SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form	:	Substance (UVCB)
Trade name	:	Gasoline
Chemical name	:	Gasoline; Low boiling point naphtha -unspecified; [A complex combination of hydrocarbons consisting primarily of paraffins, cycloparaffins, aromatic and olefinic hydrocarbons having carbon numbers predominantly greater than C3 and boiling in the range of 30°C to 260°C (86°F to 500°F).]
EC Index-No.	:	649-378-00-4
EC-No.	:	289-220-8
CAS-No.	:	86290-81-5
REACH registration No	:	01-2119471335-39-0117, UK-01-4615601157-2-0003
Product code	:	400003272
Type of product	:	Fuel
Synonyms	:	BF ULG 95 10ppmS E0 Udy Umk E5 BOB UK, SU10, Super Unleaded petrol, Unleaded 99, UL 99, (Super) Unleaded 97, (S)UL 97, Unleaded 95, UL 95, 99NORDICS, UK BOB for E0-E5 blending, EURO BOB for E0-E10 blending, CBOB Gasoline
Product group	:	Trade product
Other means of identification	:	Meets BS EN 228:2012 + A1:2017 after 0.0% to 3.0% v/v methanol addition and / or 0.0 % to 10.0% v/v ethanol addition

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

1.2.1. Relevant identified uses

Main use category	:	Industrial use
Industrial/Professional use spec	:	For professional use only Used in closed systems
Use of the substance/mixture	:	Identified Uses Fuels Exposure scenarios Listed in Annex
Function or use category	:	Fuels

Title	Life cycle stage	Use descriptors
Manufacture of substance [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)] (ES Ref.: 9.1.1b)	Industrial, Manufacture	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28, ERC1, ESVOC SPERC 1.1.v1
Manufacture of substance [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)] (ES Ref.: 9.1.1b)	Industrial, Manufacture	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28, ERC1, ESVOC SPERC 1.1.v1
Use of substance as intermediate [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)] (ES Ref.: 9.2.1b)	Industrial	SU8, SU9, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28, ERC6a, ESVOC SPERC 6.1a.v1
Use of substance as intermediate [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)] (ES Ref.: 9.2.1b)	Industrial	SU8, SU9, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28, ERC6a, ESVOC SPERC 6.1a.v1
Formulation & (re)packing of substances and mixtures [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)] (ES Ref.: 9.4.1b)	Industrial, Formulation	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28, ERC2, ESVOC SPERC 2.2.v1

Title	Life cycle stage	Use descriptors
Formulation & (re)packing of substances and mixtures [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)] (ES Ref.: 9.4.1b)	Industrial, Formulation	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28, ERC2, ESVOC SPERC 2.2.v1
Use as a fuel: Industrial [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)] (ES Ref.: 9.10.1b)	Industrial	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28, ERC7, ESVOC SPERC 7.12a.v1
Use as a fuel: Industrial [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)] (ES Ref.: 9.10.1b)	Industrial	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28, ERC7, ESVOC SPERC 7.12a.v1
Use as a fuel: Professional [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)] (ES Ref.: 9.11.1b)	Professional	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28, ERC9a, ERC9b, ESVOC SPERC 9.12b.v1
Use as a fuel: Professional [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)] (ES Ref.: 9.11.1b)	Professional	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28, ERC9a, ERC9b, ESVOC SPERC 9.12b.v1
Use as a fuel: Consumer [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)] (ES Ref.: 9.12.1b)	Consumer	PC13, ERC9a, ERC9b, ESVOC SPERC 9.12c.v1

Full text of use descriptors: see section 16

1.2.2. Uses advised against

Title	Use descriptors	Reason
Use in Coatings: Professional (not classified as H340, H350 or H361; containing less than 0.1% benzene)	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19, ERC8a, ERC8d	Potential adverse human health effects and symptoms
Use in Cleaning Agents: Professional (not classified as H340, H350 or H361; containing less than 0.1% benzene)	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC10, PROC11, PROC13, ERC8a, ERC8d	Potential adverse human health effects and symptoms
Use in Cleaning Agents: Consumer (not classified as H340, H350 or H361; containing less than 0.1% benzene)	PC3, PC4, PC9a, PC24, PC35, PC38, ERC8a, ERC8d	Potential adverse human health effects and symptoms

Full text of use descriptors: see section 16

1.3. Details of the supplier of the safety data sheet

Supplier
ESSAR OIL (UK) LTD Ltd
Stanlow Manufacturing Complex, P.O. Box 3, Ellesmere Port
UK– CH65 4HB – Cheshire
UK
T +44 (0)151 350 4003
sds@essaroil.co.uk

Only Representative
Intertek Health, Environmental and Regulatory Services GmbH
Intertek Deutschland GmbH Stangenstr. 1
DE– 70771 Leinfelden-Echterdingen
Deutschland
reach-or.de@intertek.com

1.4. Emergency telephone number

Emergency number : Essar Oil (UK) Ltd: +44 (0)151 350 4545 (English only)
NCEC Carechem 24: +44(0)870 190 6777

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flam. Liq. 1	H224
Skin Irrit. 2	H315
Muta. 1B	H340
Carc. 1A	H350
Repr. 2	H361fd
STOT SE 3	H336
Asp. Tox. 1	H304
Aquatic Chronic 2	H411

Adverse physicochemical, human health and environmental effects

Extremely flammable liquid and vapour. May be fatal if swallowed and enters airways. Causes skin irritation. May cause drowsiness or dizziness. May cause cancer. May cause genetic defects. Suspected of damaging fertility. Suspected of damaging the unborn child. Toxic to aquatic life with long lasting effects.

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS02 GHS07 GHS08 GHS09

Signal word (CLP) : Danger

Contains : n-hexane, toluene, benzene

Hazard statements (CLP) : H224 - Extremely flammable liquid and vapour.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H336 - May cause drowsiness or dizziness.
H340 - May cause genetic defects.
H350 - May cause cancer.
H361fd - Suspected of damaging fertility. Suspected of damaging the unborn child.
H411 - Toxic to aquatic life with long lasting effects.

Precautionary statements (CLP) : P201 - Obtain special instructions before use.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273 - Avoid release to the environment.
P280 - Wear protective gloves, protective clothing, eye protection, face protection.
P301+P310 - IF SWALLOWED: Immediately call a doctor.
P331 - Do NOT induce vomiting.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.

Extra phrases : Restricted to professional users due to classification as mutagenic Category 1B and carcinogenic Category 1B, except for fuel uses.

2.3. Other hazards

Other hazards which do not result in classification : Electrostatic charges may be generated during handling. Containers must be properly grounded before beginning transfer. Vapours are heavier than air and may travel considerable distance to an ignition source and flash back to source of vapours. Flammable vapours may accumulate in the container. In high concentrations vapours cause anaesthetic and narcotic effect.

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

Contains no PBT/vPvB substances ≥ 0.1% assessed in accordance with REACH Annex XIII

Component	
n-hexane (110-54-3)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
Toluene (108-88-3)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
Benzene (71-43-2)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
cyclohexane (110-82-7)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
Ethylbenzene (100-41-4)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
Trimethylbenzene (25551-13-7)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
Xylene (all isomers) (1330-20-7)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605
The substance/mixture has no endocrine disrupting properties.

Component	
Toluene(108-88-3)	The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605
Benzene(71-43-2)	The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605
cyclohexane(110-82-7)	The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605
Xylene (all isomers)(1330-20-7)	The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

SECTION 3: Composition/information on ingredients

3.1. Substances

Comments : Hazard classification of this material is based on the worst possible case
Substance type : UVCB
Trade name : Gasoline
CAS-No. : 86290-81-5
EC-No. : 289-220-8
EC Index-No. : 649-378-00-4

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Gasoline	CAS-No.: 86290-81-5 EC-No.: 289-220-8 EC Index-No.: 649-378-00-4 REACH-no: 01-2119471335-39-0117, UK-01-4615601157-2-0003	100	See section 2.1
n-hexane (Constituent)	CAS-No.: 110-54-3 EC-No.: 203-777-6 EC Index-No.: 601-037-00-0	≥ 3	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Repr. 2, H361f STOT SE 3, H336 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Chronic 2, H411 (M=100)
Toluene (Constituent)	CAS-No.: 108-88-3 EC-No.: 203-625-9 EC Index-No.: 601-021-00-3	≥ 3	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Repr. 2, H361d STOT SE 3, H336 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Chronic 3, H412
Benzene (Constituent)	CAS-No.: 71-43-2 EC-No.: 200-753-7 EC Index-No.: 601-020-00-8	≤ 1.05	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Muta. 1B, H340 Carc. 1A, H350 STOT RE 1, H372 Asp. Tox. 1, H304 Aquatic Chronic Not classified
cyclohexane (Constituent)	CAS-No.: 110-82-7 EC-No.: 203-806-2 EC Index-No.: 601-017-00-1		Flam. Liq. 2, H225 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Ethylbenzene (Constituent)	CAS-No.: 100-41-4 EC-No.: 202-849-4 EC Index-No.: 601-023-00-4		Flam. Liq. 2, H225 Acute Tox. 4 (Inhalation:vapour), H332 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Chronic 3, H412
Trimethylbenzene (Constituent)	CAS-No.: 25551-13-7 EC-No.: 247-099-9 EC Index-No.: 601-043-00-3		Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation:vapour), H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335 Aquatic Chronic 2, H411
Xylene (all isomers) (Constituent)	CAS-No.: 1330-20-7 EC-No.: 215-535-7 EC Index-No.: 601-022-00-9		Flam. Liq. 3, H226 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation), H332 Skin Irrit. 2, H315

Specific concentration limits:		
Name	**Product identifier**	**Specific concentration limits**
n-hexane (Constituent)	CAS-No.: 110-54-3 EC-No.: 203-777-6 EC Index-No.: 601-037-00-0	(5 ≤C < 100) STOT RE 2, H373

Full text of H and EUH statements: see section 16

Comments : The full UVCB ingredient list is not known
May contain dyes and markers at < 0.20 % v/v for tax purposes and to prevent fraud.
The substances identified as "constituents" are chemical compounds that are typically present in the UVCB substance. Their presence may be relevant for hazard classification, or other health / environmental reasons (i.e. OELs)

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Caution. First aider: Pay attention to self-protection!. IF exposed or concerned: Get medical advice/attention.

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing. Get immediate medical advice/attention. If experiencing respiratory symptoms: Give oxygen or artificial respiration if necessary. Unconscious: maintain adequate airway and respiration.

First-aid measures after skin contact : Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Wash with water and soap as a precaution. If skin irritation or rash occurs: Get medical advice/attention.

First-aid measures after eye contact : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Ensure adequate flushing of eyes by separating eyelids with the fingers. If eye irritation persists: Get medical advice/attention.

First-aid measures after ingestion : Do not induce vomiting. Get immediate medical advice/attention. Rinse mouth out with water. Aspiration of the product into the lungs may cause very serious pneumonia. Vomiting: prevent asphyxia/aspiration pneumonia.

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

Symptoms/effects : Symptoms may be delayed.

Symptoms/effects after inhalation : Depression of the central nervous system, headaches, dizziness, drowsiness, loss of coordination. Mental confusion. Cardiac arrhythmias. High concentrations in the air cause a deficiency of oxygen with the risk of unconsciousness or death. Danger of serious damage to health by prolonged exposure through inhalation.

