / Operating Conditions Measures described in Section 3 are applied. Where different Risk Management / Operating Conditions Measures are adopted, users are required to ensure that the risks are managed at least equivalent. Data on hazard characteristics do not allow the derivation of a DNEL for skin irritant effects. Data on hazard characteristics do not support the need to establish a DNEL for other health effects. Risk Management Measures are based on qualitative risk characterization.
4.2 Environment
The guide line is based on assumed conditions of use that may not apply to all sites; so you may need a scaling operation to define appropriate risk management measures for each site. The required efficiency of wastewater removal can be achieved by using onsite / offsite technologies, either individually or in combination. The required air removal efficiency can be achieved by using onsite technologies, either individually or in combination. Further information on scaling activities and control technologies is provided by the SpERC Technical Data Sheet (http://cefic.org/en/reach-for-industries-libraries.html). Local evaluations on EU refineries were carried out using site-specific data and they are attached to the PETRORISK - "Specific site site" worksheet.

4. Formulation and (re) packaging of substances and mixtures

Section 1	
Title	
Formulation and (re) packaging of substances and mixtures	
Usage descriptors	
Sector of Use	3, 10
Process category	1, 2, 3, 8a, 8b, 15
Environmental Release Category	2
Specific Environmental Release Category	ESVOC SpERC 2.2.v1
Processes, Assignments, Covered Activities	
Formulation of the substance and its mixtures in continuous and discontinuous operations within closed or containment systems, including accidental exposure during storage, transfer of material, mixing, maintenance, sampling and associated laboratory activities .	
Evaluation method	
See section 3.	
Section 2 Operative conditions and risk management measures	
Section 2.1 Workers'exposure control	
Product Characteristics	
Product physical state	Liquid, vapor pressure > 10 kPa in standard conditions.
Substance concentration in the product	It covers a percentage of substance in the product up to 100% (unless otherwise indicated).
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure up to 8 hours (unless otherwise indicated).
Human factors not influenced by risk management	n.a.
Other operating conditions affecting exposure	It requires the use of the product at a temperature not exceeding 20 ° C compared to room temperature, unless otherwise specified. It requires the application of a suitable basic hygiene standards in the workplace.
Caratteristiche dello scenario	**Misure specifiche per la gestione dei rischi e condizioni operative**
General measures (skin irritants)	Avoid direct skin contact with the product. Identify potential indirect contact areas with the skin. Wear protective gloves (tested according to EN374) if there is a probability that the substance will come into contact with your hands. Eliminate contamination / spillage as soon as they occur. Immediately remove any contamination with the skin. Provide basic training to personnel aimed at preventing / limiting exposures and notifying any dermatological problems.
General measures (carcinogenic agents)	Consider technical progress and process updates (including automation) to eliminate dispersions. Limit exposure by taking measurements such as closed systems, dedicated equipment and special suction / local exhaust ventilation systems. Drain the systems and clean the transfer lines before interrupting the containment. Clean / purge the equipment, if possible, before maintenance. Where exposure is available: limit access to authorized personnel only, provide operators with specific training on activities and operations to minimize exposure risk, wear gloves and protective suits to prevent skin contamination , use a respiratory protective device when required for certain exposure scenarios, immediately discard any leaks and dispose of the waste under safe conditions. Ensure the adoption of safe work systems or equivalent risk management solutions. Inspect, monitor, and maintain all devices and control measures. Take into account the need for a risk-based health surveillance system.
General Exposure (closed systems) + with sampling	Manipulate the substance in a closed system. Sampling via a closed loop or a system designed to prevent exposure. Wear protective gloves conforming to EN374.
General Exposure (closed systems) + outside	Manipulate the substance in a closed system. .
Sampling during the process.	Sampling via a closed loop or a system designed to prevent exposure.
Lab activities	Handle only under a chemical hood or use equivalent methods to minimize exposure hazards.

Closed loading and unloading of bulk products	Ensure that the transfer of the material takes place in containment or with extract ventilation.
Drums/lots transfer	Ensure that the transfer of the material takes place in containment or extract ventilation.
Cleaning and maintenance of equipment	Drain and purge the system before opening or maintaining the equipment. Store drains in sealed containers until disposal or subsequent recycling. Immediately remove spills. Wear chemical protection gloves (conforming to EN374), together with a basic training course.
Storage	Make sure the operation is done outside. Store the substance inside a closed system.

Section 2.2 Envirnomental exposure control	
Product characteristics	
The substance is a UVCB complex. Mostly hydrophobic	
Quantity used	
EU tons fraction used locally	0.1
Regional tons (tons / year)	1.65e7
Regional tons fraction used locally	0.0018
Site annual tons (tons/year)	3.0e4
Maximum site daily tons (kg/day)	1.0e5
Frequency and duration of use	
Continuous release	
Days of emission (days/year)	300
Environmental factors not influenced by risk management	
Local dilution factor in fresh water	10
Local dilution factor in sea water	100
Other operating conditions affecting environmental exposure	
Fraction released in the air by the process (initial release before the application of risk management measures)	0.025
Fraction released in wastewater by the process (initial release before the application of risk management measures)	0.002
Fraction released in the ground by the process (initial release before the application of risk management measures)	0.0001
Technical measures and conditions at the process level (source) to prevent releases	
Procedures vary from site to site, so conservative process emissions estimates are used	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Environmental risk is related to the indirect exposure of humans by ingestion. In case of drainage to a sewage treatment plant, no treatment is required.	
Handle emissions in such a way as to ensure a typical removal efficiency of (%).	56.5
Handle the waste water on site (before starting the unloading operation) to ensure the required removal efficiency ≥ (%):	97.4
In case of drainage to an urban wastewater treatment plant, ensure the effective removal required on site ≥ (%)	0
Organizational measures to prevent / limit the release from the site	
Do not distribute the sludge generated by the treatment of industrial waters on natural soils. Sludges generated by industrial water treatment must be incinerated, kept under containment or treated	
Conditions and measures for the municipal wastewater treatment plant	
Estimated removal of waste water by means of an urban treatment plant (%).	95.5
Total efficiency of wastewater removal, after adoption of RMMs in the site and offsite (urban treatment plant) (%)	95.5
Maximum allowed tons of site (MSafe) on the basis of the next release after total waste removal (kg/g).	1.0e5
Supposed flow for the urban wastewater treatment plant (m^3 / d)	2000
Conditions and measures related to the external treatment of waste for disposal	
The external treatment and disposal of waste must comply with applicable local and / or national legislation	
Conditions and measures for the external recovery of waste	
Waste collection and recycling must comply with applicable local and / or national legislation	
Section 3 Extimation of exposure	
3.1 Health	
For the purpose of assessing the exposure level at the workplace, where not expressly indicated, the ECETOC TRA method has been used.	
3.2 Environment	
The Hydrocarbon Block Method (HBM) was used to calculate the environmental exposure with the Petrorisk model.	

Section 4
4.1 Health
It is expected that exposures will not exceed DN (M) EL when the Risk Management / Operating Conditions Measures described in Section 3 are applied. Where different Risk Management / Operating Conditions Measures are adopted, users are required to ensure that the risks are managed at least equivalent. Data on hazard characteristics do not allow the derivation of a DNEL for skin irritant effects. Data on hazard characteristics do not support the need to establish a DNEL for other health effects. Risk Management Measures are based on qualitative risk characterization.
4.2 Environment
The guide line is based on assumed conditions of use that may not apply to all sites; so you may need a scaling operation to define appropriate risk management measures for each site. The required efficiency of wastewater removal can be achieved by using onsite / offsite technologies, either individually or in combination. The required air removal efficiency can be achieved by using onsite technologies, either individually or in combination. Further information on scaling activities and control technologies is provided by the SpERC Technical Data Sheet (http://cefic.org/en/reach-for-industries-libraries.html). Local evaluations on EU refineries were carried out using site-specific data and they are attached to the PETRORISK - "Specific site site" worksheet.

5. Use in coatings

Section 1	
Title	
Use in coatings	
Usage descriptors	
Sector of Use	3
Process category	1, 2, 3, 8a, 8b, 15
Environmental Release Category	4
Specific Environmental Release Category	ESVOC SpERC 4.3a.v1
Processes, Assignments, Covered Activities	
It covers use in coatings (paints, inks, adhesives, etc.) in closed or containment systems, including accidental exposure during use (reception of material, storage, preparation and transfer of bulk products or seeds -fusion, application and film-forming activities), cleaning of equipment, maintenance and associated laboratory activities.	
Evaluation method	
See section 3.	
Section 2 Operative conditions and risk management measures	
Section 2.1 Workers'exposure control	
Product Characteristics	
Product physical state	Liquid, vapor pressure > 10 kPa in standard conditions.
Substance concentration in the product	It covers a percentage of substance in the product up to 100% (unless otherwise indicated).
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure up to 8 hours (unless otherwise indicated).
Human factors not influenced by risk management	n.a.
Other operating conditions affecting exposure	It requires the use of the product at a temperature not exceeding 20 ° C compared to room temperature, unless otherwise specified. It requires the application of a suitable basic hygiene standards in the workplace.
Exposure scenarios	**Specific measures for risk management and operational conditions**
General measures (skin irritants)	Avoid direct skin contact with the product. Identify potential indirect contact areas with the skin. Wear protective gloves (tested according to EN374) if there is a probability that the substance will come into contact with your hands. Eliminate contamination / spillage as soon as they occur. Immediately remove any contamination with the skin. Provide basic training to personnel aimed at preventing / limiting exposures and notifying any dermatological problems.
General measures (carcinogenic agents)	Consider technical progress and process updates (including automation) to eliminate dispersions. Limit exposure by taking measurements such as closed systems, dedicated equipment and special suction / local exhaust ventilation systems. Drain the systems and clean the transfer lines before interrupting the containment. Clean / purge the equipment, if possible, before maintenance. Where exposure is available: limit access to authorized personnel only, provide operators with specific training on activities and operations to minimize exposure risk, wear gloves and protective suits to prevent skin contamination , use a respiratory protective device when required for certain exposure scenarios, immediately discard any leaks and dispose of the waste under safe conditions. Ensure the adoption of safe work systems or equivalent risk management solutions. Inspect, monitor, and maintain all devices and control measures. Take into account the need for a risk-based health surveillance system.
Film formation - accelerated drying, drying and other technologies	Manipulate the substance in a closed system. Ensure an adequate standard of general ventilation. Natural ventilation is done through doors, windows, etc. In controlled ventilation environments, the air is introduced or removed by an electric vacuum cleaner.
General Exposure (closed system)	Manipulate the substance in a closed system. Ensure an adequate standard of general ventilation. Natural ventilation is done through doors, windows, etc. In controlled ventilation environments, the air is introduced or removed by an electric vacuum cleaner.

Product transfer	Ensure that the transfer of the material takes place in containment or ith extract ventilation.
Lab activities	Handle only under a chemical hood or use equivalent methods to minimize exposure hazards.
Cleaning and maintenance of equipment	Drain and purge the system before opening or maintaining the equipment. Store drains in sealed containers until disposal or subsequent recycling. Immediately remove spills. Wear chemical protection gloves (conforming to EN374), together with a basic training course.
Storage	Make sure the operation is done outside. Store the substance inside a closed system.

Section 2.2 Envirnomental exposure control	
Product characteristics	
The substance is a UVCB complex. Mostly hydrophobic	
Quantity used	
EU tons fraction used locally	0.1
Regional tons (tons / year)	6.2e3
Regional tons fraction used locally	1.0
Site annual tons (tons/year)	6.2e3
Maximum site daily tons (kg/day)	2.1e4
Frequency and duration of use	
Continuous release	
Days of emission (days/year)	300
Environmental factors not influenced by risk management	
Local dilution factor in fresh water	10
Local dilution factor in sea water	100
Other operating conditions affecting environmental exposure	
Fraction released in the air by the process (initial release before the application of risk management measures)	0.98
Fraction released in wastewater by the process (initial release before the application of risk management measures)	0.007
Fraction released in the ground by the process (initial release before the application of risk management measures)	0
Technical measures and conditions at the process level (source) to prevent releases	
Procedures vary from site to site, so conservative process emissions estimates are used	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Prevent the release of undissolved substances or recover them from wastewater. Environmental risk is related to the indirect exposure of humans by ingestion. In case of drainage to a sewage treatment plant, no treatment is required.	
Handle emissions in such a way as to ensure a typical removal efficiency of (%).	94.1
Handle the waste water on site (before starting the unloading operation) to ensure the required removal efficiency ≥ (%):	92.6
In case of drainage to an urban wastewater treatment plant, ensure the effective removal required on site ≥ (%)	0
Organizational measures to prevent / limit the release from the site	
Do not distribute the sludge generated by the treatment of industrial waters on natural soils. Sludges generated by industrial water treatment must be incinerated, kept under containment or treated	
Conditions and measures for the municipal wastewater treatment plant	
Estimated removal of waste water by means of an urban treatment plant (%).	95.5
Total efficiency of wastewater removal, after adoption of RMMs in the site and offsite (urban treatment plant) (%)	95.5
Maximum allowed tons of site (MSafe) on the basis of the next release after total waste removal (kg/g).	2.1e4
Supposed flow for the urban wastewater treatment plant (m^3 / d)	2000
Conditions and measures related to the external treatment of waste for disposal	
The external treatment and disposal of waste must comply with applicable local and / or national legislation	
Conditions and measures for the external recovery of waste	
Waste collection and recycling must comply with applicable local and / or national legislation	
Section 3 Extimation of exposure	
3.1 Health	
For the purpose of assessing the exposure level at the workplace, where not expressly indicated, the ECETOC TRA method has been used.	
3.2 Environment	

The Hydrocarbon Block Method (HBM) was used to calculate the environmental exposure with the Petrorisk model.
Section 4
4.1 Health
It is expected that exposures will not exceed DN (M) EL when the Risk Management / Operating Conditions Measures described in Section 3 are applied. Where different Risk Management / Operating Conditions Measures are adopted, users are required to ensure that the risks are managed at least equivalent. Data on hazard characteristics do not allow the derivation of a DNEL for skin irritant effects. Data on hazard characteristics do not support the need to establish a DNEL for other health effects. Risk Management Measures are based on qualitative risk characterization.
4.2 Environment
The guide line is based on assumed conditions of use that may not apply to all sites; so you may need a scaling operation to define appropriate risk management measures for each site. The required efficiency of wastewater removal can be achieved by using onsite / offsite technologies, either individually or in combination. The required air removal efficiency can be achieved by using onsite technologies, either individually or in combination. Further information on scaling activities and control technologies is provided by the SpERC Technical Data Sheet (http://cefic.org/en/reach-for-industries-libraries.html). Local evaluations on EU refineries were carried out using site-specific data and they are attached to the PETRORISK - "Specific site site" worksheet.

