



E10

Safety Data Sheet

according to Regulation (EU) 2020/878

Reference number: 814597

Revision date: 31/07/2024 Supersedes version of: 09/09/2016 Version: 3.0

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

1.1. Product identifier

Product form	: Substance (UVCB)
Trade name	: E10
Chemical name	: Gasoline; 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.	: 01-2119471335-39-0020

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

1.2.1. Relevant identified uses

Use of the substance/mixture : Fuel for spark ignition piston engines - NOT recommended for aviation piston engines

Title	Use descriptors
Use of substance as an intermediate - Industrial (ES Ref.: ES-2)	SU8, SU9, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC6a, ESVOC SPERC 6.1a.v1
Distribution of substance - Industrial (ES Ref.: ES-3)	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Formulation & (Re)packing of substance - Industrial (ES Ref.: ES-4)	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC2, ESVOC SPERC 2.2.v1
Use of substance as a Fuel - Industrial (ES Ref.: ES-5)	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16, ERC7, ESVOC SPERC 7.12a.v1
Use of substance as a Fuel - Professional (ES Ref.: ES-6)	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16, ERC9a, ERC9b, ESVOC SPERC 9.12b.v1
Use of substance as a Fuel - Consumer (ES Ref.: ES-7)	PC13, ERC9a, ERC9b, ESVOC SPERC 9.12c.v1
Manufacture of substance - Industrial (ES Ref.: ES-1)	SU8, SU9, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC1, ERC4, ESVOC SPERC 1.1.v1

Full text of use descriptors: see section 16

1.2.2. Uses advised against

Restrictions on use : Uses other than those covered by the exposure scenarios appended to this Safety Data Sheet are not supported.

1.3. Details of the supplier of the safety data sheet

Manufacturer

Irving Oil Whitegate Refinery Limited
Whitegate, Midleton, Co. Cork, Ireland
E-mail: esds@irvingoil.com

1.4. Emergency telephone number

Emergency number : + 353 21 4622 200

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Flammable liquids, Category 1	H224
Skin corrosion/irritation, Category 2	H315
Serious eye damage/eye irritation, Category 2	H319
Germ cell mutagenicity, Category 1B	H340
Carcinogenicity, Category 1B	H350
Reproductive toxicity, Category 2	H361fd
Specific target organ toxicity – Single exposure, Category 3, Narcosis	H336
Aspiration hazard, Category 1	H304
Hazardous to the aquatic environment – Chronic Hazard, Category 2	H411

Full text of H- and EUH-statements: see section 16

Adverse physicochemical, human health and environmental effects

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

2.2. Label elements

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

Hazard pictograms (CLP)



Signal word (CLP)

: Danger

Hazard statements (CLP)

: H224 - Extremely flammable liquid and vapour.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H319 - Causes serious eye 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 POISON CENTER, a doctor.
P331 - Do NOT induce vomiting.

Extra phrases

: Restricted to professional users.

2.3. Other hazards

Contains no PBT and/or vPvB substances $\geq 0.1\%$ assessed in accordance with REACH 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

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance type	: UVCB
Name	: Unleaded Gasoline
CAS-No.	: 86290-81-5
EC-No.	: 289-220-8
EC Index-No.	: 649-378-00-4

Name	Product identifier	Conc.	Classification according to Regulation (EC) No. 1272/2008 [CLP]
gasoline (Main constituent) (Note P)	CAS-No.: 86290-81-5 EC-No.: 289-220-8 EC Index-No.: 649-378-00-4 REACH-no: 01-2119471335-39	> 90	Flam. Liq. 1, H224 Skin Irrit. 2, H315 Carc. 1B, H350 Muta. 1B, H340 Repr. 2, H361fd STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411
toluene (Constituent)	CAS-No.: 108-88-3 EC-No.: 203-625-9 EC Index-No.: 601-021-00-3 REACH-no: 01-2119471310-51	≥ 0 – ≤ 15	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Repr. 2, H361d STOT SE 3, H336 STOT RE 2, H373 Asp. Tox. 1, H304
ethanol (Additive)	CAS-No.: 64-17-5 EC-No.: 200-578-6 EC Index-No.: 603-002-00-5	< 10	Flam. Liq. 2, H225
n-hexane (Constituent)	CAS-No.: 110-54-3 EC-No.: 203-777-6 EC Index-No.: 601-037-00-0 REACH-no: 01-2119480412-44	< 2	Flam. Liq. 2, H225 Repr. 2, H361f Asp. Tox. 1, H304 STOT RE 2, H373 Skin Irrit. 2, H315 STOT SE 3, H336 Aquatic Chronic 2, H411
benzene (Constituent) (Note E)	CAS-No.: 71-43-2 EC-No.: 200-753-7 EC Index-No.: 601-020-00-8 REACH-no: 01-2119447106-44	< 1	Flam. Liq. 2, H225 Carc. 1A, H350 Muta. 1B, H340 STOT RE 1, H372 Asp. Tox. 1, H304 Eye Irrit. 2, H319 Skin Irrit. 2, H315

Specific concentration limits:

Name	Product identifier	Specific concentration limits (Conc.)
n-hexane (Constituent)	CAS-No.: 110-54-3 EC-No.: 203-777-6 EC Index-No.: 601-037-00-0 REACH-no: 01-2119480412-44	(5 ≤ C ≤ 100) STOT RE 2, H373

Full text of H- and EUH-statements: see section 16

Note E: Substances with specific effects on human health (see Chapter 4 of Annex VI to Directive 67/548/EEC) that are classified as carcinogenic, mutagenic and/or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are also classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances, the risk phrases R20, R21, R22, R23, R24, R25, R26, R27, R28, R39, R68 (harmful), R48 and R65 and all combinations of these risk phrases shall be preceded by the word 'Also'.

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

Note P: Note P : The classification as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0,1 % w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-)P260-P262- P301 + P310-P331 (Table 3.1) or the S-phrases (2-)23-24-62 (Table 3.2) shall apply. This note applies only to certain complex oil-derived substances in Part 3.

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	: Get medical advice/attention if you feel unwell. If medical advice is needed, have product container or label at hand. Never give anything by mouth to an unconscious person.
First-aid measures after inhalation	: Move the affected person away from the contaminated area and into the fresh air. If experiencing respiratory symptoms: Call a poison center or a doctor.
First-aid measures after skin contact	: Take off immediately all contaminated clothing. Wash skin thoroughly with mild soap and water. If skin irritation occurs: Get medical advice/attention.
First-aid measures after eye contact	: Immediately rinse with water for a prolonged period while holding the eyelids wide open. If eye irritation persists: Get medical advice/attention.
First-aid measures after ingestion	: If swallowed, seek medical advice immediately and show this container or label. Immediately call a POISON CENTER/doctor. Do not induce vomiting/risk of damage to lungs exceeds poisoning risk.

