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

1.1. Product identifier


Product form	: Substance
Trade name/designation	: STRAIGHT RUN GASOLINE
Chemical name	: Gasoline, straight-run, topping-plant
EC Index	: 649-270-00-7
EC-No.	: 271-727-0
CAS-No.	: 68606-11-1
REACH registration No	: 01-2119494191-38-0010
Product group	: Trade product

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

1.2.1. Relevant identified uses

Main use category	: Industrial use, Professional use, Consumer use
Use of the substance/mixture	: Fuels see attached exposure scenario.

Title	Use descriptors
Use as an intermediate (ES Ref.: 02e (Benz 20%-79%))	SU8, SU9, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC6a, ESVOC SPERC 6.1a.v1
Distribution (ES Ref.: 03e (Benz 20%-79%))	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Use as an intermediate (ES Ref.: 02e (Benz 20%-79%))	SU3, SU8, SU9, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC6a, ESVOC SPERC 6.1a.v1
Distribution (ES Ref.: 03e (Benz 20%-79%))	SU3, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Distribution (ES Ref.: 03e (Benz 20%-79%))	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Distribution (ES Ref.: 03e (Benz 20%-79%))	SU3, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Use as an intermediate (ES Ref.: 02b (Benz 0%-1%))	SU8, SU9, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC6a, ESVOC SPERC 6.1a.v1
Use as an intermediate (ES Ref.: 02c (Benz 1%-5%))	SU8, SU9, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC6a, ESVOC SPERC 6.1a.v1
Use as an intermediate (ES Ref.: 02d (Benz 5%-20%))	SU8, SU9, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC6a, ESVOC SPERC 6.1a.v1
Distribution (ES Ref.: 03b (Benz 0%-1%))	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Distribution (ES Ref.: 03c (Benz 1%-5%))	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Distribution (ES Ref.: 03d (Benz 5%-20%))	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7, ESVOC SPERC 1.1b.v1
Uses in coatings (ES Ref.: 05b (Benz 0%-1%))	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC4, ESVOC SPERC 4.3a.v1
Use in cleaning agents (ES Ref.: 07b (Benz 0%-1%))	PROC1, PROC2, PROC3, PROC8a, PROC8b, ERC4, ESVOC SPERC 4.4a.v1
Use as a fuel (ES Ref.: 10b (Benz 0%-1%))	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16, ERC7, ESVOC SPERC 7.12a.v1
Use in rubber production and processing (ES Ref.: 13b (Benz 0%-1%))	SU10, SU11, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC9, PROC15, ERC4, ERC6d, ESVOC SPERC 4.19.v1
Use as a fuel (ES Ref.: 11b (Benz 0%-1%))	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16, ERC9a, ERC9b, ESVOC SPERC 9.12b.v1
Use as a fuel (ES Ref.: 12b (Benz 0%-1%))	PC13, ERC9a, ERC9b, ESVOC SPERC 9.12c.v1

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Title	Use descriptors
Formulation & (re)packing of substances and mixtures (ES Ref.: 04 (Benz 20%-79%))	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC2, ESVOC SPERC 2.2.v1
Formulation & (re)packing of substances and mixtures (ES Ref.: 04 (Benz 20%-79%))	SU3, SU10, PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC2, ESVOC SPERC 2.2.v1
Formulation & (re)packing of substances and mixtures (ES Ref.: 04b (Benz 0%-1%))	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC2, ESVOC SPERC 2.2.v1
Formulation & (re)packing of substances and mixtures (ES Ref.: 04c (Benz 1%-5%))	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC2, ESVOC SPERC 2.2.v1
Formulation & (re)packing of substances and mixtures (ES Ref.: 04d (Benz 5%-20%))	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, ERC2, ESVOC SPERC 2.2.v1

Full text of use descriptors: see section 16

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 (This telephone number is available during office hours only.)


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. 2	H225
Skin Irrit. 2	H315
Muta. 1B	H340
Carc. 1B	H350
Repr. 2	H361fd
STOT SE 3	H336

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Asp. Tox. 1 H304

Aquatic Chronic 2 H411

Full text of H statements : see section 16

2.2. Label elements

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

Hazard pictograms (CLP) :



Signal word : Danger

Hazard statements (CLP) :

- H225 - Highly 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/sparks/open flames/hot surfaces. - No smoking.
- P280 - Wear protective gloves/ protective clothing/ 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 contents/container to .

Listed in Annex VI : EC Index-No. : 649-270-00-7

2.3. Other hazards

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

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance name : GASOLINE, STRAIGHT-RUN, TOPPING PLANT
 CAS-No. : 68606-11-1
 EC-No. : 271-727-0
 EC Index : 649-270-00-7

Substance name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Gasoline, straight run, topping plant	(CAS-No.) 68606-11-1 (EC-No.) 271-727-0 (EC Index) 649-270-00-7	<= 100	Flam. Liq. 1, H224 Skin Irrit. 2, H315 Muta. 1B, H340 Carc. 1B, H350 Repr. 2, H361f STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Chronic 2, H411

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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

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	(C >= 5) STOT RE 2, H373

Full text of H-statements: see section 16

3.2. Mixtures

Not applicable

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. After contact with skin, wash immediately with plenty of water and soap. Wash contaminated clothing before reuse. In case of doubt or persistent symptoms, consult always a physician.
- 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: Mental confusion. 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 genetic defects. May cause cancer. Suspected of damaging fertility. Suspected of damaging the unborn child.

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

No data available

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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 : Highly 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.

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.

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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)

see attached exposure scenario.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

benzene (71-43-2)		
EU	IOELV TWA (mg/m ³)	3,25 mg/m ³ (measured or calculated in relation to a reference period of eight hours)
EU	IOELV TWA (ppm)	1 ppm (measured or calculated in relation to a reference period of eight hours)
EU	Notes	Substantial contribution to the total body burden via dermal exposure possible
Austria	TEL TRK (mg/m ³)	3,2 mg/m ³
Austria	TEL TRK (ppm)	1 ppm
Belgium	Limit value (mg/m ³)	3,25 mg/m ³
Belgium	Limit value (ppm)	1 ppm
Bulgaria	OEL TWA (mg/m ³)	3,25 mg/m ³
Croatia	GVI (granična vrijednost izloženosti) (mg/m ³)	3,25 mg/m ³
Croatia	GVI (granična vrijednost izloženosti) (ppm)	1 ppm
Cyprus	OEL TWA (mg/m ³)	3,25 mg/m ³
Cyprus	OEL TWA (ppm)	1 ppm
Czech Republic	Expoziční limity (PEL) (mg/m ³)	3 mg/m ³
Denmark	Grænseværdie (langvarig) (mg/m ³)	1,6 mg/m ³
Denmark	Grænseværdie (langvarig) (ppm)	0,5 ppm
Estonia	OEL TWA (mg/m ³)	1,5 mg/m ³
Estonia	OEL TWA (ppm)	0,5 ppm
Estonia	OEL STEL (mg/m ³)	9 mg/m ³
Estonia	OEL STEL (ppm)	3 ppm
Finland	HTP-arvo (8h) (mg/m ³)	3,25 mg/m ³ (all works)
Finland	HTP-arvo (8h) (ppm)	1 ppm (all works)
France	VME (mg/m ³)	3,25 mg/m ³ (restrictive limit)
France	VME (ppm)	1 ppm (restrictive limit)
Greece	OEL TWA (mg/m ³)	3,19 mg/m ³
Greece	OEL TWA (ppm)	1 ppm
Hungary	MK-érték	3 mg/m ³
Ireland	OEL (8 hours ref) (mg/m ³)	3 mg/m ³
Ireland	OEL (8 hours ref) (ppm)	1 ppm
Ireland	OEL (15 min ref) (mg/m ³)	9 mg/m ³ (calculated)