6. Use in cleaning products

Section 1	
Title	
Use in cleaning products (GEST4_I)	
Usage descriptors	
Sector of Use	3
Process category	1, 2, 3, 8a, 8b
Environmental Release Category	4
Specific Environmental Release Category	ESVOC SpERC 4.4a.v1
Processes, Assignments, Covered Activities	
It covers use as a component of cleaning products inside closed or containment systems, including accidental exposures during transfer from the storage site, mixing / dilution in the preparatory phase and cleaning activities, as well as cleaning and maintenance of the equipment.	
Evaluation method	
See section 3.	
Section 2 Operative conditions and risk management measures	
Section 2.1 Workers'exposure control	
Product Characteristics	
Product physical state	Liquid, vapor pressure > 10 kPa in standard conditions.
Substance concentration in the product	It covers a percentage of substance in the product up to 100% (unless otherwise indicated).
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure up to 8 hours (unless otherwise indicated).
Human factors not influenced by risk management	n.a.
Other operating conditions affecting exposure	It requires the use of the product at a temperature not exceeding 20 ° C compared to room temperature, unless otherwise specified. It requires the application of a suitable basic hygiene standards in the workplace.
Exposure scenarios	**Specific measures for risk management and operational conditions**
General measures (skin irritants)	Avoid direct skin contact with the product. Identify potential indirect contact areas with the skin. Wear protective gloves (tested according to EN374) if there is a probability that the substance will come into contact with your hands. Eliminate contamination / spillage as soon as they occur. Immediately remove any contamination with the skin. Provide basic training to personnel aimed at preventing / limiting exposures and notifying any dermatological problems.
General measures (carcinogenic agents)	Consider technical progress and process updates (including automation) to eliminate dispersions. Limit exposure by taking measurements such as closed systems, dedicated equipment and special suction / local exhaust ventilation systems. Drain the systems and clean the transfer lines before interrupting the containment. Clean / purge the equipment, if possible, before maintenance. Where exposure is available: limit access to authorized personnel only, provide operators with specific training on activities and operations to minimize exposure risk, wear gloves and protective suits to prevent skin contamination , use a respiratory protective device when required for certain exposure scenarios, immediately discard any leaks and dispose of the waste under safe conditions. Ensure the adoption of safe work systems or equivalent risk management solutions. Inspect, monitor, and maintain all devices and control measures. Take into account the need for a risk-based health surveillance system.
Bulk products transfer	Ensure that the transfer of the material takes place in containment or extract ventilation
Use in systems under containment, Automated process with closed (semi) systems.	Manipulate the substance in a closed system. Wear protective gloves conforming to EN374.
Filling / preparation of equipment for drums or containers	Ensure that the transfer of the material takes place in containment or extract ventilation.
Cleaning and maintenance of equipment	Drain and purge the system before opening or maintaining the equipment.

	Store drains in sealed containers until disposal or subsequent recycling. Immediately remove spills. Wear chemical protection gloves (conforming to EN374), together with a basic training course.
Storage	Store the substance inside a closed system.
Section 2.2 Envirnomental exposure control	
Product characteristics	
The substance is a UVCB complex. Mostly hydrophobic	
Quantity used	
EU tons fraction used locally	0.1
Regional tons (tons / year)	5.12e2
Regional tons fraction used locally	0.2
Site annual tons (tons/year)	1.0e2
Maximum site daily tons (kg/day)	5.0e3
Frequency and duration of use	
Continuous release	
Days of emission (days/year)	20
Environmental factors not influenced by risk management	
Local dilution factor in fresh water	10
Local dilution factor in sea water	100
Other operating conditions affecting environmental exposure	
Fraction released in the air by the process (initial release before the application of risk management measures)	1.0
Fraction released in wastewater by the process (initial release before the application of risk management measures)	0.00003
Fraction released in the ground by the process (initial release before the application of risk management measures)	0
Technical measures and conditions at the process level (source) to prevent releases	
Procedures vary from site to site, so conservative process emissions estimates are used	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Prevent the release of undissolved substances or recover them from wastewater. Environmental risk is related to the indirect exposure of humans by ingestion. In case of drainage to a sewage treatment plant, no treatment is required.	
Handle emissions in such a way as to ensure a typical removal efficiency of (%).	70
Handle the waste water on site (before starting the unloading operation) to ensure the required removal efficiency ≥ (%):	4.4
In case of drainage to an urban wastewater treatment plant, ensure the effective removal required on site ≥ (%)	0
Organizational measures to prevent / limit the release from the site	
Do not distribute the sludge generated by the treatment of industrial waters on natural soils. Sludges generated by industrial water treatment must be incinerated, kept under containment or treated.	
Conditions and measures for the municipal wastewater treatment plant	
Estimated removal of waste water by means of an urban treatment plant (%).	95.5
Total efficiency of wastewater removal, after adoption of RMMs in the site and offsite (urban treatment plant) (%)	95.5
Maximum allowed tons of site (MSafe) on the basis of the next release after total waste removal (kg/g).	2.9e4
Supposed flow for the urban wastewater treatment plant (m^3 / d)	2000
Conditions and measures related to the external treatment of waste for disposal	
The external treatment and disposal of waste must comply with applicable local and / or national legislation	
Conditions and measures for the external recovery of waste	
Waste collection and recycling must comply with applicable local and / or national legislation	
Section 3 Extimation of exposure	
3.1 Health	
For the purpose of assessing the exposure level at the workplace, where not expressly indicated, the ECETOC TRA method has been used.	
3.2 Environment	

The Hydrocarbon Block Method (HBM) was used to calculate the environmental exposure with the Petrorisk model.
Section 4
4.1 Health
It is expected that exposures will not exceed DN (M) EL when the Risk Management / Operating Conditions Measures described in Section 3 are applied. Where different Risk Management / Operating Conditions Measures are adopted, users are required to ensure that the risks are managed at least equivalent. Data on hazard characteristics do not allow the derivation of a DNEL for skin irritant effects. Data on hazard characteristics do not support the need to establish a DNEL for other health effects. Risk Management Measures are based on qualitative risk characterization.
4.2 Environment
The guide line is based on assumed conditions of use that may not apply to all sites; so you may need a scaling operation to define appropriate risk management measures for each site. The required efficiency of wastewater removal can be achieved by using onsite / offsite technologies, either individually or in combination. The required air removal efficiency can be achieved by using onsite technologies, either individually or in combination. Further information on scaling activities and control technologies is provided by the SpERC Technical Data Sheet (http://cefic.org/en/reach-for-industries-libraries.html). Local evaluations on EU refineries were carried out using site-specific data and they are attached to the PETRORISK - "Specific site site" worksheet.

7. Use as fuel - Industrial sector

Section 1	
Title	
Use as fuel	
Usage descriptors	
Sector of Use	3
Process category	1, 2, 3, 8a, 8b, 16
Environmental Release Category	7
Specific Environmental Release Category	ESVOC SpERC 7.12a.v1
Processes, Assignments, Covered Activities	
It covers use as fuel (or fuel additive and additive component) within closed or containment systems, including accidental exposures during the activities associated with the transfer, use, maintenance of equipment and handling of products waste.	
Evaluation method	
See section 3.	
Section 2 Operative conditions and risk management measures	
Section 2.1 Workers'exposure control	
Product Characteristics	
Product physical state	Liquid, vapor pressure > 10 kPa in standard conditions.
Substance concentration in the product	It covers a percentage of substance in the product up to 100% (unless otherwise indicated).
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure up to 8 hours (unless otherwise indicated).
Human factors not influenced by risk management	n.a.
Other operating conditions affecting exposure	It requires the use of the product at a temperature not exceeding 20 ° C compared to room temperature, unless otherwise specified. It requires the application of a suitable basic hygiene standards in the workplace.
Exposure scenarios	**Specific measures for risk management and operational conditions**
General measures (skin irritants)	Avoid direct skin contact with the product. Identify potential indirect contact areas with the skin. Wear protective gloves (tested according to EN374) if there is a probability that the substance will come into contact with your hands. Eliminate contamination / spillage as soon as they occur. Immediately remove any contamination with the skin. Provide basic training to personnel aimed at preventing / limiting exposures and notifying any dermatological problems.
General measures (carcinogenic agents)	Consider technical progress and process updates (including automation) to eliminate dispersions. Limit exposure by taking measurements such as closed systems, dedicated equipment and special suction / local exhaust ventilation systems. Drain the systems and clean the transfer lines before interrupting the containment. Clean / purge the equipment, if possible, before maintenance. Where exposure is available: limit access to authorized personnel only, provide operators with specific training on activities and operations to minimize exposure risk, wear gloves and protective suits to prevent skin contamination , use a respiratory protective device when required for certain exposure scenarios, immediately discard any leaks and dispose of the waste under safe conditions. Ensure the adoption of safe work systems or equivalent risk management solutions. Inspect, monitor, and maintain all devices and control measures. Take into account the need for a risk-based health surveillance system.
Closed unloading of bulk products	Ensure that the transfer of the material takes place in containment or with extract ventilation.
Drums/lots transfer	Ensure that the transfer of the material takes place in containment or with extract ventilation.
Refueling	Ensure that the transfer of the material takes place in containment or with extract ventilation.
Aircraft supply	Ensure that the transfer of the material takes place in containment or with extract ventilation.
General exposure (closed system)	Manipulate the substance in a closed system.

	Ensure an adequate standard of general ventilation. Natural ventilation is done through doors, windows, etc. In controlled ventilation environments, the air is introduced or removed by an electric vacuum cleaner.
Use as a fuel (closed system)	Manipulate the substance in a closed system.
Cleaning and maintenance of equipment	Drain the system before opening or maintaining the equipment. Store drains in sealed containers until disposal or subsequent recycling. Immediately remove spills. Ensure an adequate standard of general ventilation. Natural ventilation is done through doors, windows, etc. In controlled ventilation environments, the air is introduced or removed by an electric vacuum cleaner. Wear chemical protection gloves (conforming to EN374), together with a basic training course.
Storage	Store the substance inside a closed system. Ensure an adequate standard of general ventilation. Natural ventilation is done through doors, windows, etc. In controlled ventilation environments, the air is introduced or removed by an electric vacuum cleaner.

Section 2.2 Envirnomental exposure control	
Product characteristics	
The substance is a UVCB complex. Mostly hydrophobic	
Quantity used	
EU tons fraction used locally	0.1
Regional tons (tons / year)	1.4e6
Regional tons fraction used locally	1
Site annual tons (tons/year)	1.4e6
Maximum site daily tons (kg/day)	4.6e6
Frequency and duration of use	
Continuous release	
Days of emission (days/year)	300
Environmental factors not influenced by risk management	
Local dilution factor in fresh water	10
Local dilution factor in sea water	100
Other operating conditions affecting environmental exposure	
Fraction released in the air by the process (initial release before the application of risk management measures)	0.0025
Fraction released in wastewater by the process (initial release before the application of risk management measures)	0.00001
Fraction released in the ground by the process (initial release before the application of risk management measures)	0
Technical measures and conditions at the process level (source) to prevent releases	
Procedures vary from site to site, so conservative process emissions estimates are used	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Environmental risk is related to the indirect exposure of humans by ingestion. In case of drainage to a sewage treatment plant, no treatment is required.	
Handle emissions in such a way as to ensure a typical removal efficiency of (%).	99.4
Handle the waste water on site (before starting the unloading operation) to ensure the required removal efficiency ≥ (%):	76.9
In case of drainage to an urban wastewater treatment plant, ensure the effective removal required on site ≥ (%)	0
Organizational measures to prevent / limit the release from the site	
Do not distribute the sludge generated by the treatment of industrial waters on natural soils. Sludges generated by industrial water treatment must be incinerated, kept under containment or treated.	
Conditions and measures for the municipal wastewater treatment plant	
Estimated removal of waste water by means of an urban treatment plant (%).	95.5
Total efficiency of wastewater removal, after adoption of RMMs in the site and offsite (urban treatment plant) (%)	95.5
Maximum allowed tons of site (MSafe) on the basis of the next release after total waste removal (kg/g).	4.6e6
Supposed flow for the urban wastewater treatment plant (m^3 / d)	2000
Conditions and measures related to the external treatment of waste for disposal	
Combustion emissions are governed by current control measures. Emissions to combustion are taken into account in the impact assessment at regional level.	
Conditions and measures for the external recovery of waste	
Waste collection and recycling must comply with applicable local and / or national legislation	
Section 3 Extimation of exposure	

3.1 Health
For the purpose of assessing the exposure level at the workplace, where not expressly indicated, the ECETOC TRA method has been used.
3.2 Environment
The Hydrocarbon Block Method (HBM) was used to calculate the environmental exposure with the Petrorisk model.
Section 4
4.1 Health
It is expected that exposures will not exceed DN (M) EL when the Risk Management / Operating Conditions Measures described in Section 3 are applied. Where different Risk Management / Operating Conditions Measures are adopted, users are required to ensure that the risks are managed at least equivalent. Data on hazard characteristics do not allow the derivation of a DNEL for skin irritant effects. Data on hazard characteristics do not support the need to establish a DNEL for other health effects. Risk Management Measures are based on qualitative risk characterization.
4.2 Environment
The guide line is based on assumed conditions of use that may not apply to all sites; so you may need a scaling operation to define appropriate risk management measures for each site. The required efficiency of wastewater removal can be achieved by using onsite / offsite technologies, either individually or in combination. The required air removal efficiency can be achieved by using onsite technologies, either individually or in combination. Further information on scaling activities and control technologies is provided by the SpERC Technical Data Sheet (http://cefic.org/en/reach-for-industries-libraries.html). Local evaluations on EU refineries were carried out using site-specific data and they are attached to the PETRORISK - "Specific site site" worksheet.

8. Use as fuel – Professional sector

Section 1	
Title	
Use as fuel	
Usage descriptors	
Sector of Use	22
Process category	1, 2, 3, 8a, 8b, 16
Environmental Release Category	9a, 9b
Specific Environmental Release Category	ESVOC SpERC 9.12.v1
Processes, Assignments, Covered Activities	
It covers use as fuel (or fuel additive and additive component) within closed or containment systems, including accidental exposures during the activities associated with the transfer, use, maintenance of equipment and handling of products waste.	
Evaluation method	
See section 3.	
Section 2 Operative conditions and risk management measures	
Section 2.1 Workers'exposure control	
Product Characteristics	
Product physical state	Liquid, vapor pressure > 10 kPa in standard conditions.
Substance concentration in the product	It covers a percentage of substance in the product up to 100% (unless otherwise indicated).
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure up to 8 hours (unless otherwise indicated).
Human factors not influenced by risk management	n.a.
Other operating conditions affecting exposure	It requires the use of the product at a temperature not exceeding 20 ° C compared to room temperature, unless otherwise specified. It requires the application of a suitable basic hygiene standards in the workplace.
Exposure scenarios	**Specific measures for risk management and operational conditions**
General measures (skin irritants)	Avoid direct skin contact with the product. Identify potential indirect contact areas with the skin. Wear protective gloves (tested according to EN374) if there is a probability that the substance will come into contact with your hands. Eliminate contamination / spillage as soon as they occur. Immediately remove any contamination with the skin. Provide basic training to personnel aimed at preventing / limiting exposures and notifying any dermatological problems.
General measures (carcinogenic agents)	Consider technical progress and process updates (including automation) to eliminate dispersions. Limit exposure by taking measurements such as closed systems, dedicated equipment and special suction / local exhaust ventilation systems. Drain the systems and clean the transfer lines before interrupting the containment. Clean / purge the equipment, if possible, before maintenance. Where exposure is available: limit access to authorized personnel only, provide operators with specific training on activities and operations to minimize exposure risk, wear gloves and protective suits to prevent skin contamination , use a respiratory protective device when required for certain exposure scenarios, immediately discard any leaks and dispose of the waste under safe conditions. Ensure the adoption of safe work systems or equivalent risk management solutions. Inspect, monitor, and maintain all devices and control measures. Take into account the need for a risk-based health surveillance system.
General exposure (closed system), outside	Manipulate the substance in a closed system.
Closed unloading of bulk products	Ensure that the transfer of the material takes place in containment or with extract ventilation.
Drums/lots transfer	Ensure that the transfer of the material takes place in containment or with extract ventilation.
Refueling	Ensure that the transfer of the material takes place in containment or with extract ventilation.
Aircraft supply	Ensure that the transfer of the material takes place in containment or with extract

	ventilation.
Use as fuel (closed system)	Manipulate the substance in a closed system.
Cleaning and maintenance of equipment	Drain the system before opening or maintaining the equipment. Store drains in sealed containers until disposal or subsequent recycling. Immediately remove spills. Ensure an adequate standard of general ventilation. Natural ventilation is done through doors, windows, etc. In controlled ventilation environments, the air is introduced or removed by an electric vacuum cleaner. Ensure that operating personnel are properly formed in order to limit any exposure.
Storage	Store the substance inside a closed system. Ensure an adequate standard of general ventilation. Natural ventilation is done through doors, windows, etc. In controlled ventilation environments, the air is introduced or removed by an electric vacuum cleaner.

