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

1.1. Product identifier

Product form : Mixture
Trade name/designation : UNLEADED PETROL EURO BMB 98
Product group : Trade product

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 : Fuels

1.2.2. Uses advised against

No data available

1.3. Details of the supplier of the safety data sheet

Supplier

NIS a.d. Novi Sad
Narodnog Fronta 12
21000 Novi Sad - Serbia
T + 381 (0) 21 481 1111
Dragana.Cvetkov@nis.eu (REACH)

Only Representative

REACH Law Ltd.
Vänrikinkuja 3 JK 21
02600 Espoo - Finland
T +358(0) 9 412 3055 - F +358 (0) 9 412 3049
sds@reachlaw.fi

Manufacturer

NIS a.d. Novi Sad
Narodnog Fronta 12
21000 Novi Sad - Serbia
T + 381 (0) 21 481 1111
Dragana.Cvetkov@nis.eu (REACH)

1.4. Emergency telephone number

Emergency number : + 381 (0) 21 481 1111
Only available during office hours.

Country	Official advisory body	Address	Emergency number
Ireland	National Poisons Information Centre Beaumont Hospital	Beaumont Hospital Beaumont Road 9 Dublin	+353 1 809 21 66 (public, 8am - 10pm, 7/7) +353 01 809 2566 (Professionals, 24/7)
United Kingdom	National Poisons Information Service (Newcastle Centre) Regional Drugs and Therapeutics Centre, Wolfson Unit	Claremont Place Newcastle-upon-Tyne NE1 4LP Newcastle	0844 892 0111 (UK only, 24/7, healthcare professionals only)


SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Flam. Liq. 1 H224
Skin Irrit. 2 H315
Muta. 1B H340
Carc. 1B H350
Repr. 2 H361
STOT SE 3 H336
Asp. Tox. 1 H304
Aquatic Chronic 2 H411

Full text of H statements : see section 16

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2.2. Label elements

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

Hazard pictograms (CLP) :



Signal word :

Danger

Hazard statements (CLP) :

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

Precautionary statements (CLP) :

P201 - Obtain special instructions before use.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Wear protective clothing, protective gloves, eye protection, face protection.
P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER/doctor
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P501 - Dispose of container, contents to a hazardous or special waste collection point.

2.3. Other hazards

Other hazards :

PBT/vPvB data. This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT). This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).


SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Substance name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Gasoline	(CAS-No.) 86290-81-5 (EC-No.) 289-220-8 (EC Index) 649-378-00-4 (REACH-no) 01-2119471335-39-0169	>= 86	Flam. Liq. 1, H224 Asp. Tox. 1, H304 Skin Irrit. 2, H315 Muta. 1B, H340 Carc. 1B, H350 STOT SE 3, H336 Aquatic Chronic 2, H411 Repr. 2, H361fd
tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	(CAS-No.) 1634-04-4 (EC-No.) 216-653-1 (EC Index) 603-181-00-X (REACH-no) 01-2119452786-27	<= 14	Flam. Liq. 2, H225 Skin Irrit. 2, H315

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Toluene	(CAS-No.) 108-88-3 (EC-No.) 203-625-9 (EC Index) 601-021-00-3	>= 3	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Repr. 2, H361d STOT SE 3, H336 STOT RE 2, H373 Asp. Tox. 1, H304
n-Hexane	(CAS-No.) 110-54-3 (EC-No.) 203-777-6 (EC Index) 601-037-00-0	>= 3	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Repr. 2, H361f STOT SE 3, H336 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Chronic 2, H411
benzene	(CAS-No.) 71-43-2 (EC-No.) 200-753-7 (EC Index) 601-020-00-8	<= 1	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Muta. 1B, H340 Carc. 1A, H350 STOT RE 1, H372 Asp. Tox. 1, H304
methanol	(CAS-No.) 67-56-1 (EC-No.) 200-659-6 (EC Index) 603-001-00-X (REACH-no) 01-2119433307-44	< 1	Flam. Liq. 2, H225 Acute Tox. 3 (Inhalation), H331 Acute Tox. 3 (Dermal), H311 Acute Tox. 3 (Oral), H301 STOT SE 1, H370

Specific concentration limits:

Substance name	Product identifier	Specific concentration limits
n-Hexane	(CAS-No.) 110-54-3 (EC-No.) 203-777-6 (EC Index) 601-037-00-0	(5 =<C < 100) STOT RE 2, H373
methanol	(CAS-No.) 67-56-1 (EC-No.) 200-659-6 (EC Index) 603-001-00-X (REACH-no) 01-2119433307-44	(3 =<C < 10) STOT SE 2, H371 (C >= 10) STOT SE 1, H370

Full text of H-statements: see section 16


SECTION 4: First aid measures

4.1. Description of first aid measures

- Additional advice : First aider: Pay attention to self-protection. See also section 8. Never give anything by mouth to an unconscious person. Show this safety data sheet to the doctor in attendance. Treat symptomatically. In case of doubt or persistent symptoms, consult always a physician.
- Inhalation : Keep at rest. Provide fresh air. Give oxygen or artificial respiration if necessary. Call a physician immediately.
- Skin contact : Take off immediately all contaminated clothing. Wash with plenty of water/. In case of doubt or persistent symptoms, consult always a physician. Wash contaminated clothing before reuse.
- Eyes contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists: Get medical advice/attention.
- Ingestion : Do NOT induce vomiting. Rinse mouth immediately and drink plenty of water. Never give anything by mouth to an unconscious person. Get medical advice/attention.

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

- Inhalation : Vapours may cause drowsiness and dizziness. The following symptoms may occur: Cough. Headache.
- Skin contact : Irritating to skin. The following symptoms may occur: erythema (redness). Repeated exposure may cause skin dryness or cracking.
- Eyes contact : Contact with eyes may cause irritation.
- Ingestion : Harmful: may cause lung damage if swallowed.
- Chronic symptoms : May cause cancer. May cause genetic defects. Suspected of damaging fertility. Suspected of damaging the unborn child.

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

No data available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, Alcohol resistant foam, Carbon dioxide, Dry extinguishing powder.
 Unsuitable extinguishing media : Strong water jet.

5.2. Special hazards arising from the substance or mixture

Specific hazards : Extremely flammable liquid and vapour. Heating causes rise in pressure with risk of bursting. Vapours may form explosive mixture with air. Vapours are heavier than air and may spread along floors. Vapours are heavier than air and may travel considerable distance to an ignition source and flash back to source of vapours. Hazardous decomposition products COx. Do not allow run-off from fire-fighting to enter drains or water courses.

5.3. Advice for firefighters

Firefighting instructions : Special protective equipment for firefighters. . In case of fire: Wear self-contained breathing apparatus. Use water spray or fog for cooling exposed containers. Evacuate personnel to a safe area. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

For non-emergency personnel : Evacuate personnel to a safe area. Stay upwind/keep distance from source. Provide adequate ventilation. Use personal protective equipment as required. Concerning personal protective equipment to use, see section 8. Avoid contact with skin and eyes. Do not breathe vapour/aerosol. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ensure equipment is adequately earthed. Use explosion-proof equipment. Use only non-sparking tools.

6.1.2. For emergency responders

For emergency responders : Ensure procedures and training for emergency decontamination and disposal are in place. Concerning personal protective equipment to use, see section 8.

6.2. Environmental precautions


Do not allow to enter into surface water or drains.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Stop leak if safe to do so. Dam up. Take up liquid spill into absorbent material, e.g.: sand, earth, vermiculite or powdered limestone. Collect in closed and suitable containers for disposal. Recover large spills by pumping (use an explosion proof or hand pump). Dispose of as special waste in compliance with local and national regulations. Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases.

6.4. Reference to other sections

Concerning personal protective equipment to use, see section 8. Concerning disposal elimination after cleaning, see section 13.

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Provide adequate ventilation. Use personal protective equipment as required. Concerning personal protective equipment to use, see section 8. Avoid contact with skin, eyes and clothing. Do not breathe vapour/aerosol. Take precautionary measures against static discharges. Ensure equipment is adequately earthed. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take any precaution to avoid mixing with combustibles... See also section 10. Ensure proper process control to avoid excess waste discharge (temperature, concentration, pH, time). Do not allow to enter into surface water or drains.

Hygiene measures : Keep good industrial hygiene. Take off contaminated clothing. Wash hands and face before breaks and immediately after handling of the product. When using do not eat, drink or smoke. Separate working clothes from town clothes. Keep away from food, drink and animal feedingstuffs.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Storage of flammable liquids. Keep container tightly closed in a cool, well-ventilated place. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not store near or with any of the incompatible materials listed in section 10.

Packaging materials : Keep only in the original container.