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benzene (71-43-2)		
Ireland	OEL (15 min ref) (ppm)	3 ppm (calculated)
Italy	OEL TWA (mg/m ³)	3,25 mg/m ³
Italy	OEL TWA (ppm)	1 ppm
Latvia	OEL TWA (mg/m ³)	3,25 mg/m ³
Latvia	OEL TWA (ppm)	1 ppm
Lithuania	IPRV (mg/m ³)	3,25 mg/m ³
Lithuania	IPRV (ppm)	1 ppm
Lithuania	TPRV (mg/m ³)	19 mg/m ³
Lithuania	TPRV (ppm)	6 ppm
Luxembourg	OEL TWA (mg/m ³)	3,25 mg/m ³
Luxembourg	OEL TWA (ppm)	1 ppm
Netherlands	Grenswaarde TGG 8H (mg/m ³)	0,7 mg/m ³
Poland	NDS (mg/m ³)	1,6 mg/m ³
Portugal	OEL TWA (ppm)	0,5 ppm
Portugal	OEL STEL (ppm)	2,5 ppm
Romania	OEL TWA (mg/m ³)	3,25 mg/m ³
Romania	OEL TWA (ppm)	1 ppm
Slovenia	OEL TWA (mg/m ³)	3,25 mg/m ³
Slovenia	OEL TWA (ppm)	1 ppm
Slovenia	OEL STEL (mg/m ³)	13 mg/m ³
Slovenia	OEL STEL (ppm)	4 ppm
Spain	VLA-ED (mg/m ³)	3,25 mg/m ³ (manufacturing, commercialization and use restrictions according to REACH)
Spain	VLA-ED (ppm)	1 ppm (manufacturing, commercialization and use restrictions according to REACH)
Sweden	nivågränsvärde (NVG) (mg/m ³)	1,5 mg/m ³
Sweden	nivågränsvärde (NVG) (ppm)	0,5 ppm
Sweden	kortidsvärde (KTV) (mg/m ³)	9 mg/m ³
Sweden	kortidsvärde (KTV) (ppm)	3 ppm
United Kingdom	WEL TWA (mg/m ³)	3,25 mg/m ³
United Kingdom	WEL TWA (ppm)	1 ppm
United Kingdom	WEL STEL (mg/m ³)	9,75 mg/m ³ (calculated)
United Kingdom	WEL STEL (ppm)	3 ppm (calculated)
Norway	Grenseverdier (AN) (mg/m ³)	3 mg/m ³
Norway	Grenseverdier (AN) (ppm)	1 ppm
Norway	Grenseverdier (Korttidsverdi) (mg/m ³)	6 mg/m ³ (value calculated)
Norway	Grenseverdier (Korttidsverdi) (ppm)	2 ppm (value calculated)
Switzerland	MAK (mg/m ³)	1,6 mg/m ³
Switzerland	MAK (ppm)	0,5 ppm
Australia	TWA (mg/m ³)	3,2 mg/m ³
Australia	TWA (ppm)	1 ppm
Canada (Quebec)	VECD (mg/m ³)	15,5 mg/m ³
Canada (Quebec)	VECD (ppm)	5 ppm
Canada (Quebec)	VEMP (mg/m ³)	3 mg/m ³



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benzene (71-43-2)		
Canada (Quebec)	VEMP (ppm)	1 ppm
USA - ACGIH	ACGIH TWA (ppm)	0,5 ppm
USA - ACGIH	ACGIH STEL (ppm)	2,5 ppm
USA - IDLH	US IDLH (ppm)	500 ppm
USA - NIOSH	NIOSH REL (TWA) (ppm)	0,1 ppm
USA - NIOSH	NIOSH REL (STEL) (ppm)	1 ppm
USA - OSHA	OSHA PEL (TWA) (ppm)	10 ppm 1 ppm
USA - OSHA	OSHA PEL (STEL) (ppm)	5 ppm (see 29 CFR 1910.1028)
USA - OSHA	OSHA PEL (Ceiling) (ppm)	25 ppm
Toluene (108-88-3)		
EU	IOELV TWA (mg/m ³)	192 mg/m ³
EU	IOELV TWA (ppm)	50 ppm
EU	IOELV STEL (mg/m ³)	384 mg/m ³
EU	IOELV STEL (ppm)	100 ppm
EU	Notes	Possibility of significant uptake through the skin
Austria	MAK (mg/m ³)	190 mg/m ³
Austria	MAK (ppm)	50 ppm
Austria	MAK Short time value (mg/m ³)	380 mg/m ³
Austria	MAK Short time value (ppm)	100 ppm
Belgium	Limit value (mg/m ³)	77 mg/m ³
Belgium	Limit value (ppm)	20 ppm
Belgium	Short time value (mg/m ³)	384 mg/m ³
Belgium	Short time value	100 ppm
Bulgaria	OEL TWA (mg/m ³)	192 mg/m ³
Bulgaria	OEL TWA (ppm)	50 ppm
Bulgaria	OEL STEL (mg/m ³)	384 mg/m ³
Bulgaria	OEL STEL (ppm)	100 ppm
Croatia	GVI (granična vrijednost izloženosti) (mg/m ³)	192 mg/m ³
Croatia	GVI (granična vrijednost izloženosti) (ppm)	50 ppm
Croatia	KGVI (kratkotrajna granična vrijednost izloženosti) (mg/m ³)	384 mg/m ³
Croatia	KGVI (kratkotrajna granična vrijednost izloženosti) (ppm)	100 ppm
Cyprus	OEL TWA (mg/m ³)	192 mg/m ³
Cyprus	OEL TWA (ppm)	50 ppm
Cyprus	OEL STEL (mg/m ³)	384 mg/m ³
Cyprus	OEL STEL (ppm)	100 ppm
Czech Republic	Expoziční limity (PEL) (mg/m ³)	200 mg/m ³
Denmark	Grænseværdie (langvarig) (mg/m ³)	94 mg/m ³
Denmark	Grænseværdie (langvarig) (ppm)	25 ppm
Estonia	OEL TWA (mg/m ³)	192 mg/m ³
Estonia	OEL TWA (ppm)	50 ppm
Estonia	OEL STEL (mg/m ³)	384 mg/m ³
Estonia	OEL STEL (ppm)	100 ppm
Finland	HTP-arvo (8h) (mg/m ³)	81 mg/m ³



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Toluene (108-88-3)		
Finland	HTP-arvo (8h) (ppm)	25 ppm
Finland	HTP-arvo (15 min)	380 mg/m ³
Finland	HTP-arvo (15 min) (ppm)	100 ppm
France	VME (mg/m ³)	76,8 mg/m ³ (restrictive limit)
France	VME (ppm)	20 ppm (restrictive limit)
France	VLE (mg/m ³)	384 mg/m ³ (restrictive limit)
France	VLE (ppm)	100 ppm (restrictive limit)
Germany	TRGS 900 Occupational exposure limit value (mg/m ³)	190 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)
Germany	TRGS 903 (BGW)	600 µg/l Parameter: Toluene - Medium: whole blood - Sampling time: end of shift 1,5 mg/l Parameter: o-Cresol - Medium: urine - Sampling time: end of several shifts (after hydrolysis) 1,5 mg/l Parameter: o-Cresol - Medium: urine - Sampling time: end of shift (after hydrolysis)
Gibraltar	8h mg/m ³	192 mg/m ³
Gibraltar	8h ppm	50 ppm
Gibraltar	Short-term mg/m ³	384 mg/m ³
Gibraltar	Short-term ppm	100 ppm
Greece	OEL TWA (mg/m ³)	192 mg/m ³
Greece	OEL TWA (ppm)	50 ppm
Greece	OEL STEL (mg/m ³)	384 mg/m ³
Greece	OEL STEL (ppm)	100 ppm
Hungary	AK-érték	190 mg/m ³
Hungary	CK-érték	380 mg/m ³
Ireland	OEL (8 hours ref) (mg/m ³)	192 mg/m ³
Ireland	OEL (8 hours ref) (ppm)	50 ppm
Ireland	OEL (15 min ref) (mg/m ³)	384 mg/m ³
Ireland	OEL (15 min ref) (ppm)	100 ppm
Italy	OEL TWA (mg/m ³)	192 mg/m ³
Italy	OEL TWA (ppm)	50 ppm
Latvia	OEL TWA (mg/m ³)	50 mg/m ³
Latvia	OEL TWA (ppm)	14 ppm
Lithuania	IPRV (mg/m ³)	192 mg/m ³
Lithuania	IPRV (ppm)	50 ppm
Lithuania	TPRV (mg/m ³)	384 mg/m ³
Lithuania	TPRV (ppm)	100 ppm
Luxembourg	OEL TWA (mg/m ³)	192 mg/m ³
Luxembourg	OEL TWA (ppm)	50 ppm
Luxembourg	OEL STEL (mg/m ³)	384 mg/m ³
Luxembourg	OEL STEL (ppm)	100 ppm