Section 2.2 Envirnomental exposure control	
Product characteristics	
The substance is a UVCB complex. Mostly hydrophobic	
Quantity used	
EU tons fraction used locally	0.1
Regional tons (tons / year)	1.19e6
Regional tons fraction used locally	0.0005
Site annual tons (tons/year)	5.9e2
Maximum site daily tons (kg/day)	1.6e3
Frequency and duration of use	
Continuous release	
Days of emission (days/year)	365
Environmental factors not influenced by risk management	
Local dilution factor in fresh water	10
Local dilution factor in sea water	100
Other operating conditions affecting environmental exposure	
Fraction released in the air by the process (initial release before the application of risk management measures)	0.01
Fraction released in wastewater by the process (initial release before the application of risk management measures)	0.00001
Fraction released in the ground by the process (initial release before the application of risk management measures)	0.00001
Technical measures and conditions at the process level (source) to prevent releases	
Procedures vary from site to site, so conservative process emissions estimates are used	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Environmental risk is related to the indirect exposure of humans by ingestion. In case of drainage to a sewage treatment plant, no treatment is required.	
Handle emissions in such a way as to ensure a typical removal efficiency of (%).	N/A
Handle the waste water on site (before starting the unloading operation) to ensure the required removal efficiency ≥ (%):	3.4
In case of drainage to an urban wastewater treatment plant, ensure the effective removal required on site ≥ (%)	0
Organizational measures to prevent / limit the release from the site	
Do not distribute the sludge generated by the treatment of industrial waters on natural soils. Sludges generated by industrial water treatment must be incinerated, kept under containment or treated.	
Conditions and measures for the municipal wastewater treatment plant	
Estimated removal of waste water by means of an urban treatment plant (%).	95.5
Total efficiency of wastewater removal, after adoption of RMMs in the site and offsite (urban treatment plant) (%)	95.5
Maximum allowed tons of site (MSafe) on the basis of the next release after total waste removal (kg/g).	1.5e4
Supposed flow for the urban wastewater treatment plant (m^3 / d)	2000
Conditions and measures related to the external treatment of waste for disposal	
Combustion emissions are governed by current control measures. Emissions to combustion are taken into account in the impact assessment at regional level.	
Conditions and measures for the external recovery of waste	
Waste collection and recycling must comply with applicable local and / or national legislation	
Section 3 Extimation of exposure	
3.1 Health	
For the purpose of assessing the exposure level at the workplace, where not expressly indicated, the ECETOC TRA method has	

been used.
3.2 Environment
The Hydrocarbon Block Method (HBM) was used to calculate the environmental exposure with the Petrorisk model.
Section 4
4.1 Health
It is expected that exposures will not exceed DN (M) EL when the Risk Management / Operating Conditions Measures described in Section 3 are applied. Where different Risk Management / Operating Conditions Measures are adopted, users are required to ensure that the risks are managed at least equivalent. Data on hazard characteristics do not allow the derivation of a DNEL for skin irritant effects. Data on hazard characteristics do not support the need to establish a DNEL for other health effects. Risk Management Measures are based on qualitative risk characterization.
4.2 Environment
The guide line is based on assumed conditions of use that may not apply to all sites; so you may need a scaling operation to define appropriate risk management measures for each site. The required efficiency of wastewater removal can be achieved by using onsite / offsite technologies, either individually or in combination. The required air removal efficiency can be achieved by using onsite technologies, either individually or in combination. Further information on scaling activities and control technologies is provided by the SpERC Technical Data Sheet (http://cefic.org/en/reach-for-industries-libraries.html). Local evaluations on EU refineries were carried out using site-specific data and they are attached to the PETRORISK - "Specific site site" worksheet.

9. Use as fuel – Consumers

Section 1		
Title		
Use as fuel		
Usage descriptors		
Sector of Use	21	
Process category	13	
Environmental Release Category	9a, 9b	
Specific Environmental Release Category	ESVOC SpERC 9.12c.v1	
Processes, Assignments, Covered Activities		
It covers the use by the consumer as liquid fuel		
Evaluation method		
See section 3.		
Section 2 Operative conditions and risk management measures		
Section 2.1 Workers'exposure control		
Product Characteristics		
Product physical state	Liquid, vapor pressure> 10 kPa under standard conditions.	
Substance concentration in the product	Unless otherwise specified it covers concentrations up to 100 (%)	
Quantity used	Unless otherwise specified, it consumes up to 37500 grams; covers a skin contact area up to 420 cm^2.	
Frequency and duration of use/exposure	Unless otherwise specified, it includes usage frequencies up to 0.413 times a day; covers exposures up to 2 hours for each event.	
Other operating conditions affecting exposure	Unless otherwise specified, use at room temperature is assumed; it is assumed to be used in a room of 20 m^3; It is assumed to be used with typical ventilation conditions.	
Exposure scenarios	**Specific measures for risk management and operational conditions**	
Fuel - Liquid - Subcategory Added: fuel supply for motor vehicles	OC	Unless otherwise specified it includes concentrations up to 1 (%); includes up to 52 days / year usage; includes usage frequencies up to 1 time per day; includes a skin contact area up to 210.00 cm^2; for each use it consumes up to 37500 grams; it includes outdoor use; it is used in a room of 100 m^3; for each use it includes exposures up to 0.04 hours per event.
	RMM	No specific value of RMM developed beyond the reported OCs.
Fuel - Liquid - Subcategory Added: fuel supply for scooters	OC	Unless otherwise specified it includes concentrations up to 1 (%); includes up to 52 days / year usage; includes usage frequencies up to 1 time per day; includes a skin contact area up to 210.00 cm^2; for each use it consumes up to 3750 grams; it includes outdoor use; it is used in a room of 100 m^3; for each use it includes exposures up to 0.03 hours per event.
	RMM	No specific value of RMM developed beyond the reported OCs.
Fuel - liquid - subcategory added: garden equipment - use	OC	Unless otherwise specified it includes concentrations up to 1 (%); includes up to 26 days / year usage; includes usage frequencies up to 1 time per day; for each use it consumes up to 750 grams; it includes outdoor use; it is used in a room of 100 m^3; for each use it includes exposures up to 2.00 hours per event.
	RMM	No specific value of RMM developed beyond the reported OCs.
Fuel - liquid - subcategory added: garden equipment - refueling	OC	Unless otherwise specified it includes concentrations up to 1 (%); includes up to 26 days / year usage; includes usage frequencies up to 1 time per day; It includes a skin contact area up to 420.00 cm^2; for each use it consumes up to 750 grams; it includes use in a garage for cars (34 m^3) under typical ventilation conditions; it is used in a room of 34 m^3; for each use it includes exposures up to 0.03 hours per event.
	RMM	No specific value of RMM developed beyond the reported OCs.
Section 2.2 Envirnomental exposure control		
Product characteristics		
The substance is a UVCB complex. Mostly hydrophobic		
Quantity used		
EU tons fraction used locally		0.1

Regional tons (tons / year)	1.39e7
Regional tons fraction used locally	0.0005
Site annual tons (tons/year)	7.0e3
Maximum site daily tons (kg/day)	1.9e4
Frequency and duration of use	
Continuous release	
Days of emission (days/year)	365
Environmental factors not influenced by risk management	
Local dilution factor in fresh water	10
Local dilution factor in sea water	100
Other operating conditions affecting environmental exposure	
Fraction released in the air by the process (initial release before the application of risk management measures)	0.01
Fraction released in wastewater by the process (initial release before the application of risk management measures)	0.00001
Fraction released in the ground by the process (initial release before the application of risk management measures)	0.00001
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Environmental risk is related to the indirect exposure of humans (mainly inhalation)	
Handle emissions in such a way as to ensure a typical removal efficiency of (%).	95.5
Handle the waste water on site (before starting the unloading operation) to ensure the required removal efficiency ≥ (%):	1.8e5
In case of drainage to an urban wastewater treatment plant, ensure the effective removal required on site ≥ (%)	2000
Conditions and measures related to the external treatment of waste for disposal	
Combustion emissions are governed by current control measures. Emissions to combustion are taken into account in the impact assessment at regional level.	
Conditions and measures for the external recovery of waste	
This substance is consumed during use and no rejection of the substance is to be recovered.	
Section 3 Extimation of exposure	
3.1 Health	
For the purpose of assessing the exposure level at the workplace, where not expressly indicated, the ECETOC TRA method has been used.	
3.2 Environment	
The Hydrocarbon Block Method (HBM) was used to calculate the environmental exposure with the Petrorisk model.	
Section 4	
4.1 Health	
No evaluation of the exposures was presented for human health. Where different Risk Management / Operating Conditions are adopted, users are required to ensure that risks are managed at least equivalent.	
4.2 Environment	
The guide line is based on assumed conditions of use that may not apply to all sites; so you may need a scaling operation to define appropriate risk management measures for each site. Further information on scaling activities and control technologies is provided by the SpERC Technical Data Sheet (http://cefic.org/en/reach-for-industries-libraries.html).	

10. Production and processing of rubber

Section 1	
Title	
Production and processing of rubber	
Usage descriptors	
Sector of Use	3, 10, 11
Process category	1, 2, 3, 8a, 8b, 9, 210
Environmental Release Category	1, 4, 6d
Processes, Assignments, Covered Activities	
Production of tires and generic rubber articles in closed or under containment systems, including accidental exposure during the processing of raw rubber (unworked), handling and mixing of rubber additives, classification, vulcanization, cooling, finishing and maintenance.	
Evaluation method	
See section 3.	
Section 2 Operative conditions and risk management measures	
Section 2.1 Workers'exposure control	
Product Characteristics	
Product physical state	Liquid, vapor pressure > 10 kPa in standard conditions.
Substance concentration in the product	It covers a percentage of substance in the product up to 100% (unless otherwise indicated).
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure of up to 8 hours (unless otherwise specified).
Human factors not influenced by risk mangement	n.a.
Exposure scenarios	**Specific measures for risk management and operational conditions**
General measures (skin irritants)	Avoid direct skin contact with the product. Identify potential indirect contact areas with the skin. Wear protective gloves (tested according to EN374) if there is a probability that the substance will come into contact with your hands. Eliminate contamination / spillage as soon as they occur. Immediately remove any contamination with the skin. Provide basic training to personnel aimed at preventing / limiting exposures and notifying any dermatological problems.
General measures (carcinogenic agents)	Consider technical progress and process updates (including automation) to eliminate dispersions. Limit exposure by taking measurements such as closed systems, dedicated equipment and special suction / local exhaust ventilation systems. Drain the systems and clean the transfer lines before interrupting the containment. Clean / purge the equipment, if possible, before maintenance. Where exposure is available: limit access to authorized personnel only, provide operators with specific training on activities and operations to minimize exposure risk, wear gloves and protective suits to prevent skin contamination , use a respiratory protective device when required for certain exposure scenarios, immediately discard any leaks and dispose of the waste under safe conditions. Ensure the adoption of safe work systems or equivalent risk management solutions. Inspect, monitor, and maintain all devices and control measures. Take into account the need for a risk-based health surveillance system.
Product transfers (closed systems)	Store the substance inside a closed system. Ensure that the transfer of the material takes place in containment or extract ventilation.
General Exposure (closed systems)	Manipolare la sostanza in un sistema chiuso.
Product transfers	Ensure that the transfer of the material takes place in containment or extract ventilation.
Weigh bulk products	Manipulate the substance in a closed system. Wear protective gloves conforming to EN374.
Laboratory activities	Handle only under a chemical hood or use equivalent methods to minimize exposure hazards.
Cleaning and maintenance of equipment	Drain the system before opening or maintaining the equipment. Store drains in sealed containers until disposal or subsequent recycling.

	Immediately remove spills. Ensure an adequate standard of general ventilation. Natural ventilation is done through doors, windows, etc. In controlled ventilation environments, the air is introduced or removed by an electric vacuum cleaner. Ensure that operating personnel are properly formed in order to limit any exposure.
Section 2.2 Envirnomental exposure control	
Product characteristics	
The substance is a UVCB complex. Mostly hydrophobic	
Quantity used	
EU tons fraction used locally	0.1
Regional tons (tons / year)	94
Regional tons fraction used locally	1
Site annual tons (tons/year)	94
Maximum site daily tons (kg/day)	4.7e3
Frequency and duration of use	
Continuous release	
Days of emission (days/year)	20
Environmental factors not influenced by risk management	
Local dilution factor in fresh water	10
Local dilution factor in sea water	100
Other operating conditions affecting environmental exposure	
Fraction released in the air by the process (initial release before the application of risk management measures)	0.003
Fraction released in wastewater by the process (initial release before the application of risk management measures)	0.01
Fraction released in the ground by the process (initial release before the application of risk management measures)	0.0001
Technical measures and conditions at the process level (source) to prevent releases	
Procedures vary from site to site, so conservative process emissions estimates are used	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Prevent the release of undissolved substances or recover them from wastewater. Environmental risk is related to the indirect exposure of humans by ingestion. In case of drainage to a sewage treatment plant, no treatment is required.	
Handle emissions in such a way as to ensure a typical removal efficiency of (%).	0
Handle the waste water on site (before starting the unloading operation) to ensure the required removal efficiency ≥ (%):	23.9
In case of drainage to an urban wastewater treatment plant, ensure the effective removal required on site ≥ (%)	0
Organizational measures to prevent / limit the release of the site	
Do not distribute the sludge generated by the treatment of industrial waters on natural soils. Sludges generated by industrial water treatment must be incinerated, kept under containment or treated	
Conditions and measures for the municipal wastewater treatment plant	
Estimated removal of waste water by means of an urban treatment plant (%).	95.5
Total efficiency of wastewater removal, after adoption of RMMs in the site and offsite (urban treatment plant) (%)	95.5
Maximum allowed tons of site (MSafe) on the basis of the next release after total waste removal (kg/g).	4.2e4
Supposed flow for the urban wastewater treatment plant (m^3 / d)	2000
Conditions and measures related to the external treatment of waste for disposal	
The external treatment and disposal of waste must comply with applicable local and / or national legislation	
Conditions and measures for the external recovery of waste	
Waste collection and recycling must comply with applicable local and / or national legislation	
Section 3 Extimation of exposure	
3.1 Health	
For the purpose of assessing the exposure level at the workplace, where not expressly indicated, the ECETOC TRA method has been used.	
3.2 Environment	

The Hydrocarbon Block Method (HBM) was used to calculate the environmental exposure with the Petrorisk model.
Section 4
4.1 Health
It is expected that exposures will not exceed DN (M) EL when the Risk Management / Operating Conditions Measures described in Section 3 are applied. Where different Risk Management / Operating Conditions Measures are adopted, users are required to ensure that the risks are managed at least equivalent. Data on hazard characteristics do not allow the derivation of a DNEL for skin irritant effects. Data on hazard characteristics do not support the need to establish a DNEL for other health effects. Risk Management Measures are based on qualitative risk characterization.
4.2 Environment
The guide line is based on assumed conditions of use that may not apply to all sites; so you may need a scaling operation to define appropriate risk management measures for each site. The required efficiency of wastewater removal can be achieved by using onsite / offsite technologies, either individually or in combination. The required air removal efficiency can be achieved by using onsite technologies, either individually or in combination. Further information on scaling activities and control technologies is provided by the SpERC Technical Data Sheet (http://cefic.org/en/reach-for-industries-libraries.html). Local evaluations on EU refineries were carried out using site-specific data and they are attached to the PETRORISK - "Specific site site" worksheet.