Symptoms/effects after skin contact : Irritation.

Symptoms/effects after eye contact : May cause eye irritation.

Symptoms/effects after ingestion : Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis. Risk of lung oedema.

Chronic symptoms : May cause cancer. May cause hereditary genetic damage. May impair fertility and cause harm to the unborn child. Prolonged or repeated contact may cause skin to become dry or cracked.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Alcohol resistant foam. Dry powder. Sand. Carbon dioxide.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Fire hazard	:	Extremely flammable liquid and vapour. Heavier than air, vapours may travel long distances along ground, ignite and flash back to source. Floats on water.
Explosion hazard	:	Risk of explosion if heated under confinement. May form flammable/explosive vapour-air mixture. Prevent the product from entering drains or confined areas.
Reactivity in case of fire	:	Do not scatter spilled material with high-pressure water streams. Reacts violently with water.
Hazardous decomposition products in case of fire	:	May release flammable gases. Combustion generates: Carbon oxides (CO, CO2). Nitrogen oxides. Sulphur oxides.

5.3. Advice for firefighters

Precautionary measures fire	:	Keep upwind. Exposure to fire/heat: seal off low-lying areas. Heavy vapours. Shut off low-level openings in the vicinity (ventilation shafts, drains...). Consider evacuation. Stop leak if safe to do so. Fight fire from safe distance and protected location. or. Fight fire from a safe distance or use hoses with support or cannon engine. Close doors and windows of adjacent premises.
Firefighting instructions	:	Keep public away from danger area. If no hazard for/from the surroundings: controlled burning. Shut off source of fuel if possible, and allow fire to burn out. or. Fight fire with normal precautions from a reasonable distance. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion. Eliminate all ignition sources if safe to do so. Dilute combustible/toxic gases/vapours with water spray. Contain the extinguishing fluids by bunding. Use water spray or fog for cooling exposed containers. Risk of explosion if heated under confinement. Physical explosion risk: extinguish/cool from behind cover.
Protection during firefighting	:	Do not attempt to take action without suitable protective equipment. Do not enter fire area without proper protective equipment, including respiratory protection. Self-contained breathing apparatus. Complete protective clothing.
Other information	:	Prevent fire fighting water from entering the environment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	:	Contact with walking surface may result in formation of slippery film/falling hazard. Ventilate area. Eliminate every possible source of ignition. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel

Emergency procedures	:	Only qualified personnel equipped with suitable protective equipment may intervene. No open flames, no sparks, and no smoking. Avoid breathing vapours, mist, spray, gas. Avoid contact with skin, eyes and clothing. Keep upwind.

6.1.2. For emergency responders

Protective equipment	:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures	:	Mark out the contaminated area with signs and prevent access to unauthorized personnel. Monitor the atmosphere at regular intervals. All equipment used when handling the product must be grounded. Stop leak if safe to do so.

6.2. Environmental precautions

Avoid discharge to atmosphere. Do not allow to enter drains or water courses. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Notify authorities if product enters sewers or public waters. Floats on water. On water, recover/skim from surface and pour out in disposal container.

6.3. Methods and material for containment and cleaning up

For containment	:	Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Cover liquid spill with foam or sand/earth. Cover with: Dry powder. Dilute/disperse combustible gas/vapour with water curtain. Following release to a body of water such as a river, contain liquid spill using floatation barriers.

Methods for cleaning up	:	Ground and bond container and receiving equipment. Use explosion-proof equipment. Use non-sparking tools. Take precautionary measures against static discharge. Contain large spillage with sand or earth. Cover spill with non combustible material, e.g.: sand, earth, vermiculite. Take up mechanically (sweeping, shovelling) and collect in suitable container for disposal. Clean contaminated surfaces with an excess of water. Contaminated product, soil or water intended for disposal have to be considered as dangerous. Assumes no free product in wastewater stream; oil-water separation (e.g. via oil water separators, oil skimmers, dissolved air floatation) may be required under some circumstances. Wash clothing and equipment after handling.
Other information	:	Dispose of materials or solid residues at an authorized site. Maritime spillages should be dealt with using Shipboard Oil Pollution Emergency Plan (SOPEP) as required by MARPOL Annex I Regulation 37.

6.4. Reference to other sections

For further information see section 4. First aid measures. For further information refer to section 8: "Exposure controls/personal protection". For further information, refer to section 10 : "Stability and Reactivity". For further information refer to section 13. Disposal considerations.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed	:	As a result of flow, agitation, etc, electrostatic charges can be generated. Ensure equipment is adequately earthed. In use, may form flammable vapour-air mixture.
Precautions for safe handling	:	Do not handle until all safety precautions have been read and understood. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only outdoors or in a well-ventilated area. Flammable vapours may accumulate in the container. Use explosion-proof equipment. Wear personal protective equipment. Avoid breathing vapours. Avoid contact with skin and eyes. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Have emergency equipment (for fires, spills, leaks, etc.) readily available.
Hygiene measures	:	Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures	:	Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge.
Storage conditions	:	Store in a well-ventilated place. Keep cool. Store locked up. Flammable vapours can accumulate in head space of closed systems. Handle empty containers with care because residual vapours are flammable.
Incompatible products	:	Oxidizing agent. Strong acids. Strong bases.
Heat and ignition sources	:	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Information on mixed storage	:	Store away from strong oxidizers, strong bases, strong acids.
Storage area	:	May be stored under inert gas. Dike and vent equipped storage tanks. Provide proper grounding. Storage of this product may be subject to the Control of Pollution (Oil Storage) (England) Regulations 2001. Additional guidance may be obtained from the Environment Agency.

7.3. Specific end use(s)

Do not ingest. Use as a fuel. Section. 1.2. Relevant identified uses of the substance or mixture and uses advised against.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 National occupational exposure and biological limit values

n-hexane (110-54-3)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	n-Hexane
IOEL TWA	72 mg/m³
IOEL TWA [ppm]	20 ppm
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
United Kingdom - Occupational Exposure Limits	
Local name	n-Hexane
WEL TWA [1]	72 mg/m³
WEL TWA [2]	20 ppm
Regulatory reference	EH40. HSE

Toluene (108-88-3)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Toluene
IOEL TWA	192 mg/m³
IOEL TWA [ppm]	50 ppm
IOEL STEL	384 mg/m³
IOEL STEL [ppm]	100 ppm
Remark (CH)	Skin
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
United Kingdom - Occupational Exposure Limits	
Local name	Toluene
WEL TWA [1]	191 mg/m³
WEL TWA [2]	50 ppm
WEL STEL	384 mg/m³
WEL STEL (ppm)	100 ppm
Remark (CH)	Sk (Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity)
Regulatory reference	EH40. HSE

Benzene (71-43-2)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Benzene
IOEL TWA	3.25 mg/m³
IOEL TWA [ppm]	1 ppm
Remark (CH)	Skin. Substantial contribution to the total body burden via dermal exposure possible.
Regulatory reference	DIRECTIVE (EU) 2017/2398
United Kingdom - Occupational Exposure Limits	
Local name	Benzene
WEL TWA [1]	3.25 mg/m³
WEL TWA [2]	1 ppm

Benzene (71-43-2)	
Remark (CH)	Carc (Capable of causing cancer and/or heritable genetic damage. See paragraphs 49–51), Sk (Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity)
Regulatory reference	EH40. HSE

cyclohexane (110-82-7)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Cyclohexane
IOEL TWA	700 mg/m³
IOEL TWA [ppm]	200 ppm
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
United Kingdom - Occupational Exposure Limits	
Local name	Cyclohexane
WEL TWA [1]	350 mg/m³
WEL TWA [2]	100 ppm
WEL STEL	1050 mg/m³
WEL STEL (ppm)	300 ppm
Regulatory reference	EH40. HSE

Ethylbenzene (100-41-4)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Ethylbenzene
IOEL TWA	442 mg/m³
IOEL TWA [ppm]	100 ppm
IOEL STEL	884 mg/m³
IOEL STEL [ppm]	200 ppm
Remark (CH)	Skin
Regulatory reference	COMMISSION DIRECTIVE 2000/39/EC
United Kingdom - Occupational Exposure Limits	
Local name	Ethylbenzene
WEL TWA [1]	441 mg/m³
WEL TWA [2]	100 ppm
WEL STEL	552 mg/m³
WEL STEL (ppm)	125 ppm
Remark (CH)	Sk (Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity)
Regulatory reference	EH40. HSE

Trimethylbenzene (25551-13-7)	
United Kingdom - Occupational Exposure Limits	
Local name	Trimethylbenzenes
WEL TWA [1]	125 mg/m³

Trimethylbenzene (25551-13-7)	
WEL TWA [2]	25 ppm
Regulatory reference	EH40. HSE

Xylene (all isomers) (1330-20-7)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Xylene, mixed isomers, pure
IOEL TWA	221 mg/m³
IOEL TWA [ppm]	50 ppm
IOEL STEL	442 mg/m³
IOEL STEL [ppm]	100 ppm
Remark (CH)	Skin
Regulatory reference	COMMISSION DIRECTIVE 2000/39/EC
United Kingdom - Occupational Exposure Limits	
Local name	Xylene
WEL TWA [1]	220 mg/m³ o-,m-,p- or mixed isomers
WEL TWA [2]	50 ppm o-,m-,p- or mixed isomers
WEL STEL	441 mg/m³ o-,m-,p- or mixed isomers
WEL STEL (ppm)	100 ppm o-,m-,p- or mixed isomers
Remark (CH)	Sk (Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity), BMGV (Biological monitoring guidance values are listed in Table 2)
Regulatory reference	EH40. HSE

8.1.2. Recommended monitoring procedures

Monitoring methods	
Monitoring methods	Determination of aromatic hydrocarbons in the air of workplace. Personal monitoring. Monitor the atmosphere at regular intervals. Workplace exposure - General requirements for the performance of procedures for the measurement of chemical agents.
Biological monitoring methods	A specific exposure sampling method is not available

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

Gasoline (86290-81-5)	
DNEL/DMEL (Workers)	
Acute - systemic effects, inhalation	1286.4 mg/m³
Acute - local effects, inhalation	1066.67 mg/m³
Long-term - local effects, inhalation	837.5 mg/m³
DNEL/DMEL (General population)	
Acute - systemic effects, inhalation	1152 mg/m³
Acute - local effects, inhalation	640 mg/m³
Long-term - local effects, inhalation	178.57 mg/m³

Gasoline (86290-81-5)	
DNEL/DMEL (additional information)	
Additional information	ECHA (European Chemicals Agency)
PNEC (Water)	
PNEC aqua (freshwater)	uPDATED No data available
PNEC aqua (marine water)	No data available
PNEC (Sediment)	
PNEC sediment (freshwater)	No data available
PNEC sediment (marine water)	No data available
PNEC (Soil)	
PNEC soil	No data available
PNEC (Oral)	
PNEC oral (secondary poisoning)	8.77 mg/kg wet weight
PNEC (STP)	
PNEC sewage treatment plant	No data available
PNEC (additional information)	
Additional information	Material nearly insoluble in water. UVCB. Presentation is based on CONCAWE recommendations

8.1.5. Control banding

No additional information available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Appropriate engineering controls:
Industrial and professional. Perform risk assessment prior to use. Use only explosion-proof equipment. Ensure adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. Provide local exhaust or general room ventilation to minimize mist and/or vapour concentrations. A specific assessment of inhalation risks from the presence of flammable or toxic gases in tank headspaces, confined spaces, product residue, tank waste water, waste water and unintentional releases should be made to help determine controls appropriate to local circumstances.