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Malta	OEL TWA (mg/m ³)	192 mg/m ³
Malta	OEL TWA (ppm)	50 ppm
Malta	OEL STEL (mg/m ³)	384 mg/m ³
Malta	OEL STEL (ppm)	100 ppm
Netherlands	Grenswaarde TGG 8H (mg/m ³)	150 mg/m ³
Netherlands	Grenswaarde TGG 15MIN (mg/m ³)	384 mg/m ³
Poland	NDS (mg/m ³)	100 mg/m ³
Poland	NDSch (mg/m ³)	200 mg/m ³
Portugal	OEL TWA (mg/m ³)	192 mg/m ³ (indicative limit value)
Portugal	OEL TWA (ppm)	50 ppm (indicative limit value)
Portugal	OEL STEL (mg/m ³)	384 mg/m ³ (indicative limit value)
Portugal	OEL STEL (ppm)	100 ppm (indicative limit value)
Romania	OEL TWA (mg/m ³)	192 mg/m ³
Romania	OEL TWA (ppm)	50 ppm
Romania	OEL STEL (mg/m ³)	384 mg/m ³
Romania	OEL STEL (ppm)	100 ppm
Slovakia	NPHV (priemerná) (mg/m ³)	192 mg/m ³
Slovakia	NPHV (priemerná) (ppm)	50 ppm
Slovakia	NPHV (Hraničná) (mg/m ³)	384 mg/m ³
Slovenia	OEL TWA (mg/m ³)	192 mg/m ³
Slovenia	OEL TWA (ppm)	50 ppm
Slovenia	OEL STEL (mg/m ³)	384 mg/m ³
Slovenia	OEL STEL (ppm)	100 ppm
Spain	VLA-ED (mg/m ³)	192 mg/m ³ (indicative limit value)
Spain	VLA-ED (ppm)	50 ppm (indicative limit value)
Spain	VLA-EC (mg/m ³)	384 mg/m ³
Spain	VLA-EC (ppm)	100 ppm
Sweden	nivågränsvärde (NVG) (mg/m ³)	192 mg/m ³
Sweden	nivågränsvärde (NVG) (ppm)	50 ppm
Sweden	kortidsvärde (KTV) (mg/m ³)	384 mg/m ³
Sweden	kortidsvärde (KTV) (ppm)	100 ppm
United Kingdom	WEL TWA (mg/m ³)	191 mg/m ³
United Kingdom	WEL TWA (ppm)	50 ppm
United Kingdom	WEL STEL (mg/m ³)	384 mg/m ³
United Kingdom	WEL STEL (ppm)	100 ppm
Norway	Grenseverdier (AN) (mg/m ³)	94 mg/m ³
Norway	Grenseverdier (AN) (ppm)	25 ppm
Norway	Grenseverdier (Korttidsverdi) (mg/m ³)	141 mg/m ³ (value calculated)
Norway	Grenseverdier (Korttidsverdi) (ppm)	37,5 ppm (value calculated)
Switzerland	MAK (mg/m ³)	190 mg/m ³
Switzerland	MAK (ppm)	50 ppm
Switzerland	KZGW (mg/m ³)	760 mg/m ³
Switzerland	KZGW (ppm)	200 ppm
Australia	TWA (mg/m ³)	191 mg/m ³
Australia	TWA (ppm)	50 ppm



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Australia	STEL (mg/m ³)	574 mg/m ³
Australia	STEL (ppm)	150 ppm
Canada (Quebec)	VEMP (mg/m ³)	188 mg/m ³
Canada (Quebec)	VEMP (ppm)	50 ppm
USA - ACGIH	ACGIH TWA (ppm)	20 ppm
USA - IDLH	US IDLH (ppm)	500 ppm
USA - NIOSH	NIOSH REL (TWA) (mg/m ³)	375 mg/m ³
USA - NIOSH	NIOSH REL (TWA) (ppm)	100 ppm
USA - NIOSH	NIOSH REL (STEL) (mg/m ³)	560 mg/m ³
USA - NIOSH	NIOSH REL (STEL) (ppm)	150 ppm
USA - OSHA	OSHA PEL (TWA) (ppm)	200 ppm
USA - OSHA	OSHA PEL (Ceiling) (ppm)	300 ppm
n-Hexane (110-54-3)		
EU	IOELV TWA (mg/m ³)	72 mg/m ³
EU	IOELV TWA (ppm)	20 ppm
Austria	MAK (mg/m ³)	72 mg/m ³
Austria	MAK (ppm)	20 ppm
Austria	MAK Short time value (mg/m ³)	288 mg/m ³
Austria	MAK Short time value (ppm)	80 ppm
Belgium	Limit value (mg/m ³)	72 mg/m ³
Belgium	Limit value (ppm)	20 ppm
Bulgaria	OEL TWA (mg/m ³)	72 mg/m ³
Bulgaria	OEL TWA (ppm)	20 ppm
Croatia	GVI (granična vrijednost izloženosti) (mg/m ³)	72 mg/m ³
Croatia	GVI (granična vrijednost izloženosti) (ppm)	20 ppm
Cyprus	OEL TWA (mg/m ³)	72 mg/m ³
Cyprus	OEL TWA (ppm)	20 ppm
Czech Republic	Expoziční limity (PEL) (mg/m ³)	70 mg/m ³
Denmark	Grænseværdie (langvarig) (mg/m ³)	72 mg/m ³
Denmark	Grænseværdie (langvarig) (ppm)	20 ppm
Estonia	OEL TWA (mg/m ³)	72 mg/m ³
Estonia	OEL TWA (ppm)	20 ppm
Finland	HTP-arvo (8h) (mg/m ³)	72 mg/m ³
Finland	HTP-arvo (8h) (ppm)	20 ppm
France	VME (mg/m ³)	72 mg/m ³ (restrictive limit)
France	VME (ppm)	20 ppm (restrictive limit)
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)
Germany	TRGS 903 (BGW)	5 mg/l Parameter: 2,5-Hexandione plus 4,5-Dihydroxy-2-hexanone - Medium: urine - Sampling time: end of shift (after hydrolysis)
Gibraltar	8h mg/m ³	72 mg/m ³
Gibraltar	8h ppm	20 ppm



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n-Hexane (110-54-3)

Greece	OEL TWA (mg/m ³)	72 mg/m ³
Greece	OEL TWA (ppm)	20 ppm
Hungary	AK-érték	72 mg/m ³
Ireland	OEL (8 hours ref) (mg/m ³)	72 mg/m ³
Ireland	OEL (8 hours ref) (ppm)	20 ppm
Ireland	OEL (15 min ref) (mg/m ³)	216 mg/m ³ (calculated)
Ireland	OEL (15 min ref) (ppm)	60 ppm (calculated)
Italy	OEL TWA (mg/m ³)	72 mg/m ³
Italy	OEL TWA (ppm)	20 ppm
Latvia	OEL TWA (mg/m ³)	72 mg/m ³
Latvia	OEL TWA (ppm)	20 ppm
Lithuania	IPRV (mg/m ³)	72 mg/m ³
Lithuania	IPRV (ppm)	20 ppm
Luxembourg	OEL TWA (mg/m ³)	72 mg/m ³
Luxembourg	OEL TWA (ppm)	20 ppm
Malta	OEL TWA (mg/m ³)	72 mg/m ³
Malta	OEL TWA (ppm)	20 ppm
Netherlands	Grenswaarde TGG 8H (mg/m ³)	72 mg/m ³
Netherlands	Grenswaarde TGG 15MIN (mg/m ³)	144 mg/m ³
Poland	NDS (mg/m ³)	72 mg/m ³
Portugal	OEL TWA (mg/m ³)	72 mg/m ³ (indicative limit value)
Portugal	OEL TWA (ppm)	20 ppm (indicative limit value)
Romania	OEL TWA (mg/m ³)	72 mg/m ³
Romania	OEL TWA (ppm)	20 ppm
Slovenia	OEL TWA (mg/m ³)	72 mg/m ³
Slovenia	OEL TWA (ppm)	20 ppm
Spain	VLA-ED (mg/m ³)	72 mg/m ³ (indicative limit value)
Spain	VLA-ED (ppm)	20 ppm (indicative limit value)
Sweden	nivågränsvärde (NVG) (mg/m ³)	90 mg/m ³
Sweden	nivågränsvärde (NVG) (ppm)	25 ppm
Sweden	kortidsvärde (KTV) (mg/m ³)	180 mg/m ³
Sweden	kortidsvärde (KTV) (ppm)	50 ppm
United Kingdom	WEL TWA (mg/m ³)	72 mg/m ³
United Kingdom	WEL TWA (ppm)	20 ppm
United Kingdom	WEL STEL (mg/m ³)	216 mg/m ³ (calculated)
United Kingdom	WEL STEL (ppm)	60 ppm (calculated)
Norway	Grenseverdier (AN) (mg/m ³)	72 mg/m ³
Norway	Grenseverdier (AN) (ppm)	20 ppm
Norway	Grenseverdier (Korttidsverdi) (mg/m ³)	108 mg/m ³ (value calculated)
Norway	Grenseverdier (Korttidsverdi) (ppm)	30 ppm (value calculated)
Switzerland	MAK (mg/m ³)	180 mg/m ³
Switzerland	MAK (ppm)	50 ppm
Switzerland	KZGW (mg/m ³)	1440 mg/m ³