7.3. Specific end use(s)

No data available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Toluene (108-88-3)		
Canada (Quebec)	VEMP (mg/m ³)	0 mg/m ³
n-Hexane (110-54-3)		
Slovakia	NPHV (priemerná) (mg/m ³)	20 mg/m ³ 72 mg/m ³
Slovakia	NPHV (Hraničná) (mg/m ³)	140 mg/m ³
Canada (Quebec)	VEMP (mg/m ³)	0 mg/m ³
Gasoline (86290-81-5)		
Belgium	Limit value (mg/m ³)	903 mg/m ³
Belgium	Limit value (ppm)	300 ppm
Belgium	Short time value (mg/m ³)	1501 mg/m ³
Belgium	Short time value	500 ppm
Czech Republic	Expoziční limity (PEL) (mg/m ³)	400 mg/m ³
Ireland	OEL (8 hours ref) (ppm)	300 ppm
Ireland	OEL (15 min ref) (ppm)	500 ppm
Lithuania	IPRV (mg/m ³)	200 mg/m ³
Lithuania	TPRV (mg/m ³)	300 mg/m ³
Netherlands	Grenswaarde TGG 8H (mg/m ³)	240 mg/m ³
Netherlands	Grenswaarde TGG 15MIN (mg/m ³)	480 mg/m ³
Portugal	OEL TWA (ppm)	300 ppm
Portugal	OEL STEL (ppm)	500 ppm
Spain	VLA-ED (ppm)	300 ppm (manufacturing, commercialization and use restrictions according to REACH)
Sweden	nivågränsvärde (NVG) (mg/m ³)	250 mg/m ³
Switzerland	MAK (mg/m ³)	1100 mg/m ³



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Gasoline (86290-81-5)		
Switzerland	MAK (ppm)	300 ppm
Australia	TWA (mg/m ³)	900 mg/m ³
USA - ACGIH	ACGIH TWA (ppm)	300 ppm
USA - ACGIH	ACGIH STEL (ppm)	500 ppm
tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane (1634-04-4)		
EU	IOELV TWA (mg/m ³)	183,5 mg/m ³
EU	IOELV TWA (ppm)	50 ppm
EU	IOELV STEL (mg/m ³)	367 mg/m ³
EU	IOELV STEL (ppm)	100 ppm
Austria	MAK (mg/m ³)	180 mg/m ³
Austria	MAK (ppm)	50 ppm
Austria	MAK Short time value (mg/m ³)	360 mg/m ³
Austria	MAK Short time value (ppm)	100 ppm
Belgium	Limit value (mg/m ³)	146 mg/m ³
Belgium	Limit value (ppm)	40 ppm
Belgium	Short time value (mg/m ³)	367 mg/m ³
Belgium	Short time value	100 ppm
Bulgaria	OEL TWA (mg/m ³)	183,5 mg/m ³
Bulgaria	OEL TWA (ppm)	50 ppm
Bulgaria	OEL STEL (mg/m ³)	367 mg/m ³
Bulgaria	OEL STEL (ppm)	100 ppm
Croatia	GVI (granična vrijednost izloženosti) (mg/m ³)	183,5 mg/m ³
Croatia	GVI (granična vrijednost izloženosti) (ppm)	50 ppm
Croatia	KGVI (kratkotrajna granična vrijednost izloženosti) (mg/m ³)	367 mg/m ³
Croatia	KGVI (kratkotrajna granična vrijednost izloženosti) (ppm)	100 ppm
Cyprus	OEL TWA (mg/m ³)	183,5 mg/m ³
Cyprus	OEL TWA (ppm)	50 ppm
Cyprus	OEL STEL (mg/m ³)	367 mg/m ³
Cyprus	OEL STEL (ppm)	100 ppm
Czech Republic	Expoziční limity (PEL) (mg/m ³)	100 mg/m ³
Denmark	Grænseværdie (langvarig) (mg/m ³)	144 mg/m ³
Denmark	Grænseværdie (langvarig) (ppm)	40 ppm
Estonia	OEL TWA (mg/m ³)	183,5 mg/m ³
Estonia	OEL TWA (ppm)	50 ppm
Estonia	OEL STEL (mg/m ³)	367 mg/m ³
Estonia	OEL STEL (ppm)	100 ppm
Finland	HTP-arvo (8h) (mg/m ³)	180 mg/m ³
Finland	HTP-arvo (8h) (ppm)	50 ppm
Finland	HTP-arvo (15 min)	360 mg/m ³
Finland	HTP-arvo (15 min) (ppm)	100 ppm
France	VME (mg/m ³)	183,5 mg/m ³ (restrictive limit)
France	VME (ppm)	50 ppm (restrictive limit)
France	VLE (mg/m ³)	367 mg/m ³ (restrictive limit)
France	VLE (ppm)	100 ppm (restrictive limit)



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tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane (1634-04-4)		
Germany	TRGS 900 Occupational exposure limit value (mg/m ³)	180 mg/m ³ (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed)
Germany	TRGS 900 Occupational exposure limit value (ppm)	50 ppm (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed)
Gibraltar	8h mg/m ³	183,5 mg/m ³
Gibraltar	8h ppm	50 ppm
Gibraltar	Short-term mg/m ³	367 mg/m ³
Gibraltar	Short-term ppm	100 ppm
Greece	OEL TWA (mg/m ³)	183,5 mg/m ³
Greece	OEL TWA (ppm)	50 ppm
Greece	OEL STEL (mg/m ³)	367 mg/m ³
Greece	OEL STEL (ppm)	100 ppm
Hungary	AK-érték	183,5 mg/m ³
Hungary	CK-érték	367 mg/m ³
Ireland	OEL (8 hours ref) (mg/m ³)	183,5 mg/m ³
Ireland	OEL (8 hours ref) (ppm)	50 ppm
Ireland	OEL (15 min ref) (mg/m ³)	367 mg/m ³
Ireland	OEL (15 min ref) (ppm)	100 ppm
Italy	OEL TWA (mg/m ³)	183,5 mg/m ³
Italy	OEL TWA (ppm)	50 ppm
Italy	OEL STEL (mg/m ³)	367 mg/m ³
Italy	OEL STEL (ppm)	100 ppm
Latvia	OEL TWA (mg/m ³)	183,5 mg/m ³
Latvia	OEL TWA (ppm)	50 ppm
Lithuania	IPRV (mg/m ³)	183,5 mg/m ³
Lithuania	IPRV (ppm)	50 ppm
Lithuania	TPRV (mg/m ³)	367 mg/m ³
Lithuania	TPRV (ppm)	100 ppm
Luxembourg	OEL TWA (ppm)	50 ppm
Luxembourg	OEL STEL (mg/m ³)	367 mg/m ³
Luxembourg	OEL STEL (ppm)	100 ppm
Malta	OEL TWA (mg/m ³)	183,5 mg/m ³
Malta	OEL TWA (ppm)	50 ppm
Malta	OEL STEL (mg/m ³)	367 mg/m ³
Malta	OEL STEL (ppm)	100 ppm
Netherlands	Grenswaarde TGG 8H (mg/m ³)	180 mg/m ³
Netherlands	Grenswaarde TGG 15MIN (mg/m ³)	360 mg/m ³
Poland	NDS (mg/m ³)	180 mg/m ³
Poland	NDSch (mg/m ³)	270 mg/m ³
Portugal	OEL TWA (mg/m ³)	183,5 mg/m ³ (indicative limit value)
Portugal	OEL TWA (ppm)	50 ppm (indicative limit value)
Portugal	OEL STEL (mg/m ³)	367 mg/m ³ (indicative limit value)
Portugal	OEL STEL (ppm)	100 ppm (indicative limit value)



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tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane (1634-04-4)

Romania	OEL TWA (mg/m ³)	183,5 mg/m ³
Romania	OEL TWA (ppm)	50 ppm
Romania	OEL STEL (mg/m ³)	367 mg/m ³
Romania	OEL STEL (ppm)	100 ppm
Slovakia	NPHV (priemerná) (mg/m ³)	183,5 mg/m ³
Slovakia	NPHV (priemerná) (ppm)	50 ppm
Slovakia	NPHV (Hraničná) (mg/m ³)	367 mg/m ³
Slovenia	OEL TWA (mg/m ³)	183,5 mg/m ³
Slovenia	OEL TWA (ppm)	50 ppm
Slovenia	OEL STEL (mg/m ³)	367 mg/m ³
Slovenia	OEL STEL (ppm)	100 ppm
Spain	VLA-ED (mg/m ³)	183,5 mg/m ³ (indicative limit value)
Spain	VLA-ED (ppm)	50 ppm (indicative limit value)
Spain	VLA-EC (mg/m ³)	367 mg/m ³
Spain	VLA-EC (ppm)	100 ppm
Sweden	nivågränsvärde (NVG) (mg/m ³)	110 mg/m ³
Sweden	nivågränsvärde (NVG) (ppm)	30 ppm
Sweden	kortidsvärde (KTV) (mg/m ³)	367 mg/m ³
Sweden	kortidsvärde (KTV) (ppm)	100 ppm
United Kingdom	WEL TWA (mg/m ³)	183,5 mg/m ³
United Kingdom	WEL TWA (ppm)	50 ppm
United Kingdom	WEL STEL (mg/m ³)	367 mg/m ³
United Kingdom	WEL STEL (ppm)	100 ppm
Norway	Grenseverdier (AN) (mg/m ³)	183,5 mg/m ³
Norway	Grenseverdier (AN) (ppm)	50 ppm
Norway	Grenseverdier (Korttidsverdi) (mg/m ³)	367 mg/m ³ (value from the regulation)
Norway	Grenseverdier (Korttidsverdi) (ppm)	100 ppm (value from the regulation)
Switzerland	MAK (mg/m ³)	180 mg/m ³
Switzerland	MAK (ppm)	50 ppm
Switzerland	KZGW (mg/m ³)	270 mg/m ³
Switzerland	KZGW (ppm)	75 ppm
Australia	TWA (mg/m ³)	92 mg/m ³
Australia	TWA (ppm)	25 ppm
Australia	STEL (mg/m ³)	275 mg/m ³
Australia	STEL (ppm)	75 ppm
Canada (Quebec)	VEMP (mg/m ³)	144 mg/m ³
Canada (Quebec)	VEMP (ppm)	40 ppm
USA - ACGIH	ACGIH TWA (ppm)	50 ppm

methanol (67-56-1)

EU	IOELV TWA (mg/m ³)	260 mg/m ³
EU	IOELV TWA (ppm)	200 ppm
EU	Notes	Possibility of significant uptake through the skin
Austria	MAK (mg/m ³)	260 mg/m ³
Austria	MAK (ppm)	200 ppm
Austria	MAK Short time value (mg/m ³)	1040 mg/m ³