ETBE

1. Using ETBE in fuels - Industrial sector

Section 1		
Title		
Using ETE in fuels; CAS NR 637-92-3		
Usage descriptors		
Sector of Use	Industrial (SU3)	
Process category	PROC1, PROC2, PROC3, PROC8A, PROC8B, PROC16	
Environmental Release Category	ESVOC3 SpERC	
Processes, Assignments, Covered Activities		
It covers use as fuel (or fuel additive), including the activities associated with the transfer, use, maintenance of equipment and waste disposal.		
Section 2 Operative conditions and risk management measures		
Section 2.1 Workers'exposure control		
Product Characteristics		
Product physical state	Liquid, vapor pressure> 10 kPa under standard conditions.	
Substance concentration in the product	It covers a percentage of substance in the product up to 15%	
Quantity used	n.a.	
Frequency and duration of use/exposure	It covers a daily exposure of up to 8 hours (unless otherwise specified).	
Human factors not influenced by risk management	n.a.	
Other operating conditions affecting exposure	It requires the application of a suitable basic hygiene standards in the workplace.	
Exposure scenarios	**Specific measures for risk management and operational conditions**	
Transfer of bulk products; Discontinuous process with sampling; Filling / preparation of equipment from drums or containers.	Manipulate the substance within a predominantly closed system equipped with extraction ventilation. Do not undertake activities that allow exposure for more than 4 hours. Wear a whole mask (EN140 compliant) with Type A or above filter.	
Stock / batch transfers; Filling / preparation of equipment from drums or containers; Transfer of bulk products; dedicated structure.	Use pumps for drums.	
General Exposure (closed systems)	Specific measures have not been identified.	
General Exposure (closed systems) with sampling	Ensure an extract ventilation system at the material transfer points and at other openings.	
General Exposure (closed systems); Use in discontinuous processes under containment; with sampling.	Provide extraction ventilation at the points where the emissions occur.	
(closed systems); use of fuel.	Specific measures have not been identified.	
Cleaning and maintenance of equipment; non-dedicated structure such as repair of fuel pumps inside buildings.	Drain the system before opening or maintaining the equipment. Do not undertake activities that allow exposure for more than 4 hours.	
Storage; General Exposure (closed systems)	Specific measures have not been identified.	
Storage; General Exposure (closed systems); with sampling.	Make sure the operation is done outside	
Section 2.2 Envirnomental exposure control		
Product characteristics		
The substance is formed by a single chemical entity; predominantly hydrophobic; Ready biodegradable.		
Transport and distribution		
Operating conditions		
For outdoor use.		
Quantity used		
Regional tons (tons / year)		901,000
Regional tons fraction used locally		0.02

Average Daily Tons of the Site (kg / day)		51,486
Site annual tons (tons/year)		18,020
Frequency and duration of use		
Continuous release		
Emission days (days/year)		350
Other operating conditions affecting environmental exposure		
Use in closed systems, in dry or humid processes.		
Fraction released into the air from the process		1.00e-04
Fraction released into waste water from the process		1.00e-05
Fraction released from the process (only regional)		1.00e-05
RMMs		
Technical measures and conditions at the process level (source) to prevent releases		
Procedures vary from site to site, so conservative process emissions estimates are used		
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground		
Air	No air emission control required; required removal efficiency of 0%	
Waste water	Treat waste water on site (before starting the unloading operation) to ensure the removal efficiency required> 95%	
Ground	Handle emissions in such a way as to ensure a typical removal efficiency of 0%	
Organizational measures to prevent / limit the release from the site		
Prevent the release of undigested substances or their recovery from wastewater.		
Conditions and measures for the municipal wastewater treatment plant.		
It is assumed that the discharge flow from the industrial waste water treatment plant is 2000 m^3 / day.		
Conditions and measures related to the external treatment of waste for disposal		
n.a.		
Conditions and measures for the external recovery of waste		
n.a.		
Other environmental control measures in addition to the previous ones		
None		

2. Using ETBE in fuels - Professional sector

Section 1	
Title	
Using ETBE in fuels; CAS NR 637-92-3	
Usage descriptors	
Sector of Use	Professional (SU22)
Process category	PROC1, PROC2, PROC3, PROC8A, PROC8B, PROC9, PROC16
Environmental Release Category	ESVOC30 SpERC
Processes, Assignments, Covered Activities	
It covers use as fuel (or fuel additive), including the activities associated with the transfer, use, maintenance of equipment and waste disposal.	
Section 2 Operative conditions and risk management measures	
Section 2.1 Workers'exposure control	
Product Characteristics	
Product physical state	Liquid, vapor pressure> 10 kPa under standard conditions.
Substance concentration in the product	It covers a percentage of substance in the product up to 15%
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure of up to 8 hours (unless otherwise specified).
Human factors not influenced by risk management	n.a.
Other operating conditions affecting exposure	It requires the application of a suitable basic hygiene standards in the workplace.
Exposure scenarios	**Specific measures for risk management and operational conditions**
Transfer of bulk products; Discontinuous process with sampling; Filling / preparation of equipment from drums or containers.	Manipulate the substance within a predominantly closed system equipped with extraction ventilation. Do not undertake activities that allow exposure for more than 4 hours. Wear a whole mask (EN140 compliant) with Type A or above filter.
Stock / batch transfers; filling / preparing equipment from drums or containers; Transfer of bulk products; dedicated structure.	Make sure the operation is done outside. Ensure that the transfer of the material takes place in containment or extract ventilation.
Refueling	Ensure an adequate standard of controlled ventilation (10 to 15 air units per hour). Do not perform activities that allow for exposure for more than 1 hour. Wear a whole mask (EN140 compliant) with Type A or above filter.
General Exposure (closed systems); with sampling	Do not undertake activities that allow for exposure for more than 4 hours. Wear a whole mask (EN140 compliant) with Type A or above filter.
General Exposure (closed systems); Use in discontinuous processes under containment; with sampling	Ensure an adequate standard of controlled ventilation (10 to 15 air units per hour).
Filling barrels and small containers; dedicated structure	Use drum pumps or pay special attention when loading from containers. Do not undertake activities that allow exposure for more than 4 hours. Wear a whole mask (EN140 compliant) with Type A or above filter.
(closed systems); use of fuel.	Make sure the operation is done outside. Ensure an adequate standard of controlled ventilation (10 to 15 air units per hour).
Cleaning and maintenance of equipment. non-dedicated structure such as repair of fuel pumps inside buildings.	Drain and purge the system before opening or maintaining the equipment. Do not undertake activities that allow for exposure for more than 4 hours. Wear a whole mask (EN140 compliant) with Type A or above filter.
Cleaning and maintenance of equipment. Structure not dedicated eg repair of fuel pumps outside of buildings.	Drain and purge the system before opening or maintaining the equipment. Do not undertake activities that allow for exposure for more than 4 hours. Wear a whole mask (EN140 compliant) with Type A or above filter.
Storage; General Exposure (closed systems)	Specific measures have not been identified.
Section 2.2 Envirnomental exposure control	
Product characteristics	
The substance is formed by a single chemical entity; predominantly hydrophobic; Ready biodegradable.	

Operating conditions		
For outdoor use.		
Quantity used		
Average daily consumption for a dispersive type of use (Kg / day)		4.94
Frequency and duration of use		
Dispersive use		
Emission days (days/year)		365
Other operating conditions affecting environmental exposure		
Use in open systems		
Fraction released in the air from strongly dispersive use (only regional)		1.00e-2
Fracture released in wastewater from strongly dispersive use		1.00e-05
Fracture released on the surface of the water from strongly dispersive use (only regional)		1.00e-04
Fraction released in the soil from strongly dispersive use (only regional)		1.00e-05
RMMs		
Technical measures and conditions at the process level (source) to prevent releases		
Procedures vary from site to site, so conservative process emissions estimates are used		
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground		
Air	No air emission control required; required removal efficiency of 0%	
Waste water	Treat waste water on site (before starting the unloading operation) to ensure the removal efficiency required> 95%	
Ground	Handle emissions in such a way as to ensure a typical removal efficiency of 0%	
Organizational measures to prevent / limit the release from the site		
Prevent the release of undigested substances or their recovery from wastewater.		
Conditions and measures for the municipal wastewater treatment plant.		
It is assumed that the discharge flow from the industrial waste water treatment plant is 2000 m^3 / day.		
Conditions and measures related to the external treatment of waste for disposal		
n.a.		
Conditions and measures for the external recovery of waste		
n.a.		
Other environmental control measures in addition to the previous ones		
None		

3. Using ETBE in fuels – Consumer

Section 1			
Title			
Using ETBE in fuels; CAS NR 637-92-3			
Usage descriptors			
Sector of Use	Consumer		
Process category	PC13		
Environmental Release Category	ERC8d		
Specific Environmental Release category	ESVOC30 SpERC		
Processes, tasks, activities covered			
Using fuel for fueling in 2 and 4 stroke engines.			
Section 2 Operative conditions and risk management measures			
Section 2.1 Workers'exposure control			
Product Characteristics			
Product physical state	Liquid, vapor pressure> 10 kPa under standard conditions.		
Vapour pressure	170 hPa at 25°C		
Concentration of the substance into the product	Diesel, containing <15% of the substance		
Quantity used	Up to 60 liters for refueling		
Frequency and duration of use/exposure	Up to 3 times a week		
Other operating conditions affecting exposure	Unless otherwise specified, use at room temperature is recommended.		
Exposure scenarios	**Specific measures for risk management and operational conditions**		
PC13: Fuel	OC	Unless otherwise specified, it includes concentrations up to 15%; includes uses up to 150 days / year; includes uses up to 1 time per day of use; for every use, includes exposures up to 15 minutes per event.	
	RMM	No specific value of RMM developed beyond the reported OCs.	
Section 2.2 Envirnomental exposure control			
Product characteristics			
The substance is formed by a single chemical entity; predominantly hydrophobic; Ready biodegradable.			
Operating conditions			
For indoor/outdoor use.			
Quantity used			
Average daily consumption for a dispersive type of use (Kg / day)			4.94
Frequency and duration of use			
Dispersive use			
Emission days (days/year)			365
Other operating conditions affecting environmental exposure			
Use in open systems			
Fraction released in the air from strongly dispersive use (only regional)			1.00e-02
Fracture released in wastewater from strongly dispersive use			1.00e-05
Fracture released on the surface of the water from strongly dispersive use (only regional)			1.00e-04
Fraction released in the soil from strongly dispersive use (only regional)			1.00e-05
RMMs			
Technical measures and conditions at the process level (source) to prevent releases			
Procedures vary from site to site, so conservative process emissions estimates are used			
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground			
Air	No air emission control required; required removal efficiency of 0%		
Waste water	Treat waste water on site (before starting the unloading operation) to ensure the removal efficiency required> 95%		
Ground	Handle emissions in such a way as to ensure a typical removal efficiency of 0%		
Organizational measures to prevent / limit the release from the site			
Prevent the release of undigested substances or their recovery from wastewater.			
Conditions and measures for the municipal wastewater treatment plant.			

It is assumed that the discharge flow from the industrial waste water treatment plant is 2000 m^3 / day.
Conditions and measures related to the external treatment of waste for disposal
n.a.
Conditions and measures for the external recovery of waste
n.a.
Other environmental control measures in addition to the previous ones
None

MTBE

1. Using MTBE in fuels - Industrial

Section 1	
Title	
Using MTBE in fuels; CAS NR 1634-04-4	
Usage descriptors	
Sector of Use	Industrial
Process category	PROC1, PROC2, PROC3, PROC8A, PROC8B, PROC16
Specific Environmental Release Category	ESVOC3 SpERC
Processes, Assignments, Covered Activities	
It covers use as fuel (or fuel additive), including the activities associated with the transfer, use, maintenance of equipment and waste disposal.	
Section 2 Operative conditions and risk management measures	
Section 2.1 Workers'exposure control	
Product Characteristics	
Product physical state	Liquid, vapor pressure> 10 kPa under standard conditions.
Substance concentration in the product	It covers a percentage of substance in the product up to 15%
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure of up to 8 hours (unless otherwise specified).
Human factors not influenced by risk management	n.a.
Other operating conditions affecting exposure	It requires the application of a suitable basic hygiene standards in the workplace.
Exposure scenarios	**Specific measures for risk management and operational conditions**
General measures (skin irritants)	Avoid direct skin contact with the product. Identify potential indirect contact areas with the skin. Wear protective gloves (tested according to EN374) if there is a chance that the substance will come into contact with your hands. Eliminate contamination / spillage as soon as they occur. Immediately remove any contamination with the skin. Provide basic training to personnel aimed at preventing / limiting exposures and notifying any dermatological problems.
Transfer of bulk products; Discontinuous process; with sampling; filling / preparing equipment from drums or containers.	Ensure that the transfer of the material takes place in containment or with extract ventilation.
Stock / batch transfers; filling / preparing equipment from drums or containers; transfer of bulk products; dedicated structure.	Use pumps for drums.
General Exposure (closed systems)	Specific measures have not been identified.
General Exposure (closed systems) with sampling	Specific measures have not been identified.
General Exposure (closed systems); Use in discontinuous processes under containment; with sampling.	Do not undertake activities that allow for exposure for more than 4 hours. Wear a whole mask (EN140 compliant) with Type A or above filter.
(closed systems); use of fuel.	Specific measures have not been identified.
(closed systems); Discontinuous process.	Do not undertake activities that allow for exposure for more than 4 hours. Wear a whole mask (EN140 compliant) with Type A or above filter.
Cleaning and maintenance of equipment; non-dedicated structure such as repair of fuel pumps inside buildings.	Do not undertake activities that allow for exposure for more than 4 hours. Wear a whole mask (EN140 compliant) with Type A or above filter.
Storage; General Exposure (closed systems)	Specific measures have not been identified.
Storage; General Exposure (closed systems); with sampling.	Make sure the operation is done outside

Section 2.2 Envirnomental exposure control	
Product characteristics	
The substance is formed by a single chemical entity; predominantly hydrophobic; Ready biodegradable.	
Transport and distribution	
Operating conditions	
For outdoor use.	
Quantity used	
EU tons fraction used locally	0.57
Regional tons (tons / year)	659,000
Regional tons fraction used locally	0.02
Daily average tons of the site (kg/day)	37,657
Annual site tons (kg/day)	13,180
Frequency and duration of use	
Continuous release	
Emission Days (Days / Year)	350
Other operating conditions affecting environmental exposure	
Use in closed systems, in dry or humid processes.	
Fraction released into the air by the process	1.00e-04
Fraction released into waste water by the process	1.00e-05
Fraction released by the process (only regional)	1.00e-05
RMMs	
Technical measures and conditions at the process level (source) to prevent releases	
Procedures vary from site to site, so conservative process emissions estimates are used	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Air	No air emission control required; required removal efficiency of 0%
Waste water	Treat waste water on site (before starting the unloading operation) to ensure the removal efficiency required> 95%
Ground	Handle emissions in such a way as to ensure a typical removal efficiency of 0%
Organizational measures to prevent / limit the release from the site	
Prevent the release of undigested substances or their recovery from wastewater.	
Conditions and measures for the municipal wastewater treatment plant.	
It is assumed that the discharge flow from the industrial waste water treatment plant is 2000 m^3 / day.	
Conditions and measures related to the external treatment of waste for disposal	
n.a.	
Conditions and measures for the external recovery of waste	
n.a.	
Other environmental control measures in addition to the previous ones	
None	