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

Symptoms/effects	: May cause genetic defects. May cause cancer. Suspected of damaging fertility. Suspected of damaging the unborn child.
Symptoms/effects after inhalation	: May cause drowsiness or dizziness. Moderate narcotic effect, headaches, nausea.
Symptoms/effects after skin contact	: Causes skin irritation. Symptoms may include skin rash, inflammation, redness, itching, swelling and similar related to an allergic reaction. Absorbed through the skin.
Symptoms/effects after eye contact	: Causes serious eye irritation. Blurred vision. Lacrimation. Itching.
Symptoms/effects after ingestion	: May be fatal if swallowed and enters airways. Aspiration of the product into the lungs may cause very serious pneumonia. May cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

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

Treat symptomatically. Symptoms may be delayed. When using high-pressure equipment, injection of product under the skin can occur. In this case, the casualty should be sent immediately to the hospital. Do not wait for symptoms to develop. High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. These injuries often require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury. Early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents (e.g. in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Carbon dioxide. Dry powder. Foam.
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. Vapour could form explosive mixture with air. Vapours are heavier than air and may travel considerable distance to an ignition source and flash back to source of vapours. Heating will cause a rise in pressure with a risk of bursting. May form an explosive mixture in the presence of air.
Hazardous decomposition products in case of fire	: Carbon dioxide. Carbon monoxide. Nitrogen oxides. Sulphur oxides.

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

5.3. Advice for firefighters

- Firefighting instructions : Do not enter fire area without proper protective equipment, including respiratory protection. Do not fight fire when fire reaches explosives. Use water spray or fog for cooling exposed containers. Do not allow run-off from fire-fighting to enter drains or water courses.
- Protection during firefighting : Do not attempt to take action without suitable protective equipment. Wear fire/flame resistant/retardant clothing. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Emergency procedures : Only qualified personnel equipped with suitable protective equipment may intervene. Evacuate area. Ventilate spillage area. No open flames, no sparks, and no smoking. Avoid breathing vapours, mist. Do not get in eyes, on skin, or on clothing.

6.1.2. For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment. Use personal protective equipment as required. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment. Do not allow to enter drains or water courses. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

- Methods for cleaning up : Stop leak if safe to do so. Contain the spilled material by bunding. Take up liquid spill into absorbent material, e.g.: sand, earth, vermiculite. Do not absorb with saw-dust or any other combustible absorbent material. For large spills, confine the spill in a dike and charge it with wet sand or earth for subsequent safe disposal.

6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Obtain special instructions before use. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Flammable vapours may accumulate in the container. Use explosion-proof equipment. Wear personal protective equipment. Use only outdoors or in a well-ventilated area. Avoid breathing vapours, mist. Avoid contact with skin and eyes. Do not expose pregnant or breastfeeding women.
- Hygiene measures : Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Handle in accordance with good industrial hygiene and safety procedures. Keep away from food, drink and animal feedingstuffs.

7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Ground/bond container and receiving equipment.
- Storage conditions : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Store in a well-ventilated place. Keep container tightly closed. Refer to the detailed list of incompatible materials in section 10 Stability/Reactivity. Containers (tanks) should be grounded and provided with adequate pressure relief valve.
- Storage area : Store away from heat. Store in a well-ventilated place. Earth the equipment.

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

7.3. Specific end use(s)

Refer to supplemental exposure scenarios if attached.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 National occupational exposure and biological limit values

gasoline (86290-81-5)	
Ireland - Occupational Exposure Limits	
Local name	Petrol (Gasoline)
OEL TWA	300 ppm
OEL STEL	500 ppm
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024
toluene (108-88-3)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Toluene
IOEL TWA	192 mg/m ³
	50 ppm
IOEL STEL	384 mg/m ³
	100 ppm
Remark	Skin
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
Ireland - Occupational Exposure Limits	
Local name	Toluene
OEL TWA	192 mg/m ³
	50 ppm
OEL STEL	384 mg/m ³
	100 ppm
Remark	IOELV (Indicative Occupational Exposure Limit Values), Skin (Substances which have the capacity to penetrate intact skin when they come in contact with it and be absorbed into the body. A substantial contribution to the total body burden via dermal exposure is possible)
Regulatory reference	Chemical Agents Code of Practice 2024
Ireland - Biological limit values	
Local name	Toluene
Ireland - BMGV	0.02 mg/l Parameter: toluene - Medium: blood - Sampling time: Prior to last shift of workweek 0.03 mg/l Parameter: toluene - Medium: urine - Sampling time: End of shift 0.3 mg/g creatinine Parameter: o-cresol - Medium: urine - Sampling time: End of shift - Notations: B (Background)
Regulatory reference	Biological Monitoring Guidelines (HSA, 2011)

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

n-hexane (110-54-3)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	n-Hexane
IOEL TWA	72 mg/m ³
	20 ppm
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
Ireland - Occupational Exposure Limits	
Local name	n-Hexane
OEL TWA	72 mg/m ³
	20 ppm
Remark	IOELV (Indicative Occupational Exposure Limit Values), Skin (Substances which have the capacity to penetrate intact skin when they come in contact with it and be absorbed into the body. A substantial contribution to the total body burden via dermal exposure is possible)
Regulatory reference	Chemical Agents Code of Practice 2024
Ireland - Biological limit values	
Local name	Hexane
Ireland - BMGV	0.4 mg/l Parameter: 2,5-Hexanedion - Medium: urine - Sampling time: End of shift at end of workweek
Regulatory reference	Biological Monitoring Guidelines (HSA, 2011)
benzene (71-43-2)	
EU - Binding Occupational Exposure Limit (BOEL)	
Local name	Benzene
BOEL TWA	3.25 mg/m ³
	1 ppm
Notes	Skin (Substantial contribution to the total body burden via dermal exposure possible)
Regulatory reference	DIRECTIVE (EU) 2019/130 (amending Directive 2004/37/EC)
EU - Biological Limit Value (BLV)	
Local name	Benzene
BLV	28 µg/l Parameter: benzene - Medium: blood - Sampling time: immediately end of shift 46 µg/g creatinine Parameter: phenylmercapturic - Medium: urine - Sampling time: end of exposure/shift
Regulatory reference	SCOEL List of recommended health-based BLVs and BGVs
Ireland - Occupational Exposure Limits	
Local name	Benzene
OEL TWA	1.65 mg/m ³ (from 5th April 2024 until 5th April 2026)
	0.5 ppm (from 5th April 2024 until 5th April 2026)
	0.2 ppm (0.66 mg/m ³ from 5th April 2026)
Remark	BOELV (Binding Occupational Exposure Limit Values), Skin (Substances which have the capacity to penetrate intact skin when they come in contact with it and be absorbed into the body. A substantial contribution to the total body burden via dermal exposure is possible), Carc.1A (Substances known to have carcinogenic potential for humans), Muta.1B (Substances which should be regarded as if they induce heritable mutations in the germ cells of humans)

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

benzene (71-43-2)	
Regulatory reference	Chemical Agents Code of Practice 2024
Ireland - Biological limit values	
Local name	Benzene
Ireland - BMGV	25 µg/g creatinine Parameter: S-Phenylmercapturic acid - Medium: urine - Sampling time: End of shift - Notations: B (Background) 50 µg/g creatinine Parameter: t,t-Muconic acid - Medium: urine - Sampling time: End of shift - Notations: B (Background)
Regulatory reference	Biological Monitoring Guidelines (HSA, 2011)

ethanol (64-17-5)	
Ireland - Occupational Exposure Limits	
Local name	Ethanol [Ethyl alcohol]
OEL STEL	1000 ppm
Remark	Advisory OELV (Advisory Occupational Exposure Limit Values)
Regulatory reference	Chemical Agents Code of Practice 2024

8.1.2. Recommended monitoring procedures

Monitoring methods	
Monitoring methods	Refer to all applicable national, international and local regulations or provisions. Workplace atmospheres. Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy. Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents. Workplace exposure - General requirements for the performance of procedures for the measurement of chemical agents.