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methanol (67-56-1)		
Austria	MAK Short time value (ppm)	800 ppm
Belgium	Limit value (mg/m ³)	266 mg/m ³
Belgium	Limit value (ppm)	200 ppm
Belgium	Short time value (mg/m ³)	333 mg/m ³
Belgium	Short time value	250 ppm
Bulgaria	OEL TWA (mg/m ³)	260 mg/m ³
Bulgaria	OEL TWA (ppm)	200 ppm
Croatia	GVI (granična vrijednost izloženosti) (mg/m ³)	260 mg/m ³
Croatia	GVI (granična vrijednost izloženosti) (ppm)	200 ppm
Cyprus	OEL TWA (mg/m ³)	260 mg/m ³
Cyprus	OEL TWA (ppm)	200 ppm
Czech Republic	Expoziční limity (PEL) (mg/m ³)	250 mg/m ³
Denmark	Grænseværdie (langvarig) (mg/m ³)	260 mg/m ³
Denmark	Grænseværdie (langvarig) (ppm)	200 ppm
Estonia	OEL TWA (mg/m ³)	250 mg/m ³
Estonia	OEL TWA (ppm)	200 ppm
Estonia	OEL STEL (mg/m ³)	350 mg/m ³
Estonia	OEL STEL (ppm)	250 ppm
Finland	HTP-arvo (8h) (mg/m ³)	270 mg/m ³
Finland	HTP-arvo (8h) (ppm)	200 ppm
Finland	HTP-arvo (15 min)	330 mg/m ³
Finland	HTP-arvo (15 min) (ppm)	250 ppm
France	VME (mg/m ³)	260 mg/m ³ (restrictive limit)
France	VME (ppm)	200 ppm (restrictive limit)
France	VLE (mg/m ³)	1300 mg/m ³
France	VLE (ppm)	1000 ppm
Germany	TRGS 900 Occupational exposure limit value (mg/m ³)	270 mg/m ³ (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed)
Germany	TRGS 900 Occupational exposure limit value (ppm)	200 ppm (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed)
Germany	TRGS 903 Biological limit value	30 mg/l Parameter: Methanol - Medium: urine - Sampling time: end of shift 30 mg/l Parameter: Methanol - Medium: urine - Sampling time: end of several shifts (for long-term exposures)
Gibraltar	8h mg/m ³	260 mg/m ³
Gibraltar	8h ppm	200 ppm
Greece	OEL TWA (mg/m ³)	260 mg/m ³
Greece	OEL TWA (ppm)	200 ppm
Greece	OEL STEL (mg/m ³)	325 mg/m ³
Greece	OEL STEL (ppm)	250 ppm
Hungary	AK-érték	260 mg/m ³
Ireland	OEL (8 hours ref) (mg/m ³)	260 mg/m ³
Ireland	OEL (8 hours ref) (ppm)	200 ppm
Ireland	OEL (15 min ref) (mg/m ³)	780 mg/m ³ (calculated)



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methanol (67-56-1)		
Ireland	OEL (15 min ref) (ppm)	600 ppm (calculated)
Italy	OEL TWA (mg/m ³)	260 mg/m ³
Italy	OEL TWA (ppm)	200 ppm
Latvia	OEL TWA (mg/m ³)	260 mg/m ³
Latvia	OEL TWA (ppm)	200 ppm
Lithuania	IPRV (mg/m ³)	260 mg/m ³
Lithuania	IPRV (ppm)	200 ppm
Luxembourg	OEL TWA (mg/m ³)	260 mg/m ³
Luxembourg	OEL TWA (ppm)	200 ppm
Malta	OEL TWA (mg/m ³)	260 mg/m ³
Malta	OEL TWA (ppm)	200 ppm
Netherlands	Grenswaarde TGG 8H (mg/m ³)	133 mg/m ³
Netherlands	Grenswaarde TGG 8H (ppm)	100 ppm
Poland	NDS (mg/m ³)	100 mg/m ³
Poland	NDSch (mg/m ³)	300 mg/m ³
Portugal	OEL TWA (mg/m ³)	260 mg/m ³ (indicative limit value)
Portugal	OEL TWA (ppm)	200 ppm (indicative limit value)
Portugal	OEL STEL (ppm)	250 ppm
Romania	OEL TWA (mg/m ³)	260 mg/m ³
Romania	OEL TWA (ppm)	200 ppm
Slovakia	NPHV (priemerná) (mg/m ³)	260 mg/m ³
Slovakia	NPHV (priemerná) (ppm)	200 ppm
Slovenia	OEL TWA (mg/m ³)	260 mg/m ³
Slovenia	OEL TWA (ppm)	200 ppm
Spain	VLA-ED (mg/m ³)	266 mg/m ³ (indicative limit value)
Spain	VLA-ED (ppm)	200 ppm (indicative limit value)
Sweden	nivågränsvärde (NVG) (mg/m ³)	250 mg/m ³
Sweden	nivågränsvärde (NVG) (ppm)	200 ppm
Sweden	kortidsvärde (KTV) (mg/m ³)	350 mg/m ³
Sweden	kortidsvärde (KTV) (ppm)	250 ppm
United Kingdom	WEL TWA (mg/m ³)	266 mg/m ³
United Kingdom	WEL TWA (ppm)	200 ppm
United Kingdom	WEL STEL (mg/m ³)	333 mg/m ³
United Kingdom	WEL STEL (ppm)	250 ppm
Norway	Grenseverdier (AN) (mg/m ³)	130 mg/m ³
Norway	Grenseverdier (AN) (ppm)	100 ppm
Norway	Grenseverdier (Korttidsverdi) (mg/m ³)	162,5 mg/m ³ (value calculated)
Norway	Grenseverdier (Korttidsverdi) (ppm)	125 ppm (value calculated)
Switzerland	MAK (mg/m ³)	260 mg/m ³
Switzerland	MAK (ppm)	200 ppm
Switzerland	KZGW (mg/m ³)	1040 mg/m ³
Switzerland	KZGW (ppm)	800 ppm
Australia	TWA (mg/m ³)	262 mg/m ³
Australia	TWA (ppm)	200 ppm

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methanol (67-56-1)		
Australia	STEL (mg/m ³)	328 mg/m ³
Australia	STEL (ppm)	250 ppm
Canada (Quebec)	VECD (mg/m ³)	328 mg/m ³
Canada (Quebec)	VECD (ppm)	250 ppm
Canada (Quebec)	VEMP (mg/m ³)	262 mg/m ³
Canada (Quebec)	VEMP (ppm)	200 ppm
USA - ACGIH	ACGIH TWA (ppm)	200 ppm
USA - ACGIH	ACGIH STEL (ppm)	250 ppm
USA - IDLH	US IDLH (ppm)	6000 ppm
USA - NIOSH	NIOSH REL (TWA) (mg/m ³)	260 mg/m ³
USA - NIOSH	NIOSH REL (TWA) (ppm)	200 ppm
USA - NIOSH	NIOSH REL (STEL) (mg/m ³)	325 mg/m ³
USA - NIOSH	NIOSH REL (STEL) (ppm)	250 ppm
USA - OSHA	OSHA PEL (TWA) (mg/m ³)	260 mg/m ³
USA - OSHA	OSHA PEL (TWA) (ppm)	200 ppm

Additional information : Personal air monitoring. Concentration measurement in air


8.2. Exposure controls

- Engineering measure(s) : Closed system. Provide adequate ventilation. Use only in area provided with appropriate exhaust ventilation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Take precautionary measures against static discharge. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Organisational measures to prevent /limit releases, dispersion and exposure. See also section 7.
- Personal protective equipment : The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
- Hand protection : Wear chemically resistant gloves (tested to EN374) . NBR (Nitrile rubber). 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.
- Eye protection : Safety glasses (EN166)
- Body protection : Wear suitable coveralls to prevent exposure to the skin
- Respiratory protection : In case of insufficient ventilation, wear suitable respiratory equipment. Filter type: A (EN 141). Half-face mask (DIN EN 140) (EN 140). full face mask (DIN EN 136) (EN 136). Self-contained open-circuit compressed air breathing apparatus (EN 137)
- Thermal hazard protection : Not required for normal conditions of use. Use dedicated equipment.
- Environmental exposure controls : Do not allow to enter into surface water or drains. Comply with applicable Community environmental protection legislation.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Physical state : Liquid
- Colour : Colourless.
- Odour : petroleum hydrocarbon odour.
- Odour threshold : No data available
- pH : Not applicable

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Relative evaporation rate (butylacetate=1)	: No data available
Melting / freezing point	: No data available
Freezing point	: No data available
Initial boiling point and boiling range	: 35 - 210 °C
Flash point	: -40 °C
Auto-ignition temperature	: 280 - 470 °C
Decomposition temperature	: No data available
Flammability (solid, gas)	: Not applicable
Vapour pressure	: 45- 80 kPa
Vapour density	: No data available
Relative density	: 0,720 - 0,775 kg/m ³ (15°C)
Solubility	: Water: Insoluble
Partition coefficient n-octanol/water	: No data available
Kinematic viscosity	: < 1 mm ² /s (40 °C)
Dynamic viscosity	: No data available
Explosive properties	: Not applicable.
Oxidising properties	: Not applicable.
Explosive limits	: LEL: 1,4-UEL:7,6 vol %

9.2. Other information

No data available

SECTION 10: Stability and reactivity

10.1. Reactivity

Extremely flammable liquid and vapour. Reference to other sections: 10.5.

10.2. Chemical stability

The product is stable under storage at normal ambient temperatures.

10.3. Possibility of hazardous reactions

Vapours may form explosive mixture with air. Reference to other sections 10.4.

10.4. Conditions to avoid

Keep away from sources of heat (e.g. hot surfaces), sparks and open flames. See also section 7. Handling and storage.