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n-Hexane (110-54-3)		
Switzerland	KZGW (ppm)	400 ppm
Australia	TWA (mg/m ³)	72 mg/m ³
Australia	TWA (ppm)	20 ppm
Canada (Quebec)	VEMP (mg/m ³)	176 mg/m ³
Canada (Quebec)	VEMP (ppm)	50 ppm
USA - ACGIH	ACGIH TWA (ppm)	50 ppm
USA - IDLH	US IDLH (ppm)	1100 ppm (10% LEL)
USA - NIOSH	NIOSH REL (TWA) (mg/m ³)	180 mg/m ³
USA - NIOSH	NIOSH REL (TWA) (ppm)	50 ppm
USA - OSHA	OSHA PEL (TWA) (mg/m ³)	1800 mg/m ³
USA - OSHA	OSHA PEL (TWA) (ppm)	500 ppm

STRAIGHT RUN GASOLINE (68606-11-1)	
DNEL/DMEL (workers)	
Acute - systemic effects, inhalation	(15min) 1300 mg/m ³
Acute - local effects, inhalation	(15min) 1100 mg/m ³
Long-term - local effects, inhalation	(8h) 840 mg/m ³
DNEL/DMEL (general population)	
Acute - systemic effects, inhalation	(15min) 1200 mg/m ³
Acute - local effects, inhalation	(15min) 640 mg/m ³
Long-term - local effects, inhalation	(24h) 180 mg/m ³

Additional information : Occupational Exposure Limits : . Not applicable

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 : rubber gloves. (EN 374). Breakthrough time : >360min. 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. Wear chemically resistant gloves (tested to EN374) . NBR (Nitrile rubber)
- 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.

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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 No data available
pH	: Not applicable
Relative evaporation rate (butylacetate=1)	: < 1
Melting / freezing point	: No data available
Freezing point	: No data available
Initial boiling point and boiling range	: IBP 35°C - FBP 180 °C
Flash point	: No data available
Auto-ignition temperature	: 280-450 °C
Decomposition temperature	: No data available
Flammability (solid, gas)	: Not applicable, liquid
Vapour pressure	: 80 kPa
Vapour density	: 3-5 (Air=1)
Relative density	: 0.640 - 0.745 g/cm ³ (15°C)
Solubility	: No data available.
Partition coefficient n-octanol/water	: UVCB No data available
Kinematic viscosity	: Not applicable
Dynamic viscosity	: Not applicable
Explosive properties	: Not applicable. The study does not need to be conducted because there are no chemical groups associated with explosive properties present in the molecule.
Oxidising properties	: Not applicable. The classification procedure needs not to be applied because there are no chemical groups present in the molecule which are associated with oxidising properties.
Explosive limits	: LEL:1-UEL:7,6 vol %

9.2. Other information

No data available

SECTION 10: Stability and reactivity

10.1. Reactivity

Highly 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.

10.4. Conditions to avoid


Keep away from sources of heat (e.g. hot surfaces), sparks and open flames. Remove all sources of ignition. Risk of explosion. See also section 7.

10.5. Incompatible materials

Strong acids. Strong bases. Strong oxidizing agents. Halogenated compounds. See also section 7.

10.6. Hazardous decomposition products

Does not decompose when used for intended uses. Thermal decomposition can lead to the escape of irritating gases and vapours. Reference to other sections: 5.2.

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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	810 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

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, straight run, topping plant (68606-11-1)	
LD50/oral/rat	> 5000 mg/kg
LD50/dermal/rat	> 2000 mg/kg
LC50/inhalation/4h/rat	> 5610 mg/m ³

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.

Carcinogenicity : May cause cancer.

Reproductive toxicity : Suspected of damaging fertility. Suspected of damaging the unborn child.

STOT-single exposure : May cause drowsiness or dizziness.

Gasoline, straight run, topping plant (68606-11-1)	
LOAEL, male, acute, Inhalation, Rat, systemic	4320 mg/m ³ (1 hours)

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

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


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.

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)

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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])

Gasoline, straight run, topping plant (68606-11-1)	
LL50, fish, acute, Freshwater, Pimephales promelas (fathead minnow)	8.2 mg/l (96 hours, equivalent or similar to EPA 66013-75-009)
NOELR, fish, Chronic, Freshwater, Pimephales promelas (fathead minnow)	2.6 mg/l (14 days, OECD 204)
EL50, daphnia, acute, Freshwater, daphnia	4.5 mg/l (48 hours, OECD Test Guideline 202)
NOELR, daphnia, Chronic, Freshwater, daphnia	2.6 mg/l (21 days, OECD 211)
EL50, algae, Freshwater, Pseudokirchneriella subcapitata	3.1 mg/l (72 hours, OECD Test Guideline 201)
LL50, microorganisms, Freshwater, Tetrahymena pyriformis	15.41 mg/l (72 hours, Quantitative structure-activity relationship (QSAR))

12.2. Persistence and degradability

STRAIGHT RUN GASOLINE (68606-11-1)	
Persistence and degradability	Not applicable.

12.3. Bioaccumulative potential

STRAIGHT RUN GASOLINE (68606-11-1)	
Partition coefficient n-octanol/water	UVCB No data available

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

12.4. Mobility in soil

STRAIGHT RUN GASOLINE (68606-11-1)	
Ecology - soil	No data available.

12.5. Results of PBT and vPvB assessment

STRAIGHT RUN GASOLINE (68606-11-1)	
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. Refer to manufacturer/supplier for information on recovery/recycling. Collect and dispose of waste product at an authorised disposal facility. Dispose of contaminated materials in accordance with current regulations.

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Additional information : Never use pressure to empty container. Do not burn, or use a cutting torch on the empty drum. Do not puncture or incinerate. 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. The following Waste Codes are only suggestions:
130702 - petrol
150110 - packaging containing residues of or contaminated by dangerous substances
Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

SECTION 14: Transport information

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


ADR	IMDG	IATA	ADN	RID
14.1. UN number				
1268	1268	1268	1268	1268
14.2. UN proper shipping name				
PETROLEUM DISTILLATES, N.O.S. (Gasoline, straight run, topping plant)	PETROLEUM DISTILLATES, N.O.S. (Gasoline, straight run, topping plant)	Petroleum distillates, n.o.s. (Gasoline, straight run, topping plant)	PETROLEUM DISTILLATES, N.O.S. (Gasoline, straight run, topping plant)	PETROLEUM DISTILLATES, N.O.S. (Gasoline, straight run, topping plant)
Transport document description				
UN 1268 PETROLEUM DISTILLATES, N.O.S. (Gasoline, straight run, topping plant), 3, II, (D/E), ENVIRONMENTALLY HAZARDOUS	UN 1268 PETROLEUM DISTILLATES, N.O.S. (Gasoline, straight run, topping plant), 3, II, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS	UN 1268 Petroleum distillates, n.o.s. (Gasoline, straight run, topping plant), 3, II, ENVIRONMENTALLY HAZARDOUS	UN 1268 PETROLEUM DISTILLATES, N.O.S. (Gasoline, straight run, topping plant), 3, II, ENVIRONMENTALLY HAZARDOUS	UN 1268 PETROLEUM DISTILLATES, N.O.S. (Gasoline, straight run, topping plant), 3, II, ENVIRONMENTALLY HAZARDOUS
14.3. Transport hazard class(es)				
3	3	3	3	3
				
14.4. Packing group				
II	II	II	II	II
14.5. Environmental hazards				
Dangerous for the environment : Yes	Dangerous for the environment : Yes Marine pollutant : Yes	Dangerous for the environment : Yes	Dangerous for the environment : Yes	Dangerous for the environment : Yes
ADN :N2				

14.6. Special precautions for user

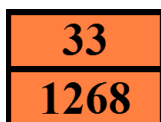
Special precautions for user : No data available

- Overland transport

Classification code (ADR) : F1
Special provisions : 640C, 664
Limited quantities (ADR) : 1I
Excepted quantities (ADR) : E2
Packing instructions (ADR) : P001

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Mixed packing provisions (ADR) : MP19
 Portable tank and bulk container instructions (ADR) : T7
 Portable tank and bulk container special provisions (ADR) : TP1, TP8, TP28
 Tank code (ADR) : L1.5BN
 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


Limited quantities (IMDG) : 1 L
 Excepted quantities (IMDG) : E2
 Packing instructions (IMDG) : P001
 IBC packing instructions (IMDG) : IBC02
 Tank instructions (IMDG) : T7
 Tank special provisions (IMDG) : TP1, TP8, TP28
 EmS-No. (Fire) : F-E
 EmS-No. (Spillage) : S-E
 Stowage category (IMDG) : B
 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) : A3
 ERG code (IATA) : 3H

- Inland waterway transport

Classification code (ADN) : F1
 Special provisions (ADN) : 640C
 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

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- Rail transport

Classification code (RID)	: F1
Special provisions (RID)	: 640C
Limited quantities (RID)	: 1L
Excepted quantities (RID)	: E2
Packing instructions (RID)	: P001
Mixed packing provisions (RID)	: MP19
Portable tank and bulk container instructions (RID)	: T7
Portable tank and bulk container special provisions (RID)	: TP1, TP8, TP28
Tank codes for RID tanks (RID)	: L1.5BN
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

Code: IBC : No data available.