8.2.2. Personal protection equipment

Personal protective equipment:
Avoid all unnecessary exposure. Use personal protective equipment as required. A risk assessment is required. Full protective flameproof clothing. Gloves. Protective goggles. Head/neck protection.

Personal protective equipment symbol(s):

8.2.2.1. Eye and face protection

Eye protection:
Chemical goggles or safety glasses. Non-vented. EN 166

8.2.2.2. Skin protection

Skin and body protection:
Safety boots. EN ISO 20345. Head protection

Hand protection:
Chemical resistant gloves (according to European standard NF EN 374 or equivalent). Choosing the proper glove is a decision that depends not only on the type of material, but also on other quality features, which differ for each manufacturer. Please follow the instructions related to the permeability and the penetration time provided by the manufacturer. Polyvinyl alcohol (PVA) gloves are not water resistant: these gloves should not be used in the event of an emergency.

Hand protection

Type	Material	Permeation	Thickness (mm)	Penetration	Standard
Reusable gloves, Disposable gloves	Nitrile rubber	5 (> 240 minutes)			EN ISO 374
Reusable gloves	Neoprene rubber (HNBR)	3 (> 60 minutes)			EN ISO 374
Disposable gloves	Polyvinylchloride (PVC)	3 (> 60 minutes)			EN ISO 374

Other skin protection

Materials for protective clothing:
Flame retardant antistatic protective clothing. Standard EN ISO 14116

8.2.2.3. Respiratory protection

Respiratory protection:
No respiratory protection needed under normal use conditions. In case of inadequate ventilation wear respiratory protection. Where exposure through inhalation may occur from use, respiratory protection equipment is recommended

Respiratory protection

Device	Filter type	Condition	Standard
Full face mask	Type AX - Low-boiling (<65 °C) organic compounds, Type P3	If conc. in air > exposure limit, Short term exposure	EN 136, EN 14387
Supplied-Air Respirator (SAR)		Long term exposure, Mist formation, Vapour protection, If conc. in air > 1 vol %	EN 136, BS EN 12021

8.2.2.4. Thermal hazards

No additional information available

8.2.3. Environmental exposure controls

Environmental exposure controls:
Avoid release to the environment. Do not exceed the occupational exposure limits (OEL).

Consumer exposure controls:
Do not ingest. If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Other information:
Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Do not eat, drink or smoke when using this product. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Colour	:	Colourless. to. straw yellow.
Appearance	:	Clear.
Odour	:	Hydrocarbon.
Odour threshold	:	Not available
Melting point	:	Not applicable
Freezing point	:	Not available
Boiling point	:	≈ 20 (20 – 210) °C On basis of test data
Flammability	:	Not applicable

Explosive properties	:	Not classified as explosive according to EC criteria, but may present risks in the event of a fire. Risk of explosion if heated under confinement.
Oxidising properties	:	Not applicable. Non oxidizing material according to EC criteria.
Explosive limits	:	Not available
Lower explosion limit	:	1.4 vol % On basis of test data
Upper explosion limit	:	7.6 vol % On basis of test data
Flash point	:	< 0 °C
Auto-ignition temperature	:	280 – 470 °C ECHA (European Chemicals Agency)
Decomposition temperature	:	Not available
pH	:	Not available
Viscosity, kinematic	:	≤ 1 mm²/s On basis of test data
Solubility	:	Floats on water. Water: 0.41 – 2000 mg/l
Partition coefficient n-octanol/water (Log Kow)	:	≈ 2 (1.99 – 5.25) (calculated value)
Vapour pressure	:	45 – 100 kPa On basis of test data
Vapour pressure at 50 °C	:	Not available
Density	:	720 – 775 kg/m³ @ 15 °C
Relative density	:	Not available
Relative vapour density at 20 °C	:	Not available
Particle characteristics	:	Not applicable

9.2. Other information

9.2.1. Information with regard to physical hazard classes

No additional information available

9.2.2. Other safety characteristics

Other properties	:	Electrostatic charges may be generated during handling,Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level
Additional information	:	Chemical safety assessment (Additional information)

SECTION 10: Stability and reactivity

10.1. Reactivity

Extremely flammable liquid and vapour. The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Avoid contact with hot surfaces. No flames, no sparks. Eliminate all sources of ignition.

10.5. Incompatible materials

Oxidizing agent. Strong acids. Strong bases.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

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

Acute toxicity (oral)	:	Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (dermal)	:	Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (inhalation)	:	Not classified (Based on available data, the classification criteria are not met)

Gasoline (86290-81-5)	
LD50 oral rat	> 5000 mg/kg (OECD 401 method)
LD50 dermal rabbit	> 2000 mg/kg (OECD 402 method)
LC50 inhalation rat (mg/l)	> 5 mg/l (OECD 403 method)

Trimethylbenzene	
LD50 dermal rat	3440 mg/kg bodyweight On basis of test data

Xylene (all isomers)	
LC50 inhalation rat (Vapours - mg/l/4h)	29.09 mg/l/4h (Published data)

Skin corrosion/irritation : Causes skin irritation.
Serious eye damage/irritation : Not classified (Based on available data, the classification criteria are not met)
Respiratory or skin sensitisation : Not classified (Based on available data, the classification criteria are not met. Not expected to be a skin sensitizer)
Germ cell mutagenicity : May cause genetic defects.
Carcinogenicity : May cause cancer.

Gasoline (86290-81-5)	
IARC group	2B - Possibly carcinogenic to humans

Toluene	
IARC group	3 - Not classifiable

Benzene	
IARC group	1 - Carcinogenic to humans

Reproductive toxicity : Suspected of damaging fertility. Suspected of damaging the unborn child.
STOT-single exposure : May cause drowsiness or dizziness.
Additional information : In the event of exposure to high concentrations : Depression of the central nervous system, headaches, dizziness, drowsiness, loss of coordination

n-hexane (110-54-3)	
STOT-single exposure	May cause drowsiness or dizziness.

Toluene (108-88-3)	
STOT-single exposure	May cause drowsiness or dizziness.

cyclohexane (110-82-7)	
STOT-single exposure	May cause drowsiness or dizziness.

Trimethylbenzene (25551-13-7)	
STOT-single exposure	May cause respiratory irritation.

STOT-repeated exposure : Not classified (Based on available data, the classification criteria are not met)

Gasoline (86290-81-5)	
NOAEC (inhalation, rat, vapour, 90 days)	1402 mg/l/6h/day (OECD 453 method)

n-hexane	
NOAEL (oral, rat, 90 days)	40 mg/kg bodyweight/day (OECD 408 method)
STOT-repeated exposure	May cause damage to organs (central nervous system) through prolonged or repeated exposure (if inhaled).

Toluene	
STOT-repeated exposure	May cause damage to organs (central nervous system) through prolonged or repeated exposure (inhalation).

Benzene	
STOT-repeated exposure	Causes damage to organs (haematopoietic system) through prolonged or repeated exposure (inhalation, oral).

Ethylbenzene	
STOT-repeated exposure	May cause damage to organs (hearing organs) through prolonged or repeated exposure (oral, inhalation).

Trimethylbenzene	
NOAEL (oral, rat, 90 days)	600 mg/kg bodyweight/day (OECD 408 method)
NOAEC (inhalation, rat, vapour, 90 days)	1800 mg/m³ (OECD 452 method)

Aspiration hazard : May be fatal if swallowed and enters airways.

Gasoline (86290-81-5)	
Viscosity, kinematic	≤ 1 mm²/s On basis of test data
Hydrocarbon	Yes

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Adverse health effects caused by endocrine disrupting properties : The substance/mixture has no endocrine disrupting properties.

11.2.2. Other information

Potential adverse human health effects and symptoms : May be fatal if swallowed and enters airways,Causes skin irritation,May cause drowsiness or dizziness,May cause cancer,May cause genetic defects,Suspected of damaging fertility. Suspected of damaging the unborn child.

Other information : Likely routes of exposure: inhalation, skin and eye,Inhalation causes narcotic effects,Information on Effects: refer to section 4

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Toxic to aquatic life with long lasting effects.

Ecology - air : Not dangerous for the ozone layer.

Acute aquatic toxicity : Not classified (Based on available data, the classification criteria are not met)

Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

Gasoline (86290-81-5)	
LC50 - Fish [1]	≈ 8.2 mg/l (Published data)
LC50 - Fish [2]	≈ 10 mg/l (OECD 203 method)
EC50 - Daphnia [1]	≈ 4.5 mg/l (OECD 202 method)
EC50 72h - Algae [1]	≈ 3.1 mg/l (OECD 201 method)
NOEC chronic crustacea	2.6 mg/l (OECD 211 method)

n-hexane (110-54-3)	
LC50 - Fish [1]	12 mg/l (OECD 203 method)
EC50 - Daphnia [1]	3 mg/l (OECD 202 method)
ErC50 algae	55 mg/l (OECD 201 method)
NOEC chronic fish	2.28 mg/l Quantitative structure-activity relationship (QSAR)
NOEC chronic crustacea	3.97 mg/l Quantitative structure-activity relationship (QSAR)
NOEC chronic algae	25 ng/l Quantitative structure-activity relationship (QSAR)

Toluene (108-88-3)	
LC50 - Fish [1]	≈ 5.5 mg/l (Published data)
EC50 - Daphnia [1]	≈ 3.75 mg/l (Published data)
EC50 72h - Algae [1]	≈ 134 mg/l (Published data)
NOEC chronic fish	≈ 1.4 mg/l (Published data)
NOEC chronic crustacea	≈ 0.74 mg/l (Published data)
NOEC chronic algae	≈ 10 mg/l (Published data)

Benzene (71-43-2)	
LC50 - Fish [1]	≈ 5.3 mg/l (OECD 203 method)
EC50 - Daphnia [1]	≈ 10 mg/l (OECD 202 method)
EC50 72h - Algae [1]	≈ 32 mg/l (OECD 201 method)
ErC50 algae	100 mg/l
NOEC chronic fish	≈ 0.8 mg/l (Published data)
NOEC chronic crustacea	≈ 3 mg/l (Published data)
NOEC chronic algae	≈ 34 mg/l (OECD 201 method)

cyclohexane (110-82-7)	
LC50 - Fish [1]	4.53 mg/l (OECD 203 method)
EC50 - Daphnia [1]	0.9 mg/l (OECD 202 method)
EC50 72h - Algae [1]	3.4 mg/l (OECD 201 method)
NOEC chronic fish	0.447 mg/l Quantitative structure-activity relationship (QSAR)
NOEC chronic crustacea	0.835 mg/l Quantitative structure-activity relationship (QSAR)
NOEC chronic algae	0.462 mg/l Quantitative structure-activity relationship (QSAR)

Ethylbenzene (100-41-4)	
LC50 - Fish [1]	5.1 mg/l On basis of test data
LC50 - Fish [2]	4.2 mg/l (OECD 203 method)
EC50 - Daphnia [1]	1.8 mg/l On basis of test data
EC50 - Daphnia [2]	2.6 mg/l On basis of test data
EC50 96h - Algae [1]	3.6 mg/l On basis of test data
EC50 96h - Algae [2]	7.7 mg/l On basis of test data
NOEC chronic crustacea	0.96 mg/l On basis of test data
NOEC chronic algae	3.4 mg/l On basis of test data

Trimethylbenzene (25551-13-7)	
LC50 - Fish [1]	7.72 mg/l On basis of test data
EC50 - Daphnia [1]	3.6 mg/l (OECD 202 method)
EC50 96h - Algae [1]	2.356 mg/l Quantitative structure-activity relationship (QSAR)
NOEC chronic crustacea	≈ 0.4 (0.4 – 2) mg/l (Published data)
NOEC chronic algae	24.2 mg/l (OECD 301F method)

Xylene (all isomers) (1330-20-7)	
LC50 - Fish [1]	2.6 mg/l (OECD 203 method)

Xylene (all isomers) (1330-20-7)	
EC50 - Daphnia [1]	1 mg/l (OECD 202 method)
EC50 72h - Algae [1]	1.3 mg/l (Published data)
NOEC chronic fish	1.3 mg/l On basis of test data
NOEC chronic crustacea	0.96 mg/l On basis of test data
NOEC chronic algae	0.44 mg/l (Published data)

12.2. Persistence and degradability

Gasoline (86290-81-5)	
Persistence and degradability	UVCB. Inherently biodegradable.

n-hexane (110-54-3)	
Persistence and degradability	Readily biodegradable.