10.5. Incompatible materials

oxidising substances. See also section 7. Handling and storage.

10.6. Hazardous decomposition products


Carbon oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

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

benzene (71-43-2)	
LD50/oral/rat	> 2000 mg/kg
LD50/dermal/rabbit	> 8200 mg/kg
LC50/inhalation/4h/rat	44,66 mg/l/4h
Toluene (108-88-3)	
LD50/oral/rat	2600 mg/kg
LD50/dermal/rabbit	12000 mg/kg
LC50/inhalation/4h/rat	12,5 mg/l/4h

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n-Hexane (110-54-3)	
LD50/oral/rat	25 g/kg
LD50/dermal/rabbit	3000 mg/kg
LC50/inhalation/4h/rat (ppm)	48000 ppm/4h

Gasoline (86290-81-5)	
LD50/oral/rat	14000 mg/kg
LD50/dermal/rat	> 2000 mg/kg
LD50/dermal/rabbit	> 2000 mg/kg
LC50/inhalation/4h/rat	> 5,2 mg/l (Exposure time: 4 h)

tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane (1634-04-4)	
LD50/oral/rat	> 2000 mg/kg (OECD401)
LD50/dermal/rat	> 2000 mg/kg (OECD402)
LD50/dermal/rabbit	10000 mg/kg
LC50/inhalation/4h/rat	85 mg/l/4h
LC50 inhalation rat (Vapours - mg/l/4h)	85 mg/l/4h (OECD403)

methanol (67-56-1)	
LD50/oral/rat	6200 mg/kg (ATE: 100 mg/kg)
LD50/dermal/rabbit	15840 mg/kg ((ATE: 300 mg/kg)
LC50/inhalation/4h/rat (ppm)	8h 128,2 ppm (ATE: 3 mg/l ((Vapours)

Skin corrosion/irritation : Causes skin irritation.
pH: Not applicable

Serious eye damage/irritation : Not classified (Based on available data, the classification criteria are not met.)
pH: Not applicable

Respiratory or skin sensitisation : Not classified (Based on available data, the classification criteria are not met.)

Germ cell mutagenicity : May cause genetic defects.
Benzene

Carcinogenicity : May cause cancer.
Benzene

Reproductive toxicity : Suspected of damaging fertility or the unborn child.
n-Hexane :
Suspected of damaging fertility.
Toluene :
Suspected of damaging the unborn child.

STOT-single exposure : May cause drowsiness or dizziness.

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

tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane (1634-04-4)	
NOAEL (oral, rat, 90 days)	209 mg/kg bodyweight/day

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

UNLEADED PETROL EURO BMB 98	
Kinematic viscosity	< 1 mm ² /s (40 °C)

Other information : Symptoms related to the physical, chemical and toxicological characteristics.
Reference to other sections: 4.2.

SECTION 12: Ecological information

12.1. Toxicity

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



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benzene (71-43-2)	
LC50 fish 1	10,7 - 14,7 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	8,76 - 15,6 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC50 fish 2	5,3 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])
EC50 Daphnia 2	10 mg/l (Exposure time: 48 h - Species: Daphnia magna)
Toluene (108-88-3)	
LC50 fish 1	15,22 - 19,05 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	5,46 - 9,83 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC50 fish 2	12,6 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 Daphnia 2	11,5 mg/l (Exposure time: 48 h - Species: Daphnia magna)
n-Hexane (110-54-3)	
LC50 fish 1	2,1 - 2,98 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane (1634-04-4)	
LC50 fish 1	(96h) 672 mg/l Freshwater
EC50 Daphnia 1	472 mg/l Freshwater
LC50 fish 2	(96h) 574 mg/l Marine water
EC50 Daphnia 2	106 mg/l Marine water
ErC50 (algae)	491 mg/l
NOEC chronic fish	(21 d) 62 mg/l
NOEC chronic crustacea	51 mg/l Freshwater
NOEC chronic algae	103 mg/l
EC10, Pseudomonas putida	710 (18 hours, (Bringmann-Kühn test))
methanol (67-56-1)	
LC50 fish 1	28200 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	> 10000 mg/l (48h - Daphnia magna - DIN 38412 TEIL 11)
EC50 other aquatic organisms 1	22000 mg/l (96h - Pseudokirchnerella subcapitata - OECD 201)
LC50 fish 2	> 100 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
NOEC(200h), fish, Chronic, Oryzias latipes (Ricefish)	7900 mg/l
12.2. Persistence and degradability	
UNLEADED PETROL EURO BMB 98	
Persistence and degradability	Gasoline. Substance is complex UVCB. Not applicable.
12.3. Bioaccumulative potential	
UNLEADED PETROL EURO BMB 98	
Partition coefficient n-octanol/water	No data available
Bioaccumulative potential	Gasoline. Substance is complex UVCB. Not applicable.
benzene (71-43-2)	
BCF fish 1	3,5 - 4,4
Partition coefficient n-octanol/water	2,1
Toluene (108-88-3)	
Partition coefficient n-octanol/water	2,7
tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane (1634-04-4)	
Bioconcentration factor (BCF)	1,5
Partition coefficient n-octanol/water	1,06 (20 °C)
methanol (67-56-1)	
BCF fish 1	< 10

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methanol (67-56-1)	
Partition coefficient n-octanol/water	-0,77

12.4. Mobility in soil

UNLEADED PETROL EURO BMB 98	
Ecology - soil	No data available.

tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane (1634-04-4)	
Surface tension	72,5 mN/m (21.5 °C, 1.07 g/L)

12.5. Results of PBT and vPvB assessment

UNLEADED PETROL EURO BMB 98	
Results of PBT assessment	This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT). This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

ingredient	
methanol (67-56-1)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Other adverse effects

No data available

SECTION 13: Disposal considerations


13.1. Waste treatment methods






Product/Packaging disposal recommendations	: Handle with care. Safe handling: see section 7. Handling and storage. Dispose of contaminated materials in accordance with current regulations. Refer to manufacturer/supplier for information on recovery/recycling. Collect and dispose of waste product at an authorised disposal facility.
Additional information	: Never use pressure to empty container. Do not puncture or incinerate. Do not burn, or use a cutting torch on the empty drum. Delivery to an approved waste disposal company. Dispose of contaminated materials in accordance with current regulations.
Further ecological information	: Do not allow to enter into surface water or drains.
European waste catalogue (2001/573/EC, 75/442/EEC, 91/689/EEC)	: Classified as hazardous waste according to European Union regulations. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities. The following Waste Codes are only suggestions: 130702 - petrol 150110 - packaging containing residues of or contaminated by dangerous substances

SECTION 14: Transport information

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

ADR	IMDG	IATA	ADN	RID
14.1. UN number				
1203	1203	1203	1203	1203
14.2. UN proper shipping name				
MOTOR SPIRIT/GASOLINE/PE TROL	GASOLINE	Gasoline	GASOLINE	GASOLINE
Transport document description				
UN 1203 MOTOR SPIRIT/GASOLINE/PE TROL, 3, II, (D/E)	UN 1203 GASOLINE, 3, II	UN 1203 Gasoline, 3, II	UN 1203 GASOLINE, 3, II	UN 1203 GASOLINE, 3, II

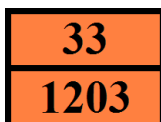
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ADR	IMDG	IATA	ADN	RID
14.3. Transport hazard class(es)				
3	3	3	3	3
				
14.4. Packing group				
II	II	II	II	II
14.5. Environmental hazards				
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No	Dangerous for the environment : No	Dangerous for the environment : No
ADN :N2				

14.6. Special precautions for user

- Overland transport


Classification code (ADR) : F1
 Special provisions : 243, 534, 363, 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 : D/E
 EAC code : 3YE

- Transport by sea

Special provisions (IMDG) : 243, 363
 Limited quantities (IMDG) : 1 L
 Excepted quantities (IMDG) : E2
 Packing instructions (IMDG) : P001
 IBC packing instructions (IMDG) : IBC02
 Tank instructions (IMDG) : T4
 Tank special provisions (IMDG) : TP1
 EmS-No. (Fire) : F-E

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

- Rail transport

Classification code (RID) : F1
 Special provisions (RID) : 243, 363, 534
 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. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code


Not applicable

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

The following restrictions are applicable according to Annex XVII of the REACH Regulation (EC) No 1907/2006:

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29. Substances which are classified as germ cell mutagen category 1A or 1B in Part 3 of Annex VI to Regulation (EC) No 1272/2008 and are listed in Appendix 3 or Appendix 4, respectively.	benzene - Gasoline
28. Substances which are classified as carcinogen category 1A or 1B in Part 3 of Annex VI to Regulation (EC) No 1272/2008 and are listed in Appendix 1 or Appendix 2, respectively.	benzene - Gasoline
48. Toluene	Toluene
40. Substances classified as flammable gases category 1 or 2, flammable liquids categories 1, 2 or 3, flammable solids category 1 or 2, substances and mixtures which, in contact with water, emit flammable gases, category 1, 2 or 3, pyrophoric liquids category 1 or pyrophoric solids category 1, regardless of whether they appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 or not.	UNLEADED PETROL EURO BMB 98 - benzene - Toluene - n-Hexane - Gasoline - tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane - methanol
5. Benzene	benzene
3(a) Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 2.1 to 2.4, 2.6 and 2.7, 2.8 types A and B, 2.9, 2.10, 2.12, 2.13 categories 1 and 2, 2.14 categories 1 and 2, 2.15 types A to F	UNLEADED PETROL EURO BMB 98 - benzene - tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane - methanol
3. Liquid substances or mixtures which are regarded as dangerous in accordance with Directive 1999/45/EC or are fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008	UNLEADED PETROL EURO BMB 98 - benzene - tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane - methanol
3(c) Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard class 4.1	UNLEADED PETROL EURO BMB 98
3(b) Substances or mixtures fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: Hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10	UNLEADED PETROL EURO BMB 98 - benzene - tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane - methanol