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:

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	STRAIGHT RUN GASOLINE - benzene - Gasoline, straight run, topping plant
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	STRAIGHT RUN GASOLINE - benzene - Gasoline, straight run, topping plant
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	STRAIGHT RUN GASOLINE - benzene - Gasoline, straight run, topping plant
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	STRAIGHT RUN GASOLINE - Gasoline, straight run, topping plant
5. Benzene	benzene
28. Substances which appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 classified as Carcinogen category 1A or 1B (Table 3.1) or Carcinogen category 1 or 2 (Table 3.2) and listed as follows: Carcinogen category 1A (Table 3.1)/Carcinogen category 1 (Table 3.2) listed in Appendix 1 Carcinogen category 1B (Table 3.1)/Carcinogen category 2 (Table 3.2) listed in Appendix 2	STRAIGHT RUN GASOLINE - benzene - Gasoline, straight run, topping plant
29. Substances which appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 classified as Germ cell Mutagen category 1A or 1B (Table 3.1) or Mutagen category 1 or 2 (Table 3.2) and listed as follows: Mutagen category 1A (Table 3.1)/Mutagen category 1 (Table 3.2) listed in Appendix 3 Mutagen category 1B (Table 3.1)/Mutagen category 2 (Table 3.2) listed in Appendix 4	STRAIGHT RUN GASOLINE - benzene - Gasoline, straight run, topping plant
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.	STRAIGHT RUN GASOLINE - benzene - Toluene - n-Hexane - Gasoline, straight run, topping plant
48. Toluene	Toluene

STRAIGHT RUN GASOLINE is not on the REACH Candidate List

STRAIGHT RUN GASOLINE is not on the REACH Annex XIV List

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15.1.2. National regulations

Germany

Reference to AwSV : Water hazard class (WGK) 3, severe hazard to waters (Classification according to AwSV; ID No. 9162)

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

Netherlands

Waterbezwaarlijkheid : 2 - May cause hereditary genetic damage
3 - May cause cancer.
6 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. (A)

SZW-lijst van kankerverwekkende stoffen : GASOLINE, STRAIGHT-RUN, TOPPING PLANT is listed

SZW-lijst van mutagene stoffen : GASOLINE, STRAIGHT-RUN, TOPPING PLANT is listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : The substance is not listed

Denmark

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

15.2. Chemical safety assessment

For this substance a chemical safety assessment has been carried out


SECTION 16: Other information

Indication of changes:

14		Modified	
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Abbreviations and acronyms:

	DNEL = Derived No Effect Level
	DMEL = Derived Minimal Effect level
	PNEC = Predicted No Effect Concentration
	OEL-STEL = Occupational Exposure Limits - Short Term Exposure Limits (STELs)
	TWA = time weighted average
	LC50 = Median lethal concentration
	LD50 = Median lethal dose
	LL50 = Median lethal level
	EC50 = Median Effective Concentration
	EL50 = Median effective level
	ErC50 = EC50 in terms of reduction of growth rate
	ErL50 = EL50 in terms of reduction of growth rate
	NOEL = no-observed-effect level
	NOEC = No observed effect concentration
	NOELR = No observed effect loading rate

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	NOAEC = No observed adverse effect concentration
	NOAEL = No observed adverse effect level
	EWC = European waste catalogue
	NA = Not applicable
	N.O.S. = Not Otherwise Specified
	VOC = Volatile organic compounds
	mg/kg BW = mg/kg bodyweight
	QSAR = Quantitative structure-activity relationship (QSAR)
	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
	WGK = Wassergefährdungsklasse (Water Hazard Class under German Federal Water Management Act)
	ABM = Algemene beoordelingsmethodiek

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


Full text of H- and EUH-statements:

Aquatic Chronic 2	Hazardous to the aquatic environment - chronic hazard category 2
Asp. Tox. 1	Aspiration hazard, Category 1
Carc. 1A	Carcinogenicity, Category 1A
Carc. 1B	Carcinogenicity, Category 1B
Eye Irrit. 2	Serious eye damage/eye irritation Category 2
Flam. Liq. 1	Flammable liquids, Category 1
Flam. Liq. 2	Flammable liquids, Category 2
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
Skin Irrit. 2	Skin corrosion/irritation, Category 2
STOT RE 1	Specific target organ toxicity — Repeated exposure, Category 1
STOT RE 2	Specific target organ toxicity — Repeated exposure, Category 2
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Narcosis
H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H350	May cause cancer.
H361d	Suspected of damaging the unborn child.
H361f	Suspected of damaging fertility.
H361fd	Suspected of damaging fertility. Suspected of damaging the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.

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]

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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
Use as an intermediate Classified as (H350, H340, H361f and/or H361d) Benzene content : 20% - 79%	SU8, SU9		PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC6a	ESVOC SPERC 6.1a.v1
Distribution Classified as (H350, H340, H361f and/or H361d) Benzene content : 20% - 79%			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 Classified as (H350, H340, H361f and/or H361d) Benzene content : 20% - 79%			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC2	ESVOC SPERC 2.2.v1
Use as an intermediate Classified as (H350, H340, H361f and/or H361d) Benzene content : 20% - 79%	SU3, SU8, SU9		PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC6a	ESVOC SPERC 6.1a.v1
Distribution Classified as (H350, H340, H361f and/or H361d) Benzene content : 20% - 79%	SU3		PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	ESVOC SPERC 1.1b.v1
Distribution Classified as (H350, H340, H361f and/or H361d) Benzene content : 20% - 79%			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	ESVOC SPERC 1.1b.v1
Distribution Classified as (H350, H340, H361f and/or H361d)	SU3		PROC1, PROC2, PROC3, PROC8a, PROC8b,		ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b,	ESVOC SPERC 1.1b.v1



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Benzene content : 20% - 79%			PROC15		ERC6c, ERC6d, ERC7	
Formulation & (re)packing of substances and mixtures Classified as (H350, H340, H361f and/or H361d) Benzene content : 20% - 79%	SU3, SU10		PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC2	ESVOC SPERC 2.2.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
Use as an intermediate Classified as (H350, H340, H361f and/or H361d) Benzene content : 5% - 20%	SU8, SU9		PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC6a	ESVOC SPERC 6.1a.v1
Distribution Classified as (H350, H340, H361f and/or H361d) Benzene content : 0% - 1%			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	ESVOC SPERC 1.1b.v1
Distribution 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
Distribution Classified as (H350, H340, H361f and/or H361d) Benzene content : 5% - 20%			PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15		ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	ESVOC SPERC 1.1b.v1
Formulation & (re)packing of substances and			PROC1, PROC2, PROC3,		ERC2	ESVOC SPERC 2.2.v1



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<p>mixtures Classified as (H350, H340, H361f and/or H361d) Benzene content : 0% - 1%</p>			<p>PROC8a, PROC8b, PROC15</p>			
<p>Formulation & (re)packing of substances and mixtures Classified as (H350, H340, H361f and/or H361d) Benzene content : 1% - 5%</p>			<p>PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15</p>		ERC2	<p>ESVOC SPERC 2.2.v1</p>
<p>Formulation & (re)packing of substances and mixtures Classified as (H350, H340, H361f and/or H361d) Benzene content : 5% - 20%</p>			<p>PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15</p>		ERC2	<p>ESVOC SPERC 2.2.v1</p>
<p>Uses in coatings Classified as (H350, H340, H361f and/or H361d) Benzene content : 0% - 1%</p>			<p>PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15</p>		ERC4	<p>ESVOC SPERC 4.3a.v1</p>
<p>Use in cleaning agents Classified as (H350, H340, H361f and/or H361d) Benzene content : 0% - 1%</p>			<p>PROC1, PROC2, PROC3, PROC8a, PROC8b</p>		ERC4	<p>ESVOC SPERC 4.4a.v1</p>
<p>Use as a fuel Classified as (H350, H340, H361f and/or H361d) Benzene content : 0% - 1%</p>			<p>PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16</p>		ERC7	<p>ESVOC SPERC 7.12a.v1</p>
<p>Use as a fuel Classified as (H350, H340, H361f and/or H361d) Benzene content : 0% - 1%</p>			<p>PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC16</p>		ERC9a, ERC9b	<p>ESVOC SPERC 9.12b.v1</p>
<p>Use as a fuel Classified as (H350, H340, H361f and/or</p>		PC13			ERC9a, ERC9b	<p>ESVOC SPERC 9.12c.v1</p>

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H361d) Benzene content : 0% - 1%						
Use in rubber production and processing Classified as (H350, H340, H361f and/or H361d) Benzene content : 0% - 1%	SU10, SU11		PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC9, PROC15		ERC4, ERC6d	ESVOC SPERC 4.19.v1

1. Exposure scenario 02e (Benz 20%-79%)

Use as an intermediate

ES Ref.: 02e (Benz 20%-79%) ES Type: Worker
--

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.