Toluene (108-88-3)	
Persistence and degradability	Readily biodegradable. Photolysis in the air. Abiotic degradation.
BOD (% of ThOD)	≥ 80 % ThOD ECHA (European Chemicals Agency)

Benzene (71-43-2)	
Persistence and degradability	Readily biodegradable. Indirect photolysis : air.
ThOD	No data available
Biodegradation	≈ 88 % (OECD 301F method)

cyclohexane (110-82-7)	
Persistence and degradability	Readily biodegradable in water.

Ethylbenzene (100-41-4)	
Persistence and degradability	Readily biodegradable.
Biochemical oxygen demand (BOD)	1.44 g O_2/g substance
Chemical oxygen demand (COD)	2.1 g O_2/g substance
ThOD	3.17 g O_2/g substance

Trimethylbenzene (25551-13-7)	
Persistence and degradability	In soil and sediments : Biodegradable.

Xylene (all isomers) (1330-20-7)	
Persistence and degradability	In soil and sediments : Biodegradable. Readily biodegradable in water.

12.3. Bioaccumulative potential

Gasoline (86290-81-5)	
Partition coefficient n-octanol/water (Log Kow)	≈ 2 (1.99 – 5.25) (calculated value)
Bioaccumulative potential	UVCB. Potential for bioaccumulation (4 ≥ Log Kow ≤ 5).

n-hexane (110-54-3)	
Partition coefficient n-octanol/water (Log Pow)	3.9 (OECD 107 method)
Bioaccumulative potential	Low bioaccumulation potential.

Toluene (108-88-3)	
Bioconcentration factor (BCF REACH)	≈ 90 (Published data)
Partition coefficient n-octanol/water (Log Kow)	≈ 2.73 (Published data)
Bioaccumulative potential	Low bioaccumulation potential.

Benzene (71-43-2)	
BCF - Fish [1]	< 10 mg/kg (OECD 305 method)
Bioconcentration factor (BCF REACH)	13 Quantitative structure-activity relationship (QSAR)
Partition coefficient n-octanol/water (Log Kow)	2.13
Bioaccumulative potential	Low bioaccumulation potential.

cyclohexane (110-82-7)	
Bioconcentration factor (BCF REACH)	167 Quantitative structure-activity relationship (QSAR)
Partition coefficient n-octanol/water (Log Pow)	3.44 @ 25 °C
Bioaccumulative potential	Low bioaccumulation potential.

Ethylbenzene (100-41-4)	
Bioconcentration factor (BCF REACH)	110 (calculated value)
Partition coefficient n-octanol/water (Log Pow)	3.6 @ 20 °C
Partition coefficient n-octanol/water (Log Kow)	3.15
Bioaccumulative potential	Low bioaccumulation potential.

Trimethylbenzene (25551-13-7)	
BCF - Fish [1]	100 – 300 Quantitative structure-activity relationship (QSAR)
Partition coefficient n-octanol/water (Log Pow)	3.42
Partition coefficient n-octanol/water (Log Kow)	< 4
Bioaccumulative potential	Low bioaccumulation potential.

Xylene (all isomers) (1330-20-7)	
BCF - Fish [1]	25.9 mg/kg On basis of test data
Partition coefficient n-octanol/water (Log Pow)	3.2 @ 20 °C
Bioaccumulative potential	Low bioaccumulation potential.

12.4. Mobility in soil

Gasoline (86290-81-5)	
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	1.71 – 4.35
Ecology - soil	The full UVCB ingredient list is not known. Mobility and bioaccumulation potential.

n-hexane (110-54-3)	
Surface tension	17.89 mN/m
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	3.34 Quantitative structure-activity relationship (QSAR)
Ecology - soil	Low mobility (soil).

Toluene (108-88-3)	
Mobility in soil	≈ 485 Henry's constant :

Toluene (108-88-3)	
Surface tension	≈ 27.73 mN/m (Published data)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	≈ 2.26 On basis of test data
Ecology - soil	Low mobility (soil).

Benzene (71-43-2)	
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	1.848 Quantitative structure-activity relationship (QSAR)
Ecology - soil	Low mobility (soil).

cyclohexane (110-82-7)	
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	2.89 (calculated value)
Ecology - soil	Low mobility (soil).

Ethylbenzene (100-41-4)	
Surface tension	71.2 mN/m On basis of test data
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	2.71 (calculated value)
Ecology - soil	Low mobility (soil).

Trimethylbenzene (25551-13-7)	
Ecology - soil	Adsorbs into the soil.

Xylene (all isomers) (1330-20-7)	
Surface tension	28.7 mN/m
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	2.73 (OECD 121 method)
Ecology - soil	Low mobility (soil).

12.5. Results of PBT and vPvB assessment

Gasoline (86290-81-5)
This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Endocrine disrupting properties

Adverse effects on the environment caused by endocrine disrupting properties : The substance/mixture has no endocrine disrupting properties.

12.7. Other adverse effects

Additional information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste) : Disposal must be done according to official regulations.
Waste treatment methods : Assure that emissions are compliant with all applicable air pollution control regulations.
Sewage disposal recommendations : Do not dispose of waste into sewer. Disposal must be done according to official regulations.

Product/Packaging disposal recommendations	:	Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation. Beware of residues or vapours which remain in the drums.
Additional information	:	Handle empty containers with care because residual vapours are flammable.
Ecology - waste materials	:	Hazardous waste due to toxicity. Avoid release to the environment.

SECTION 14: Transport information

In accordance with ADR / IMDG / ADN

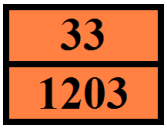
ADR	IMDG	ADN
14.1. UN number or ID number		
UN 1203	UN 1203	UN 1203
14.2. UN proper shipping name		
GASOLINE	GASOLINE	GASOLINE
Transport document description		
UN 1203 GASOLINE, 3, II, (D/E), ENVIRONMENTALLY HAZARDOUS	UN 1203 GASOLINE, 3, II, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS	UN 1203 GASOLINE, 3, II, ENVIRONMENTALLY HAZARDOUS
14.3. Transport hazard class(es)		
3	3	3
		
14.4. Packing group		
II	II	II
14.5. Environmental hazards		
Dangerous for the environment: Yes	Dangerous for the environment: Yes Marine pollutant: Yes	Dangerous for the environment: Yes
No supplementary information available		

14.6. Special precautions for user

Special transport precautions : Refer to protective measures listed in Sections 7 and 8

Overland transport

Classification code (ADR)	:	F1
Special provisions (ADR)	:	243, 534, 363, 664
Limited quantities (ADR)	:	1l
Excepted quantities (ADR)	:	E2
Packing instructions (ADR)	:	P001, IBC02, R001
Special packing provisions (ADR)	:	BB2
Mixed packing provisions (ADR)	:	MP19
Portable tank and bulk container instructions (ADR)	:	T4
Portable tank and bulk container special provisions (ADR)	:	TP1
Tank code (ADR)	:	LGBF
Tank special provisions (ADR)	:	TU9
Vehicle for tank carriage	:	FL
Transport category (ADR)	:	2
Special provisions for carriage - Operation (ADR)	:	S2, S20
Hazard identification number (Kemler No.)	:	33

Orange plates : 

Tunnel restriction code (ADR) : D/E
EAC code : 3YE

Transport by sea

Transport regulations (IMDG) : MARPOL Annex I rules apply for bulk shipments by sea.
Special provisions (IMDG) : 243, 363
Limited quantities (IMDG) : 1 L
Excepted quantities (IMDG) : E2
Packing instructions (IMDG) : P001
IBC packing instructions (IMDG) : IBC02
Tank instructions (IMDG) : T4
Tank special provisions (IMDG) : TP1
EmS-No. (Fire) : F-E
EmS-No. (Spillage) : S-E
Stowage category (IMDG) : E
Properties and observations (IMDG) : Immiscible with water.

Inland waterway transport

Classification code (ADN) : F1
Special provisions (ADN) : 243, 363, 534
Limited quantities (ADN) : 1 L
Excepted quantities (ADN) : E2
Carriage permitted (ADN) : T
Equipment required (ADN) : PP, EX, A
Ventilation (ADN) : VE01
Number of blue cones/lights (ADN) : 1

14.7. Maritime transport in bulk according to IMO instruments

IBC code : Not applicable.

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

EU Restriction list

Reference code	Applicable on	Entry title or description
3(a)	Gasoline ; n-hexane ; Toluene ; Benzene ; cyclohexane ; Ethylbenzene ; Trimethylbenzene ; Xylene (all isomers)	Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 2.1 to 2.4, 2.6 and 2.7, 2.8 types A and B, 2.9, 2.10, 2.12, 2.13 categories 1 and 2, 2.14 categories 1 and 2, 2.15 types A to F
3(b)	Gasoline ; n-hexane ; Toluene ; Benzene ; cyclohexane ; Ethylbenzene ; Trimethylbenzene ; Xylene (all isomers)	Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10
3(c)	Gasoline ; n-hexane ; Toluene ; cyclohexane ; Ethylbenzene ; Trimethylbenzene	Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard class 4.1

EU Restriction list		
Reference code	**Applicable on**	**Entry title or description**
5.	Benzene	Benzene
28.	Gasoline ; Benzene	Substances which are classified as carcinogen category 1A or 1B in Part 3 of Annex VI to Regulation (EC) No 1272/2008 and are listed in Appendix 1 or Appendix 2, respectively.
29.	Gasoline ; Benzene	Substances which are classified as germ cell mutagen category 1A or 1B in Part 3 of Annex VI to Regulation (EC) No 1272/2008 and are listed in Appendix 3 or Appendix 4, respectively.
30.	Gasoline	Substances which are classified as reproductive toxicant category 1A or 1B in Part 3 of Annex VI to Regulation (EC) No 1272/2008 and are listed in Appendix 5 or Appendix 6, respectively.
40.	Gasoline ; n-hexane ; Toluene ; Benzene ; cyclohexane ; Ethylbenzene ; Trimethylbenzene ; Xylene (all isomers)	Substances classified as flammable gases category 1 or 2, flammable liquids categories 1, 2 or 3, flammable solids category 1 or 2, substances and mixtures which, in contact with water, emit flammable gases, category 1, 2 or 3, pyrophoric liquids category 1 or pyrophoric solids category 1, regardless of whether they appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 or not.
48.	Toluene	Toluene
57.	cyclohexane	Cyclohexane
72.	Benzene	The substances listed in column 1 of the Table in Appendix 12

Gasoline is not on the REACH Candidate List
Gasoline is not on the REACH Annex XIV List
Gasoline is not subject to REGULATION (EU) No 649/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 concerning the export and import of hazardous chemicals.
Gasoline is not subject to Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC
Gasoline, Low boiling point naphtha is not subject to REGULATION (EU) No 1005/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 September 2009 on substances that deplete the ozone layer.
Contains no substance subject to Regulation (EU) 2019/1148 of the European Parliament and of the Council of 20 June 2019 on the marketing and use of explosives precursors.