Contains no substance on the REACH candidate list

Contains no REACH Annex XIV substances

15.1.2. National regulations

Germany

Reference to AwSV : Water hazard class (WGK) 3, severe hazard to water (Classification according to AwSV, Annex 1)

12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)


Netherlands

SZW-lijst van kankerverwekkende stoffen : benzene, Gasoline are listed
 SZW-lijst van mutagene stoffen : benzene, Gasoline are listed
 NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : None of the components are listed
 NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : n-Hexane is listed
 NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : Toluene, methanol are listed

Denmark

Classification remarks : Emergency management guidelines for the storage of flammable liquids must be followed

Recommendations Danish Regulation : Young people below the age of 18 years are not allowed to use the product
 Pregnant/breastfeeding women working with the product must not be in direct contact with the product

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15.2. Chemical safety assessment

For the following substances of this mixture a chemical safety assessment has been carried out

tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane
methanol

SECTION 16: Other information

Indication of changes:

16	Other information	Modified	
	Exposure scenarios	Modified	

Abbreviations and acronyms:


	ADN = Accord Européen relatif au Transport International des Marchandises Dangereuses par voie de Navigation du Rhin ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route CLP = Classification, Labelling and Packaging Regulation according to 1272/2008/EC IATA = International Air Transport Association IMDG = International Maritime Dangerous Goods Code LEL = Lower Explosive Limit/Lower Explosion Limit UEL = Upper Explosion Limit/Upper Explosive Limit REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals
	N = Dangerous for the environment
	TWA = time weighted average
	vPvB = very persistent and very bioaccumulating
	WGK = Wassergefährdungsklasse (Water Hazard Class under German Federal Water Management Act)
	T = Toxic
	TLV = Threshold limits
	STEL = Short term exposure limit
	DNEL = Derived No Effect Level
	CSR = Chemical Safety Report
	EC50 = Median Effective Concentration

Sources of key data used to compile the datasheet : European Chemicals Bureau CSR, ECHA Website.

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:


Acute Tox. 3 (Dermal)	Acute toxicity (dermal), Category 3
Acute Tox. 3 (Inhalation)	Acute toxicity (inhal.), Category 3
Acute Tox. 3 (Oral)	Acute toxicity Category 3
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
Muta. 1B	Germ cell mutagenicity, hazard categories 1B
Repr. 2	Reproductive toxicity, Hazard Category 2
Repr. 2	Reproductive toxicity, Hazard Category 2
Repr. 2	Reproductive toxicity, Hazard Category 2
Repr. 2	Reproductive toxicity, Hazard Category 2
Skin Irrit. 2	Skin corrosion/irritation, Category 2

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STOT RE 1	Specific target organ toxicity — Repeated exposure, Category 1
STOT RE 2	Specific target organ toxicity — Repeated exposure, Category 2
STOT SE 1	Specific target organ toxicity — single exposure, Category 1
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Narcosis
H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H304	May be fatal if swallowed and enters airways.
H311	Toxic in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H350	May cause cancer.
H361	Suspected of damaging fertility or the unborn child.
H361d	Suspected of damaging the unborn child.
H361f	Suspected of damaging fertility.
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.
H370	Causes damage to organs.
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.

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830
Classification according to Regulation (EC) No. 1272/2008 [CLP]
Labelling according to Regulation (EC) No. 1272/2008 [CLP]

DISCLAIMER OF LIABILITY The information in this SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product, this SDS information may not be applicable.

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Annex to the safety data sheet

Annex : Identified uses						
Title	Sector of use	Product category	Process category	Article category	Environmental release	SPERC
Manufacture of substance Not classified as (H350, H340, H361f and/or H361d) Benzene content : < 0,1%			PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15		ERC1	ESVOC SPERC 1.1.v1
Manufacture of substance Classified as (H350, H340, H361f and/or H361d) Benzene content : 0% - 1%			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC1	ESVOC SPERC 1.1.v1
Manufacture of substance Classified as (H350, H340, H361f and/or H361d) Benzene content : 1% - 5%			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC1	ESVOC SPERC 1.1.v1
Use as an intermediate Classified as (H350, H340, H361f and/or H361d) Benzene content : 0% - 1%	SU8, SU9		PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC6a	ESVOC SPERC 6.1a.v1
Use as an intermediate Classified as: (H350, H340, H361f and/or H361d) Benzene content : 1% - 5%.	SU8, SU9		PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC6a	ESVOC SPERC 6.1a.v1
Distribution Not classified as (H350, H340, H361f and/or H361d) Benzene content : < 0,1%			PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15		ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	ESVOC SPERC 1.1b.v1
Distribution Classified as (H350, H340,			PROC1, PROC2, PROC3,		ERC4, ERC5, ERC6a, ERC6b,	ESVOC SPERC 1.1b.v1



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H361f and/or H361d) Benzene content : 0% - 1%			PROC8a, PROC8b, PROC15		ERC6c, ERC6d, ERC7	
Distribution of substance Classified as: (H350, H340, H361f and/or H361d) Benzene content : 1% - 5%.			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	ESVOC SPERC 1.1b.v1
Formulation & (re)packing of substances and mixtures Not classified as (H350, H340, H361f and/or H361d) Benzene content : < 0,1%			PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15		ERC2	ESVOC SPERC 2.2.v1
Formulation & (re)packing of substances and mixtures Classified as (H350, H340, H361f and/or H361d) Benzene content : 0% - 1%			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC2	ESVOC SPERC 2.2.v1
Use as a fuel Classified as (H350, H340, H361f and/or H361d) Benzene content : 0% - 1%			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16		ERC7	ESVOC SPERC 7.12a.v1
Use as a fuel Not classified as (H350, H340, H361f and/or H361d) Benzene content : < 0,1%			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16		ERC9a, ERC9b	ESVOC SPERC 9.12b.v1
Use as a fuel Classified as (H350, H340, H361f and/or H361d) Benzene content : 0% - 1%			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16		ERC9a, ERC9b	ESVOC SPERC 9.12b.v1
Use as a fuel Not classified as (H350, H340, H361f and/or H361d) Benzene content :		PC13			ERC9a, ERC9b	ESVOC SPERC 9.12c.v1

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< 0,1%						
Use as a fuel Classified as (H350, H340, H361f and/or H361d) Benzene content : 0% - 1%		PC13			ERC9a, ERC9b	ESVOC SPERC 9.12c.v1

1. Exposure scenario 01a (Benz < 0,1%)

Manufacture of substance
Not classified as: (H350, H340, H361f and/or H361d)
Benzene content : <0,1%

ES Ref.: 01a (Benz < 0,1%) ES Type: Worker Version: 2	
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Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15 ERC1 ESVOC SPERC 1.1.v1
Processes, tasks activities covered	Manufacture of substance or use as process chemical or extracting 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).
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC15	Use as laboratory reagent

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).


Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational 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.	

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance	
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	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 exposures (closed systems)	No other specific measures identified.	
General exposures (closed systems),CS56 - with sample collection	No other specific measures identified.	
CS16 - General exposures (open systems)	Provide extract ventilation to points where emissions occur	
CS29 - Mixing operations (closed systems)	No other specific measures identified.	
CS2 - Process sampling	No other specific measures identified.	
CS36 - Laboratory activities	Handle in a fume cupboard or under extract ventilation.	
CS14 - Bulk transfers	No other specific measures identified.	
CS8 - Drum/batch transfers	No other specific measures identified.	
CS5 - Equipment maintenance	No other specific measures identified.	
Storage	No other specific measures identified.	

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

ERC1	Manufacture of substances
ESVOC SPERC 1.1.v1	Manufacture of substance: Industrial (SU3)

Product characteristics


Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	11000000
	Fraction of regional tonnage used locally:	0,44
	Annual site tonnage (tons/year):	500000
	Maximum daily site tonnage (kg/day)	17000000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,0025
	Release fraction to wastewater from process (initial release prior to RMM):	0,000019
	Release fraction to soil from process (initial release prior to RMM):	0,0001

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Prevent discharge of undissolved substance to or recover from onsite wastewater,Risk from environmental exposure is driven by freshwater sediment,If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	90
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	95,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	

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Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	96,1
	Maximum allowable site tonnage (MSafe)	18000000
	Assumed domestic sewage treatment plant flow (m ³ /d):	10000
Conditions and measures related to external treatment of waste for disposal	During manufacturing no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	During manufacturing no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented, Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels, Available hazard data do not enable the derivation of a DNEL for 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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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures, Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination, Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html), 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.
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1. Exposure scenario 01b (Benz 0%-1%)

Manufacture of substance
Classified as: (H350, H340, H361f and/or H361d)
Benzene content : 0% - 1%

ES Ref.: 01b (Benz 0%-1%) ES Type: Worker Version: 2
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Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 ERC1 ESVOC SPERC 1.1.v1
Processes, tasks activities covered	Manufacture of substance or use as process chemical or extracting 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).
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

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

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

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).


Operational conditions

Amount used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	Not applicable
Other given operational 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.

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop
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

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	operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of waste 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),CS56 - with sample collection	E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,PPE15 - Wear suitable gloves tested to EN374.	
General exposures (closed systems),CS54 - Continuous process	E47 - Handle substance within a closed system.	
General exposures (closed systems),CS55 - Batch process	E47 - Handle substance within a closed system,Ensure operation is undertaken outdoors.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
CS14 - Bulk transfers	Ensure material transfers are under containment or extract ventilation.	
CS39 - 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,Clear spills immediately,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Storage	Ensure operation is undertaken outdoors,E84 - Store substance within a closed system.	