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

Gasoline; 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). (86290-81-5)	
DNEL/DMEL (Workers)	
Long-term - systemic effects, dermal	234 mg/kg bodyweight/day (DMEL, as benzene)
Long-term - systemic effects, inhalation	3.2 mg/m ³ (DMEL, as benzene)

8.1.5. Control banding

No additional information available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Appropriate engineering controls:

Ensure good ventilation of the work station. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Organisational measures to prevent/limit releases, dispersion and exposure. The health hazard risks arising from handling this material are affected by different factors, such as physical form and quantity. Site-specific risk assessments are recommended to determine the appropriate levels of exposure control measures.

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

8.2.2. Personal protection equipment

Personal protective equipment:

Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the protective equipment. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

8.2.2.1. Eye and face protection

Eye protection:

Googles or face shield may be required, dependant on task (EN166 or EN ISO 1632-1). Do not wear contact lenses

8.2.2.2. Skin protection

Hand protection:

Solvent-resistant gloves. ISO 374-1. Recommended materials. Nitrile rubber gloves. Selection of protective gloves should be made based on the type of task performed. The selection of specific gloves for a specific application and time of use in a working area, should also take into account other factors on the working space, such as (but not limited to): other chemicals that are possibly used, physical requirements (protection against cutting/drilling, skill, thermal protection), and the instructions/specification of the supplier of gloves. Carefully check the glove for cracks or damage before reusing it, dispose of gloves where the penetration time is exceeded. The penetration time depends on temperature, glove material, thickness and construction. Penetration time is measured against EN 374 in laboratory conditions corresponding to permanent static contact and is not necessarily representative of the risk in the workplace. Contact the gloves' supplier for further information on the selection and resistance of gloves.

Other skin protection

Materials for protective clothing:

Wear chemically protective gloves, lab coat or apron to prevent prolonged or repeated skin contact. Wear foot protection

8.2.2.3. Respiratory protection

Respiratory protection:

In case of insufficient ventilation, wear suitable respiratory equipment. Extra personal protection: A/P2 filter respirator for organic vapour and harmful dust

8.2.2.4. Thermal hazards

Thermal hazard protection:

Not required for normal conditions of use.

8.2.3. Environmental exposure controls

Environmental exposure controls:

Avoid release to the environment. Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Colour	: Pale yellow. (may be dyed various colours).
Appearance	: Clear.
Odour	: Pungent. petroleum.
Odour threshold	: Not available
Melting point	: Not available
Freezing point	: Not available
Boiling point	: 25 – 215 °C
Flammability	: Extremely flammable liquid and vapour.
Lower explosion limit	: 1.3 vol %
Upper explosion limit	: 7.6 vol %
Flash point	: < -40 °C (closed cup)
Auto-ignition temperature	: 445 °C
Decomposition temperature	: Not available
pH	: Not available
Viscosity, kinematic	: 0.5 – 1.5 mm ² /s (20 °C)
Solubility	: Insoluble in water. Soluble in aromatic hydrocarbons. soluble in most organic solvents.
Partition coefficient n-octanol/water (Log Kow)	: Not available
Vapour pressure	: 45 – 100 kPa (20 °C)

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

Vapour pressure at 50°C	: Not available
Density	: Not available
Relative density	: 0.725 – 0.775 (15 °C)
Relative vapour density at 20°C	: > 1
Particle characteristics	: Not applicable

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Explosion limits	: 1.4 – 7.6 vol %
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9.2.2. Other safety characteristics

Relative evaporation rate (butylacetate=1)	: 10 – 11 (20 °C)
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SECTION 10: Stability and reactivity

10.1. Reactivity

Extremely flammable liquid and vapour. Can form explosive mixtures with air.

10.2. Chemical stability

Stable under normal conditions of use.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use. Hazardous polymerisation: Will not occur.

10.4. Conditions to avoid

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

10.5. Incompatible materials

Strong acids. Strong bases. Strong oxidizing agents. Strong reducing agents.

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)
Additional information	: Inhalation may affect the nervous system causing headache, possibly dizziness, nausea, weakness, loss of coordination and unconsciousness

Gasoline; 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). (86290-81-5)

LD50 oral rat	14000 mg/kg
LD50 dermal rabbit	3750 mg/kg
LC50 Inhalation - Rat (Vapours)	> 5.2 mg/l/4h

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

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

Gasoline; 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). (86290-81-5)

Additional information	Gasoline was negative in microbial mutagenicity and unscheduled DNA tests in rat hepatocytes. Gasoline did not induce chromosome aberrations in vivo in rat bone marrow cells and was negative in a mouse dominant lethal assay.
Carcinogenicity	: May cause cancer.
Additional information	: Two year inhalation studies of vaporized unleaded gasoline produced an increased incidence of kidney tumours in male rats and liver tumours in female mice. Repeated skin application of various petroleum naphthas in mice for two years resulted in an increased incidence of skin tumours but only in the presence of severe skin irritation. Follow-up mechanistic studies suggest that the occurrence of these tumours may be the consequence of promotional processes and not relevant to human risk assessment. Epidemiology data collected from a study of more than 18,000 petroleum marketing and distribution workers showed no increased risk of leukaemia, multiple myeloma, or kidney cancer from gasoline exposure. Unleaded gasoline has been identified as a possible carcinogen by the International Agency for Research on Cancer.
Reproductive toxicity	: Suspected of damaging fertility. Suspected of damaging the unborn child.
Additional information	: No evidence of developmental toxicity was found in pregnant laboratory animals (rats and mice) exposed to high vapour concentrations of unleaded gasoline and petroleum naphthas via inhalation. A two-generation reproductive toxicity study of vapour recovery gasoline did not adversely affect reproductive function or offspring survival and development.
STOT-single exposure	: May cause drowsiness or dizziness.

gasoline (86290-81-5)