Directive 2012/18/EU (SEVESO III)

Seveso III Part II (Named dangerous substances)	Qualifying quantity (tonnes)	
	Lower-tier	**Upper-tier**
34. Petroleum products and alternative fuels (a) gasolines and naphthas, (b) kerosenes (including jet fuels), (c) gas oils (including diesel fuels, home heating oils and gas oil blending streams) (d) heavy fuel oils (e) alternative fuels serving the same purposes and with similar properties as regards flammability and environmental hazards as the products referred to in points (a) to (d)	2500	25000

Contains no substance subject to Regulation (EC) 273/2004 of the European Parliament and of the Council of 11 February 2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances.

15.1.2. National regulations

United Kingdom

British National Regulations : Control of Substances Hazardous to Health Regulations 2002 (as amended).
EH40/2005 Workplace exposure limits.
Guidance on the classification and assessment of waste - Technical Guidance WM3 (UK).
Health and Safety at Work Act.
The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG Regs).
The Dangerous Substances and Explosive Atmospheres Regulations 2002.
The Personal Protective Equipment at Work Regulations 1992 [SI 1992 No. 2966].
The Workplace (Health, Safety and Welfare) Regulations 1992 [SI 1992 No. 3004].

Other information : Storage of this product may be subject to the Control of Pollution (Oil Storage) (England) Regulations 2001. Additional guidance may be obtained from the Environment Agency.

15.2. Chemical safety assessment

A chemical safety assessment has been carried out

SECTION 16: Other information

Indication of changes:
Revision - See : *.

Indication of changes			
Section	**Changed item**	**Change**	**Comments**
	Date of issue	Modified	
1.1	Other means of identification	Modified	
1.1	Name	Modified	
1.1	Trade name	Modified	
1.1	REACH registration No	Modified	
2.2	Precautionary statements (CLP)	Modified	
2.3	ED comment	Added	
3	Composition/information on ingredients	Modified	
4.1	First-aid measures after eye contact	Modified	
6.2	Environmental precautions	Modified	
6.3	For containment	Modified	
8.1	PNEC soil	Modified	
8.1	PNEC sediment (marine water)	Modified	
8.1	PNEC sediment (freshwater)	Modified	
8.1	PNEC aqua (marine water)	Modified	
8.1	PNEC oral (secondary poisoning)	Modified	
8.1	PNEC sewage treatment plant	Modified	
8.1	PNEC aqua (freshwater)	Modified	
8.1	PNEC (additional information)	Modified	
8.1	DNEL/DMEL (additional information)	Modified	
8.2	Personal protective equipment	Modified	
9.1	Log Kow	Modified	
9.1	Viscosity, kinematic	Modified	
9.1	Solubility	Modified	
9.1	Melting point	Modified	
9.1	Auto-ignition temperature	Modified	
9.1	Appearance	Modified	
9.1	Odour	Modified	
9.1	Vapour pressure	Modified	
9.1	Boiling point	Modified	
9.1	Density	Modified	
9.1	Particle size	Added	

Indication of changes			
Section	**Changed item**	**Change**	**Comments**
9.1	Solubility in water	Added	
9.1	Oxidising properties	Modified	
9.1	Upper explosive limit (UEL)	Modified	
9.1	Lower explosive limit (LEL)	Modified	
9.2	Other properties	Modified	
9.2	Additional information	Modified	
10.1	Reactivity	Modified	
11	Adverse health effects caused by endocrine disrupting properties	Added	
11.1	LC50 inhalation rat (mg/l)	Modified	
11.1	LD50 dermal rabbit	Modified	
11.1	LD50 oral rat	Modified	
11.1	Reason for no classification	Modified	
11.1	Other information	Modified	
11.1	NOAEC (inhalation, rat, vapour, 90 days)	Modified	
11.1	Additional information	Added	
12.1	LC50 fish 1	Modified	
12.1	Ecology - general	Modified	
12.1	Ecology - air	Modified	
12.1	NOEC chronic crustacea	Modified	
12.1	EC50 72h algae (1)	Modified	
12.1	EC50 Daphnia 1	Modified	
12.1	LC50 fish 2	Added	
12.2	Persistence and degradability	Modified	
12.3	Log Kow	Modified	
12.3	Bioaccumulative potential	Modified	
12.4	Log Koc	Added	
12.4	Ecology - soil	Modified	
12.6	Adverse effects on the environment caused by endocrine disrupting properties	Added	
13.1	Product/Packaging disposal recommendations	Modified	
13.1	Sewage disposal recommendations	Modified	
16	Training advice	Modified	
16	Data sources	Modified	

Abbreviations and acronyms:	
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road

Abbreviations and acronyms:	
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
DMEL	Derived Minimal Effect level
DNEL	Derived-No Effect Level
EC	European Community
EC50	Median effective concentration
ECETOC TRA	European Centre for Ecotoxicology and Toxicology of Chemicals (ECETOC) Targeted Risk Assessment (TRA)
EN	European Norm
EU	European Union
IARC	International Agency for Research on Cancer
IBC	Intermediate bulk container
IMDG	International Maritime Dangerous Goods
IOELV	Indicative Occupational Exposure Limit Values
ISO	International Standards
LC50	Median lethal concentration
LD50	Median lethal dose
LOAEL	Lowest Observed Adverse Effect Level
LTD	Limited
MARPOL	MARPOL 73/78 is the International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978.
NF	National Foreword
NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
OECD	Organisation for Economic Co-operation and Development
PBT	Persistent Bioaccumulative Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
RMM	Risk management measures
SDS	Safety Data Sheet
SOLAS	[The International Convention for the] Safety of Life at Sea
SOPEP	Ship Oil Pollution Emergency Plan
STEL	Short-term exposure limit
STP	Sewage treatment plant
TLM	Median Tolerance Limit
TWA	Time weighted average
UVCB	(Substance of) Unknown or Variable composition
vPvB	Very Persistent and Very Bioaccumulative

Abbreviations and acronyms:	
WEL	Workplace exposure limit

Data sources : ECHA (European Chemicals Agency). REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. Manufacturer Information.

Training advice : Training staff on good practice. The hazard of asphyxiation is often overlooked and must be stressed during operator training. This training must be provided by a qualified staff.

Other information : Manufacturer Information.

Full text of H- and EUH-statements:	
Acute Tox. 4 (Dermal)	Acute toxicity (dermal), Category 4
Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Acute Tox. 4 (Inhalation:vapour)	Acute toxicity (inhalation:vapour) Category 4
Aquatic Acute 1	Hazardous to the aquatic environment – Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment – Chronic Hazard, Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment – Chronic Hazard, Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment – Chronic Hazard, Category 3
Aquatic Chronic Not classified	Hazardous to the aquatic environment – Chronic Hazard Not classified
Asp. Tox. 1	Aspiration hazard, Category 1
Carc. 1A	Carcinogenicity, Category 1A
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Flam. Liq. 1	Flammable liquids, Category 1
Flam. Liq. 2	Flammable liquids, Category 2
Flam. Liq. 3	Flammable liquids, Category 3
H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H350	May cause cancer.
H361d	Suspected of damaging the unborn child.
H361f	Suspected of damaging fertility.
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.

Full text of H- and EUH-statements:	
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.
Muta. 1B	Germ cell mutagenicity, Category 1B
Repr. 2	Reproductive toxicity, Category 2
Skin Irrit. 2	Skin corrosion/irritation, Category 2
STOT RE 1	Specific target organ toxicity – Repeated exposure, Category 1
STOT RE 2	Specific target organ toxicity – Repeated exposure, Category 2
STOT SE 3	Specific target organ toxicity – Single exposure, Category 3, Narcosis

Full text of use descriptors	
ERC1	Manufacture of substances
ERC2	Formulation of preparations
ERC6a	Industrial use resulting in manufacture of another substance (use of intermediates)
ERC7	Industrial use of substances in closed systems
ERC8a	Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
ERC8d	Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor)
ERC9a	Wide dispersive indoor use of substances in closed systems
ERC9b	Wide dispersive outdoor use of substances in closed systems
ESVOC SPERC 1.1.v1	Manufacture of substances: Industrial (SU8, SU9)
ESVOC SPERC 2.2.v1	Formulation & packing of preparations and mixtures: Industrial (SU10)
ESVOC SPERC 6.1a.v1	Manufacture of substances: Industrial (SU8, SU9)
ESVOC SPERC 7.12a.v1	Use as a fuel: Industrial (SU3)
ESVOC SPERC 9.12b.v1	Use as a fuel: Professional (SU22)
ESVOC SPERC 9.12c.v1	Use as a fuel: Consumer (SU21)
PC13	Fuels
PC24	Lubricants, greases, release products
PC3	Air care products
PC35	Washing and cleaning products
PC38	Welding and soldering products, flux products
PC4	Anti-Freeze and De-icing products
PC9a	Coatings and paints, thinners, paint removers
PROC1	Use in closed process, no likelihood of exposure
PROC10	Roller application or brushing
PROC11	Non-industrial spraying
PROC13	Treatment of articles by dipping and pouring

Full text of use descriptors	
PROC15	Use as laboratory reagent
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected
PROC19	Manual activities involving hand contact
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC28	Manual maintenance (cleaning and repair) of machinery
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Chemical production where opportunity for exposure arises
PROC5	Mixing or blending in batch processes
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
SU8	Manufacture of bulk, large scale chemicals (including petroleum products)
SU9	Manufacture of fine chemicals

Safety Data Sheet (SDS), EU

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

Annex to the safety data sheet

Identified Uses	Es N°	Short title	Page
Manufacture of substance [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)]	1		**Error! Bookmark not defined.**
Manufacture of substance [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)]	2		**Error! Bookmark not defined.**
Use of substance as intermediate [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)]	3		**Error! Bookmark not defined.**
Use of substance as intermediate [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)]	4		**Error! Bookmark not defined.**
Formulation & (re)packing of substances and mixtures [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)]	5		**Error! Bookmark not defined.**
Formulation & (re)packing of substances and mixtures [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)]	6		**Error! Bookmark not defined.**
Use as a fuel: Industrial [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)]	7		**Error! Bookmark not defined.**
Use as a fuel: Industrial [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)]	8		**Error! Bookmark not defined.**
Use as a fuel: Professional [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)]	9		**Error! Bookmark not defined.**
Use as a fuel: Professional [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)]	10		**Error! Bookmark not defined.**
Use as a fuel: Consumer [classified as H340 and/or H350 and/or H361; containing 0% to 1% benzene)]	11		**Error! Bookmark not defined.**

1. Exposure scenario 9.1.1b

Manufacture of substance [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)]

ES Ref.: 9.1.1b ES Type: Worker	Association ref code: CONC.1.LU.1

Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28 ERC1 ESVOC SPERC 1.1.v1
Processes, tasks, activities covered	Manufacture of the substance or use as a process chemical or extraction agent within closed or contained systems. Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container). Use at industrial sites (IS) Manufacture (M)

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15	Use as laboratory reagent
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Concentration of substance in product	Unless otherwise stated: Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Frequency and duration of use	Unless otherwise stated:Covers daily exposures up to 8 hours	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented	
	Covers use at ambient temperatures,unless stated differently	

Specific operational conditions:

Covers percentage substance in the product up to 1 %	Benzene	< 1 %

Risk Management Measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.	
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorized persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately.	