2. Using MTBE in fuels - Professional

Section 1	
Title	
Using MTBE in fuels; CAS NR 1634-04-4	
Usage descriptors	
Sector of Use	Professional
Process category	PROC1, PROC2, PROC3, PROC8A, PROC8B, PROC9, PROC16
Environmental Release Category	ERC8b, ERC8e
Specific Environmental Release Category	ESVOC30 SpERC
Processes, Assignments, Covered Activities	
It covers use as fuel (or fuel additive), including the activities associated with the transfer, use, maintenance of equipment and waste disposal.	
Section 2 Operative conditions and risk management measures	
Section 2.1 Workers'exposure control	
Product Characteristics	
Product physical state	Liquid, vapor pressure> 10 kPa under standard conditions.
Substance concentration in the product	It covers a percentage of substance in the product up to 15%
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure of up to 8 hours (unless otherwise specified).
Human factors not influenced by risk management	n.a.
Other operating conditions affecting exposure	It requires the application of a suitable basic hygiene standards in the workplace.
Exposure scenarios	**Specific measures for risk management and operational conditions**
General measures (skin irritants)	Avoid direct skin contact with the product. Identify potential indirect contact areas with the skin. Wear protective gloves (tested according to EN374) if there is a chance that the substance will come into contact with your hands. Eliminate contamination / spillage as soon as they occur. Immediately remove any contamination with the skin. Provide basic training to personnel aimed at preventing / limiting exposures and notifying any dermatological problems.
Transfer of bulk products; Discontinuous process; with sampling; filling / preparing equipment from drums or containers.	Ensure that the transfer of the material takes place in containment or with extract ventilation.
Stock / batch transfers; filling / preparing equipment from drums or containers; transfer of bulk products; dedicated structure.	Ensure that the transfer of the material takes place in containment or with extract ventilation.
Refueling	Ensure an adequate standard of controlled ventilation (10 to 15 air units per hour).
General Exposure (closed systems) with sampling	Specific measures have not been identified.
General Exposure (closed systems); Use in discontinuous processes under containment; with sampling.	Make sure the operation is done outside.
Filling barrels and small containers; dedicated structure	Use drum pumps or pay special attention when loading from containers. Do not perform activities that allow for exposure for more than 1 hour. Wear a whole mask (EN140 compliant) with Type A or above filter.
(closed systems); use of fuel.	Specific measures have not been identified
Cleaning and maintenance of equipment. non-dedicated structure such as repair of fuel pumps inside buildings.	Drain and purge the system before opening or maintaining the equipment. Do not undertake activities that allow for exposure for more than 4 hours. Wear a whole mask (EN140 compliant) with Type A or above filter.
Cleaning and maintenance of equipment. Structure not dedicated eg repair of fuel pumps outside of buildings.	Drain and purge the system before opening or maintaining the equipment. Do not undertake activities that allow for exposure for more than 4 hours. Wear a whole mask (EN140 compliant) with Type A or above filter.
Storage; general exposures (closed	Specific measures have not been identified

systems)	
Section 2.2 Envirnomental exposure control	
Product characteristics	
The substance is formed by a single chemical entity; predominantly hydrophobic; Ready biodegradable.	
Operating conditions	
For outdoor use.	
Quantity used	
Average daily consumption for a dispersive type of use (Kg / day)	3.61
Frequency and duration of use	
Dispersive use	
Emission days (days/year)	365
Other operating conditions affecting environmental exposure	
Use in open systems	
Fraction released in the air from strongly dispersive use (only regional)	1.00e-02
Fracture released in wastewater from strongly dispersive use	1.00e-05
Fracture released on the surface of the water from strongly dispersive use (only regional)	1.00e-04
Fraction released in the soil from strongly dispersive use (only regional)	1.00e-05
RMMs	
Technical measures and conditions at the process level (source) to prevent releases	
Procedures vary from site to site, so conservative process emissions estimates are used	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Air	No air emission control required; required removal efficiency of 0%
Waste water	Treat waste water on site (before starting the unloading operation) to ensure the required removal removal of 38%
Ground	No emissions checks are required on the ground; the required removal efficiency is equal to 0%.
Organizational measures to prevent / limit the release from the site	
Prevent the release of undigested substances or their recovery from wastewater. (OMS1)	
Conditions and measures for the municipal wastewater treatment plant.	
It is assumed that the discharge flow from the industrial waste water treatment plant is 2000 m^3 / day.	
Conditions and measures related to the external treatment of waste for disposal	
n.a.	
Conditions and measures for the external recovery of waste	
n.a.	
Other environmental control measures in addition to the previous ones	
None	

3. Using MTBE in fuels - Consumer

Section 1			
Title			
Using MTBE in fuels; CAS NR 1634-04-4			
Usage descriptors			
Sector of Use	Consumer		
Process category	PC13		
Environmental Category Release	ERC8d		
Specific Environmental Category Release	ESVOC30 SpERC		
Processes, tasks, activities covered			
Using fuel for fueling in 2 and 4 stroke engines.			
Section 2 Operative conditions and risk management measures			
Section 2.1 Workers'exposure control			
Product Characteristics			
Product physical state	Liquid, vapor pressure> 10 kPa under standard conditions.		
Vapour pressure	330 hPa at 25°C		
Concentration of the substance into the product	Diesel, containing <15% of the substance		
Quantity used	Up to 60 liters for refueling		
Frequency and duration of use / exposure	Up to 3 times a week		
Other operating conditions affecting exposure	Unless otherwise specified, use at room temperature is recommended		
Exposure scenarios	**Specific measures for risk management and operating conditions**		
PC13: Fuel	OC	Unless otherwise specified, it includes concentrations up to 15%; includes uses up to 150 days / year; includes uses up to 1 time per day of use; for every use, includes exposures up to 15 minutes per event.	
	RMM	No specific value of RMM developed beyond the reported OCs.	
Section 2.2 Envirnomental exposure control			
Product characteristics			
The substance is formed by a single chemical entity; predominantly hydrophobic; Ready biodegradable.			
Operating conditions			
For outdoor use.			
Quantity used			
Average daily consumption for a type of dispersive use (Kg / day)			3.61
Frequency and duration of use			
Dispersive use			
Emission days (days/year)			365
Other operating conditions affecting environmental exposure			
Use in open systems			
Fraction released in the air from strongly dispersive use (only regional)			1.00e-02
Fracture released in wastewater from strongly dispersive use			1.00e-05
Fracture released on the surface of the water from strongly dispersive use (only regional)			1.00e-04
Fraction released in the soil from strongly dispersive use (only regional)			1.00e-05
RMMs			
Technical measures and conditions at the process level (source) to prevent releases			
Procedures vary from site to site, so conservative process emissions estimates are used			
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground			
Air	No air emission control required; required removal efficiency of 0%		
Waste water	Treat waste water on site (before starting the unloading operation) to ensure the required removal removal of 37%		
Ground	Handle emissions in such a way as to ensure a typical removal efficiency of 0%		
Organizational measures to prevent / limit the release from the site			
Prevent the release of undigested substances or their recovery from wastewater.			

Conditions and measures for the municipal wastewater treatment plant.
It is assumed that the discharge flow from the industrial waste water treatment plant is 2000 m^3 / day.
Conditions and measures related to the external treatment of waste for disposal
n.a.
Conditions and measures for the external recovery of waste
n.a.
Other environmental control measures in addition to the previous ones
None

TAME

1. Use in fuels - Industrial

Section 1	**Titolo dello scenario di esposizione**
Title	Use in fuel; CAS 91995-60-7
Usage descriptors	Sector of use: Industrial SU3
	Process category: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16.
	Environmental Release Category: ERC8b
	Specific Environmental Release Category: ESVOC3 SpERC
Process, Assignments, Covered Activities	It covers use as an additive in fuels and includes activities associated with its transfer, use, maintenance of equipment and waste treatment.
Section 2	**Operating conditions and risk management measures**
Section 2.1	**Workers' exposure control**
Product Characteristics	
Product physical state	Liquid, vapor pressure> 10 kPa under standard conditions
Substance concentration in the product	Includes percentage of substance in product up to 15% (Gnew)
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure of up to 8 hours (unless otherwise specified).
Human factors not influenced by risk management	n.a.
Other operating conditions affecting exposure	It requires the application of a suitable basic hygiene standards in the workplace.
Exposure scenarios	**Specific measures for risk management**
Relocation of bulk products. Discontinuous process by sampling. Filling / preparation of equipment from drums or containers.	Ensure that the transfer of the material takes place in containment or extract ventilation
Stock / batch transfers; Filling / preparation of equipment from drums or containers; transfer of bulk products; dedicated structure.	Use pumps for drums
General Exposure (closed systems)	Specific measures have not been identified
General Exposure (closed systems) with sampling	Specific measures have not been identified
General Exposure (closed systems); use in discontinuous processes under containment with sampling	Specific measures have not been identified
(closed systems); Use of fuel	Specific measures have not been identified
(closed systems); Discontinuous process	Specific measures have not been identified
Cleaning and maintenance of non-dedicated equipment such as sheltered fuel pumps	Drain and purge the system before opening or maintaining the equipment
Storage; general exposures (closed systems)	Specific measures have not been identified
Storage General Exposure (closed systems) with sampling	Specific measures have not been identified
Section2.2	**Environmental exposure control**
Product characteristics	The substance is formed by a single chemical entity
	Mostly hydrophobic
	Ready biodegradable
Operating conditions	For outdoor use
Quantity used	
EU tons fraction used locally	1
Regional tons (tons / year)	790,000
Regional tons fraction used locally	0.02
Daily average tons of the site (kg/day)	52,667
Annual site tons (kg/day)	15,800
Frequency and duration of use	
Release Type	Continuous

Emission days (days/year)	350
Other operational conditions affecting environmental exposure	Use in closed systems
	Both in dry and wet processes
Fraction released into the air by the process	1.00e-04
Fraction released into the waste water by the process	3.00e-05
Fraction released by the process (only regional)	1.00e-05
RMMs	
Technical measures at the process level (source) to prevent releases	Procedures vary from site to site, so conservative process emissions estimates are used
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Air	No air emission control required; required removal efficiency of 0%
Waste water	Handle the wastewater in the site (before getting to drain the water) to ensure the required removal efficiency> 78%.
Ground	No soil emission control is required. The required removal efficiency is 0%.
Organizational measures to prevent / limit the release from the site	Prevent the release of undigested substances or their recovery from wastewater. Sludges generated by industrial water treatment must be incinerated, kept under containment or treated.
Conditions and measures for the municipal wastewater treatment plant	It is assumed that the discharge flow from the industrial waste water treatment plant is 2000 m^3 / day.
Conditions and measures related to the external treatment of waste for disposal	n.a.
Conditions and measures for the external recovery of waste	n.a.
Other environmental control measures than those above	None

2. Use in fuel - Professional

Section 1	**Title of exposure scenario**
Title	**Use in fuels; CAS 91995-60-7**
Usage descriptors	Sector of Use: Professional SU22
	Process Category: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC9, PROC16.
	Environmental Release Category: ERC8b
	Specific Environmental Release Category: ESVOC30 SpERC
Process, Assignments, Covered Activities	Includes use as a fuel additive and includes activities associated with its transfer, use, maintenance of equipment and waste treatment.
Section 2	**Operating conditions and risk management measures**
Section 2.1	**Workers' exposure control**
Product Characteristics	
Product physical state	Liquid, vapor pressure> 10 kPa under standard conditions
Substance concentration in the product	Includes percentage of substance in product up to 15% (Gnew)
Quantity used	n.a.
Frequency and duration of use/exposure	It covers a daily exposure of up to 8 hours (unless otherwise specified).
Human factors not influenced by risk management	n.a.
Other operating conditions affecting exposure	It requires the application of a suitable basic hygiene standards in the workplace.
Exposure scenarios	**Specific measures for risk management**
Relocation of bulk products; Discontinuous sampling process; filling / preparing equipment from drums or containers	Ensure an extract ventilation system at the material transfer points and other openings
Stock / batch transfers; filling / preparing equipment from drums or containers; transfer of bulk products; dedicated structure	Ensure an extract ventilation system at the material transfer points and other openings
Refueling	Ensure an adequate standard of controlled ventilation (10 to 15 air units per hour)
General Exposure (closed systems); with sampling	Specific measures have not been identified
General Exposure (closed systems); use in discontinuous processes under containment with sampling	Specific measures have not been identified
Filling barrels and small containers; dedicated structure	Use pumps for drums. Make sure the operation is done outside. Use vapors recovery systems if necessary
(closed systems) Use of fuel	Specific measures have not been identified
(closed systems) Discontinuous process	Specific measures have not been identified
Cleaning and maintenance of equipment; non-dedicated structure such as sheltered fuel pumps	Drain the system before opening or maintaining the equipment. Wear a whole mask (EN140 compliant) with Type A or above filter. Limit exposure by partial isolation of operations or equipment and ensure proper ventilation of the extraction in case of openings.
Cleaning and maintenance of equipment; non-dedicated structure such as externally fixed fuel pumps	
Storage; general exposures (closed systems)	Specific measures have not been identified
Section 2.2	**Environmental exposure control**
Product characteristics	The substance is formed by a single chemical entity
	Mostly hydrophobic
	Ready biodegradable
Operating conditions	For outdoor use
Quantity used	
Average daily consumption over a year for widely dispersed use (Kg / day)	4.33
Frequency and duration of use	
Release Type	Continuous (FD2)

Emission days (days/year)	365
Other operational conditions affecting environmental exposure	Utilizzare in sistemi aperti
Fraction released in the air from strongly dispersive use (only regional)	1.00e-02
Fraction released in the discharge waters by strongly dispersive use	1.00e-05
Fracture released on the surface of the water from strongly dispersive use (only regional)	1.00e-04
Fraction released in the soil from strongly dispersive use (only regional)	1.00e-05
RMMs	
Technical measures at the process level (source) to prevent releases	Procedures vary from site to site, so conservative process emissions estimates are used
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	
Air	No air emission control required; Required removal efficiency of 0% (TCR5)
Waste water	Treat wastewater on site (before getting to drain water) to ensure the required removal efficiency> 37%.
Ground	No soil emission control is required. The required removal efficiency is 0%.
Organizational measures to prevent / limit the release from the site	Prevent the release of undigested substances or their recovery from wastewater.
Conditions and measures for the municipal wastewater treatment plant	It is assumed that the discharge flow from the industrial waste water treatment plant is 2000 m^3 / day.
Conditions and measures related to the external treatment of waste for disposal	n.a.
Conditions and measures for the external recovery of waste	n.a.
Other environmental control measures than those above	None