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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 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, Ensure operation is undertaken outdoors, Avoid carrying out operation for more than 1 hour.	
General exposures (closed systems)	Provide extract ventilation to points where emissions occur, PPE15 - Wear suitable gloves tested to EN374, Ensure operation is undertaken outdoors, Avoid carrying out activities involving exposure for more than 4 hours, E47 - Handle substance within a closed system.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure, Avoid carrying out activities involving exposure for more than 1 hour.	
CS14 - Bulk transfers	Ensure material transfers are under containment or extract ventilation, PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training, Avoid carrying out activities involving exposure for more than 1 hour, or, Wear a respirator conforming to EN140 with Type A filter or better.	
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, Avoid carrying out activities involving exposure for more than 1 hour, or, Wear a respirator conforming to EN140 with Type A filter or better, Ensure operation is undertaken outdoors, Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Storage	E84 - Store substance within a closed system, PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training, Avoid carrying out activities involving exposure for more than 1 hour.	

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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):	11000000
	Fraction of regional tonnage used locally:	1
	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):	0,003
	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.	
	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 (%):	98,2
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	57,4
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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	98,2
	Maximum allowable site tonnage (MSafe)	50000
	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.

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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 03e (Benz 20%-79%)

Distribution

ES Ref.: 03e (Benz 20%-79%) ES Type: Worker
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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) 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 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

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	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,PPE15 - Wear suitable gloves tested to EN374,Avoid carrying out activities involving exposure for more than 4 hours.	
CS2 - Process sampling	Sample via a closed loop or other system to avoid exposure,PPE15 - Wear suitable gloves tested to EN374.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
Bulk closed loading	Ensure material transfers are under containment or extract ventilation,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,Avoid carrying out activities involving exposure for more than 1 hour.	
Bulk closed loading and unloading	Ensure material transfers are under containment or extract ventilation,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,Avoid carrying out activities involving exposure for more than 1 hour.	
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,Avoid carrying out activities involving exposure for more than 1 hour,or,Wear a respirator conforming to EN140 with Type A filter or better,Ensure operation is undertaken outdoors.	
Storage	PPE15 - Wear suitable gloves tested to EN374,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):	25000000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	51000
	Maximum daily site tonnage (kg/day)	170000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk	Local freshwater dilution factor:	10

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management	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 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 (%):	90
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	83,3
	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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,8
	Maximum allowable site tonnage (MSafe)	670000
	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
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	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 04 (Benz 20%-79%)

Formulation & (re)packing of substances and mixtures

ES Ref.: 04 (Benz 20%-79%)

ES Type: Worker

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 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

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	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,Avoid carrying out activities involving exposure for more than 4 hours.	
General exposures (closed systems)	Provide extract ventilation to points where emissions occur,E47 - Handle substance within a closed system,PPE15 - Wear suitable gloves tested to EN374,Avoid carrying out activities involving exposure for more than 4 hours,Ensure operation is undertaken outdoors.	
Storage	PPE15 - Wear suitable gloves tested to EN374,E84 - Store substance within a closed system,Avoid carrying out activities involving exposure for more than 4 hours.	
CS2 - Process sampling	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,Avoid carrying out activities involving exposure for more than 4 hours.	
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,PPE15 - Wear suitable gloves tested to EN374.	
CS8 - Drum/batch transfers	Ensure material transfers are under containment or extract ventilation,PPE15 - Wear suitable gloves tested to EN374.	
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,Avoid carrying out activities involving exposure for more than 1 hour,or,Wear a respirator conforming to EN140 with Type A filter or better,Ensure operation is undertaken outdoors.	

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):	14000000
	Fraction of regional tonnage used locally:	1
	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):	0,002
	Release fraction to soil from process (initial release	0,0001

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	prior to RMM):	
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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	Prevent discharge of undissolved substance to or recover from onsite wastewater, Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation), If discharging to 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 (%):	98,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	68
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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	98,7
	Maximum allowable site tonnage (MSafe)	100000
	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 Petrорisk 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 02e (Benz 20%-79%)

Use as an intermediate

ES Ref.: 02e (Benz 20%-79%) ES Type: Worker
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Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 SU3, 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 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,Ensure operation is undertaken outdoors,Avoid carrying out operation for more than 1 hour.	
General exposures (closed systems)	Provide extract ventilation to points where emissions occur,PPE15 - Wear suitable gloves tested to EN374,Ensure operation is undertaken outdoors,Avoid carrying out activities involving exposure for more than 4 hours,E47 - Handle substance within a closed system.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure,Avoid carrying out activities involving exposure for more than 1 hour.	
CS14 - Bulk transfers	Ensure material transfers are under containment or extract ventilation,PPE16 - Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training,Avoid carrying out activities involving exposure for more than 1 hour,or,Wear a respirator conforming to EN140 with Type A filter or better.	
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,Avoid carrying out activities involving exposure for more than 1 hour,or,Wear a respirator conforming to EN140 with Type A filter or better,Ensure operation is undertaken outdoors,Provide a good standard of controlled ventilation (10 to 15 air changes per hour).	
Storage	E84 - Store substance within a closed system,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,Avoid carrying out activities involving exposure for more than 1 hour.	

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):	2210000
	Fraction of regional tonnage used locally:	0,0068
	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

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Other given operational conditions affecting environmental exposure	Release fraction to air from process (initial release prior to RMM):	0,025
	Release fraction to wastewater from process (initial release prior to RMM):	0,003
	Release fraction to soil from process (initial release prior to RMM):	0,001

Risk management measures

Technical conditions and measures at process level 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 (%):	80
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	92,9
	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 (%):	95,5
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,5
	Maximum allowable site tonnage (MSafe)	78000
	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
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	(http://cefic.org/en/reach-for-industries-libraries.html).
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1. Exposure scenario 03e (Benz 20%-79%)

Distribution

ES Ref.: 03e (Benz 20%-79%) ES Type: Worker
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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) 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 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

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	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,PPE15 - Wear suitable gloves tested to EN374,Avoid carrying out activities involving exposure for more than 4 hours.	
CS2 - Process sampling	Sample via a closed loop or other system to avoid exposure,PPE15 - Wear suitable gloves tested to EN374.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
Bulk closed loading	Ensure material transfers are under containment or extract ventilation,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,Avoid carrying out activities involving exposure for more than 1 hour.	
Bulk closed loading and unloading	Ensure material transfers are under containment or extract ventilation,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,Avoid carrying out activities involving exposure for more than 1 hour.	
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,Avoid carrying out activities involving exposure for more than 1 hour,or,Wear a respirator conforming to EN140 with Type A filter or better,Ensure operation is undertaken outdoors.	
Storage	PPE15 - Wear suitable gloves tested to EN374,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):	25000000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	51000
	Maximum daily site tonnage (kg/day)	170000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk	Local freshwater dilution factor:	10

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management	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 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 (%):	90
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	83,3
	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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,8
	Maximum allowable site tonnage (MSafe)	670000
	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
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	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 03e (Benz 20%-79%)

Distribution

ES Ref.: 03e (Benz 20%-79%) ES Type: Worker
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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) 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 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