	Dispose of this material and its container at hazardous or special waste collection point. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.	
General measures,Flammability	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures,Aspiration hazard	Do not ingest. If swallowed then seek immediate medical assistance	
General exposures (closed systems),With occasional controlled exposure	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Assumes activities are above room temperature	800 °C
General exposures (closed systems),Batch process,With occasional controlled exposure	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Assumes activities are above room temperature	
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Put lids on containers immediately after use	
Bulk transfers,Closed systems,Loading and unloading	Ensure material transfers are under containment or extract ventilation	
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Wear suitable coveralls to prevent exposure to the skin. Clear spills immediately	
Storage,Closed systems,With occasional controlled exposure	Store substance within a closed system	

2.2 Contributing scenario controlling environmental exposure (ERC1, ESVOC SPERC 1.1.v1)

ERC1	Manufacture of substances
ESVOC SPERC 1.1.v1	Manufacture of substances: Industrial (SU8, SU9)

Product characteristics	
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions		
Amounts used	Fraction of EU tonnage used in region:	0.1
	Regional use tonnage	11000000 t/yr
	Fraction of Regional tonnage used locally:	0.45
	Annual site tonnage	5200000 t/yr
	Maximum daily site tonnage	17000000 kg/day
Frequency and duration of use	Continuous release,Emission days	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0.0008
	Release fraction to wastewater from process (initial release prior to RMM):	0.00004
	Release fraction to soil from process (initial release prior to RMM):	0.0001

Risk Management Measures		
Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to municipal sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of	90 %
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	95.1 %
	If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of	0 %

Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via municipal sewage treatment	95.5 %
	Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	95.5 %
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	19000000 kg/day
	Assumed domestic sewage treatment plant flow	10000 m³/d
Conditions and measures related to external treatment of waste for disposal	During manufacturing no waste of the substance is generated	
Conditions and measures related to external recovery of waste	During manufacturing no waste of the substance is generated	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	Hydrocarbon Block Method (Petrorisk)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not enable the derivation of a DNEL for aspiration effects. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation

4.2. Environment

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

1. Exposure scenario 9.1.1b

Manufacture of substance [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)]

ES Ref.: 9.1.1b ES Type: Worker	Association ref code: CONC.1.LU.1

Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28 ERC1 ESVOC SPERC 1.1.v1
Processes, tasks, activities covered	Manufacture of the substance or use as a process chemical or extraction agent within closed or contained systems. Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container). Use at industrial sites (IS) Manufacture (M)

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15	Use as laboratory reagent

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Frequency and duration of use	Unless otherwise stated:Covers daily exposures up to 8 hours	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented,Covers use at ambient temperatures,unless stated differently	

Specific operational conditions:

Covers percentage substance in the product up to 5%	Benzene	< 5 %

Risk Management Measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.	
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorized persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of this material and its container at hazardous or special waste collection point. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control	

	measures are regularly inspected and maintained. Consider the need for risk based health surveillance.	
General measures,Flammability	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures,Aspiration hazard	Do not ingest. If swallowed then seek immediate medical assistance	
General exposures (closed systems)	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Assumes activities are above room temperature	
General exposures (closed systems),With occasional controlled exposure	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Assumes activities are above room temperature	
General exposures (closed systems),Batch process	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Assumes activities are above room temperature	
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Put lids on containers immediately after use	
Bulk transfers,Closed systems,Loading and unloading	Ensure material transfers are under containment or extract ventilation	
Equipment cleaning and maintenance	Avoid carrying out activities involving exposure for more than 4 hours per day. Drain down and flush system prior to equipment break-in or maintenance. Wear a respirator conforming to EN140. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Wear suitable coveralls to prevent exposure to the skin. Clear spills immediately	
Storage	Store substance within a closed system. Wear suitable gloves tested to EN374	
Storage,With occasional controlled exposure	Provide extract ventilation to points where emissions occur. Store substance within a closed system	

2.2 Contributing scenario controlling environmental exposure (ERC1, ESVOC SPERC 1.1.v1)

ERC1	Manufacture of substances
ESVOC SPERC 1.1.v1	Manufacture of substances: Industrial (SU8, SU9)

Product characteristics		
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic	
Operational conditions		
Amounts used	Fraction of EU tonnage used in region:	0.1
	Regional use tonnage	11000000 t/yr
	Fraction of Regional tonnage used locally:	0.45
	Annual site tonnage	5200000 t/yr
	Maximum daily site tonnage	17000000 kg/day
Frequency and duration of use	Continuous release,Emission days	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0.0008
	Release fraction to wastewater from process (initial release prior to RMM):	0.00004
	Release fraction to soil from process (initial release prior to RMM):	0.0001
Risk Management Measures		
Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to municipal sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of	90 %

	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	95.1 %
	If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of	0 %
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via municipal sewage treatment	95.5 %
	Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	95.5 %
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	19000000 kg/day
	Assumed domestic sewage treatment plant flow	10000 m³/d
Conditions and measures related to external treatment of waste for disposal	During manufacturing no waste of the substance is generated	
Conditions and measures related to external recovery of waste	During manufacturing no waste of the substance is generated	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	Hydrocarbon Block Method (Petrorisk)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not enable the derivation of a DNEL for aspiration effects. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation

4.2. Environment

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

1. Exposure scenario 9.2.1b

Use of substance as intermediate [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)]

ES Ref.: 9.2.1b ES Type: Worker	Association ref code: CONC.3.FU.1B

Use descriptors	SU8, SU9 PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28 ERC6a ESVOC SPERC 6.1a.v1
Processes, tasks, activities covered	Use of substance as an intermediate within closed or contained systems (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container). Use at industrial sites (IS)

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15	Use as laboratory reagent
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Concentration of substance in product	Unless otherwise stated: Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Frequency and duration of use	Unless otherwise stated:Covers daily exposures up to 8 hours	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented,Covers use at ambient temperatures,unless stated differently	

Specific operational conditions:

Covers percentage substance in the product up to 1 %	Benzene	< 1 % Benzene

Risk Management Measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.	
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorized persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of this material and its container at hazardous or special waste collection point. Ensure	

	safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.	
General measures,Flammability	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures,Aspiration hazard	Do not ingest. If swallowed then seek immediate medical assistance	
General exposures (closed systems),With occasional controlled exposure	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
General exposures (closed systems),Batch process	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Put lids on containers immediately after use	
Bulk transfers,Closed systems,Loading and unloading	Ensure material transfers are under containment or extract ventilation	
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Clear spills immediately. Wear suitable coveralls to prevent exposure to the skin	
Storage,With occasional controlled exposure	Store substance within a closed system	

2.2 Contributing scenario controlling environmental exposure (ERC6a, ESVOC SPERC 6.1a.v1)

ERC6a	Industrial use resulting in manufacture of another substance (use of intermediates)
ESVOC SPERC 6.1a.v1	Manufacture of substances: Industrial (SU8, SU9)

Product characteristics		
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic	
Operational conditions		
Amounts used	Fraction of EU tonnage used in region:	0.1
	Regional use tonnage	630000 t/yr
	Fraction of Regional tonnage used locally:	0.024
	Annual site tonnage	15000 t/yr
	Maximum daily site tonnage	50000 kg/day
Frequency and duration of use	Continuous release,Emission days	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0.025
	Release fraction to wastewater from process (initial release prior to RMM):	0.003
	Release fraction to soil from process (initial release prior to RMM):	0.001
Risk Management Measures		
Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to municipal sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of	80 %
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	95.5 %
	If discharging to municipal sewage treatment plant, no onsite wastewater treatment required.	0 %
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via municipal sewage treatment	95.5 %

	Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	95.5 %
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	51000 kg/day
	Assumed domestic sewage treatment plant flow	2000 m³/d
Conditions and measures related to external treatment of waste for disposal	This substance is consumed during use and no waste of the substance is generated	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	Hydrocarbon Block Method (Petrorisk)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not enable the derivation of a DNEL for aspiration effects. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation

4.2. Environment

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

1. Exposure scenario 9.2.1b

Use of substance as intermediate [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)]

ES Ref.: 9.2.1b ES Type: Worker	Association ref code: CONC.3.FU.1B

Use descriptors	SU8, SU9 PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28 ERC6a ESVOC SPERC 6.1a.v1
Processes, tasks, activities covered	Use of substance as an intermediate within closed or contained systems (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container). Use at industrial sites (IS)

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15	Use as laboratory reagent
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Concentration of substance in product	Unless otherwise stated: Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Frequency and duration of use	Unless otherwise stated:Covers daily exposures up to 8 hours	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented,Covers use at ambient temperatures,unless stated differently	

Specific operational conditions:

Covers percentage substance in the product up to 5%	Benzene	< 5 % Benzene

Risk Management Measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.	
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorized persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of this material and its container at hazardous or special waste collection point. Ensure	

	safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.	
General measures,Flammability	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures,Aspiration hazard	Do not ingest. If swallowed then seek immediate medical assistance	
General exposures (closed systems)	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
General exposures (closed systems),Batch process	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
General exposures (closed systems),With occasional controlled exposure	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Put lids on containers immediately after use	
Bulk transfers,Closed systems,Loading and unloading	Ensure material transfers are under containment or extract ventilation	
Equipment cleaning and maintenance	Avoid carrying out activities involving exposure for more than 4 hours per day. Drain down and flush system prior to equipment break-in or maintenance. Wear a respirator conforming to EN140. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Clear spills immediately. Wear suitable coveralls to prevent exposure to the skin	
Storage	Store substance within a closed system	
Storage,With occasional controlled exposure	Provide extract ventilation to points where emissions occur. Store substance within a closed system	

2.2 Contributing scenario controlling environmental exposure (ERC6a, ESVOC SPERC 6.1a.v1)

ERC6a	Industrial use resulting in manufacture of another substance (use of intermediates)
ESVOC SPERC 6.1a.v1	Manufacture of substances: Industrial (SU8, SU9)

Product characteristics		
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic	
Operational conditions		
Amounts used	Fraction of EU tonnage used in region:	0.1
	Regional use tonnage	630000 t/yr
	Fraction of Regional tonnage used locally:	0.024
	Annual site tonnage	15000 t/yr
	Maximum daily site tonnage	50000 kg/day
Frequency and duration of use	Continuous release,Emission days	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0.025
	Release fraction to wastewater from process (initial release prior to RMM):	0.003
	Release fraction to soil from process (initial release prior to RMM):	0.001
Risk Management Measures		
Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to municipal sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of	80 %