3. Use in fuels - consumer

Section 1		**Title of exposure scenario**
Title		**Using TAME in fuels; CAS 91995-60-7**
Usage descriptors		Sector of use: consumer
		Process Category: PC13
		Environmental Release Category: ERC8d
		Environmental Release Category: ESVOC30 SpERC
Process, Assignments, Covered Activities		Using fuel for fueling in 2 and 4 stroke engines.
Section 2		**Operating conditions and risk management measures**
Section 2.1		**Workers' exposure control**
Caratteristiche del prodotto		
Vapour pressure		330 hPa at 25°C
Product physical state		Liquid, vapor pressure> 10 kPa under standard conditions
Concentration of the substance into the product		Diesel, containing <15% of the substance
Quantity used		Up to 60 liters for refueling
Frequency and duration of use / exposure		Up to 3 times a week
Other operating conditions affecting exposure		Unless otherwise specified, room temperature is used (ConsOC15)
Technical measures at the process level (source) to prevent releases		
Product Categories		
PC13: fuel	OC	Unless otherwise specified, it includes concentrations up to 15%; includes uses up to 150 days / year; includes uses up to 1 time per day of use; for every use, includes exposures up to 15 minutes per event.
	RMM	No specific value of RMM developed beyond the reported OCs.
Section 2.2		**Environmental exposure control.**
Product characteristics		The substance is formed by a single chemical entity
		Mostly hydrophobic
		Ready biodegradable
Operating conditions		For outdoor/indoor use
Quantity used		
Average daily consumption for a type of dispersive use (Kg / day)		4.33
Frequency and duration of use		
Release Type		Dispersive use.
Emission Days (Days / Year)		365
Other operational conditions affecting environmental exposure		Use in open systems
Fraction released in the air from strongly dispersive use (only regional)		1.00e-02
Fracture released in wastewater from strongly dispersive use		1.00e-05
Fracture released on the surface of the water from strongly dispersive use (only regional)		1.00e-04
Fraction released in the soil from strongly dispersive use (only regional)		1.00e-05
RMMs		
Technical measures at the process level (source) to prevent releases		Procedures vary from site to site, so conservative process emissions estimates are used
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground		
Air		No air emission control required; Required removal efficiency of 0%
Waste water		Treat wastewater on site (before getting to drain water) to ensure the required removal efficiency of 37%.
Ground		Handle emissions in such a way as to ensure a typical removal efficiency of 0%

Organizational measures to prevent / limit the release from the site	Prevent the release of undigested substances or their recovery from wastewater.
Conditions and measures for the municipal wastewater treatment plant	It is assumed that the discharge flow from the industrial waste water treatment plant is 2000 m^3 / day.
Conditions and measures related to the external treatment of waste for disposal	n.a.
Conditions and measures for the external recovery of waste	n.a.
Other environmental control measures than those above	None

ETHANOL

1. Industrial formulation and re-packaging of Ethanol and its mixtures

Section 1		
Title: Exposure scenario for industrial formulation and re-packaging of Ethanol and its mixtures		
REACh Association for Ethanol No. ES3		
Systematic title based on usage descriptors	SU3, SU10, PROC3, PROC5, PROC8a, PROC8b, PROC9, PROC14, ERC2	
Process, Assignments, Covered Activities	It covers the industrial formulation, packaging and re-packaging of the substance and its mixtures in discontinuous or continuous operations, including storage, material transfer, mixing, small and large scale packaging, maintenance. Includes the formulation of fuels containing ethanol.	
Evaluation methodology	Integrated model Ecetoc TRA version 2.	
Exposure scenario		
Operating conditions and risk management measures		
Process categories: Production or formulation of chemicals or articles using technologies related to the mixing of solid and liquid materials, and where the process is phase-out and provides the opportunity for significant contacts at each stage. Fill lines specifically designed to capture both vapor and aerosol emissions and minimize leakage. Sampling, loading, filling, transfer, unloading, bagging in dedicated structures and not with the possibility of exposure to dust, vapor, aerosol or spill, and cleaning of equipment. Environmental Release Categories: Production of Organic and Inorganic Substances in the Chemical, Petrochemicals, Primary Metals and Minerals Industry, including Intermediates and Monomers, using discontinuous or continuous processes by employing dedicated or multi-function tools, both controlled by the point of technical view or managed by manual intervention.		
Number of sites using the substance: Substance widely used		
Evaluation method		
Workers' exposure control		
Product characteristics (Includes packaging design that influences exposure)	Physical state of the product	Liquid
	Concentration of the substance into the product	Up to 100%
	Vapour pressure	5,73 kPa
Quantity used	n.a. in level 1 of model TRA	
Frequency and duration of use / exposure	Exposure frequency (weekly)	> 4 days/week
	Exposure frequency (annual)	240 days/week
	Durata dell'esposizione	> 4 h/days
Human factors not influenced by risk management	Potentially exposed body parts	Two hands only the palm (automated processes / PROC3) Two hands (transfer, filling etc./PROC8a,b)
	Exposed skin surface	480 cm^2 (automated processes / PROC3) 960 cm^2 (transfer, filling etc./PROC8a,b)
Other operating conditions affecting exposure	It requires the application of a suitable basic hygiene standards in the workplace	
	Installation (indoor/outdoor)	Outdoor
Technical measures at the process level (source) to prevent releases	Specific technical prevention measures are not required.	
Technical measures and conditions to control dispersal from source to workers	Make sure material transfer occurs under contained or extracted ventilation. Provide good ventilation to the points where you check the emissions. Provide a standard voucher for general or controlled ventilation (5 to 15 air changes per hour).	
Measures and conditions to prevent / limit releases, dispersion and exposure	No specific measure identified.	
Conditions and measures related to personal protection, hygiene and evaluation of health	Eye protection - Eye protection should be used when handling the product if there is a risk of spraying. Wear gloves tested according to EN374 during activities when skin contact is possible.	

Environmental exposure control		
Product characteristics	Physical state of the product	Liquid
	Concentration of the substance into the product	Up to 100%
Quantity used	Daily at point source	n.a.
	Annual at point source	280,000 tons/year (worst scenario at point source)
	Annual total	3,800,000 tons/year total market
Frequency and duration of use / exposure	Release model	Continuous: 300 days/year
Environmental factors not influenced by risk management	Surface water reception capacity	18,000 m^3/day (default)
Other operating conditions affecting environmental exposure	Processing settings (inside / outside)	Inside
	Process temperature	Room temperature
	Process pressure	Atmospheric pressure
Technical measures at the process level (source) to prevent releases	Keep containers tightly closed. Store in a confined area. Do not drain into drainage. Waste products and empty containers should be disposed as hazardous waste in accordance with all regional and national laws. Formulation activities are considered to be mostly closed processes.	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	Apply technical measures aimed at reducing and cleaning waste water (wastewater treatment / local wastewater treatment plant - eg biological treatments)	Efficiency > 90%
Organizational measures to prevent / limit the release from the site	Do not discharge wastewater directly into the environment.	Release of waste water into the local or communal wastewater treatment plant.
Conditions and measures for the municipal wastewater treatment plant	Size of the local wastewater treatment plant	> 2000 m^3/day
	Decrease of effectiveness	90% (for ethanol)
	Sludge treatment	Disposal or recovery
Conditions and measures concerning waste treatment	Incineration or disposal of hazardous waste for use in recycled fuels.	

Estimation of exposure			
Estimates of worker exposure are calculated using the Ecetoc TRA v2 model. The exposure estimates below are based on PROC, with an higher exposure level for this scenario.			
Worker exposure	Estimation of exposure	DNEL	Comments
Inhalation (mg/m^3)	96.04	950	The PROC8a results are the highest in this exposure scenario.
Skin(mg/Kg/day)	13.71	343	
Combined (mg/Kg/giorno)	27.43	343	
The **Environmental Exposure Estimation** is calculated using the Ecetoc TRA v2 model, including the data from the TGD A & B tables (MC-Ib, IC-9, UC-27, the main source fraction 0.1) and is based on the worst scenario. Ethanol is completely soluble in water, is rapidly biodegradable, non - bioaccumulable, does not accumulate in sediments or soils and is presumed to degrade to 90% in local or municipal water treatment plant at evaluated conditions.			
Release Time per Year (Days / Year)	300	Local release in air (kg / day)	469
Fraction used at the local main source	0.1	Local release in wastewater (kg / day)	28
Quantities used locally (Kg / day)	93.333	Local release in soil (kg / day)	9
Environmental exposure	PEC	PNEC	**Comments**
In the wastewater treatment plant / untreated wastewater (mg / l)	1.73	580	-
In fresh water (mg/l)	0,185	0,96	-
In local soils	0.0117 (mg/kg)	0.63 (mg/kg of treated wastewater)	-
In local sea water (mg/l)	0,0186	0,79	-

Total quantity delivered daily through the local environment	Negligible if compared with diet intake and endogenous formation
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Workers' exposure and environmental emissions have been calculated using the Ecetoc TRA version 2. If the local environmental emission conditions deviate significantly from the default values used, please use the algorithm below to estimate the environmental impact, proper local emission and RCRs: PEC corrected = calculated PEC * local emission factor * localized discharge fraction of treated waste water * local river flow fraction * local efficiency of the purification plant.	
Additional suggestions beyond the assessment of chemical safety Note: The measures outlined in this section have not been taken into account in the exposure estimation for exposure to the above scenario. They are not subject to the obligations under REACh Article 37 (4).	Use specific measures to reduce exposure beyond the estimated exposure scenario whenever possible.

2. Use of ethanol as a fuel for automotive by consumers

Section 1		
Title: Exposure scenario for use of ethanol as a fuel for automotive by consumers		
REACh Association for Ethanol No. ES9a		
Systematic title based on usage descriptors	SU21, PC13, ERC9a, ERC9b	
Processes, assignments, covered activities	It covers the use of fuel containing ethanol by consumers.	
Evaluation methodology	Integrated Ecetoc TRA Version 2, ConsExpo v 4.1	
Exposure scenario		
Operating conditions and risk management measures		
Process categories: Using ethanol as a fuel for vehicles. Less exposure to ethanol vapors is possible during refueling at the refueling station or transfers from portable fuel tanks. Exposure to ethanol is not expected during the current use of fuel (engine operation) under the predictable conditions of use until the substance is burned in engine closed systems. Environmental Release Categories: Extremely dispersive use on the outside by the public. Usage (generally) is the source of smaller releases through accidental spills and evaporation during filling operations.		
Number of sites using the substance: Substance widely used		
Evaluation method		
Workers' exposure control		
Content of the substance inside the product	Concentration of the substance into the product	It may e higher than 25%.
Quantity used	Up to 100 l	
Exposure / Release Fraction	0,001 (only with steam and reduced leakages during tank filling)	
Frequency and duration of use / exposure	Frequency of exposure	weekly
	Exposure duration per event	< 5 minutes (only during tank filling)
External settings and conditions during use	Outside	
Technical conditions of use (relative to the product)	No specific measures are required	
Organizational protection measures for consumers, eg consumer recommendations and / or instructions for use, eg labeling	No specific measures are required	
Environmental exposure control		
Product characteristics	Physical state of the product	Liquid
	Concentration of the substance into the product	It may be > 25%
Quantity used	Daily at point source	n.a.
	Annual at point source	n.a. (strongly dispersive use)
	Annual total	3,800,000 tons/year total market for industrial, professional and consumer use.
Frequency and duration of use / exposure	Release model	Continuous: 365 days/year
Environmental factors not influenced by risk management	Surface water reception capacity	18,000 m^3/day
Other operating conditions affecting environmental exposure	Processing settings (inside / outside)	Outside
	Process temperature	Room temperature
	Process pressure	Atmospheric pressure
Conditions and measures for the municipal wastewater treatment plant	No release in wastewater is expected from this use. The only forms of environmental release from the use of ethanol as fuel by consumers are related to evaporation during filling operations (<0.01% assuming that less than 10 grams of ethanol evaporates while filling a 75 liter tank for a duration of 2-3 minutes).	
Conditions and measures for waste disposal resulting from the use of the product	No waste is expected from this use.	
Conditions and measures for the recovery of waste resulting from the	n.a.	

use of the product				
Estimation of exposure				
Employee exposure estimates are only indicative for a particular PC. Exposure estimates were calculated using the industrial model (draft version MasterCSA_8 April 2010) CSA (PC13, Automobile, 100% concentration fuel supply).				
Workers' exposure	Estimation of exposure	DNEL	Comments	
Skin (mg/Kg/day)	35,00	LTS 206		
Orall (mg/kg/day)	0,00	LTS 87		
Inhalation (mg/m^3 for 24 hours a day)	1,54	LTS 144		
All, systemic				
The **Environmental Exposure Estimation** is based on the Ecetoc TRA v2 model based on custom settings and a total use of 3,800,000 tpa.				
Release Time per Year (Days / Year)	365	Local release in the air (kg/day)	n.a. widely dispersed	
Fraction used at the local main source	0.002	Local release in wastewater (kg/day)	n.a. widely dispersed	
Quantity used locally (Kg/day)	n.a.	Local release in the soil (kg/day)	n.a. widely dispersed	
Environmental Exposure	PEC	PNEC	**Comments**	
In the purification plant (mg/l)	0,065	580	-	
In fresh water (mg/l)	0,0240	0,96	-	
In the local soil (mg/kg)	0,0273	0,63 (mg/kg of treated wastewater)	-	
In local marine waters	0,0034	0,79	-	
Total quantity delivered daily through the local environment		Negligible if compared with diet intake and endogenous formation		
Additional suggestions beyond the assessment of chemical safety Note: The measures outlined in this section have not been taken into account in the exposure estimation for exposure to the above scenario. They are not subject to the obligations under REACh Article 37 (4).		Use specific measures to reduce exposure beyond the estimated exposure scenario whenever possible.		

TOLUENE

1. Formulation or re-packaging of toluene and its mixtures

Section 1		
Title: Exposure scenario for formulation or re-packaging of toluene and its mixtures		
REACh Association for Toluene No. ES21		
Systematic title based on usage descriptors	SU3, SU10, PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15, ERC2	
Processes, assignments, covered activities	It covers the formulation, packaging and re-packaging of the substance and its mixtures in discontinuous or continuous operations, including storage, material transfer, mixing, small to large scale packaging, maintenance and laboratory connected. Includes the formulation of toluene-containing fuels.	
Evaluation methodology	EUSES Model 2.1.1 with use of predetermined ESVOC SpERC release fractions	
Exposure scenario		
Operating conditions and risk management measures		
Process categories: Production or formulation of chemicals or articles using technologies related to the mixing of solid and liquid materials, and where the process is phase-out and provides the opportunity for significant contacts at each stage. Fill lines specifically designed to capture both vapor and aerosol emissions and minimize leakage. Sampling, loading, filling, transfer, unloading, bagging in dedicated structures and not with the possibility of exposure to dust, vapor, aerosol or spill, and cleaning of equipment. Environmental Release Categories: Production of Organic and Inorganic Substances in the Chemical, Petrochemicals, Primary Metals and Minerals Industry, including Intermediates and Monomers, using discontinuous or continuous processes by employing dedicated or multi-function tools, both controlled by the point of technical view or managed by manual intervention.		
Number of sites using the substance: Substance widely used		
Evaluation method		
Workers'exposure control		
Product Characteristics (Includes packaging design that influences exposure)	Physical state of the product	Liquid
	Concentration of the substance into the product	Up to 100%
	Vapour pressure of the substance	0,5<X<10 kPa (OC4)
Quantity used	15.000 tons/year	
Frequency and duration of use / exposure	Frequency of exposure (weekly)	> 5 days/week
	Frequency of exposure (annual)	300 days/year
	Duration of exposure	<8 h/days
Human factors not influenced by risk management	n.a.	
Other operating conditions affecting exposure	It assumes that the product is used at a temperature not exceeding 20 ° C compared to room temperature, unless otherwise specified (G15). It requires the application of a suitable basic hygiene standards in the working environment (G1). It is recommended that users take into consideration exposure limits in the workplace or other equivalent values (G38).	
Technical measures at the process level (source) to prevent releases	Do not distribute the sludges generated by the treatment of industrial waters on natural soils (OMS2)	
Technical measures and conditions to control dispersal from source to workers	General measures (skin irritants) (G19): avoid skin contact with the product. Identify the potential areas for indirect contact with the skin. Wear suitable gloves (tested according to EN 374) in case of possible contact with hands with the substance. Remove impurities / spills of the product as soon as they are present. Immediately remove any contamination with the skin. Perform basic staff training so that exposure is minimized and any skin problems (E3) are reported. In addition (where there is potential for further significant aerosol exposure): other skin protection measures such as waterproof suits and visors will be required during high dispersion activities that may result in aerosol release.	