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

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

STOT-single exposure	May cause drowsiness or dizziness.
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STOT-repeated exposure	: Not classified (Based on available data, the classification criteria are not met)
Additional information	: Two year inhalation studies of wholly vaporized unleaded gasoline, and 90 days studies of various petroleum naphthas, did not produce significant target organ toxicity in laboratory animals. Nephropathy in male rats, characterized by the accumulation of alpha-2-u- globulin in epithelial cells of the proximal tubules was observed, however follow-up studies suggest that these changes are unique to the male rat.

toluene (108-88-3)

STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.
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n-hexane (110-54-3)

STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.
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benzene (71-43-2)

STOT-repeated exposure	Causes damage to organs through prolonged or repeated exposure.
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Aspiration hazard	: May be fatal if swallowed and enters airways.
Additional information	: Swallowing the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis

Gasoline; 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). (86290-81-5)

Viscosity, kinematic	0.5 – 1.5 mm ² /s (20 °C)
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E10

Safety Data Sheet

according to Regulation (EU) 2020/878

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Adverse health effects caused by endocrine disrupting properties

: 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

11.2.2. Other information

No additional information available

SECTION 12: Ecological information

12.1. Toxicity

Hazardous to the aquatic environment, short-term (acute)

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

Hazardous to the aquatic environment, long-term (chronic)

: Toxic to aquatic life with long lasting effects.

Additional information

: Acute aquatic toxicity studies on samples of gasoline and naphtha streams show acute toxicity values greater than 1 mg/L and mostly in the range 1-100 mg/L. These tests were carried out on water accommodated fractions, in closed systems to prevent evaporative loss. Results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon composition. These substances should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment.

12.2. Persistence and degradability

Gasoline; 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). (86290-81-5)

Persistence and degradability

The hydrocarbons in this material are not readily biodegradable but are regarded as inherently biodegradable since their hydrocarbon components can be degraded by microorganisms.

12.3. Bioaccumulative potential

Gasoline; 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). (86290-81-5)

Bioaccumulative potential

Log Kow values measured for the hydrocarbon components of this material range from 3 to greater than 6 and therefore are regarded as having the potential to bioaccumulate. In practise, metabolic processes or physical properties may prevent this effect or limit bioavailability.

12.4. Mobility in soil

Gasoline; 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). (86290-81-5)

Ecology - soil

On release to water, hydrocarbons will float on the surface and since they are sparingly soluble, the only significant loss is volatilisation to air. In air, these hydrocarbons are photodegraded by reaction with hydroxyl radicals with half lives varying from 6.5 days for benzene to 0.5 days for n-dodecane.

12.5. Results of PBT and vPvB assessment

No additional information available

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

12.6. Endocrine disrupting properties

Adverse effects on the environment caused by endocrine disrupting properties

: 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.

12.7. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods

: Dispose of contents/container in accordance with licensed collector's sorting instructions.

Product/Packaging disposal recommendations

: Refer to manufacturer/supplier for information on recovery/recycling. Disposal must be done according to official regulations.

Additional information

: Do not re-use empty containers. Handle empty containers with care because residual vapours are flammable. Do not burn, or use a cutting torch on the empty drum. Do not puncture or incinerate, even when empty.

European List of Waste (LoW, EC 2000/532)

: For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.
13 07 02* - petrol

SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
14.1. UN number or ID number				
UN 1203	UN 1203	UN 1203	UN 1203	UN 1203
14.2. UN proper shipping name				
GASOLINE	GASOLINE	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	UN 1203 GASOLINE, 3, II, ENVIRONMENTALLY HAZARDOUS	UN 1203 GASOLINE, 3, II, ENVIRONMENTALLY HAZARDOUS
14.3. Transport hazard class(es)				
3	3	3	3	3
14.4. Packing group				
II	II	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	Dangerous for the environment: Yes	Dangerous for the environment: Yes
No supplementary information available				


E10

Safety Data Sheet

according to Regulation (EU) 2020/878

14.6. Special precautions for user

Overland transport

Classification code (ADR)	: F1
Special provisions (ADR)	: 243, 534, 664
Limited quantities (ADR)	: 1I
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

Transport by sea

Special provisions (IMDG)	: 243
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.

Air transport

PCA Excepted quantities (IATA)	: E2
PCA Limited quantities (IATA)	: Y341
PCA limited quantity max net quantity (IATA)	: 1L
PCA packing instructions (IATA)	: 353
PCA max net quantity (IATA)	: 5L
CAO packing instructions (IATA)	: 364
CAO max net quantity (IATA)	: 60L
Special provisions (IATA)	: A100
ERG code (IATA)	: 3H

Inland waterway transport

Classification code (ADN)	: F1
Special provisions (ADN)	: 243, 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

Rail transport

Classification code (RID)	: F1
Special provisions (RID)	: 243, 534

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

Limited quantities (RID)	: 1L
Excepted quantities (RID)	: E2
Packing instructions (RID)	: P001, IBC02, R001
Special packing provisions (RID)	: BB2
Mixed packing provisions (RID)	: MP19
Portable tank and bulk container instructions (RID)	: T4
Portable tank and bulk container special provisions (RID)	: TP1
Tank codes for RID tanks (RID)	: LGBF
Special provisions for RID tanks (RID)	: TU9
Transport category (RID)	: 2
Colis express (express parcels) (RID)	: CE7
Hazard identification number (RID)	: 33

14.7. Maritime transport in bulk according to IMO instruments

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

REACH Annex XVII (Restriction List)

Not listed on REACH Annex XVII

REACH Annex XIV (Authorisation List)

Not listed on REACH Annex XIV (Authorisation List)

REACH Candidate List (SVHC)

Not listed on the REACH Candidate List

PIC Regulation (Prior Informed Consent)

Not listed on the PIC list (Regulation EU 649/2012)

POP Regulation (Persistent Organic Pollutants)

Not listed on the POP list (Regulation EU 2019/1021)

Ozone Regulation (1005/2009)

Not listed on the Ozone Depletion list (Regulation EU 1005/2009)

Dual-Use Regulation (428/2009)

Contains no substance subject to the COUNCIL REGULATION (EC) No 428/2009 of 5 May 2009 setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items.

Explosives Precursors Regulation (2019/1148)

Contains no substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

Drug Precursors Regulation (273/2004)

Contains substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances)

Name	CN designation	CAS-No.	CN code	Category, Subcategory	Threshold	Annex
Toluene		108-88-3	2902 30 00	Category 3		Annex I

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

A chemical safety assessment has been carried out

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

SECTION 16: Other information

Indication of changes:

Sections 1-16.