	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	95.5 %
	If discharging to municipal sewage treatment plant, no onsite wastewater treatment required.	0 %
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via municipal sewage treatment	95.5 %
	Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	95.5 %
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	51000 kg/day
	Assumed domestic sewage treatment plant flow	2000 m³/d
Conditions and measures related to external treatment of waste for disposal	This substance is consumed during use and no waste of the substance is generated	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	Hydrocarbon Block Method (Petrorisk)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not enable the derivation of a DNEL for aspiration effects. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation

4.2. Environment

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

1. Exposure scenario 9.4.1b

Formulation & (re)packing of substances and mixtures [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)]

ES Ref.: 9.4.1b ES Type: Worker	Association ref code: CONC.4.FU.2

Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28 ERC2 ESVOC SPERC 2.2.v1
Processes, tasks, activities covered	Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities Use at industrial sites (IS) Formulation or re-packing (F)

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15	Use as laboratory reagent
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Concentration of substance in product	Unless otherwise stated: Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Frequency and duration of use	Unless otherwise stated:Covers daily exposures up to 8 hours	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented,Covers use at ambient temperatures,unless stated differently	

Specific operational conditions:

Covers percentage substance in the product up to 1 %	Benzene	< 1 %

Risk Management Measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.	
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorized persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of this material and its container at hazardous or special waste collection point. Ensure safe systems of work or equivalent arrangements	

	are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.	
General measures,Flammability	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures,Aspiration hazard	Do not ingest. If swallowed then seek immediate medical assistance	
General exposures (closed systems),With occasional controlled exposure	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
General exposures (closed systems),Batch process	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Put lids on containers immediately after use	
Bulk transfers,Drum/batch transfers	Ensure material transfers are under containment or extract ventilation	
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Wear suitable coveralls to prevent exposure to the skin. Clear spills immediately	
Storage,With occasional controlled exposure	Store substance within a closed system. Wear suitable gloves tested to EN374	

2.2 Contributing scenario controlling environmental exposure (ERC2, ESVOC SPERC 2.2.v1)

ERC2	Formulation of preparations
ESVOC SPERC 2.2.v1	Formulation & packing of preparations and mixtures: Industrial (SU10)

Product characteristics		
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic	
Operational conditions		
Amounts used	Fraction of EU tonnage used in region:	0.1
	Regional use tonnage	10000000 t/yr
	Fraction of Regional tonnage used locally:	0.003
	Annual site tonnage	30000 t/yr
	Maximum daily site tonnage	100000 kg/day
Frequency and duration of use	Continuous release,Emission days	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements):	0.014
	Release fraction to wastewater from process (initial release prior to RMM):	0.0014
	Release fraction to soil from process (initial release prior to RMM):	0.0001
Risk Management Measures		
Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to municipal sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of	0 %
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	95 %
	If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of	0 %
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed	
Conditions and measures related to sewage treatment	Not applicable as there is no release to wastewater	

plant	Estimated substance removal from wastewater via municipal sewage treatment	95.5 %
	Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	95.5 %
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	110000 kg/day
	Assumed domestic sewage treatment plant flow	2000 m³/d
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	Hydrocarbon Block Method (Petrorisk)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not enable the derivation of a DNEL for aspiration effects. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation

4.2. Environment

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

1. Exposure scenario 9.4.1b

Formulation & (re)packing of substances and mixtures [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)]

ES Ref.: 9.4.1b ES Type: Worker	Association ref code: CONC.4.FU.2

Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28 ERC2 ESVOC SPERC 2.2.v1
Processes, tasks, activities covered	Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities Use at industrial sites (IS) Formulation or re-packing (F)

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15	Use as laboratory reagent
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Frequency and duration of use	Unless otherwise stated:Covers daily exposures up to 8 hours	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented,Covers use at ambient temperatures,unless stated differently	

Specific operational conditions:

Covers percentage substance in the product up to 5%	Benzene	< 5 % Benzene

Risk Management Measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.	
General measures (carcinogens)	Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Consider technical advances and process upgrades (including automation) for the elimination of releases. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorized persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of this material and its container at hazardous or special waste collection point. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control	

	measures are regularly inspected and maintained. Consider the need for risk based health surveillance.	
General measures,Flammability	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures,Aspiration hazard	Do not ingest. If swallowed then seek immediate medical assistance	
General exposures (closed systems)	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
General exposures (closed systems),With occasional controlled exposure	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
General exposures (closed systems),Batch process,With occasional controlled exposure	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Put lids on containers immediately after use	
Bulk transfers,Closed systems,Loading and unloading	Ensure material transfers are under containment or extract ventilation	
Equipment cleaning and maintenance	Avoid carrying out activities involving exposure for more than 4 hours per day. Drain down and flush system prior to equipment break-in or maintenance. Wear a respirator conforming to EN140. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Wear suitable coveralls to prevent exposure to the skin. Clear spills immediately	
Storage	Store substance within a closed system	
Storage,With occasional controlled exposure	Provide extract ventilation to points where emissions occur. Store substance within a closed system	

2.2 Contributing scenario controlling environmental exposure (ERC2, ESVOC SPERC 2.2.v1)

ERC2	Formulation of preparations
ESVOC SPERC 2.2.v1	Formulation & packing of preparations and mixtures: Industrial (SU10)

Product characteristics		
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic	
Operational conditions		
Amounts used	Fraction of EU tonnage used in region:	0.1
	Regional use tonnage	10000000 t/yr
	Fraction of Regional tonnage used locally:	0.003
	Annual site tonnage	30000 t/yr
	Maximum daily site tonnage	100000 kg/day
Frequency and duration of use	Continuous release,Emission days	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements):	0.014
	Release fraction to wastewater from process (initial release prior to RMM):	0.0014
	Release fraction to soil from process (initial release prior to RMM):	0.0001
Risk Management Measures		
Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment. Prevent discharge of undissolved substance to or recover from onsite wastewater. If discharging to municipal sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of	0 %

	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	95 %
	If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of	0 %
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via municipal sewage treatment	95.5 %
	Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	95.5 %
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	110000 kg/day
	Assumed domestic sewage treatment plant flow	2000 m³/d
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	Hydrocarbon Block Method (Petrorisk)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not enable the derivation of a DNEL for aspiration effects. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation

4.2. Environment

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

1. Exposure scenario 9.10.1b

Use as a fuel: Industrial [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)]

ES Ref.: 9.10.1b ES Type: Worker	Association ref code: CONC.24.FU.12

Use descriptors	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28 ERC7 ESVOC SPERC 7.12a.v1
Processes, tasks, activities covered	Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste Use at industrial sites (IS)

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Concentration of substance in product	Unless otherwise stated: Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Frequency and duration of use	Unless otherwise stated:Covers daily exposures up to 8 hours	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented,Covers use at ambient temperatures,unless stated differently	

Specific operational conditions:

Covers percentage substance in the product up to 1 %	Benzene	< 1 % Benzene

Risk Management Measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.	
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorized persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of this material and its container at hazardous or special waste collection point. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.	

General measures,Flammability	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures,Aspiration hazard	Do not ingest. If swallowed then seek immediate medical assistance	
Bulk transfers,Dedicated facility	Ensure material transfers are under containment or extract ventilation	
Drum/batch transfers,Dedicated facility	Ensure material transfers are under containment or extract ventilation	
General exposures (closed systems),With occasional controlled exposure	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Use as a fuel,Closed systems	Handle substance within a closed system	
Equipment cleaning and maintenance	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Drain down and flush system prior to equipment break-in or maintenance. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Wear suitable coveralls to prevent exposure to the skin. Clear spills immediately	
Storage,With occasional controlled exposure	Store substance within a closed system	

2.2 Contributing scenario controlling environmental exposure (ERC7, ESVOC SPERC 7.12a.v1)

ERC7	Industrial use of substances in closed systems
ESVOC SPERC 7.12a.v1	Use as a fuel: Industrial (SU3)

Product characteristics		
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic	
Operational conditions		
Amounts used	Fraction of EU tonnage used in region:	0.1
	Regional use tonnage	1000000 t/yr
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage	1000000 t/yr
	Maximum daily site tonnage	3300000 kg/day
Frequency and duration of use	Continuous release,Emission days	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0.009
	Release fraction to wastewater from process (initial release prior to RMM):	0.00001
	Release fraction to soil from process (initial release prior to RMM):	0
Risk Management Measures		
Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation). If discharging to municipal sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of	95 %
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	79.7 %
	If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of	0
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via municipal sewage treatment	95.5 %
	Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	95.5 %
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	3800000 kg/day
	Assumed domestic sewage treatment plant flow	2000 m^3/d

Conditions and measures related to external treatment of waste for disposal	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	Hydrocarbon Block Method (Petrorisk)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not enable the derivation of a DNEL for aspiration effects. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation

4.2. Environment

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

1. Exposure scenario 9.10.1b

Use as a fuel: Industrial [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)]

ES Ref.: 9.10.1b ES Type: Worker	Association ref code: CONC.24.FU.12

Use descriptors	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28 ERC7 ESVOC SPERC 7.12a.v1
Processes, tasks, activities covered	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste Use at industrial sites (IS)

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Frequency and duration of use	Unless otherwise stated:Covers daily exposures up to 8 hours	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented,Covers use at ambient temperatures,unless stated differently	

Specific operational conditions:

Covers percentage substance in the product up to 5%	Benzene	< 5 % Benzene

Risk Management Measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.	
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorized persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of this material and its container at hazardous or special waste collection point. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.	

General measures,Flammability	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures,Aspiration hazard	Do not ingest. If swallowed then seek immediate medical assistance	
Bulk transfers,Dedicated facility	Ensure material transfers are under containment or extract ventilation	
Drum/batch transfers,Dedicated facility	Ensure material transfers are under containment or extract ventilation	
General exposures (closed systems)	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
General exposures (closed systems),With occasional controlled exposure	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Use as a fuel,Closed systems	Ensure material transfers are under containment or extract ventilation. Handle substance within a closed system	
Equipment cleaning and maintenance	Avoid carrying out activities involving exposure for more than 4 hours per day. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Drain down and flush system prior to equipment break-in or maintenance. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Wear suitable coveralls to prevent exposure to the skin. Clear spills immediately	
Storage	Store substance within a closed system	
Storage,With occasional controlled exposure	Provide extract ventilation to points where emissions occur. Store substance within a closed system	

2.2 Contributing scenario controlling environmental exposure (ERC7, ESVOC SPERC 7.12a.v1)

ERC7	Industrial use of substances in closed systems
ESVOC SPERC 7.12a.v1	Use as a fuel: Industrial (SU3)

Product characteristics		
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic	
Operational conditions		
Amounts used	Fraction of EU tonnage used in region:	0.1
	Regional use tonnage	1000000 t/yr
	Fraction of Regional tonnage used locally:	1
	Annual site tonnage	1000000 t/yr
	Maximum daily site tonnage	3300000 kg/day
Frequency and duration of use	Continuous release,Emission days	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0.009
	Release fraction to wastewater from process (initial release prior to RMM):	0.00001
	Release fraction to soil from process (initial release prior to RMM):	0
Risk Management Measures		
Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation). If discharging to municipal sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of	95 %
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	79.7 %
	If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of	0
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed	
Conditions and measures related to sewage treatment	Not applicable as there is no release to wastewater	

plant	Estimated substance removal from wastewater via municipal sewage treatment	95.5 %
	Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	95.5 %
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	3800000 kg/day
	Assumed domestic sewage treatment plant flow	2000 m³/d
Conditions and measures related to external treatment of waste for disposal	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	Hydrocarbon Block Method (Petrorisk)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not enable the derivation of a DNEL for aspiration effects. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation

4.2. Environment

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

1. Exposure scenario 9.11.1b

Use as a fuel: Professional [classified as H340 and/or H350 and/or H361; (containing 0% to 1% benzene)]

ES Ref.: 9.11.1b ES Type: Worker	Association ref code: CONC.25.FU.12

Use descriptors	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28 ERC9a, ERC9b ESVOC SPERC 9.12b.v1
Processes, tasks, activities covered	Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste Widespread use by professional workers (PW)

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Concentration of substance in product	Unless otherwise stated: Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Frequency and duration of use	Unless otherwise stated:Covers daily exposures up to 8 hours	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented,Covers use at ambient temperatures,unless stated differently	

Specific operational conditions:

Covers percentage substance in the product up to 1 %	Benzene	< 1 %

Risk Management Measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.	
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorized persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of this material and its container at hazardous or special waste collection point. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.	