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

ERC1	Manufacture of substances
ESVOC SPERC 1.1.v1	Manufacture of substance: Industrial (SU3)

Product characteristics


Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	11000000
	Fraction of regional tonnage used locally:	0,44
	Annual site tonnage (tons/year):	500000
	Maximum daily site tonnage (kg/day)	17000000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,0025
	Release fraction to wastewater from process (initial release prior to RMM):	0,000019
	Release fraction to soil from process (initial release prior to RMM):	0,0001

Risk management measures

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

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	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	95,2
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils, Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	96,1
	Maximum allowable site tonnage (MSafe)	18000000
	Assumed domestic sewage treatment plant flow (m ³ /d):	10000
Conditions and measures related to external treatment of waste for disposal	During manufacturing no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	During manufacturing no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented, Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels, Available hazard data do not enable the derivation of a DNEL for 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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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures, Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination, Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
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1. Exposure scenario 01c (Benz 1%-5%)

Manufacture of substance
Classified as: (H350, H340, H361f and/or H361d)
Benzene content : 1% - 5%

ES Ref.: 01c (Benz 1%-5%) ES Type: Worker Version: 2
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Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 ERC1 ESVOC SPERC 1.1.v1
Processes, tasks activities covered	Manufacture of substance or use as process chemical or extracting 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).
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

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

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

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).


Operational conditions

Amount used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	Not applicable
Other given operational 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.

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop
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

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	operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when its use is identified for certain contributing scenario; clear up spills immediately and dispose of waste 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),CS56 - with sample collection	E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,PPE15 - Wear suitable gloves tested to EN374.	
General exposures (closed systems)	Provide extract ventilation to points where emissions occur,E47 - Handle substance within a closed system.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
CS14 - Bulk transfers	Ensure material transfers are under containment or extract ventilation.	
CS39 - 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,Clear spills immediately,PPE18 - Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.	
Storage	E84 - Store substance within a closed system,PPE15 - Wear suitable gloves tested to EN374.	

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

ERC1	Manufacture of substances
ESVOC SPERC 1.1.v1	Manufacture of substance: Industrial (SU3)

Product characteristics


Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	11000000
	Fraction of regional tonnage used locally:	0,44
	Annual site tonnage (tons/year):	500000
	Maximum daily site tonnage (kg/day)	17000000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,0025
	Release fraction to wastewater from process (initial release prior to RMM):	0,000019
	Release fraction to soil from process (initial release prior to RMM):	0,0001

Risk management measures

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

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	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	95,2
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils, Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	96,1
	Maximum allowable site tonnage (MSafe)	18000000
	Assumed domestic sewage treatment plant flow (m ³ /d):	10000
Conditions and measures related to external treatment of waste for disposal	During manufacturing no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	During manufacturing no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented, Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels, Available hazard data do not enable the derivation of a DNEL for 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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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures, Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination, Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
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1. Exposure scenario 02b (Benz 0%-1%)

Use as an intermediate
Classified as: (H350, H340, H361f and/or H361d)
Benzene content : 0% - 1%

ES Ref.: 02b (Benz 0%-1%) ES Type: Worker Version: 2
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Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 SU8, SU9 ERC6a ESVOC SPERC 6.1a.v1
Processes, tasks activities covered	Use as an intermediate within closed or contained systems (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container). Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

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

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

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).


Operational conditions

Amount used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	Not applicable
Other given operational 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.

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop
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

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	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 scenario; clear up spills immediately and dispose of waste 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), CS56 - with sample collection	E47 - Handle substance within a closed system, Sample via a closed loop or other system to avoid exposure, PPE15 - Wear suitable gloves tested to EN374.	
General exposures (closed systems)	E47 - Handle substance within a closed system, Ensure operation is undertaken outdoors.	
Storage	Ensure operation is undertaken outdoors, E84 - Store substance within a closed system.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
CS14 - Bulk transfers	Ensure material transfers are under containment or extract ventilation.	
CS39 - 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, Clear spills immediately, PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	

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

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

Product characteristics


Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	630000
	Fraction of regional tonnage used locally:	0,024
	Annual site tonnage (tons/year):	15000
	Maximum daily site tonnage (kg/day)	50000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,025
	Release fraction to wastewater from process (initial release prior to RMM):	0,0013
	Release fraction to soil from process (initial release prior to RMM):	0,001

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by freshwater sediment, Prevent discharge of undissolved substance to or recover from onsite wastewater, If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	80

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	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	95,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils, Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	96,1
	Maximum allowable site tonnage (MSafe)	55000
	Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	This substance is consumed during use and no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented, Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels, Available hazard data do not enable the derivation of a DNEL for 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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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures, Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination, Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
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1. Exposure scenario 02c (Benz 1%-5%)

Use as an intermediate
Classified as: (H350, H340, H361f and/or H361d)
Benzene content : 1% - 5%.

ES Ref.: 02c (Benz 1%-5%) ES Type: Worker Version: 2
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Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 SU8, SU9 ERC6a ESVOC SPERC 6.1a.v1
Processes, tasks activities covered	Use as an intermediate within closed or contained systems (not related to Strictly Controlled Conditions). Includes incidental exposures during recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container). Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

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

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

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).


Operational conditions

Amount used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	Not applicable
Other given operational 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.

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop
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

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	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 scenario; clear up spills immediately and dispose of waste 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), CS56 - with sample collection	E47 - Handle substance within a closed system, Sample via a closed loop or other system to avoid exposure, PPE15 - Wear suitable gloves tested to EN374.	
General exposures (closed systems)	Provide extract ventilation to points where emissions occur, E47 - Handle substance within a closed system.	
Storage	PPE15 - Wear suitable gloves tested to EN374, E84 - Store substance within a closed system.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
CS14 - Bulk transfers	Ensure material transfers are under containment or extract ventilation.	
CS39 - 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, Clear spills immediately, PPE18 - Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.	

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

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

Product characteristics


Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	630000
	Fraction of regional tonnage used locally:	0,024
	Annual site tonnage (tons/year):	15000
	Maximum daily site tonnage (kg/day)	50000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,025
	Release fraction to wastewater from process (initial release prior to RMM):	0,0013
	Release fraction to soil from process (initial release prior to RMM):	0,001

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Prevent discharge of undissolved substance to or recover from onsite wastewater, Risk from environmental exposure is driven by freshwater sediment, If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	

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	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 \geq (%):	95,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils, Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	96,1
	Maximum allowable site tonnage (MSafe)	55000
	Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	This substance is consumed during use and no waste of the substance is generated.	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented, Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels, Available hazard data do not enable the derivation of a DNEL for 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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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures, Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination, Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cfic.org/en/reach-for-industries-libraries.html), Maximum Risk Characterization Ratios for air emissions :0,08, Maximum Risk Characterization Ratios for wastewater emissions :0,91
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1. Exposure scenario 03a (Benz < 0,1%)

Distribution
Not classified as: (H350, H340, H361f and/or H361d)
Benzene content : <0,1%

ES Ref.: 03a (Benz < 0,1%) ES Type: Worker Version: 2

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15 ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7 ESVOC SPERC 1.1b.v1
Processes, tasks activities covered	Bulk loading (including marine vessel/barge, rail/road car and IBC loading) Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, distribution and associated laboratory activities. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC15	Use as laboratory reagent

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).


Operational conditions

Amount used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	Not applicable
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, Unless otherwise stated, Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop
General exposures (closed systems)	No other specific measures identified.
General exposures (closed systems), CS56 - with sample collection	No other specific measures identified.
CS16 - General exposures (open systems)	Provide extract ventilation to points where emissions occur

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CS2 - Process sampling	No other specific measures identified.	
CS36 - Laboratory activities	Handle in a fume cupboard or under extract ventilation.	
Bulk closed loading and unloading	No other specific measures identified.	
CS6 - Drum and small package filling	Fill containers/cans at dedicated fill points supplied with local extract ventilation.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
Storage	No other specific measures identified.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1)

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC5	Industrial use resulting in inclusion into or onto a matrix
ERC6a	Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6b	Industrial use of reactive processing aids
ERC6c	Industrial use of monomers for manufacture of thermo-plastics
ERC6d	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ERC7	Industrial use of substances in closed systems
ESVOC SPERC 1.1b.v1	Distribution: Industrial (SU3)

Product characteristics


Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	11000000
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	22000
	Maximum daily site tonnage (kg/day)	72000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	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

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater, No 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 ≥ (%):	0
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils, Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	96,1

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	Maximum allowable site tonnage (MSafe)	2600000
	Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented, Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels, Available hazard data do not enable the derivation of a DNEL for 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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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures, Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination, Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
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1. Exposure scenario 03b (Benz 0%-1%)

Distribution
Classified as: (H350, H340, H361f and/or H361d)
Benzene content : 0% - 1%

ES Ref.: 03b (Benz 0%-1%) ES Type: Worker Version: 2
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Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7 ESVOC SPERC 1.1b.v1
Processes, tasks activities covered	Bulk loading (including marine vessel/barge, rail/road car and IBC loading) Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, distribution and associated laboratory activities. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

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

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

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).


Operational conditions

Amount used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	Not applicable
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, Unless otherwise stated, Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop
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.