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
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
BLV	Biological limit value
BOD	Biochemical oxygen demand (BOD)
COD	Chemical oxygen demand (COD)
DMEL	Derived Minimal Effect level
DNEL	Derived-No Effect Level
EC-No.	European Community number
EC50	Median effective concentration
EN	European Standard
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Median lethal concentration
LD50	Median lethal dose
LOAEL	Lowest Observed Adverse Effect Level
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
OEL	Occupational Exposure Limit
PBT	Persistent Bioaccumulative Toxic
PNEC	Predicted No-Effect Concentration
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS	Safety Data Sheet
STP	Sewage treatment plant
ThOD	Theoretical oxygen demand (ThOD)
TLM	Median Tolerance Limit
VOC	Volatile Organic Compounds
CAS-No.	Chemical Abstract Service number
N.O.S.	Not Otherwise Specified
vPvB	Very Persistent and Very Bioaccumulative
ED	Endocrine disrupting properties

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

Abbreviations and acronyms:

TWA	Time Weighted Average (8 hours)
STEL	Short Term Exposure Limit (15 minutes)

Data sources : ECHA (European Chemicals Agency). Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 and all its amendments and modifications. Supplier's safety documents.

Training advice : Training staff on good practice. Manipulations are to be done only by qualified and authorised persons.

Full text of H- and EUH-statements:

Aquatic Chronic 2	Hazardous to the aquatic environment – Chronic Hazard, Category 2
Asp. Tox. 1	Aspiration hazard, Category 1
Carc. 1A	Carcinogenicity, Category 1A
Carc. 1B	Carcinogenicity, Category 1B
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Flam. Liq. 1	Flammable liquids, Category 1
Flam. Liq. 2	Flammable liquids, Category 2
H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye 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.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H411	Toxic 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 the substance
ERC2	Formulation into mixture

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

Full text of use descriptors	
ERC3	Formulation into solid matrix
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC5	Use at industrial site leading to inclusion into/onto article
ERC6a	Use of intermediate
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC6c	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC6d	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC7	Use of functional fluid at industrial site
ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)
ESVOC SPERC 1.1.v1	Manufacture of substances: Industrial (SU8, SU9)
ESVOC SPERC 1.1b.v1	Distribution: Industrial (SU3)
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
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC15	Use as laboratory reagent
PROC16	Use of fuels
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) 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.

E10

Safety Data Sheet

according to Regulation (EU) 2020/878

Annex to the safety data sheet

Identified Uses	Es N°	Short title	Page
Manufacture of substance	1		20
Use of substance as an intermediate	2		24
Distribution of substance	3		28
Formulation & (Re)packing of substances and mixtures	4		33
Use of substance as a Fuel - Industrial	5		37
Use of substance as a Fuel - Professional	6		41
Use of substance as a Fuel - Consumer	7		45

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

1. ES-1 - Manufacture; Manufacture of substance

1.1. Title section

Manufacture of substance

ES Ref.: ES-1
ES Type: Environment - Worker

Environment		Use descriptors
CS-1.1	Manufacture of substance	ERC1, ERC4, ESVOC SPERC 1.1.v1

Worker		Use descriptors
CS-1.2	Manufacture of substance	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15

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).
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1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Manufacture of substance (ERC1, ERC4, ESVOC SPERC 1.1.v1)

ERC1	Manufacture of the substance
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ESVOC SPERC 1.1.v1	Manufacture of substances: Industrial (SU8, SU9)

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) > 90
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Amount used, frequency and duration of use (or from service life)	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage	18700000 t/yr
Fraction of Regional tonnage used locally:	0.03
Continuous release	
Emission days	300 days/yr

Technical and organisational conditions and measures	
Prevent discharge of undissolved substance to or recover from onsite wastewater. Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation). Onsite wastewater treatment required	
Treat air emission to provide a typical removal efficiency of	99 %

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Technical and organisational conditions and measures

Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	≥ 95.2 %
If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of	≥ 80.4 %
Do not apply industrial sludge to natural soils. Sewage sludge should be incinerated, contained or reclaimed.	

Conditions and measures related to sewage treatment 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	99.1 %
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal	2000000 kg/d
Assumed domestic sewage treatment plant flow	10000 m ³ /d

Conditions and measures related to treatment of waste (including article waste)

During manufacturing no waste of the substance is generated

Other conditions affecting environmental exposure

Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Release fraction to air from process (initial release prior to RMM):	0.05
Release fraction to wastewater from process (initial release prior to RMM):	0.003
Release fraction to soil from process (initial release prior to RMM):	0.0001

1.2.2. Control of worker exposure: Manufacture of substance (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC15	Use as laboratory reagent

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) > 90 %
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Amount used (or contained in articles), frequency and duration of use/exposure

Covers daily exposures up to 8 hours,(unless stated differently)

Other conditions affecting workers exposure

Operation is carried out at elevated temperature (> 20°C above ambient temperature)

Assumes a good basic standard of occupational hygiene is implemented

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

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 systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.

General exposures (closed systems),with sample collection

Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Wear suitable gloves tested to EN374

General exposures (closed systems)

Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training

Laboratory activities

Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure

Bulk transfers

Ensure material transfers are under containment or extract ventilation. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training

Equipment cleaning and maintenance

Drain down and flush system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clean spills promptly. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Avoid carrying out activities involving exposure for more than 1 hours. Ensure operation is undertaken outdoors

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Other conditions affecting workers exposure

Storage

Wear suitable gloves tested to EN374. Store substance within a closed system

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure Manufacture of substance (ERC1, ERC4, ESVOC SPERC 1.1.v1)

Information for contributing exposure scenario

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

1.3.2. Worker exposure Manufacture of substance (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15)

Information for contributing exposure scenario

Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified H332 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified H315 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified H350 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified H304 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect, The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

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

1.4.1. 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>). Scaled local assessments for EU refineries have been performed using site-specific data and are attached in PETRORISK file - "Site-Specific Production" worksheet. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required

1.4.2. 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 dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

2. ES-2 - Industrial; Use of substance as an intermediate

2.1. Title section

Use of substance as an intermediate

ES Ref.: ES-2
ES Type: Environment - Worker

Environment		Use descriptors
CS-2.2	Use as an intermediate	ERC6a, ESVOC SPERC 6.1a.v1

Worker		Use descriptors
CS-2.1	Use as an intermediate	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15

Processes, tasks, activities covered	Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container)
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2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Use as an intermediate (ERC6a, ESVOC SPERC 6.1a.v1)

ERC6a	Use of intermediate
ESVOC SPERC 6.1a.v1	Manufacture of substances: Industrial (SU8, SU9)

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) > 90 %
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Amount used, frequency and duration of use (or from service life)

Fraction of EU tonnage used in region:	0.1
Regional use tonnage	2210000 t/yr
Fraction of Regional tonnage used locally:	0.0068
Continuous release	
Emission days	300 days/yr

Technical and organisational conditions and measures

Risk from environmental exposure is driven by freshwater sediment. If discharging to municipal sewage treatment plant, no onsite wastewater treatment required. Prevent discharge of undissolved substance to or recover from onsite wastewater	
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	≥ 92.9 %
If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of	≥ 0 %

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Technical and organisational conditions and measures

Sewage sludge should be incinerated, contained or reclaimed.