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	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,PPE15 - Wear suitable gloves tested to EN374,Avoid carrying out activities involving exposure for more than 4 hours.	
CS2 - Process sampling	Sample via a closed loop or other system to avoid exposure,PPE15 - Wear suitable gloves tested to EN374.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
Bulk closed loading	Ensure material transfers are under containment or extract ventilation,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,Avoid carrying out activities involving exposure for more than 1 hour.	
Bulk closed loading and unloading	Ensure material transfers are under containment or extract ventilation,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,Avoid carrying out activities involving exposure for more than 1 hour.	
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,Avoid carrying out activities involving exposure for more than 1 hour,or,Wear a respirator conforming to EN140 with Type A filter or better,Ensure operation is undertaken outdoors.	
Storage	PPE15 - Wear suitable gloves tested to EN374,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):	25000000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	51000
	Maximum daily site tonnage (kg/day)	170000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk	Local freshwater dilution factor:	10

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management	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 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 (%):	90
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	83,3
	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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,8
	Maximum allowable site tonnage (MSafe)	670000
	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
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	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 03e (Benz 20%-79%)

Distribution

ES Ref.: 03e (Benz 20%-79%) ES Type: Worker
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Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 SU3 ERC1, ERC2, ERC3, 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) 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 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

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	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,PPE15 - Wear suitable gloves tested to EN374,Avoid carrying out activities involving exposure for more than 4 hours.	
CS2 - Process sampling	Sample via a closed loop or other system to avoid exposure,PPE15 - Wear suitable gloves tested to EN374.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
Bulk closed loading	Ensure material transfers are under containment or extract ventilation,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,Avoid carrying out activities involving exposure for more than 1 hour.	
Bulk closed loading and unloading	Ensure material transfers are under containment or extract ventilation,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,Avoid carrying out activities involving exposure for more than 1 hour.	
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,Avoid carrying out activities involving exposure for more than 1 hour,or,Wear a respirator conforming to EN140 with Type A filter or better,Ensure operation is undertaken outdoors.	
Storage	PPE15 - Wear suitable gloves tested to EN374,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

Physical form	Substance is complex UVCB.
Other product characteristics	Substance is complex UVCB, Predominantly hydrophobic

Operational conditions

Amount used	Fraction of EU tonnage used in region:	0,1
	Regional use tonnage (tons/year):	18700000
	Fraction of regional tonnage used locally:	0,002
	Annual site tonnage (tons/year):	37500
	Maximum daily site tonnage (kg/day)	120000
Frequency and duration of use	Continuous use/release.	

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	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 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 (%):	90
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	12
	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 (%):	95,5
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,5
	Maximum allowable site tonnage (MSafe)	1100000
	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,
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	<p>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).</p>
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1. Exposure scenario 04 (Benz 20%-79%)

Formulation & (re)packing of substances and mixtures

ES Ref.: 04 (Benz 20%-79%) ES Type: Worker

Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 SU3, SU10 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 persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination;

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	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,Avoid carrying out activities involving exposure for more than 4 hours.	
General exposures (closed systems)	Provide extract ventilation to points where emissions occur,E47 - Handle substance within a closed system,PPE15 - Wear suitable gloves tested to EN374,Avoid carrying out activities involving exposure for more than 4 hours,Ensure operation is undertaken outdoors.	
Storage	PPE15 - Wear suitable gloves tested to EN374,E84 - Store substance within a closed system,Avoid carrying out activities involving exposure for more than 4 hours.	
CS2 - Process sampling	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,Avoid carrying out activities involving exposure for more than 4 hours.	
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,PPE15 - Wear suitable gloves tested to EN374.	
CS8 - Drum/batch transfers	Ensure material transfers are under containment or extract ventilation,PPE15 - Wear suitable gloves tested to EN374.	
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,Avoid carrying out activities involving exposure for more than 1 hour,or,Wear a respirator conforming to EN140 with Type A filter or better,Ensure operation is undertaken outdoors.	

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):	16500000
	Fraction of regional tonnage used locally:	0,0018
	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):	0,002

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	Release fraction to soil from process (initial release prior to RMM):	0,0001
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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	Prevent discharge of undissolved substance to or recover from onsite wastewater,Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation),If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.	
	Treat air emission to provide a typical removal efficiency of (%):	56,5
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	94,7
	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 (%):	95,5
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,58
	Maximum allowable site tonnage (MSafe)	100000
	Assumed domestic sewage treatment plant flow (m³/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 02b (Benz 0%-1%)

Use as an intermediate

ES Ref.: 02b (Benz 0%-1%)
ES Type: Worker

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 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)	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):	11000000
	Fraction of regional tonnage used locally:	1
	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):	0,003
	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.	
	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 ≥ (%):	98,2

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	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	57,4
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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	98,2
	Maximum allowable site tonnage (MSafe)	50000
	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

ES Ref.: 02c (Benz 1%-5%) ES Type: Worker
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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 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.	
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):	11000000
	Fraction of regional tonnage used locally:	1
	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):	0,003
	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.	
	Treat air emission to provide a typical removal efficiency of (%):	80
	Treat onsite wastewater (prior to receiving water	98,2

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	discharge) to provide the required removal efficiency of \geq (%):	
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	57,4
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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	98,2
	Maximum allowable site tonnage (MSafe)	50000
	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 02d (Benz 5%-20%)

Use as an intermediate

ES Ref.: 02d (Benz 5%-20%) ES Type: Worker

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 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,Ensure operation is undertaken outdoors.	
General exposures (closed systems)	Provide extract ventilation to points where emissions occur,E47 - Handle substance within a closed system,PPE15 - Wear suitable gloves tested to EN374,Ensure operation is undertaken outdoors,Avoid carrying out activities involving exposure for more than 4 hours.	
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,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,Avoid carrying out activities involving exposure for more than 1 hour.	
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,Avoid carrying out activities involving exposure for more than 1 hour,or,Wear a respirator conforming to EN140 with Type A filter or better,Ensure operation is undertaken outdoors.	
Storage	E84 - Store substance within a closed system,PPE15 - Wear suitable gloves tested to EN374.	

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):	11000000
	Fraction of regional tonnage used locally:	1
	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):	0,003
	Release fraction to soil from process (initial release prior to RMM):	0,001

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	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 (%):	80
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	98,2
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	57,4
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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	98,2
	Maximum allowable site tonnage (MSafe)	50000
	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 03b (Benz 0%-1%)

Distribution

ES Ref.: 03b (Benz 0%-1%)
ES Type: Worker

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) 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 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

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	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	
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, ESVOG 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
ESVOG 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):	25000000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	51000
	Maximum daily site tonnage (kg/day)	170000
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 humans via indirect exposure (primarily inhalation),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 (%):	90
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	83,3
	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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,8
	Maximum allowable site tonnage (MSafe)	670000
	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

ES Ref.: 03c (Benz 1%-5%)
ES Type: Worker

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) 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 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

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	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):	25000000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	51000
	Maximum daily site tonnage (kg/day)	170000
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	Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation),If	

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limit discharges, air emissions and releases to soil	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 \geq (%):	83,3
	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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,8
	Maximum allowable site tonnage (MSafe)	670000
	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 03d (Benz 5%-20%)

Distribution

ES Ref.: 03d (Benz 5%-20%) ES Type: Worker

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) 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 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

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	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,PPE15 - Wear suitable gloves tested to EN374,Avoid carrying out activities involving exposure for more than 4 hours.	
CS2 - Process sampling	Sample via a closed loop or other system to avoid exposure,PPE15 - Wear suitable gloves tested to EN374.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
Bulk closed loading	Ensure material transfers are under containment or extract ventilation,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,Avoid carrying out activities involving exposure for more than 1 hour.	
Bulk closed loading and unloading	Ensure material transfers are under containment or extract ventilation,PPE17 - Wear chemically resistant gloves (tested to EN374) in combination with specific activity training,Avoid carrying out activities involving exposure for more than 1 hour.	
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,Avoid carrying out activities involving exposure for more than 1 hour,or,Wear a respirator conforming to EN140 with Type A filter or better,Ensure operation is undertaken outdoors.	
Storage	PPE15 - Wear suitable gloves tested to EN374,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):	25000000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	51000
	Maximum daily site tonnage (kg/day)	170000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	300
Environmental factors not influenced by risk	Local freshwater dilution factor:	10

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management	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 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 (%):	90
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	83,3
	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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,8
	Maximum allowable site tonnage (MSafe)	670000
	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
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	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

ES Ref.: 04b (Benz 0%-1%)

ES Type: Worker

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 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

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	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):	14000000
	Fraction of regional tonnage used locally:	1
	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):	0,002
	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 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 (%):	0
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency	98,7

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	of \geq (%):	
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	68
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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	98,7
	Maximum allowable site tonnage (MSafe)	100000
	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 Petrisk 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 04c (Benz 1%-5%)

Formulation & (re)packing of substances and mixtures

ES Ref.: 04c (Benz 1%-5%)	
ES Type: Worker	

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 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	