	General measures for assessing the suction hazard-qualitative assessment: do not swallow. Implement a basic occupational hygiene standard. Avoid contact with contaminated tools and objects. Management / Supervision to ensure that implemented RMMs are used correctly and that OCs are properly executed. Staff training on good practices. Adequate personal hygiene standard.	
Measures and conditions to prevent / limit releases, dispersion and exposure	No specific measure identified.	
Conditions and measures related to personal protection, hygiene and health assessment	Eye protection - Eye protection should be used when handling the product if there is a risk of spraying. Wear gloves tested according to EN374 during activities when skin contact is possible.	
Environmental exposure control		
Product characteristics	Physical state of the product	Medium volatility liquid. Water solubility is 573 mg / l; the vapor pressure is 4030 Pa at 20 ° C; Kow log is 2.73. It is easily biodegradable
	Concentration of the substance into the product	Up to 100%
Quantity used	Annual total	15.000 tons/year
Frequency and duration of use / exposure	Release models	Continuous: 300 days/year
Environmental factors not influenced by risk management	Dilution Factors in Freshwater Dilution factors in sea water	10 100
Other operating conditions affecting environmental exposure	None	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	Treating air emissions to ensure a typical removal efficiency of 0% The typical on-site wastewater treatment technology provides 93.3% removal efficiency,	
Organizational measures to prevent / limit the release from the site	Do not distribute the sludge generated by the treatment of industrial waters on natural soils	
Conditions and measures for the municipal wastewater treatment plant	Size of the local wastewater treatment plant	2000 m^3/day
	Estimated removal of the substance from wastewater	93,3%
Conditions and measures concerning waste treatment	Waste collection and recycling must comply with applicable local and / or national legislation (ERW1)	
Estimation of exposure		
Estimates of worker exposure are calculated using the Ecetoc TRA v2 model.		
General parameters used	Type of activity	industrial
	Dustiness	Low (liquid substance)
	Duration of exposure	15 min – 1 h/day
	Use of ventilation	Provide a general standard of general ventilation for manual mixing / transfer / pouring operations or open-air systems at room temperature. No one for closed systems
	Use respiratory protection	None
	Use of skin protection	None
	Concentration in preparations	>25%
When recommended risk management measures (RMMs) and operating conditions (OC) are observed, exposures should not exceed DNELs and the resulting risk characterization ratio should be less than 1. (General Exposures in Closed Systems - None measure to be implemented - RCR in. = 0.00, RCR der. = 0.00; General exposures in closed systems with sample collection, with occasional controlled exposure - no action to be taken - RCR in. = 0.20, RCR der. = 0.00; General Exposure in closed systems, use in batch systems with containment - no measures to be implemented - RCR in. = 0.49, RCR der. = 0.00; General exposures in open systems, use in batch systems with sample collection, with potential aerosol generation - no measure to be implemented - RCR in = 0.39, RCR der = 0.02; Mixing operations in open systems with potential aerosol generation - Provide a standard voucher general air conditioning (no less than 3-5 air units per hour) - RCR in. = 0.69, RCR der. = 0.04; Filling in drums and small packagings - Provide a general standard of general ventilation (no less than 3-5 air units per hour) - RCR in. = 0.69, RCR der. = 0.02; Cleaning and maintenance of equipment - Drain and bleed the system before opening or maintaining the equipment - RCR in. = 0.10, RCR der. = 0.00; Storage, with occasional		

controlled exposure - no action to be taken - RCR in. = 0.20, RCR der. = 0.00;	
The **Environmental Exposure Estimate** is calculated using the EUSES 2.1.1 model with the use of ESVOC SpERC (2.2.v1) predetermined release fractions,	
When recommended risk management measures (RMM) and operating conditions (OC) are observed, exposures should not exceed PNECs and the resulting risk characterization ratio should be less than 1 (fresh water RCR 4.95E-01; RCR marine water 4.95E-02; RCR fresh water sediments 4.95E-01; RCR marine sediment 4.94E-02; RCR soil 7.38E-01; RCR STP 2.46E-01)	
Guida per gli utilizzatori a valle	
Environmental exposure. The guide line is based on assumed conditions of use that may not apply to all sites; then a scaling operand may be needed to define adequate risk management measures for each site (DSU1). The required efficiency of wastewater removal can be achieved by using onsite technologies, individually or in combination (DSU2). The required efficiency of air removal can be achieved by using onsite technology, individually or in combination (DSU3). Further information on scaling activities and control technologies is provided by the SpERC Technical Data Sheets (http://www.esig.org/en/regulatory-information/reach/ges-library/ges-library-3) (DSU4) Workers Exposure If different RMM / OCs are adopted, the user must ensure that the risks are controlled at least at an equivalent level. (G23) Risk Characterization Reports (RCRs) are computed by comparing the estimated exposure levels with the corresponding DNELs (RCR = exposure level / DNEL)	
Additional suggestions beyond the assessment of chemical safety Note: The measures outlined in this section have not been taken into account in the exposure estimation for exposure to the above scenario. They are not subject to the obligations under REACh Article 37 (4).	Use specific measures to reduce exposure beyond the estimated exposure scenario whenever possible.

XYLENE – All isomers

1. Use of Xylene and its mixtures as fuel

Section 1		
Title Exposure scenario for use of xylene and its mixtures as fuel		
Reference REACh Association for Xylene No. ES7		
Systematic title based on usage descriptors	SU3, SU10, PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16, ERC7	
Processes, assignments, covered activities	It applies to use as a fuel (or fuel additive) and includes activities related to its transfer, its use, maintenance of equipment and waste handling.	
Evaluation methodology	Model ESVOC SpERC 7.12a.v1	
Exposure scenario		
Operating conditions and risk management measures		
Treat air emissions in such a way as to ensure a typical elimination efficiency of> 90%. Typical wastewater treatment technologies in place ensure a 93.67% elimination efficiency. Prevent unloading of untreated waste into waste water or retrieve it from the site itself. Emission control in the soil is not applicable because there is no direct emission into the soil. Do not shed industrial sludges on natural soils. The purification mud should be incinerated, enclosed in containers or recovered.		
Number of sites using the substance: Substance widely used		
Evaluation method		
Workers' exposure control		
Product characteristics (Includes packaging design that influences exposure)	Physical state of the product	Liquid
	Concentration of the substance into the product	Up to 100%
	Vapour pressure of the substance	0,5<X<10 kPa
Quantity used	n.a.	
Frequency and duration of use / exposure	Frequency of exposure (weekly)	>5 days/week
	Frequency of exposure (annual)	300 days/year
	Duration of exposure	<8 h/day
Human factors not influenced by risk management	n.a.	
Other operating conditions affecting exposure	It is assumed that use does not exceed 20 ° C above room temperature, unless otherwise indicated. It is assumed that a good basic level of work hygiene is implemented. Contributing Scenarios-Operating Conditions and Risk Management Measures Bulk transfers Ensure a good level of general ventilation (no less than 3-5 air units per hour). Transfers in barrels / lot Ensure a good level of general ventilation (no less than 3-5 air units per hour). Avoid doing activities that involve an exposure greater than one hour. General Exposure (Open Systems) No other specific measure identified. General Exposure (closed systems) Ensure a good level of controlled ventilation (10-15 air units per hour) General Exposure (Open Systems) Lot Process Ensure a good level of controlled ventilation (10-15 air units per hour) General Exposures (closed systems) batch process Ensure a good level of controlled ventilation (10-15 air units per hour) Maintenance of equipment Drain and flush system prior to injecting and maintenance of equipment. Keep drainage liquids in sealed containers awaiting disposal and for subsequent recycling Cleaning Ensure ventilation / extraction at the points where it is emitted storage	

	No other specific measure identified Waste disposal Ensure a good level of general ventilation (no less than 3-5 air units per hour). Avoid doing activities that involve an exposure greater than one hour.	
Technical measures at the process level (source) to prevent releases	Do not shed industrial sludges on natural soil. The purification mud should be incinerated, enclosed in containers or recovered.	
Technical measures and conditions to control dispersal from source to workers	Laboratory activities Wear suitable gloves conforming to EN374. Wear a suitable work suit to prevent skin exposure. Bulk transfers Wear suitable gloves conforming to EN374. Avoid sketches. Clean lines before decoupling. Transfer to bins / lot Wear suitable gloves conforming to EN374. Avoid sketches. Clean lines before decoupling. Cleaning and maintenance equipment Wear a suitable work suit to prevent skin exposure. Storage Avoid immersion sampling.	
Measures and conditions to prevent / limit releases, dispersion and exposure	No further specific measure identified.	
Conditions and measures related to personal protection, hygiene and health assessment	Wear tested gloves according to EN374 standard and suitable work suit during activities when skin contact is possible	
Environmental exposure control		
Product characteristics	Physical state of the product	Medium volatility liquid. Predominantly hydrophobic. Easily biodegradable. Water solubility is 166 mg / l; the vapor pressure is 821 Pa at 20 ° C; the Kow log is 3.16.
	Concentration of the substance into the product	Up to 100%
Quantity used	Annual total	50.000 tons/year
Frequency and duration of use / exposure	Release models	Continuous: 300 days/year
Environmental factors not influenced by risk management	Dilution Factors in Freshwater Dilution factors in sea water	10 100
Other operating conditions affecting environmental exposure	Process release fraction in air (initial release before RMM): 1 Process release fraction in waste water (initial release before RMM): 0.00001 Process release fraction in soil (initial release before RMM): 0	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	Treat air emissions in such a way as to ensure a typical elimination efficiency of> 90%. Typical wastewater treatment technologies in place ensure a 93.67% elimination efficiency. Prevent unloading of untreated waste into waste water or retrieve it from the site itself. Emission control in the soil is not applicable because there is no direct emission into the soil. Do not shed industrial sludges on natural soils. The purification mud should be incinerated, enclosed in containers or recovered.	
Organizational measures to prevent / limit the release from the site	Do not shed industrial sludges on natural soil. The purification mud should be incinerated, enclosed in containers or recovered.	
Conditions and measures for the municipal wastewater treatment plant	Size of the local wastewater treatment plant	2000 m^3/day
	Estimated removal of the substance from wastewater	93,3%
Conditions and measures concerning waste treatment	Waste collection and recycling must comply with applicable local and / or national legislation	
Estimation of exposure		

Estimates of worker exposure are calculated using the Ecetoc TRA v2 model.		
General parameters used	Type of activity	industrial
	Dustiness	Low (liquid substance)
	Duration of exposure	<15 min /day
	Use of ventilation	None
	Use respiratory protection	None
	Use of skin protection	None
The **assessment of the environmental and human exposure** is calculated with the EUSES model Estimation of exposure and reference to its source (environment): Exposures are modest and do not exceed the limit values. Estimation of exposure and reference to its source (human): The ECETOC TRA tool was used to estimate workplace exposures		
Downstream User Guide		
Environment The indications are based on the alleged operational conditions, which may not apply to all sites; therefore, it is necessary to apply a scale factor to define appropriate site-specific risk management measures. The elimination efficiency required for waste water can be achieved by using on / off site technologies alone or in combination. The elimination efficiency required for the air can be obtained using on-site technologies, alone or in combination. Further details on scale factors and control technologies in the SpERC Information Document. Health Expected exposures should not exceed DN (M) EL when implementing the risk management measures / operating conditions described in "Exposure Control". Where other risk / operational risk management measures are taken, users must ensure that risks are managed at least equivalent levels. Risk management measures are based on qualitative risk characterization.		
Additional suggestions beyond the assessment of chemical safety Note: The measures outlined in this section have not been taken into account in the exposure estimation for exposure to the above scenario. They are not subject to the obligations under REACh Article 37 (4).	Use specific measures to reduce exposure beyond the estimated exposure scenario whenever possible.	

2. Formulation or re-packaging of xylene and its mixtures

Section 1		
Title Exposure scenario for formulation or re-packaging of xylene and its mixtures		
Reference REACh Association for Xylene No. ES7		
Systematic title based on usage descriptors	SU3, SU10, PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15, ERC2	
Processes, assignments, covered activities	Formulation, packaging and re-packaging of the substance and its mixtures in batch or continuous operations, including storage, transfer of materials, mixing, pasting, pressing, pelleting, extrusion, large and small scale packaging, sampling, maintenance and related laboratory activities .	
Evaluation methodology	EUSES model with use of ECETOC TRA to estimate workplace exposures	
Exposure scenario		
Operating conditions and risk management measures		
Treat air emissions in such a way as to ensure a typical elimination efficiency of> 90%. Typical wastewater treatment technologies in place ensure a 93.67% elimination efficiency. Prevent unloading of untreated waste into waste water or retrieve it from the site itself. Emission control in the soil is not applicable because there is no direct emission into the soil. Do not shed industrial sludges on natural soils. The purification mud should be incinerated, enclosed in containers or recovered.		
Number of sites using the substance: Substance widely used		
Evaluation method		
Workers' exposure control		
Product characteristics (Includes packaging design that influences exposure)	Physical state of the product	Liquid
	Concentration of the substance into the product	Up to 100%
	Vapour pressure of the substance	0,5<X<10 kPa
Quantity used	n.a.	
Frequency and duration of use / exposure	Frequency of exposure (weekly)	>5 days/week
	Frequency of exposure (annual)	300 days/year
	Duration of exposure	<8 h/day
Human factors not influenced by risk management	n.a.	
Other operating conditions affecting exposure	It is assumed that use does not exceed 20 ° C above room temperature, unless otherwise indicated. It is assumed that a good basic level of work hygiene is implemented. Contributing Scenarios-Operating Conditions and Risk Management Measures Bulk transfers Ensure that material transfers are in confinement or ventilation / extraction Transfers in barrels / lot Ensure a good level of controlled ventilation (10-15 air units per hour). General Exposure (closed systems) Manipulate the substance within a closed system. General Exposure (closed systems) with sample collection Manipulate the substance within a closed system. General Exposures (closed systems) use in batch process content Manipulate the substance within a closed system. Ensure a good level of general ventilation (no less than 3-5 air units per hour). General Exposures (Open Systems) batch process with sample collection Ensure a good level of general ventilation (no less than 3-5 air units per hour). Cleaning and maintenance of equipment Drain and flush system prior to injecting and maintenance of equipment. storage Manipulate the substance within a closed system. Batch process high temperature Manipulate the substance within a closed system. Ensure a good level of general	

	ventilation (no less than 3-5 air units per hour). Process sampling Manipulate the substance within a closed system. Ensure a good level of general ventilation (no less than 3-5 air units per hour). Laboratory activities No other specific measure identified. Spraying operations (open systems) Ensure a good level of controlled ventilation (10-15 air units per hour). Manual Transfer / Pour From Containers Ensure a good level of controlled ventilation (10-15 air units per hour). Production of prepared or articles by tabletting, compressione, extrusion or pelletising Ensure a good level of controlled ventilation (10-15 air units per hour). Filling with drums and small holes Ensure a good level of controlled ventilation (10-15 air units per hour).	
Technical measures at the process level (source) to prevent releases	Do not shed industrial sludges on natural soil. The purification mud should be incinerated, enclosed in containers or recovered.	
Technical measures and conditions to control dispersal from source to workers	Laboratory activities Wear suitable gloves conforming to EN374. Wear a suitable work suit to prevent skin exposure. Bulk transfers Wear suitable gloves conforming to EN374. Avoid sketches. Clean lines before decoupling. Transfer to bins / lot Wear suitable gloves conforming to EN374. Avoid sketches. Clean lines before decoupling. Cleaning and maintenance equipment Wear a suitable work suit to prevent skin exposure. Storage Avoid immersion sampling.	
Measures and conditions to prevent / limit releases, dispersion and exposure	No further specific measure identified.	
Conditions and measures related to personal protection, hygiene and health assessment	Wear tested gloves according to EN374 standard and suitable work suit during activities when skin contact is possible	
Environmental exposure control		
Product characteristics	Physical state of the product	Medium volatility liquid. Predominantly hydrophobic. Easily biodegradable. Water solubility is 166 mg / l; the vapor pressure is 821 Pa at 20 ° C; the Kow log is 3.16.
	Concentration of the substance into the product	Up to 100%
Quantity used	Annual total	1.000.000 tons/year
Frequency and duration of use / exposure	Release models	Continuous: 300 days/year
Environmental factors not influenced by risk management	Dilution Factors in Freshwater Dilution factors in sea water	10 100
Other operating conditions affecting environmental exposure	Process release fraction in air (initial release before RMM): 0.01 Process release fraction in waste water (initial release before RMM): 0.002 Process release fraction in soil (initial release before RMM): 0.0001	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	Treat air emissions in such a way as to ensure a typical elimination efficiency of> 90%. Typical wastewater treatment technologies in place ensure a 93.67% elimination efficiency. Prevent unloading of untreated waste into waste water or retrieve it from the site itself. Emission control in the soil is not applicable because there is no direct emission into the soil. Do not shed industrial sludges on natural soils. The purification mud should be incinerated, enclosed in containers or recovered.	