Conditions and measures related to sewage treatment 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	78000 kg/d
Assumed domestic sewage treatment plant flow	2000 m ³ /d

Conditions and measures related to treatment of waste (including article waste)

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

Other conditions affecting environmental exposure

Local freshwater dilution factor:	10
Local marine water dilution factor:	100
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

2.2.2. Control of worker exposure: Use as an intermediate (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC15	Use as laboratory reagent

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) > 90
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure

Amount used (or contained in articles), frequency and duration of use/exposure

Covers daily exposures up to 8 hours,(unless stated differently)

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Other conditions affecting workers exposure	
Operation is carried out at elevated temperature (> 20°C above ambient temperature)	
Assumes a good basic standard of occupational hygiene is implemented	
Remanufacture of reject articles	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
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 systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
General exposures (closed systems),with sample collection	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Wear suitable gloves tested to EN374
General exposures (closed systems)	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure
Bulk transfers	Ensure material transfers are under containment or extract ventilation. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clean spills promptly. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Avoid carrying out activities involving exposure for more than 1 hours. Ensure operation is undertaken outdoors
Storage	Wear suitable gloves tested to EN374. Store substance within a closed system

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

2.3. Exposure estimation and reference to its source

2.3.1. Environmental release and exposure Use as an intermediate (ERC6a, ESVOC SPERC 6.1a.v1)

Information for contributing exposure scenario

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

2.3.2. Worker exposure Use as an intermediate (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15)

Information for contributing exposure scenario

Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified H332 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified H315 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified H350 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified H304 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect.

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

2.4.1. 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>)

2.4.2. 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 support the need for a DNEL to be established for other health 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

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

3. ES-3 - Industrial; Distribution of substance

3.1. Title section

Distribution of substance

ES Ref.: ES-3
ES Type: Environment - Worker

Environment		Use descriptors
CS-3.1	Distribution of substance	ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1

Worker		Use descriptors
CS-3.2	Distribution of substance	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15

Processes, tasks, activities covered	Bulk loading (including marine vessel/barge, rail/road car and IBC loading) of substance within closed or contained systems, including incidental exposures during its sampling, storage, unloading, maintenance and associated laboratory activities.
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3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Distribution of substance (ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1)

ERC1	Manufacture of the substance
ERC2	Formulation into mixture
ERC3	Formulation into solid matrix
ERC4	Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
ERC5	Use at industrial site leading to inclusion into/onto article
ERC6a	Use of intermediate
ERC6b	Use of reactive processing aid at industrial site (no inclusion into or onto article)
ERC6c	Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC6d	Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
ERC7	Use of functional fluid at industrial site
ESVOC SPERC 1.1b.v1	Distribution: Industrial (SU3)

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) > 90 %
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Amount used, frequency and duration of use (or from service life)

Fraction of EU tonnage used in region:	0.1
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E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Amount used, frequency and duration of use (or from service life)

Regional use tonnage	18700000 t/yr
Fraction of Regional tonnage used locally:	0.002
Continuous release	
Emission days	300 days/yr

Technical and organisational conditions and measures

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	90 %
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	≥ 12 %
If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of	≥ 0 %
Do not apply industrial sludge to natural soils. Sewage sludge should be incinerated, contained or reclaimed.	

Conditions and measures related to sewage treatment 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	1100000 kg/d
Assumed domestic sewage treatment plant flow	2000 m ³ /d

Conditions and measures related to treatment of waste (including article waste)

External treatment and disposal of waste should comply with applicable local and/or national regulations	
External recovery and recycling of waste should comply with applicable local and/or national regulations	

Other conditions affecting environmental exposure

Local freshwater dilution factor:	10	
Local marine water dilution factor:	100	
Release fraction to air from process (initial release prior to RMM):	0.001	
Release fraction to wastewater from process (initial release prior to RMM):	0.00001	
Release fraction to soil from process (initial release prior to RMM):	0.00001	

3.2.2. Control of worker exposure: Distribution of substance (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
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E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC15	Use as laboratory reagent

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) > 90 %
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure

Amount used (or contained in articles), frequency and duration of use/exposure

Covers daily exposures up to 8 hours,(unless stated differently)	
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Other conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature, unless stated differently	
Assumes a good basic standard of occupational hygiene is implemented	
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
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 systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
General exposures (closed systems),with sample collection	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Wear suitable gloves tested to EN374

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Other conditions affecting workers exposure	
General exposures (closed systems)	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training
Process sampling	Sample via a closed loop or other system to avoid exposure. Wear suitable gloves tested to EN374
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure
bulk closed loading	Ensure material transfers are under containment or extract ventilation. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training
bulk closed loading and unloading	Ensure material transfers are under containment or extract ventilation. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clean spills promptly. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Avoid carrying out activities involving exposure for more than 1 hours. Ensure operation is undertaken outdoors
Storage	Wear suitable gloves tested to EN374. Store substance within a closed system

3.3. Exposure estimation and reference to its source

3.3.1. Environmental release and exposure Distribution of substance (ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1)

Information for contributing exposure scenario

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

3.3.2. Worker exposure Distribution of substance (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15)

Information for contributing exposure scenario

Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified H332 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified H315 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified H350 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified H304 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect, The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

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

3.4.1. 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)
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3.4.2. 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 dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation
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E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

4. ES-4 - Industrial, Formulation; Formulation & (Re)packing of substances and mixtures

4.1. Title section

Formulation & (Re)packing of substances and mixtures

ES Ref.: ES-4
ES Type: Environment - Worker

Environment		Use descriptors
CS-4.1	Formulation & (Re)packing of substances and mixtures	ERC2, ESVOC SPERC 2.2.v1

Worker		Use descriptors
CS-4.2	Formulation & (Re)packing of substances and mixtures	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15

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
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4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: Formulation & (Re)packing of substances and mixtures (ERC2, ESVOC SPERC 2.2.v1)

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

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) > 90 %
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Amount used, frequency and duration of use (or from service life)

Fraction of EU tonnage used in region:	0.1
Regional use tonnage	16500000 t/yr
Fraction of Regional tonnage used locally:	0.0018
Continuous release	
Emission days	300 days/yr

Technical and organisational conditions and measures

Prevent discharge of undissolved substance to or recover from onsite wastewater. 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	56.5 %
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	≥ 94.7 %

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Technical and organisational conditions and measures

If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of $\geq 0\%$

Do not apply industrial sludge to natural soils. Sewage sludge should be incinerated, contained or reclaimed.