General measures,Flammability	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures,Aspiration hazard	Do not ingest. If swallowed then seek immediate medical assistance	
Bulk transfers,Dedicated facility	Ensure material transfers are under containment or extract ventilation	
Drum/batch transfers,Dedicated facility	Ensure material transfers are under containment or extract ventilation	
refuelling	Ensure material transfers are under containment or extract ventilation	
General exposures (closed systems),With occasional controlled exposure	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Use as a fuel,Closed systems	Handle substance within a closed system	
Equipment cleaning and maintenance	Avoid carrying out activities involving exposure for more than 4 hours per day. Drain down and flush system prior to equipment break-in or maintenance. Wear a respirator conforming to EN140. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Wear suitable coveralls to prevent exposure to the skin. Clear spills immediately	
Storage,With occasional controlled exposure	Store substance within a closed system	

2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b, ESVOC SPERC 9.12b.v1)

ERC9a	Wide dispersive indoor use of substances in closed systems
ERC9b	Wide dispersive outdoor use of substances in closed systems
ESVOC SPERC 9.12b.v1	Use as a fuel: Professional (SU22)

Product characteristics		
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic	
Operational conditions		
Amounts used	Fraction of EU tonnage used in region:	0.1
	Regional use tonnage	960000 t/yr
	Fraction of Regional tonnage used locally:	0.0005
	Annual site tonnage	480 t/yr
	Maximum daily site tonnage	1300 kg/day
Frequency and duration of use	Continuous release,Emission days	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	0.01
	Release fraction to wastewater from wide dispersive use:	0.00001
	Release fraction to soil from wide dispersive use (regional only):	0.00001
Risk Management Measures		
Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation). No wastewater treatment required	
	Treat air emission to provide a typical removal efficiency of	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	0 %
	If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of	0 %
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via municipal sewage treatment	95.5 %
	Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	95.5 %
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	33000 kg/day

	Assumed domestic sewage treatment plant flow	2000 m³/d
Conditions and measures related to external treatment of waste for disposal	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	Hydrocarbon Block Method (Petrorisk)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not enable the derivation of a DNEL for aspiration effects. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation

4.2. Environment

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

1. Exposure scenario 9.11.1b

Use as a fuel: Professional [classified as H340 and/or H350 and/or H361; (containing 1% to 5% benzene)]

ES Ref.: 9.11.1b ES Type: Worker	Association ref code: CONC.25.FU.12

Use descriptors	PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28 ERC9a, ERC9b ESVOC SPERC 9.12b.v1
Processes, tasks, activities covered	Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems, including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste Widespread use by professional workers (PW)

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC8a, PROC8b, PROC16, PROC28)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected
PROC28	Manual maintenance (cleaning and repair) of machinery

Product characteristics

Physical form of product	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Concentration of substance in product	Unless otherwise stated: Covers percentage substance in the product up to 100 % (unless stated differently)

Operational conditions

Frequency and duration of use	Unless otherwise stated:Covers daily exposures up to 8 hours	
Other given operational conditions affecting workers exposure	Assumes a good basic standard of occupational hygiene is implemented,Covers use at ambient temperatures,unless stated differently	

Specific operational conditions:

Covers percentage substance in the product up to 1 %	Benzene	< 1 % (in finished product)

Risk Management Measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop. For further specification, refer to section 8 of the SDS.	
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down and flush system prior to equipment break-in or maintenance. Access to work area only for authorized persons. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Wear suitable coveralls to prevent exposure to the skin. Wear respiratory protection when its use is identified for certain contributing scenarios. For further specification, refer to section 8 of the SDS. Clear spills immediately. Dispose of this material and its container at hazardous or special waste collection point. Ensure control measures are regularly inspected and maintained. Consider the need for risk based health surveillance.	

General measures,Flammability	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures,Aspiration hazard	Do not ingest. If swallowed then seek immediate medical assistance	
Bulk transfers,Dedicated facility	Ensure material transfers are under containment or extract ventilation	
Drum/batch transfers,Dedicated facility	Ensure material transfers are under containment or extract ventilation	
refuelling	Ensure material transfers are under containment or extract ventilation	
General exposures (closed systems),With occasional controlled exposure	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure	
Use as a fuel,Closed systems	Handle substance within a closed system	
Equipment cleaning and maintenance	Avoid carrying out activities involving exposure for more than 4 hours per day. Drain down and flush system prior to equipment break-in or maintenance. Wear a respirator conforming to EN140. Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply. Wear suitable coveralls to prevent exposure to the skin. Clear spills immediately	
Storage,With occasional controlled exposure	Store substance within a closed system	

2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b, ESVOC SPERC 9.12b.v1)

ERC9a	Wide dispersive indoor use of substances in closed systems
ERC9b	Wide dispersive outdoor use of substances in closed systems
ESVOC SPERC 9.12b.v1	Use as a fuel: Professional (SU22)

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amounts used	Fraction of EU tonnage used in region:	0.1
	Regional use tonnage	960000 t/yr
	Fraction of Regional tonnage used locally:	0.0005
	Annual site tonnage	480 t/yr
	Maximum daily site tonnage	1300 kg/day
Frequency and duration of use	Continuous release,Emission days	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	0.01
	Release fraction to wastewater from wide dispersive use:	0.00001
	Release fraction to soil from wide dispersive use (regional only):	0.00001

Risk Management Measures

Technical conditions and measures at process level (source) to prevent release	Common practices vary across sites thus conservative process release estimates used	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation). No wastewater treatment required	
	Treat air emission to provide a typical removal efficiency of	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	0 %
	If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of	0 %
Organisation measures to prevent/limit release from site	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via municipal sewage treatment	95.5 %
	Total efficiency of removal from wastewater after onsite and offsite municipal treatment plant) RMMs	95.5 %
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	33000 kg/day

	Assumed domestic sewage treatment plant flow	2000 m³/d
Conditions and measures related to external treatment of waste for disposal	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	Hydrocarbon Block Method (Petrorisk)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not enable the derivation of a DNEL for aspiration effects. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation

4.2. Environment

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

1. Exposure scenario 9.12.1b

Use as a fuel: Consumer [classified as H340 and/or H350 and/or H361; containing 0% to 1% benzene)]

ES Ref.: 9.12.1b ES Type: Consumer	Association ref code: CONC.26.FU.12

Use descriptors	PC13 ERC9a, ERC9b ESVOC SPERC 9.12c.v1
Processes, tasks, activities covered	Covers consumer uses in liquid fuels Consumer use (C)

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC13)

PC13	Fuels

Product characteristics		
Physical form of product	Liquid	
Concentration of substance in product	Unless otherwise stated: Covers percentage substance in the product up to 100 % (unless stated differently)	
Operational conditions		
Frequency and duration of use	Covers use up to	1 events per day

Specific operational conditions:

Covers percentage substance in the product up to 1 %	Benzene	< 1 %
Risk Management Measures		
Conditions and measures related to information and behavioural advice to consumers	Fuels. Liquid: Automotive Refuelling	
	Covers concentrations up to	100 %
	Covers percentage substance in the product up to 1 %	< 1 % benzene
	For each use event, covers use amounts up to :	37500 g
	Covers exposure up to	0.05 hr/event
	Covers outdoor use	
	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.	Palm of one hand
	No specific risk management measure identified beyond those operational conditions stated	
	_____	
	Fuels. Liquid: Scooter Refuelling	
	Covers concentrations up to	100 %
	Covers percentage substance in the product up to 1 %	< 1 % benzene
	For each use event, covers use amounts up to :	7500 g
	Covers exposure up to	0.017 hr/event
	Covers outdoor use	
	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.	Palm of one hand
	No specific risk management measure identified beyond those operational conditions stated	
	_____	
	Fuels. Liquid: Garden Equipment - Use	
	Covers concentrations up to	100 %
	Covers percentage substance in the product up to 1 %	< 0.1 % benzene
	Covers concentrations up to	< 3 % n-hexane
	Covers concentrations up to	< 3 % toluene
	For each use event, covers use amounts up to :	750 g
	Covers exposure up to	0.033 hr/event
	Assumes that potential dermal contact is limited to inside hands / one hand / palm of hands.	

	No specific risk management measure identified beyond those operational conditions stated	

Other risk management measures:

General measures (skin irritants)	Ensure there is no direct skin contact with product. Wash off any skin contamination immediately.	
General measures,Flammability	For measures to control risks from physicochemical properties, refer to main body of the SDS, section 7 and/or 8.	
General measures,Aspiration hazard	Do not ingest. If swallowed then seek immediate medical assistance	

2.2 Contributing scenario controlling environmental exposure (ERC9a, ERC9b, ESVOC SPERC 9.12c.v1)

ERC9a	Wide dispersive indoor use of substances in closed systems
ERC9b	Wide dispersive outdoor use of substances in closed systems
ESVOC SPERC 9.12c.v1	Use as a fuel: Consumer (SU21)

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amounts used	Fraction of EU tonnage used in region:	0.1
	Regional use tonnage	8200000 t/yr
	Fraction of Regional tonnage used locally:	0.0005
	Annual site tonnage	4100 t/yr
	Maximum daily site tonnage	11000 kg/day
Frequency and duration of use	Continuous release,Exposure duration	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from wide dispersive use (regional only):	0.01
	Release fraction to wastewater from wide dispersive use:	0.00001
	Release fraction to soil from wide dispersive use (regional only):	0.00001

Risk Management Measures

Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via municipal sewage treatment	95.5 %
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	280000 kg/day
	Assumed domestic sewage treatment plant flow	2000 m³/d
Conditions and measures related to external treatment of waste for disposal	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment. External treatment and disposal of waste should comply with applicable local and/or national regulations	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated	

3. Exposure estimation and reference to its source

3.1. Health

Information for contributing exposure scenario	
2.1	The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of ECETOC report #107 and the Chapter R15 of the IRCSA TGD. Where exposure determinants differ to these source, then they are indicated

3.2. Environment

Information for contributing exposure scenario	
2.2	Hydrocarbon Block Method (Petrorisk)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the ES

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Available hazard data do not enable the derivation of a DNEL for carcinogenic effects. Available hazard data do not enable the derivation of a DNEL for aspiration effects. Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation

4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html)