Organizational measures to prevent / limit the release of the site	Do not shed industrial sludges on natural soil. The purification mud should be incinerated, enclosed in containers or recovered.	
Conditions and measures for the municipal wastewater treatment plant	Size of the local wastewater treatment plant	2000 m^3/day
	Estimated removal of the substance from wastewater	93,3%
Conditions and measures concerning waste treatment	Waste collection and recycling must comply with applicable local and / or national legislation	

Estimation of exposure		
Estimates of worker exposure are calculated using the Ecetoc TRA v2 model.		
General parameters used	Type of activity	industrial
	Dustiness	Low (liquid substance)
	Duration of exposure	<15 min /day
	Use of ventilation	None
	Use respiratory protection	None
	Use of skin protection	None
The **assessment of the environmental and human exposure** is calculated with the EUSES model Estimation of exposure and reference to its source (environment): Exposures are modest and do not exceed the limit values. Estimation of exposure and reference to its source (human): The ECETOC TRA tool was used to estimate workplace exposures		

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Environment
The indications are based on the alleged operational conditions, which may not apply to all sites; therefore, it is necessary to apply a scale factor to define appropriate site-specific risk management measures.
The elimination efficiency required for waste water can be achieved by using on / off site technologies alone or in combination. The elimination efficiency required for the air can be obtained using on-site technologies, alone or in combination. Further details on scale factors and control technologies in the SpERC Information Document.
Health
Expected exposures should not exceed DN (M) EL when implementing the risk management measures / operating conditions described in "Exposure Control". Where other risk / operational risk management measures are taken, users must ensure that risks are managed at least equivalent levels. Risk management measures are based on qualitative risk characterization.

Additional suggestions beyond the assessment of chemical safety Note: The measures outlined in this section have not been taken into account in the exposure estimation for exposure to the above scenario. They are not subject to the obligations under REACh Article 37 (4).	Use specific measures to reduce exposure beyond the estimated exposure scenario whenever possible.

CYCLOHEXANE

1. Use of cyclohexane and its mixtures as fuel

Section 1		
Title Exposure scenario for use of cyclohexane and its mixture as fuel		
Reference REACh Association for Cyclohexane No. ES7		
Systematic title based on usage descriptors	SU3, SU10, PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16, ERC7	
Processes, assignments, covered activities	It applies to use as a fuel (or fuel additive) and includes activities related to its transfer, its use, maintenance of equipment and waste handling.	
Evaluation methodology	Model ESVOC SpERC 7.12a.v1	
Exposure scenario		
Operating conditions and risk management measures		
Treat air emissions in such a way as to ensure a typical elimination efficiency of> 90%. Emission control in the soil is not applicable because there is no direct emission into the soil. Do not shed industrial sludges on natural soils. The purification mud should be incinerated, enclosed in containers or recovered.		
Number of sites using the substance: Substance widely used		
Evaluation method		
Workers' exposure control		
Product Characteristics (Includes packaging design that influences exposure)	Physical state of the product	Liquid
	Concentration of the substance into the product	Up to 100%
	Vapour pressure of the substance	>10 kPa
Quantity used	n.a.	
Frequency and duration of use / exposure	Frequency of exposure (weekly)	>5 days/week
	Frequency of exposure (annual)	300 days/year
	Duration of exposure	<8 h/day
Human factors not influenced by risk management	n.a.	
Other operating conditions affecting exposure	It is assumed that use does not exceed 20 ° C above room temperature, unless otherwise indicated. It is assumed that a good basic level of work hygiene is implemented. Contributing Scenarios-Operating Conditions and Risk Management Measures Bulk transfers No other specific measure identified. Transfers in barrels / lot No other specific measure identified. General Exposure (Open Systems) Lot Process No other specific measure identified. General Exposures (closed systems) batch process No other specific measure identified. Cleaning and maintenance of equipment Ensure ventilation / extraction at the points where it is emitted. Drain the system before stopping and maintenance of equipment. Storage No other specific measure identified	
Technical measures at the process level (source) to prevent releases	Do not shed industrial sludges on natural soil. The purification mud should be incinerated, enclosed in containers or recovered.	
Technical measures and conditions to control dispersal from source to workers	Laboratory activities Wear suitable gloves conforming to EN374. Wear a suitable work suit to prevent skin exposure. Bulk transfers Wear suitable gloves conforming to EN374. Avoid sketches. Clean lines before	

	decoupling. Transfer to bins / lot Wear suitable gloves conforming to EN374. Avoid sketches. Clean lines before decoupling. Cleaning and maintenance equipment Wear a suitable work suit to prevent skin exposure. Storage Avoid immersion sampling.	
Measures and conditions to prevent / limit releases, dispersion and exposure	No further specific measure identified.	
Conditions and measures related to personal protection, hygiene and health assessment	Wear tested gloves according to EN374 standard and suitable work suit during activities when skin contact is possible	
Controllo dell'esposizione ambientale		
Product characteristics	Physical state of the product	Liquid. Mostly hydrophobic. Easily biodegradable. Solubility in water is 52 mg / l; the vapor pressure is 124 hPa at 24 ° C; the Kow log is 3.44.
	Concentration of the substance into the product	Up to 100%
Quantity used	Annual total	1900 tons/year
Frequency and duration of use / exposure	Release models	Continuous: 100 days/year
Environmental factors not influenced by risk management	Dilution Factors in Freshwater Dilution factors in sea water	40 100
Other operating conditions affecting environmental exposure	Process release fraction in air (initial release before RMM): 0.05 Process release fraction in waste water (initial release before RMM): 0.05 Process release fraction in soil (initial release before RMM): 0.05	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	Treat air emissions in such a way as to ensure a typical elimination efficiency of> 90%. Emission control in the soil is not applicable because there is no direct emission into the soil. Do not shed industrial sludges on natural soils. The purification mud should be incinerated, enclosed in containers or recovered.	
Organizational measures to prevent / limit the release from the site	Do not shed industrial sludges on natural soil. The purification mud should be incinerated, enclosed in containers or recovered.	
Conditions and measures for the municipal wastewater treatment plant	Size of the local wastewater treatment plant	2000 m^3/day
	Estimated removal of the substance from wastewater	93,3%
Conditions and measures concerning waste treatment	Waste collection and recycling must comply with applicable local and / or national legislation	
Estimation of exposure		
Estimates of worker exposure are calculated using the Ecetoc TRA v2 model.		
General parameters used	Type of activity	industrial
	Dustiness	Low (liquid substance)
	Duration of exposure	<15 min /day
	Use of ventilation	None
	Use respiratory protection	None
	Use of skin protection	None
The **assessment of the environmental and human exposure** is calculated with the EUSES model Estimation of exposure and reference to its source (environment): Exposures are modest and do not exceed the limit values. Estimation of exposure and reference to its source (human): The ECETOC TRA tool was used to estimate workplace exposures		
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Environment The indications are based on the alleged operational conditions, which may not apply to all sites; therefore, it is necessary to apply a scale factor to define appropriate site-specific risk management measures. The elimination efficiency required for waste water can be achieved by using on / off site technologies alone or in combination. The elimination efficiency required for the air can be obtained using on-site technologies, alone or in combination. Further details on scale factors and control technologies in the SpERC Information Document.		

Health Expected exposures should not exceed DN (M) EL when implementing the risk management measures / operating conditions described in "Exposure Control". Where other risk / operational risk management measures are taken, users must ensure that risks are managed at least equivalent levels. Risk management measures are based on qualitative risk characterization.	
Additional suggestions beyond the assessment of chemical safety Note: The measures outlined in this section have not been taken into account in the exposure estimation for exposure to the above scenario. They are not subject to the obligations under REACh Article 37 (4).	Use specific measures to reduce exposure beyond the estimated exposure scenario whenever possible.

2. Formulation or re-packaging of Cyclohexane and its mixtures

Section 1		
Title Exposure scenario for formulation or re-packaging of cyclohexane and its mixtures		
Reference REACh Association for Cyclohexane No. ES21		
Systematic title based on usage descriptors	SU3, SU10, PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15, ERC2	
Processes, assignments, covered activities	It applies to use as a fuel (or fuel additive) and includes activities related to its transfer, its use, maintenance of equipment and waste handling.	
Evaluation methodology	SPERC ESVOC SpERC 2.2.v1	
Exposure scenario		
Operating conditions and risk management measures		
Prevent unloading of untreated waste into waste water and retrieve it from the site itself. Do not shed industrial sludges on natural soil. The purification mud should be incinerated, enclosed in containers or recovered. If discharged into a domestic water purification plant, ensure the required waste water elimination efficiency> 96.6%		
Number of sites using the substance: Substance widely used		
Evaluation method		
Workers' exposure control		
Product characteristics (Includes packaging design that influences exposure)	Physical state of the product	Liquid
	Concentration of the substance into the product	Up to 100%
	Vapour pressure of the substance	>10 kPa
Quantity used	n.a.	
Frequency and duration of use / exposure	Frequency of exposure (weekly)	>5 days/week
	Frequency of exposure (annual)	300 days/year
	Duration of exposure	<8 h/day
Human factors not influenced by risk management	n.a.	
Other operating conditions affecting exposure	It is assumed that use does not exceed 20 ° C above room temperature, unless otherwise indicated. It is assumed that a good basic level of work hygiene is implemented. Contributing Scenarios-Operating Conditions and Risk Management Measures Bulk transfers No other specific measure identified. Transfers in barrels / lot No other specific measure identified. Transfer / pour from manual containers Ensure ventilation / extraction of the points in the which you have emissions. General Exposure (Open Systems) batch process with sample collection spraying No other specific measure identified. General Exposure (closed systems) No other specific measure identified. Cleaning and maintenance of equipment Drain and flush system prior to injecting and maintenance of equipment. storage No other specific measure identified. Batch process high temperature No other specific measure identified. Process sampling No other specific measure identified. Laboratory activities No other specific measure identified. Mixing operations (open systems) spraying Ensure ventilation / extraction at the points where it is emitted. Filling with drums and small holes	

	Ensure a good level of general ventilation (no less than 3-5 air units per hour). Production of prepared or articles by tabletting, compression, extrusion or pelletising Ensure a good level of general ventilation (no less than 3-5 air units per hour).	
Technical measures at the process level (source) to prevent releases	Do not shed industrial sludges on natural soil. The purification mud should be incinerated, enclosed in containers or recovered. Prevent unloading of untreated waste into waste water and retrieve it from the site itself.	
Technical measures and conditions to control dispersal from source to workers	Ensure that the ventilation system is maintained and checked periodically. Ventilation is generally required when handling or using this product. Wear tested gloves according to the EN374 standard and suitable working suit during the activities when skin contact is possible.	
Measures and conditions to prevent / limit releases, dispersion and exposure	No further specific measure identified.	
Conditions and measures related to personal protection, hygiene and health assessment	Wear tested gloves according to EN374 standard and suitable work suit during activities when skin contact is possible	
Controllo dell'esposizione ambientale		
Product characteristics	Physical state of the product	Liquid. Mostly hydrophobic. Easily biodegradable. Solubility in water is 52 mg / l; the vapor pressure is 124 hPa at 24 ° C; the Kow log is 3.44.
	Concentration of the substance into the product	Up to 100%
Quantity used	Annual total	17.142.000 tons/year
Frequency and duration of use / exposure	Release models	Continuous: 300 days/year
Environmental factors not influenced by risk management	Dilution Factors in Freshwater Dilution factors in sea water	10 100
Other operating conditions affecting environmental exposure	Process release fractions in air (after site RMM typical in accordance with the requirements of the EU Solvent Emission Directive) Process release fractions in air (initial release before RMM): 0.025 (SPERC ESVOC SpERC 2.2.v1) Process release fractions in waste water (initial release before RMM): 0.0002 (SPERC ESVOC SpERC 2.2.v1) Process release fractions in soil (initial release before RMM): 0.0001 (SPERC ESVOC SpERC 2.2.v1)	
Site technical conditions and measures to reduce or limit discharges, emissions into the air and releases into the ground	Prevent unloading of untreated waste into waste water and retrieve it from the site itself. Do not shed industrial sludges on natural soil. The purification mud should be incinerated, enclosed in containers or recovered. If discharged into a domestic water purification plant, ensure the required waste water elimination efficiency> 96.6%	
Organizational measures to prevent / limit the release from the site	Do not shed industrial sludges on natural soil. The purification mud should be incinerated, enclosed in containers or recovered. Prevent unloading of untreated waste into waste water and retrieve it from the site itself.	
Conditions and measures for the municipal wastewater treatment plant	Size of the local wastewater treatment plant	2000 m^3/day
	Estimated removal of the substance from wastewater	93,3%
Conditions and measures concerning waste treatment	Waste collection and recycling must comply with applicable local and / or national legislation	
Estimation of exposure		
Estimates of worker exposure are calculated using the Ecetoc TRA v2 model.		
General parameters used	Type of activity	industrial
	Dustiness	Low (liquid substance)
	Duration of exposure	<15 min /day
	Use of ventilation	None
	Use respiratory protection	None

	Use of skin protection	None
The assessment of the environmental and human exposure is calculated with the EUSES model Estimation of exposure and reference to its source (environment): Exposures are modest and do not exceed the limit values. Estimation of exposure and reference to its source (human): The ECETOC TRA tool was used to estimate workplace exposures		
Downstream User Guide		
Environment The indications are based on the alleged operational conditions, which may not apply to all sites; therefore, it is necessary to apply a scale factor to define appropriate site-specific risk management measures. The elimination efficiency required for waste water can be achieved by using on / off site technologies alone or in combination. The elimination efficiency required for the air can be obtained using on-site technologies, alone or in combination. Further details on scale factors and control technologies in the SpERC Information Document. Health Expected exposures should not exceed DN (M) EL when implementing the risk management measures / operating conditions described in "Exposure Control". Where other risk / operational risk management measures are taken, users must ensure that risks are managed at least equivalent levels. Risk management measures are based on qualitative risk characterization.		
Additional suggestions beyond the assessment of chemical safety Note: The measures outlined in this section have not been taken into account in the exposure estimation for exposure to the above scenario. They are not subject to the obligations under REACh Article 37 (4).	Use specific measures to reduce exposure beyond the estimated exposure scenario whenever possible.	