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	<p>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.</p> <p>Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures.</p> <p>Consider the need for risk based health surveillance.</p>	
General exposures (closed systems),CS56 - 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),outdoor	Handle substance within a closed system	
CS2 - Process sampling	Sample via a closed loop or other system to avoid exposure.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
Bulk closed loading and unloading	Ensure material transfers are under containment or extract ventilation.	
CS39 - 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,Clear spills immediately,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Storage	Ensure operation is undertaken outdoors,E84 - Store substance within a closed system.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1)


ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC5	Industrial use resulting in inclusion into or onto a matrix
ERC6a	Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6b	Industrial use of reactive processing aids
ERC6c	Industrial use of monomers for manufacture of thermo-plastics
ERC6d	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ERC7	Industrial use of substances in closed systems
ESVOC SPERC 1.1b.v1	Distribution: Industrial (SU3)

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	11000000
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	22000
	Maximum daily site tonnage (kg/day)	72000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	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

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Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater, No 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 \geq (%):	0
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils, Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	96,1
	Maximum allowable site tonnage (MSafe)	2600000
	Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented, Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels, Available hazard data do not enable the derivation of a DNEL for 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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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures, Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination, Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
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1. Exposure scenario 03c (Benz 1%-5%)

Distribution of substance
Classified as: (H350, H340, H361f and/or H361d)
Benzene content : 1% - 5%.

ES Ref.: 03c (Benz 1%-5%) ES Type: Worker Version: 2
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Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7 ESVOC SPERC 1.1b.v1
Processes, tasks activities covered	Bulk loading (including marine vessel/barge, rail/road car and IBC loading) Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading, distribution and associated laboratory activities. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

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

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

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	Not applicable
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, Unless otherwise stated, Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop
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

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	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 scenario; clear up spills immediately and dispose of waste 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),CS56 - with sample collection	E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,PPE15 - Wear suitable gloves tested to EN374.	
General exposures (closed systems)	Provide extract ventilation to points where emissions occur,E47 - Handle substance within a closed system.	
CS2 - Process sampling	Sample via a closed loop or other system to avoid exposure.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
Bulk closed loading and unloading	Ensure material transfers are under containment or extract ventilation.	
CS39 - 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,Clear spills immediately,PPE18 - Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.	
Storage	Ensure operation is undertaken outdoors,E84 - Store substance within a closed system.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1)


ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC5	Industrial use resulting in inclusion into or onto a matrix
ERC6a	Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6b	Industrial use of reactive processing aids
ERC6c	Industrial use of monomers for manufacture of thermo-plastics
ERC6d	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ERC7	Industrial use of substances in closed systems
ESVOC SPERC 1.1b.v1	Distribution: Industrial (SU3)

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	11000000
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	22000
	Maximum daily site tonnage (kg/day)	72000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	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

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Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater, No 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 \geq (%):	0
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils, Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	96,1
	Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	2600000
	Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented, Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels, Available hazard data do not enable the derivation of a DNEL for 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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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures, Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination, Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html), Maximum Risk Characterization Ratios for air emissions : 0,00033, Maximum Risk Characterization Ratios for wastewater emissions : 0,0031
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1. Exposure scenario 04a (Benz < 0,1%)

Formulation & (re)packing of substances and mixtures
Not classified as: (H350, H340, H361f and/or H361d)
Benzene content : < 0,1%

ES Ref.: 04a (Benz < 0,1%)
ES Type: Worker
Version: 2

Use descriptors	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15 ERC2 ESVOC SPERC 2.2.v1
Processes, tasks activities covered	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9	Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC14	Production of preparations or articles by tableting, compression, extrusion, pelletisation
PROC15	Use as laboratory reagent

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	Not applicable
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, Unless otherwise stated, Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop
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General exposures (closed systems)	No other specific measures identified.	
General exposures (closed systems),CS56 - with sample collection	No other specific measures identified.	
CS16 - General exposures (open systems)	Provide extract ventilation to points where emissions occur	
CS2 - Process sampling	No other specific measures identified.	
CS29 - Mixing operations (closed systems)	Provide extract ventilation to points where emissions occur	
CS36 - Laboratory activities	Handle in a fume cupboard or under extract ventilation.	
CS14 - Bulk transfers	Ensure material transfers are under containment or extract ventilation.	
CS34 - Manual,CS22 - Transfer from/pouring from containers	Ensure material transfers are under containment or extract ventilation.	
CS8 - Drum/batch transfers	Ensure material transfers are under containment or extract ventilation.	
CS6 - Drum and small package filling	Fill containers/cans at dedicated fill points supplied with local extract ventilation.	
CS39 - Equipment cleaning and maintenance	No other specific measures identified.	
Storage	No other specific measures identified.	

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

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

Product characteristics


Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1000000
	Fraction of regional tonnage used locally:	0,003
	Annual site tonnage (tons/year):	30000
	Maximum daily site tonnage (kg/day)	100000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,025
	Release fraction to wastewater from process (initial release prior to RMM):	0,00064
	Release fraction to soil from process (initial release prior to RMM):	0,0001

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater,If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	0
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	95,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils,Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment	Not applicable as there is no release to wastewater	

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plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	96,1
	Maximum allowable site tonnage (MSafe)	110000
	Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented, Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels, Available hazard data do not enable the derivation of a DNEL for 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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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures, Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination, Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
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1. Exposure scenario 04b (Benz 0%-1%)

Formulation & (re)packing of substances and mixtures
Classified as: (H350, H340, H361f and/or H361d)
Benzene content : 0% - 1%

ES Ref.: 04b (Benz 0%-1%) ES Type: Worker Version: 2	
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Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 ERC2 ESVOC SPERC 2.2.v1
Processes, tasks activities covered	Formulation of the substance and its mixtures in batch or continuous operations within closed or contained systems, including incidental exposures during storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

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

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

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).


Operational conditions

Amount used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	Not applicable
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, Unless otherwise stated, Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop
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

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	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 scenario; clear up spills immediately and dispose of waste 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),CS56 - with sample collection	E47 - Handle substance within a closed system,Sample via a closed loop or other system to avoid exposure,PPE15 - Wear suitable gloves tested to EN374.	
General exposures (closed systems),outdoor	E47 - Handle substance within a closed system.	
CS2 - Process sampling	Sample via a closed loop or other system to avoid exposure.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
CS14 - Bulk transfers	Ensure material transfers are under containment or extract ventilation.	
CS8 - Drum/batch transfers	Ensure material transfers are under containment or extract ventilation.	
CS39 - 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,Clear spills immediately,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Storage	E84 - Store substance within a closed system,PPE15 - Wear suitable gloves tested to EN374.	

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

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

Product characteristics


Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	10000000
	Fraction of regional tonnage used locally:	0,003
	Annual site tonnage (tons/year):	30000
	Maximum daily site tonnage (kg/day)	100000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,025
	Release fraction to wastewater from process (initial release prior to RMM):	0,00064
	Release fraction to soil from process (initial release prior to RMM):	0,0001

Risk management measures

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

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	efficiency of (%):	
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	95,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils, Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	96,1
	Maximum allowable site tonnage (MSafe)	110000
	Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	External recovery and recycling of waste should comply with applicable local and/or national regulations.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented, Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels, Available hazard data do not enable the derivation of a DNEL for 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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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures, Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination, Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
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1. Exposure scenario 10b (Benz 0%-1%)

Use as a fuel
Classified as: (H350, H340, H361f and/or H361d)
Benzene content : 0% - 1%

ES Ref.: 10b (Benz 0%-1%) ES Type: Worker Version: 2	
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Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16 ERC7 ESVOC SPERC 7.12a.v1
Processes, tasks activities covered	Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste. Industrial use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).


Operational conditions

Amount used	Not applicable	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Human factors not influenced by risk management	Not applicable	
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, Unless otherwise stated, Assumes a good basic standard of occupational hygiene is implemented.	

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop	
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	

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	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 scenario; clear up spills immediately and dispose of waste 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.	
CS8 - 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)	E47 - Handle substance within a closed system,E1 - Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.	
Use as a fuel,CS107 - (closed systems)	E47 - Handle substance within a closed system.	
CS39 - Equipment cleaning and maintenance	Drain down and flush system prior to equipment opening or maintenance,Retain drain downs in sealed storage pending disposal or for subsequent recycle,Clear spills immediately,E1 - Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.	
Storage	E84 - Store substance within a closed system,E1 - Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.	

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

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

Product characteristics


Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	1000000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	1000000
	Maximum daily site tonnage (kg/day)	3300000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,05
	Release fraction to wastewater from process (initial release prior to RMM):	0,00001
	Release fraction to soil from process (initial release prior to RMM):	0

Risk management measures

Technical conditions and measures at process level to	Common practices vary across sites thus
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prevent release	conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation), If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	95
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	91,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils, Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	96,1
	Maximum allowable site tonnage (MSafe)	5300000
	Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	Combustion emissions limited by required exhaust emission controls, Combustion emissions considered in regional exposure assessment, External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented, Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels, Available hazard data do not enable the derivation of a DNEL for 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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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures, Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination, Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
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1. Exposure scenario 11a (Benz < 0,1%)

Use as a fuel
Not classified as: (H350, H340, H361f and/or H361d)
Benzene content : < 0,1%

ES Ref.: 11a (Benz < 0,1%) ES Type: Worker Version: 2	
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Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16 ERC9a, ERC9b ESVOC SPERC 9.12b.v1
Processes, tasks activities covered	Covers the use as a fuel (or fuel additive), and includes activities associated with its transfer, use, equipment maintenance and handling of waste. Professional use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).


Operational conditions

Amount used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	Not applicable
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, Unless otherwise stated, Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop
General exposures (closed systems)	No other specific measures identified.
Preparation of material for application, CS29 - Mixing operations (closed systems)	No other specific measures identified.
Bulk closed unloading	No other specific measures identified.
CS8 - Drum/batch transfers	No other specific measures identified.
refuelling	No other specific measures identified.
Use as a fuel, CS107 - (closed systems)	No other specific measures identified.
CS5 - Equipment maintenance	Drain down and flush system prior to equipment

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	opening or maintenance,PPE18 - Wear chemically resistant gloves (tested to EN374) in combination with intensive management supervision controls.	
Storage	No other specific measures identified.	