Conditions and measures related to sewage treatment 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 100000 kg/d

Assumed domestic sewage treatment plant flow 2000 m³/d

Conditions and measures related to treatment of waste (including article waste)

External treatment and disposal of waste should comply with applicable local and/or national regulations

External recovery and recycling of waste should comply with applicable local and/or national regulations

Other conditions affecting environmental exposure

Local freshwater dilution factor: 10

Local marine water dilution factor: 100

Release fraction to air from process (initial release prior to RMM): 0.025

Release fraction to wastewater from process (initial release prior to RMM): 0.002

Release fraction to soil from process (initial release prior to RMM): 0.0001

4.2.2. Control of worker exposure: Formulation & (Re)packing of substances and mixtures (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15)

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions

PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition

PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities

PROC15 Use as laboratory reagent

Product (article) characteristics

Physical form of product Liquid

Concentration of substance in product Covers percentage substance in the product up to 100 % (unless stated differently)

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Product (article) characteristics

	> 90 %
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure

Amount used (or contained in articles), frequency and duration of use/exposure

Covers daily exposures up to 8 hours,(unless stated differently)	
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Other conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature, unless stated differently	
Assumes a good basic standard of occupational hygiene is implemented	
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
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 systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.
General exposures (closed systems),with sample collection	Handle substance within a closed system. Sample via a closed loop or other system to avoid exposure. Wear suitable gloves tested to EN374
General exposures (closed systems)	Provide extract ventilation to points where emissions occur. Handle substance within a closed system. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training
Storage	Wear suitable gloves tested to EN374. Store substance within a closed system
Process sampling	Sample via a closed loop or other system to avoid exposure. Wear suitable gloves tested to EN374
Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure
Bulk transfers	Ensure material transfers are under containment or extract ventilation. Wear suitable gloves tested to EN374

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Other conditions affecting workers exposure

Drum/batch transfers	Ensure material transfers are under containment or extract ventilation. Wear suitable gloves tested to EN374
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clean spills promptly. Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls. Avoid carrying out activities involving exposure for more than 1 hours. Ensure operation is undertaken outdoors

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure Formulation & (Re)packing of substances and mixtures (ERC2, ESVOC SPERC 2.2.v1)

Information for contributing exposure scenario

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

4.3.2. Worker exposure Formulation & (Re)packing of substances and mixtures (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15)

Information for contributing exposure scenario

Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified H332 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified H315 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified H350 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified H304 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect, The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

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

4.4.1. 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)
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4.4.2. 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 dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation
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E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

5. ES-5 - Industrial; Use of substance as a Fuel - Industrial

5.1. Title section

Use of substance as a Fuel - Industrial

ES Ref.: ES-5
ES Type: Environment - Worker

Environment		Use descriptors
CS-5.1	Use of substance as a Fuel - Industrial	ERC7, ESVOC SPERC 7.12a.v1

Worker		Use descriptors
CS-5.2	Use of substance as a Fuel - Industrial	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16

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
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5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Use of substance as a Fuel - Industrial (ERC7, ESVOC SPERC 7.12a.v1)

ERC7	Use of functional fluid at industrial site
ESVOC SPERC 7.12a.v1	Use as a fuel: Industrial (SU3)

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) > 90 %
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Amount used, frequency and duration of use (or from service life)	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage	1400000 t/yr
Fraction of Regional tonnage used locally:	1
Continuous release	
Emission days	300 days/yr

Technical and organisational conditions and measures	
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	99.4 %
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	≥ 76.9 %
If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of	≥ 0 %

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Technical and organisational conditions and measures

Do not apply industrial sludge to natural soils. Sewage sludge should be incinerated, contained or reclaimed.

Conditions and measures related to sewage treatment 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	4600000 kg/d
Assumed domestic sewage treatment plant flow	2000 m ³ /d

Conditions and measures related to treatment of waste (including article waste)

Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment

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

Other conditions affecting environmental exposure

Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Release fraction to air from process (initial release prior to RMM):	0.0025
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

5.2.2. Control of worker exposure: Use of substance as a Fuel - Industrial (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC16	Use of fuels

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) > 90
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Amount used (or contained in articles), frequency and duration of use/exposure

Covers daily exposures up to 8 hours,(unless stated differently)

Other conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature, unless stated differently

Assumes a good basic standard of occupational hygiene is implemented

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

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 systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.

bulk closed unloading

Ensure material transfers are under containment or extract ventilation

Drum/batch transfers

Ensure material transfers are under containment or extract ventilation

refuelling

Ensure material transfers are under containment or extract ventilation

refuelling aircraft

Ensure material transfers are under containment or extract ventilation

General exposures (closed systems)

Handle substance within a closed system. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.

Use as a fuel (closed systems)

Handle substance within a closed system

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Other conditions affecting workers exposure

Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clean spills promptly. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training
Storage	Store substance within a closed system. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure Use of substance as a Fuel - Industrial (ERC7, ESVOC SPERC 7.12a.v1)

Information for contributing exposure scenario

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

5.3.2. Worker exposure Use of substance as a Fuel - Industrial (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16)

Information for contributing exposure scenario

Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified H332 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified H315 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified H350 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified H304 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect, The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

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

5.4.1. 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)
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5.4.2. 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 dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation
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E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

6. ES-6 - Professional; Use of substance as a Fuel - Professional

6.1. Title section

Use of substance as a Fuel - Professional

ES Ref.: ES-6
ES Type: Environment - Worker

Environment	Use descriptors
CS-6.1	Use of substance as a Fuel - Professional ERC9a, ERC9b, ESVOC SPERC 9.12b.v1

Worker	Use descriptors
CS-6.2	Use of substance as a Fuel - Professional PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16

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
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6.2. Conditions of use affecting exposure

6.2.1. Control of environmental exposure: Use of substance as a Fuel - Professional (ERC9a, ERC9b, ESVOC SPERC 9.12b.v1)

ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)
ESVOC SPERC 9.12b.v1	Use as a fuel: Professional (SU22)

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) > 90 %
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Amount used, frequency and duration of use (or from service life)	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage	1190000 t/yr
Fraction of Regional tonnage used locally:	0.0005
Continuous release	
Emission days	365 days/yr

Technical and organisational conditions and measures	
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 onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of	≥ 3.4 %
If discharging to municipal sewage treatment plant, provide the required onsite wastewater removal efficiency of	≥ 0 %

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Technical and organisational conditions and measures

Do not apply industrial sludge to natural soils. Sewage sludge should be incinerated, contained or reclaimed.

Conditions and measures related to sewage treatment 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	15000 kg/d
Assumed domestic sewage treatment plant flow	2000 m ³ /d

Conditions and measures related to treatment of waste (including article waste)

Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment

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

Other conditions affecting environmental exposure

Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Release fraction to air from process (initial release prior to RMM):	0.01
Release fraction to wastewater from process (initial release prior to RMM):	0.00001
Release fraction to soil from process (initial release prior to RMM):	0.00001

6.2.2. Control of worker exposure: Use of substance as a Fuel - Professional (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16)

PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC8a	Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
PROC8b	Transfer of substance or mixture (charging and discharging) at dedicated facilities
PROC16	Use of fuels

Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) > 90 %
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Amount used (or contained in articles), frequency and duration of use/exposure

Covers daily exposures up to 8 hours,(unless stated differently)

Other conditions affecting workers exposure

Assumes use at not more than 20°C above ambient temperature, unless stated differently

Assumes a good basic standard of occupational hygiene is implemented

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

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 systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenarios; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.