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	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	
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,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 (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):	14000000
	Fraction of regional tonnage used locally:	1
	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):	0,002
	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 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	0

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	efficiency of (%):	
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	98,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	68
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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	98,7
	Maximum allowable site tonnage (MSafe)	100000
	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 04d (Benz 5%-20%)

Formulation & (re)packing of substances and mixtures

ES Ref.: 04d (Benz 5%-20%) ES Type: Worker

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 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

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	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,Avoid carrying out activities involving exposure for more than 4 hours.	
General exposures (closed systems)	Provide extract ventilation to points where emissions occur,E47 - Handle substance within a closed system,PPE15 - Wear suitable gloves tested to EN374,Avoid carrying out activities involving exposure for more than 4 hours,Ensure operation is undertaken outdoors.	
Storage	PPE15 - Wear suitable gloves tested to EN374,E84 - Store substance within a closed system,Avoid carrying out activities involving exposure for more than 4 hours.	
CS2 - Process sampling	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,Avoid carrying out activities involving exposure for more than 4 hours.	
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,PPE15 - Wear suitable gloves tested to EN374.	
CS8 - Drum/batch transfers	Ensure material transfers are under containment or extract ventilation,PPE15 - Wear suitable gloves tested to EN374.	
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,Avoid carrying out activities involving exposure for more than 1 hour,or,Wear a respirator conforming to EN140 with Type A filter or better,Ensure operation is undertaken outdoors.	

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):	14000000
	Fraction of regional tonnage used locally:	1
	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):	0,002
	Release fraction to soil from process (initial release	0,0001

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	prior to RMM):	
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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	Prevent discharge of undissolved substance to or recover from onsite wastewater, Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation), If discharging to 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 (%):	98,7
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	68
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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	98,7
	Maximum allowable site tonnage (MSafe)	100000
	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 Petrорisk 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 05b (Benz 0%-1%)

Uses in coatings

ES Ref.: 05b (Benz 0%-1%)
ES Type: Worker

Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15 ERC4 ESVOC SPERC 4.3a.v1
Processes, tasks activities covered	Covers the use in coatings (paints, inks, adhesives, etc) within closed or contained systems including incidental exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application activities and film formation) and equipment cleaning, maintenance 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 potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable

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	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.	
Film formation - force drying, stoving and other technologies	Provide extract ventilation to points where emissions occur	
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.	
CS3 - Material transfers	Ensure material transfers are under containment or extract ventilation.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
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.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ESVOC SPERC 4.3a.v1)

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ESVOC SPERC 4.3a.v1	Uses in coatings: 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):	210000
	Fraction of regional tonnage used locally:	1
	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):	0,98
	Release fraction to wastewater from process (initial release prior to RMM):	0,007
	Release fraction to soil from process (initial release prior to RMM):	0

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 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 (%):	90
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	99,2

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	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	81,7
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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	99,2
	Maximum allowable site tonnage (MSafe)	50000
	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 07b (Benz 0%-1%)

Use in cleaning agents

ES Ref.: 07b (Benz 0%-1%)
ES Type: Worker

Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b ERC4 ESVOC SPERC 4.4a.v1
Processes, tasks activities covered	Covers the use as a component of cleaning products within closed or contained systems including incidental exposures during transfer from storage, mixing/diluting in the preparatory phase and cleaning activities, related equipment cleaning and maintenance. 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)

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

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, Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying.
General measures (carcinogens)	Consider technical advances and process upgrades (including automation) for the elimination of releases. minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable

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	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.	
CS14 - Bulk transfers	Ensure material transfers are under containment or extract ventilation.	
CS38 - Use in contained systems, CS93 - Automated process with (semi) closed systems.	E47 - Handle substance within a closed system, PPE15 - Wear suitable gloves tested to EN374.	
CS45 - Filling/ preparation of equipment from drums or containers.	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.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ESVOC SPERC 4.4a.v1)

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ESVOC SPERC 4.4a.v1	Use in cleaning agents: 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):	410000
	Fraction of regional tonnage used locally:	0,2
	Annual site tonnage (tons/year):	100
	Maximum daily site tonnage (kg/day)	5000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	20
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):	1
	Release fraction to wastewater from process (initial release prior to RMM):	0,00003
	Release fraction to soil from process (initial release prior to RMM):	0

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 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 (%):	70
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%):	82
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of ≥ (%):	0
Organizational measures to prevent/limit release from	Do not apply industrial sludge to natural soils, Sludge	

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the site	should be incinerated, contained or reclaimed.	
Conditions and measures related to sewage treatment plant	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,8
	Maximum allowable site tonnage (MSafe)	21000
	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

ES Ref.: 10b (Benz 0%-1%)
ES Type: Worker

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 persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination;

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	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):	1700000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	1500000
	Maximum daily site tonnage (kg/day)	5000000
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 prevent release	Common practices vary across sites thus conservative process release estimates used.	
Technical onsite conditions and measures to reduce or	Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation),If	

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limit discharges, air emissions and releases to soil	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 (%):	94,6
	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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,8
	Maximum allowable site tonnage (MSafe)	5000000
	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.	
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 11b (Benz 0%-1%)

Use as a fuel

ES Ref.: 11b (Benz 0%-1%)
ES Type: Worker

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 persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination;

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	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):	1200000
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	590
	Maximum daily site tonnage (kg/day)	1600
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 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 (%):	Not applicable
	Treat onsite wastewater (prior to receiving water	81,8

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	discharge) to provide the required removal efficiency of \geq (%):	
	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 (%):	95,8
	Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%):	95,8
	Maximum allowable site tonnage (MSafe)	7000
	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.	
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 12b (Benz 0%-1%)

Use as a fuel

ES Ref.: 12b (Benz 0%-1%)
ES Type: Consumer

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	Unless otherwise stated, Covers concentrations up to 100%
Vapour pressure	Liquid, vapour pressure > 10 kPa at STP

Operational conditions

Amount used	unless stated differently,Covers use up to 37500 g	
	Covers skin contact area up to 420 cm ²	
Frequency and duration of use	unless stated differently,Covers use up to	0,143 Uses per day
	Covers exposure up to	2 Hours/event
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 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 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 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 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. Covers concentrations up to 1%. Covers use up to 26. days/year. covers use up to 1

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		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):	9100000
	Fraction of regional tonnage used locally:	0,0005
	Annual site tonnage (tons/year):	4600
	Maximum daily site tonnage (kg/day)	12000
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	Risk from environmental exposure is driven by humans via indirect exposure (primarily inhalation).	
	Estimated substance removal from wastewater via domestic sewage treatment (%):	95,8
	Maximum allowable site tonnage (MSafe)	54000
	Assumed domestic sewage treatment plant flow (m ³ /d):	2000

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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.	
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 13b (Benz 0%-1%)

Use in rubber production and processing

ES Ref.: 13b (Benz 0%-1%) ES Type: Worker
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Use descriptors	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC9, PROC15 SU10, SU11 ERC4, ERC6d ESVOC SPERC 4.19.v1
Processes, tasks activities covered	Manufacture of tyres and general rubber articles within closed or contained systems, including incidental exposures during processing of raw (uncured) rubber, handling and mixing of rubber additives, calendaring, vulcanising, cooling and finishing as well as maintenance. 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, 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)
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	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.	
CS3 - Material transfers	E84 - Store substance within a closed system, Ensure material transfers are under containment or extract ventilation.	
General exposures (closed systems)	E47 - Handle substance within a closed system.	
CS3 - Material transfers	Ensure material transfers are under containment or extract ventilation.	
Bulk weighing	E47 - Handle substance within a closed system, PPE15 - Wear suitable gloves tested to EN374.	
CS36 - Laboratory activities	Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure	
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.	
Small scale weighing	E57 - Carry out in a vented booth or extracted enclosure.	
Storage, outdoor	E84 - Store substance within a closed system.	

2.2 Contributing scenario controlling environmental exposure (ERC4, ERC6d, ESVOC SPERC 4.19.v1)

ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC6d	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ESVOC SPERC 4.19.v1	Rubber production and processing: 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):	680
	Fraction of regional tonnage used locally:	1
	Annual site tonnage (tons/year):	680
	Maximum daily site tonnage (kg/day)	34000
Frequency and duration of use	Continuous use/release.	
	Emission days (days/year):	20
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):	0,003
	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 humans via indirect exposure (primarily inhalation), 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 (%):	0
	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of \geq (%):	97,4
	If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of \geq (%):	37,1
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 (%):	95,8
	Estimated substance removal from wastewater via domestic sewage treatment (%):	97,4
	Maximum allowable site tonnage (MSafe)	34000
	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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