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

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

Product characteristics

Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	950000
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	480
	Maximum daily site tonnage (kg/day)	1300
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from 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

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater, No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	0
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils, Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	96,1
	Maximum allowable site tonnage (MSafe)	64000
	Assumed domestic sewage treatment plant flow (m³/d):	2000
Conditions and measures related to external treatment of waste for disposal	Combustion emissions limited by required exhaust emission controls, Combustion emissions considered in regional exposure assessment, External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated.	

3. Exposure estimation and reference to its source

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3.1. Health

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented,Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels,Available hazard data do not enable the derivation of a DNEL for 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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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures,Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination,Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination,Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
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1. Exposure scenario 11b (Benz 0%-1%)

Use as a fuel
Classified as: (H350, H340, H361f and/or H361d)
Benzene content : 0% - 1%

ES Ref.: 11b (Benz 0%-1%) ES Type: Worker Version: 2	
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Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16 ERC9a, ERC9b ESVOC SPERC 9.12b.v1
Processes, tasks activities covered	Covers the use as a fuel (or fuel additives and additive components) within closed or contained systems including incidental exposures during activities associated with its transfer, use, equipment maintenance and handling of waste. Professional use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario controlling worker exposure (PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16)

PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected

Product characteristics

Physical form	Liquid, vapour pressure > 10 kPa at STP
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).

Operational conditions

Amount used	Not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).
Human factors not influenced by risk management	Not applicable
Other given operational conditions affecting workers exposure	Assumes use at not more than 20°C above ambient temperature, Unless otherwise stated, Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Other risk management measures:

General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop
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

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	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 scenario; clear up spills immediately and dispose of waste 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	E47 - Handle substance within a closed system.	
Bulk closed unloading	Ensure material transfers are under containment or extract ventilation.	
CS8 - 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, CS107 - (closed systems)	E47 - Handle substance within a closed system.	
CS5 - Equipment maintenance	Drain down and flush system prior to equipment opening or maintenance, Retain drain downs in sealed storage pending disposal or for subsequent recycle, Clear spills immediately, E1 - Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan, E119 - Ensure operatives are trained to minimise exposures.	
Storage	E84 - Store substance within a closed system, E1 - Provide a good standard of general ventilation. Natural ventilation is from doors, windows etc. Controlled ventilation means air is supplied or removed by a powered fan.	

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

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

Product characteristics


Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	950000
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	480
	Maximum daily site tonnage (kg/day)	1300
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from 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

Risk management measures

Technical conditions and measures at process level to prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	Risk from environmental exposure is driven by the freshwater, No wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	Not applicable

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	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	0
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	0
Organizational measures to prevent/limit release from the site	Do not apply industrial sludge to natural soils, Sludge should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	96,1
	Maximum allowable site tonnage (MSafe)	64000
	Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	Combustion emissions limited by required exhaust emission controls, Combustion emissions considered in regional exposure assessment, External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented, Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels, Available hazard data do not enable the derivation of a DNEL for 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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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures, Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination, Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
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1. Exposure scenario 12a (Benz < 0,1%)

Use as a fuel
Not classified as: (H350, H340, H361f and/or H361d)
Benzene content : < 0,1%

ES Ref.: 12a (Benz < 0,1%) ES Type: Consumer Version: 2	
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Use descriptors	PC13 ERC9a, ERC9b ESVOC SPERC 9.12c.v1
Processes, tasks activities covered	Covers consumer uses in liquid fuels. Consumer use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC13)


PC13	Fuels
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Product characteristics

Physical form	liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure > 10 kPa at STP

Operational conditions

Amount used	unless stated differently,Covers use up to 37500 g	37500 g
Frequency and duration of use	unless stated differently,Covers use up to	0,143 Uses per day
	Covers exposure up to	2 Hours/event
Human factors not influenced by risk management	Covers skin contact area up to	420 cm ²
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of 20 m ³	
	Covers use under typical household ventilation.	
	Fuels,Liquid: Automotive Refuelling	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 52. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 210 cm ² . For each use event, covers use amounts up to: 37500 g. Covers outdoor use. Covers use in room size of 100 m ³ . Covers exposure up to 0,05. Hours/event
	Fuels,Liquid Scooter Refuelling	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 52. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 210 cm ² . For each use event, covers use amounts up to: 3750 g. Covers outdoor use. Covers use in room size of 100 m ³ . Covers exposure up to 0,03. Hours/event
	Fuels,Liquid, Garden equipment - Use	Unless otherwise stated.

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		Covers concentrations up to 100%. Covers use up to 26. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 750 g. Covers outdoor use. Covers use in room size of 100 m3. Covers exposure up to 2,00. Hours/event
	Fuels,Liquid: Garden equipment - Refuelling	Unless otherwise stated. Covers concentrations up to 100%. Covers use up to 26. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 420 cm2. For each use event, covers use amounts up to: 750 g. Covers use in a one car garage (34m ³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,03. Hours/event

Risk management measures

Other risk management measures:

Fuels,Liquid: Automotive Refuelling	No specific risk management measure identified beyond those operational conditions stated.	
Fuels,Liquid Scooter Refuelling	No specific risk management measure identified beyond those operational conditions stated.	
Fuels,Liquid, Garden equipment - Use	No specific risk management measure identified beyond those operational conditions stated.	
Fuels,Liquid: Garden equipment - Refuelling	No specific risk management measure identified beyond those operational conditions stated.	

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

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

Product characteristics


Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	8200000
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	4100
	Maximum daily site tonnage (kg/day)	11000
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from 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

Risk management measures

Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Maximum allowable site tonnage (MSafe)	530000

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		Supersedes : 31/07/2017

	Assumed domestic sewage treatment plant flow (m ³ /d):	2000
Conditions and measures related to external treatment of waste for disposal	Combustion emissions limited by required exhaust emission controls, Combustion emissions considered in regional exposure assessment, External treatment and disposal of waste should comply with applicable local and/or national regulations.	
Conditions and measures related to external recovery of waste	This substance is consumed during use and no waste of the substance is generated.	

3. Exposure estimation and reference to its source

3.1. Health

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

3.2. Environment

Information for contributing exposure scenario	
2.2	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.


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

4.1. Health

Guidance - Health	Predicted exposures are not expected to exceed the 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.
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4.2. Environment

Guidance - Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures, Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).
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1. Exposure scenario 12b (Benz 0%-1%)

Use as a fuel
Classified as: (H350, H340, H361f and/or H361d)
Benzene content : 0% - 1%

ES Ref.: 12b (Benz 0%-1%) ES Type: Consumer Version: 2
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Use descriptors	PC13 ERC9a, ERC9b ESVOC SPERC 9.12c.v1
Processes, tasks activities covered	Covers consumer uses in liquid fuels. Consumer use
Assessment method	see section 3 of this exposure scenario.

2. Operational conditions and risk management measures

2.1 Contributing scenario consumer end-use (PC13)


PC13	Fuels
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Product characteristics

Physical form	liquid
Concentration of the Substance in Mixture/Article	Covers percentage substance in the product up to 100 % (unless stated differently).
Vapour pressure	Liquid, vapour pressure > 10 kPa at STP

Operational conditions

Amount used	unless stated differently,Covers use up to 37500 g	37500 g
Frequency and duration of use	unless stated differently,Covers use up to	0,143 Uses per day
	Covers exposure up to	2 Hours/event
Human factors not influenced by risk management	Covers skin contact area up to	420 cm ²
Other given operational conditions affecting consumers exposure	Covers use at ambient temperatures,Unless otherwise stated	
	Covers use in room size of 20 m3	
	Covers use under typical household ventilation.	
	Fuels,Liquid: Automotive Refuelling	Unless otherwise stated. Covers concentrations up to 1%. Covers use up to 52. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 210 cm2. For each use event, covers use amounts up to: 37500 g. Covers outdoor use. Covers use in room size of 100 m3. Covers exposure up to 0,05. Hours/event
	Fuels,Liquid Scooter Refuelling	Unless otherwise stated. Covers concentrations up to 1%. Covers use up to 52. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 210 cm2. For each use event, covers use amounts up to: 3750 g. Covers outdoor use. Covers use in room size of 100 m3. Covers exposure up to 0,03. Hours/event
	Fuels,Liquid, Garden equipment - Use	Unless otherwise stated.

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		Covers concentrations up to 1%. Covers use up to 26. days/year. covers use up to 1 time/on day of use. For each use event, covers use amounts up to: 750 g. Covers outdoor use. Covers use in room size of 100 m3. Covers exposure up to 2,00. Hours/event
	Fuels,Liquid: Garden equipment - Refuelling	Unless otherwise stated. Covers concentrations up to 1%. Covers use up to 26. days/year. covers use up to 1 time/on day of use. Covers skin contact area up to 420 cm2. For each use event, covers use amounts up to: 750 g. Covers use in a one car garage (34m ³) under typical ventilation. Covers use in room size of 34 m3. Covers exposure up to 0,03. Hours/event

Risk management measures

Other risk management measures:

Fuels,Liquid: Automotive Refuelling	No specific risk management measure identified beyond those operational conditions stated.	
Fuels,Liquid Scooter Refuelling	No specific risk management measure identified beyond those operational conditions stated.	
Fuels,Liquid, Garden equipment - Use	No specific risk management measure identified beyond those operational conditions stated.	
Fuels,Liquid: Garden equipment - Refuelling	No specific risk management measure identified beyond those operational conditions stated.	

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

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

Product characteristics


Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic
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Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	8200000
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	4100
	Maximum daily site tonnage (kg/day)	11000
Frequency and duration of use	Continuous use/release.	
	Number of emission days per year	365
Environmental factors not influenced by risk management	Local freshwater dilution factor:	10
	Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure	Release fraction to air from 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

Risk management measures

Conditions and measures related to sewage treatment plant	Not applicable as there is no release to wastewater	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	96,1
	Maximum allowable site tonnage (MSafe)	530000

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