General exposures (closed systems),Outdoor

Handle substance within a closed system

bulk closed unloading

Ensure material transfers are under containment or extract ventilation

Drum/batch transfers

Ensure material transfers are under containment or extract ventilation

refuelling

Ensure material transfers are under containment or extract ventilation

Use as a fuel (closed systems)

Handle substance within a closed system

Equipment cleaning and maintenance

Drain down and flush system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Clean spills promptly. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Ensure operatives are trained to minimise exposures

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Other conditions affecting workers exposure

Storage

Store substance within a closed system. Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.

6.3. Exposure estimation and reference to its source

6.3.1. Environmental release and exposure Use of substance as a Fuel - Professional (ERC9a, ERC9b, ESVOC SPERC 9.12b.v1)

Information for contributing exposure scenario

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

6.3.2. Worker exposure Use of substance as a Fuel - Professional (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16)

Information for contributing exposure scenario

Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified H332 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified H315 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified H350 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified H304 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect, The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

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

6.4.1. 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>)

6.4.2. 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 dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

7. ES-7 - Consumer; Use of substance as a Fuel - Consumer

7.1. Title section

Use of substance as a Fuel - Consumer

ES Ref.: ES-7
ES Type: Consumer

Environment	Use descriptors
CS-7.1	Use of substance as a Fuel - Consumer ERC9a, ERC9b, ESVOC SPERC 9.12c.v1

Consumer	Use descriptors
CS-7.2	Use of substance as a Fuel - Consumer PC13

Processes, tasks, activities covered	Covers consumer uses of automotive fuels only
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7.2. Conditions of use affecting exposure

7.2.1. Control of environmental exposure: Use of substance as a Fuel - Consumer (ERC9a, ERC9b, ESVOC SPERC 9.12c.v1)

ERC9a	Widespread use of functional fluid (indoor)
ERC9b	Widespread use of functional fluid (outdoor)
ESVOC SPERC 9.12c.v1	Use as a fuel: Consumer (SU21)

Product (article) characteristics	
Physical form of product	Liquid
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) > 90 %
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure

Amount used, frequency and duration of use (or from service life)	
Fraction of EU tonnage used in region:	0.1
Regional use tonnage	13900000 t/yr
Fraction of Regional tonnage used locally:	0.0005
Continuous release	
Emission days	365 days/yr

Conditions and measures related to treatment of waste (including article waste)	
Combustion emissions considered in regional exposure assessment. Combustion emissions limited by required exhaust emission controls	
External recovery and recycling of waste should comply with applicable local and/or national regulations	

Other conditions affecting environmental exposure	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Other conditions affecting environmental exposure

Release fraction to air from process (initial release prior to RMM):	0.01	
Release fraction to wastewater from process (initial release prior to RMM):	0.00001	
Release fraction to soil from process (initial release prior to RMM):	0.00001	

7.2.2. Control of consumer exposure: Use of substance as a Fuel - Consumer (PC13)

PC13	Fuels
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Product (article) characteristics

Physical form of product	Liquid
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently) > 90 %
Vapour pressure	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure

Amount used (or contained in articles), frequency and duration of use/exposure

For each use event, covers use amounts up to	37500 g
Covers skin contact area up to	420 cm ²
Covers exposure up to	0.143 t/d
Covers exposure up to	2 h/event

Other conditions affecting consumer exposure

Assumes use at not more than 20°C above ambient temperature, unless stated differently	
Assumes a good basic standard of occupational hygiene is implemented	
Liquid: Automotive Refuelling	Covers concentrations up to (%): 1%. Covers use up to (days/year): 52. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm ²): 210. For each use event, covers use amounts up to (g): 37500. Covers outdoor use Covers use in room size of (m ³): 100. Covers exposure up to (hours/event): 0.05. No specific risk management measure identified beyond those operational conditions stated.
Liquid Scooter Refuelling	Covers concentrations up to (%): 1%. Covers use up to (days/year): 52. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm ²): 210.00. For each use event, covers use amounts up to (g): 37500. Covers outdoor use Covers use in room size of (m ³): 100. Covers exposure up to (hours/event): 0.03. No specific risk management measure identified beyond those operational conditions stated
Liquid Garden Equipment - Use	Covers concentrations up to (%): 1%. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. For each use event, covers use amounts up to (g): 750. Covers outdoor use Covers use in room size of (m ³): 100. Covers exposure up to (hours/event): 2. No specific risk management measure identified beyond those operational conditions stated

E10

Annex to the safety data sheet: Exposure scenario

Reference number: 814597 CAS-No.: 86290-81-5 Product form: Substance Physical state: Liquid Substance type: UVCB

Other conditions affecting consumer exposure

Liquid: Garden Equipment - Refuelling

Covers concentrations up to (%): 1%. Covers use up to (days/year): 26. Covers use up to (times/day of use): 1. Covers skin contact area up to (cm²): 420. For each use event, covers use amounts up to (g): 750. Covers use in a one car garage (34 m³) under typical ventilation. Covers use in room size of (m³): 34. Covers exposure up to (hours/event): 0.03. No specific risk management measure identified beyond those operational conditions stated

7.3. Exposure estimation and reference to its source

7.3.1. Environmental release and exposure Use of substance as a Fuel - Consumer (ERC9a, ERC9b, ESVOC SPERC 9.12c.v1)

Information for contributing exposure scenario

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

7.3.2. Consumer exposure Use of substance as a Fuel - Consumer (PC13)

Information for contributing exposure scenario

Low Boiling Point Naphthas / Gasoline exhibits acute inhalation toxicity and is classified H332 (Harmful by inhalation) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary / additional RMMs. Low Boiling Point Naphthas / Gasoline exhibits irritation to the skin and is classified H315 (Irritating to skin) accordingly. The available data for this adverse effect do not provide quantitative dose-response information, but there exists toxicity data appropriate to allow a qualitative risk characterisation; please see section 2 of the SDS for the necessary RMMs. Low Boiling Point Naphthas / Gasoline exhibits carcinogenic effects and is classified H350 (May cause cancer) accordingly. The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from these adverse effects consistent with Directive 2004/37/E. Low Boiling Point Naphthas / Gasoline is classified H304 (Harmful: may cause lung damage if swallowed). The available data for this adverse effect do not provide quantitative dose-response information for a D(M)NEL to be derived. Instead, the toxicity data triggers a qualitative risk characterisation and the RMMs in section 2 of the SDS aims to define the appropriate RMMs necessary to protect from this adverse effect, The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of ECETOC report #107 and the Chapter R15 of the IR&CSA TGD. Where exposure determinants differ to these source, then they are indicated

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

7.4.1. 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>)

7.4.2. Health

Guidance - Health

Predicted exposures are not expected to exceed the applicable consumer reference values when the operational conditions/risk management measures given in section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels