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

1.1 Product identifier

Trade name	:	Naphtha
REACH Registration Number	:	01-2119474679-18-xxxx
Substance name	:	Naphtha (petroleum), full range straight run
EC-No.	:	265-042-6

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

Use of the Substance/Mixture	:	Industrial use, Use as an intermediate
Recommended restrictions on use	:	Use in coatings, Use in cleaning agents

1.3 Details of the supplier of the safety data sheet

Supplier	:	Borealis AG Trabrennstrasse 6-8, 1020 Vienna, Austria Telephone: +43 1 22400 0
E-mail address	:	sds@borealisgroup.com

1.4 Emergency telephone number

+358 9 39493416 Shift supervisor, Olefins (24h)
+358 10 4582267 Fire department, Kilpilahti industrial area (24h)
+358 9 471977 / +358 9 4711 (Poison Information Centre)
+1 760 476 3962 (3E), Access code: 336296

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable liquids, Category 1	H224: Extremely flammable liquid and vapour.
Skin irritation, Category 2	H315: Causes skin irritation.
Germ cell mutagenicity, Category 1B	H340: May cause genetic defects.
Carcinogenicity, Category 1B	H350: May cause cancer.
Reproductive toxicity, Category 2	H361: Suspected of damaging fertility or the unborn child.

Specific target organ toxicity - single exposure, Category 3, Central nervous system	H336: May cause drowsiness or dizziness.
Aspiration hazard, Category 1	H304: May be fatal if swallowed and enters airways.
Long-term (chronic) aquatic hazard, Category 2	H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements :

H224 Extremely flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H336 May cause drowsiness or dizziness.
H340 May cause genetic defects.
H350 May cause cancer.
H361 Suspected of damaging fertility or the unborn child.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements :

Prevention:

P201 Obtain special instructions before use.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P331 Do NOT induce vomiting.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

Additional Labelling

Contains benzene, n-hexane. Restricted to professional users.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

Substance name : Naphtha (petroleum), full range straight run

EC-No. : 265-042-6

Chemical nature : Naphtha (petroleum), full-range straight-run; Low boiling point naphtha; [A complex combination of hydrocarbons produced by distillation of crude oil. It consists of hydrocarbons having carbon numbers predominantly in the range of C 4 through C 11 and boiling in the range of approximately – 20 °C to 220 °C (– 4 °F to 428 °F).]

Components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)	M-Factor, SCL, ATE
Substance of unknown or variable composition, complex reaction products or biological material (UVCB) :			
Naphtha (petroleum), full-range straight-run; Low boiling point naphtha	64741-42-0 265-042-6	<= 100	
Main constituents :			
pentane	109-66-0 203-692-4	>= 0 - < 70	
isopentane	78-78-4 201-142-8	>= 0 - < 45	
n-hexane	110-54-3 203-777-6	>= 0 - < 40	specific concentration limit STOT RE 2; H373 >= 5 %
2-methylpentane	107-83-5 203-523-4	>= 0 - < 15	

n-heptane	142-82-5 205-563-8	>= 0 - < 20	
toluene	108-88-3 203-625-9	>= 0 - < 5	
benzene	71-43-2 200-753-7	>= 0,1 - < 5	

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Do not ingest. If swallowed then seek immediate medical assistance.

If inhaled : Move to fresh air.
Keep patient warm and at rest.
Oxygen or artificial respiration if needed.
Seek medical advice immediately.

In case of skin contact : Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.
If symptoms persist, call a physician.

In case of eye contact : In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
If easy to do, remove contact lens, if worn.
Get medical attention if irritation develops and persists.

If swallowed : If swallowed, call a poison control centre or doctor immediately.
Rinse mouth with water.
Do NOT induce vomiting.
Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Symptoms of poisoning:
Dizziness
Headache
Nausea
Shortness of breath
Convulsions
Unconsciousness

Inhalation:
Headache

Nausea
Vomiting
Unconsciousness

Skin contact:
Redness
Irritation

Eye contact:
Irritation

Ingestion:
Few or no symptoms expected.
Nausea
Diarrhoea

Risks : May be fatal if swallowed and enters airways.
Causes skin irritation.
May cause drowsiness or dizziness.
May cause genetic defects.
May cause cancer.
Suspected of damaging fertility or the unborn child.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Symptoms of poisoning may not appear for several hours.
Keep under medical supervision for at least 48 hours.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Dry powder
Carbon dioxide (CO2)
Foam
Water mist
Sand

Unsuitable extinguishing media : High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Vapours may form explosive mixtures with air.
Vapours are heavier than air and may spread along floors.
Flash back possible over considerable distance.
Fire will produce dense black smoke containing hazardous combustion products (see section 10).

Hazardous combustion : Carbon monoxide

products	Carbon dioxide (CO2) Nitrogen oxides (NOx) Hydrogen sulphide Sulphur oxides

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Wear self-contained breathing apparatus and protective suit.
Further information	:	Observe the risk of explosion. Cool containers/tanks with water spray. In the event of fire and/or explosion do not breathe fumes. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Eliminate all ignition sources if safe to do so.
Avoid and prevent all contact and exposure.
Keep people away from and upwind of spill/leak.
Attempt to stop leakage without personal risk.
Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
Ensure adequate ventilation, especially in confined areas.
Use personal protective equipment.
See chapter 8.
Remove all sources of ignition.
Do not use sparking tools.
Pay attention to flashback.

6.2 Environmental precautions

Prevent product from entering environment and drains.
If major spillage occurs, contact the proper local authorities.

6.3 Methods and material for containment and cleaning up

Soak up with inert absorbent material.
Collect mechanically and dispose in suitable container for disposal.
Non-sparking tools should be used.
Remove from surface water (e.g. by skimming or siphoning).

6.4 Reference to other sections

For personal protection see section 8.
For disposal considerations see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling	:	Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid contact with skin, eyes and clothing. Avoid inhalation of vapour or mist. Vapours may form explosive mixtures with air. Use only outdoors or in a well-ventilated area. The following actions are recommended: Closed systems for handling, process and storage. Keep away from food, drink and animal feedingstuffs. When using do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product. Take off contaminated clothing and wash before reuse.
Advice on protection against fire and explosion	:	Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges. All equipment shall be grounded. No sparking tools should be used. Use explosion-proof equipment.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice for diagnostics. Avoid and prevent all spillage, contact and exposure.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Keep containers tightly closed in a cool, well-ventilated place. Keep locked up or in an area accessible only to qualified or authorised persons. Protect from sunlight. Suitable materials for containers: Mild steel Stainless steel
Further information on storage conditions	:	Keep away from sources of ignition - No smoking.
Advice on common storage	:	Incompatible with oxidizing agents Keep away from food, drink and animal feedingstuffs.

7.3 Specific end use(s)

Specific use(s)	:	For professional users only.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
pentane	109-66-0	TWA	1.000 ppm 3.000 mg/m3	2006/15/EC
Further information	Indicative			
		HTP-arvot 15 min	630 ppm 1.900 mg/m3	FI OEL
		HTP-arvot 8h	500 ppm 1.500 mg/m3	FI OEL
		TWA	1.000 ppm 3.000 mg/m3	2006/15/EC
Further information	Indicative			
isopentane	78-78-4	TWA	1.000 ppm 3.000 mg/m3	2006/15/EC
Further information	Indicative			
		HTP-arvot 15 min	630 ppm 1.900 mg/m3	FI OEL
		HTP-arvot 8h	500 ppm 1.500 mg/m3	FI OEL
n-hexane	110-54-3	TWA	20 ppm 72 mg/m3	2006/15/EC
Further information	Indicative			
		HTP-arvot 8h	20 ppm 72 mg/m3	FI OEL
Further information	The health risk of absorbed amounts of compounds which can pass through the skin to the body cannot be evaluated from their atmospheric concentration. Therefore these compounds have the notification 'skin'in the list. Many compounds can be irritating or corrosive when in contact with the skin, especially strong acids and bases.			
2-methylpentane	107-83-5	HTP-arvot 8h	500 ppm 1.800 mg/m3	FI OEL
		HTP-arvot 15 min	630 ppm 2.300 mg/m3	FI OEL
n-heptane	142-82-5	TWA	500 ppm 2.085 mg/m3	2000/39/EC
Further information	Indicative			
		HTP-arvot 8h	300 ppm 1.200 mg/m3	FI OEL
		HTP-arvot 15 min	500 ppm 2.100 mg/m3	FI OEL
toluene	108-88-3	TWA	50 ppm	2006/15/EC

			192 mg/m3	
Further information	Indicative, Identifies the possibility of significant uptake through the skin			
		STEL	100 ppm 384 mg/m3	2006/15/EC
Further information	Indicative, Identifies the possibility of significant uptake through the skin			
		HTP-arvot 8h	25 ppm 81 mg/m3	FI OEL
Further information	'Noise': substances that are known to amplify the harmful effects of noise on hearing, The health risk of absorbed amounts of compounds which can pass through the skin to the body cannot be evaluated from their atmospheric concentration. Therefore these compounds have the notification 'skin'in the list. Many compounds can be irritating or corrosive when in contact with the skin, especially strong acids and bases.			
		HTP-arvot 15 min	100 ppm 380 mg/m3	FI OEL
Further information	'Noise': substances that are known to amplify the harmful effects of noise on hearing, The health risk of absorbed amounts of compounds which can pass through the skin to the body cannot be evaluated from their atmospheric concentration. Therefore these compounds have the notification 'skin'in the list. Many compounds can be irritating or corrosive when in contact with the skin, especially strong acids and bases.			
benzene	71-43-2	TWA	1 ppm 3,25 mg/m3	2004/37/EC
Further information	Skin, Carcinogens or mutagens			
Further information	The health risk of absorbed amounts of compounds which can pass through the skin to the body cannot be evaluated from their atmospheric concentration. Therefore these compounds have the notification 'skin'in the list. Many compounds can be irritating or corrosive when in contact with the skin, especially strong acids and bases.			
		TWA	1 ppm 3,25 mg/m3	FI OEL CM
Further information	Carcinogens or mutagens, Skin			

Biological occupational exposure limits

Substance name	CAS-No.	Control parameters	Sampling time	Basis
toluene	108-88-3	toluene: 500 Nanomoles per liter (Blood)	Morning after working day	FI BAT

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
Naphtha	Workers	Inhalation	Acute systemic effects	1300 mg/m3
	Workers	Inhalation	Long-term local effects	840 mg/m3
	Workers	Inhalation	Acute local effects	1100 mg/m3
	Consumers	Inhalation	Acute systemic	1200 mg/m3

			effects	
	Consumers	Inhalation	Long-term local effects	180 mg/m3
	Consumers		Acute local effects	640 mg/m3

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
Naphtha		
Remarks:	Substance is a hydrocarbon with a complex, unknown or variable composition (UVCB)., Conventional methods of deriving PNECs are not appropriate and it is not possible to identify a single representative PNEC for such substances., The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	

8.2 Exposure controls

Engineering measures

The following actions are recommended: Closed systems for handling, process and storage.
Use personal protective equipment.
Avoid inhalation of vapour or mist.
Provide adequate ventilation.

Personal protective equipment

Eye protection : Tightly fitting safety goggles
Face-shield
(EN 166)

Hand protection
Material : PVA
Break through time : > 480 min

Material : Nitrile rubber
Break through time : > 480 min

Remarks : Wear suitable gloves.
The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).

Skin and body protection : Wear suitable protective clothing and rubber boots.

Respiratory protection : In case of insufficient ventilation: Respirator with AX filter or self-contained breathing apparatus.
(EN 371/EN 14387:2004)

Environmental exposure controls

General advice : Prevent product from entering environment and drains. If major spillage occurs, contact the proper local authorities.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid (20 °C, 101,3 kPa)
Colour	:	clear
Odour	:	No data available
Odour Threshold	:	No data available
Melting point	:	Not applicable
Boiling range	:	-20 - 180 °C
Flammability	:	Extremely flammable.
Flash point	:	< 0 °C
Decomposition temperature	:	No data available
pH	:	No data available
Viscosity		
Viscosity, dynamic	:	< 7 Pa.s
Solubility(ies)		
Water solubility	:	< 0,1 g/l
Solubility in other solvents	:	Not applicable
Partition coefficient: n-octanol/water	:	Not applicable
Vapour pressure	:	2 - 240 kPa
Relative density	:	0,63 - 0,75
Density	:	686 g/cm³
Bulk density	:	No data available

9.2 Other information

Explosives	:	Not explosive
Oxidizing properties	:	Not applicable
Self-ignition	:	280 - 470 °C
Evaporation rate	:	No data available

Molecular weight : Not applicable

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : Vapours may form explosive mixture with air.

10.4 Conditions to avoid

Conditions to avoid : Keep away from open flames, hot surfaces and sources of ignition.

10.5 Incompatible materials

Materials to avoid : Oxidizing agents

10.6 Hazardous decomposition products

Under fire conditions:
Carbon monoxide
Carbon dioxide (CO2)
Nitrogen oxides (NOx)
Sulphur oxides
Hydrogen sulphide

SECTION 11: Toxicological information

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

Acute toxicity

Based on available data, the classification criteria are not met.

Product:

Acute oral toxicity : LD50 (Rat): > 5.000 mg/kg
Method: OECD Test Guideline 401
Remarks: Read-across (Analogy)

Acute inhalation toxicity : LC50 (Rat): > 5,61 mg/l
Test atmosphere: vapour

Method: OECD Test Guideline 403
Remarks: Read-across (Analogy)

Acute dermal toxicity : LD50 (Rabbit): > 2.000 mg/kg
Method: OECD Test Guideline 402
Remarks: Read-across (Analogy)

Skin corrosion/irritation

Causes skin irritation.

Product:

Species	:	Rabbit
Assessment	:	Irritating to skin.
Method	:	OECD Test Guideline 404
Remarks	:	Read-across (Analogy)

Serious eye damage/eye irritation

Based on available data, the classification criteria are not met.

Product:

Species	:	Rabbit
Assessment	:	No eye irritation
Method	:	OECD Test Guideline 405
Remarks	:	Read-across (Analogy)

Respiratory or skin sensitisation

Skin sensitisation

Based on available data, the classification criteria are not met.

Respiratory sensitisation

Based on available data, the classification criteria are not met.

Product:

Test Type	:	Buehler Test
Species	:	Guinea pig
Assessment	:	Does not cause skin sensitisation.
Method	:	OECD Test Guideline 406
Remarks	:	Read-across (Analogy)

Germ cell mutagenicity

May cause genetic defects.

Product:

Genotoxicity in vitro : Test Type: in vitro assay
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Remarks: Read-across (Analogy)

: Test Type: In vitro gene mutation study in mammalian cells
Method: OECD Test Guideline 476
Result: negative
Remarks: Read-across (Analogy)

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Rat
Method: OECD Test Guideline 474
Result: negative

Test Type: in vivo assay
Species: Rat
Method: OECD Test Guideline 475
Result: negative

Components:

benzene:

Genotoxicity in vitro : Test Type: Ames test
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

: Test Type: Chromosome aberration test in vitro
Metabolic activation: with and without metabolic activation
Result: positive

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Mouse
Application Route: inhalation (vapour)
Method: OECD Test Guideline 474
Result: positive

Species: Human
Result: Positive results were obtained in some in vivo tests.

Carcinogenicity

May cause cancer.

Product:

Species : Mouse
Application Route : Dermal
: 0,5 ml

Method	:	OECD Test Guideline 451
Remarks	:	Read-across (Analogy)
Species	:	Rat
Application Route	:	Inhalation
	:	292 ppm
Method	:	OECD Test Guideline 453
Remarks	:	Read-across (Analogy)

Components:

benzene:

Species	:	Rat, male and female
Application Route	:	Oral
Exposure time	:	103 wks
Dose	:	25 mg/kg bw/d
Frequency of Treatment	:	1/d, 5 d/wk
Method	:	OECD Test Guideline 453
Species	:	Mouse, male and female
Application Route	:	Inhalation
Exposure time	:	2 - 16 wks
Dose	:	960 mg/m3
Frequency of Treatment	:	6 h/d, 5 d/wk

Reproductive toxicity

Suspected of damaging fertility or the unborn child.

Product:

Effects on fertility	:	Species: Rat General Toxicity - Parent: No observed adverse effect level: > 24.700 mg/m³ General Toxicity F1: No observed adverse effect level: > 24.700 mg/m³ Method: OECD Test Guideline 421
Effects on foetal development	:	General Toxicity Maternal: NOAEL: 23.900 mg/m³ Developmental Toxicity: NOAEL: 23.900 mg/m³ Method: OECD Test Guideline 414 Teratogenicity: NOAEL: > 20.000 mg/m³ Developmental Toxicity: NOAEL: > 20.000 mg/m³ Method: OECD Test Guideline 416

STOT - single exposure

May cause drowsiness or dizziness.

Product:

Exposure routes	:	Inhalation
Remarks	:	May cause drowsiness or dizziness.

STOT - repeated exposure

Based on available data, the classification criteria are not met.

Repeated dose toxicity

Product:

Species	:	Rat
NOAEL	:	20 mg/l
Application Route	:	inhalation (vapour)
Exposure time	:	90 d
Method	:	EPA OPPTS 870.3465
Remarks	:	Systemic effects Read-across (Analogy)

Species	:	Rat
NOAEL	:	9,84 mg/l
Application Route	:	inhalation (vapour)
Method	:	OECD Test Guideline 412
Remarks	:	Read-across (Analogy)

Species	:	Rat
NOAEL	:	1402 mg/l
Application Route	:	inhalation (vapour)
Method	:	OECD Test Guideline 453
Remarks	:	Read-across (Analogy)

Species	:	Rat
NOAEL	:	3750 mg/kg
Application Route	:	Dermal
Method	:	OECD Test Guideline 410
Remarks	:	Read-across (Analogy)

Aspiration toxicity

May be fatal if swallowed and enters airways.

Product:

May be fatal if swallowed and enters airways.

11.2 Information on other hazards

Endocrine disrupting properties

Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according

to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Further information

Product:

Remarks : Components of the product may be absorbed into the body by inhalation and through the skin.

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish : LL50 (Oncorhynchus mykiss (rainbow trout)): 10 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
Remarks: Read-across (Analogy)

LL50 (fathead minnow (Pimephales promelas)): 8,2 mg/l
Exposure time: 96 h
Method: EPA 66013-75-009
Remarks: Read-across (Analogy)

Toxicity to daphnia and other aquatic invertebrates : EL50 (Daphnia magna (Water flea)): 4,5 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202
Remarks: Read-across (Analogy)

Toxicity to algae/aquatic plants : EL50 (Pseudokirchneriella subcapitata (green algae)): 3,1 mg/l
End point: Growth rate
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Read-across (Analogy)

NOELR (Pseudokirchneriella subcapitata (green algae)): 0,5 mg/l
End point: Growth rate
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Read-across (Analogy)

EL50 (Pseudokirchneriella subcapitata (microalgae)): 3,7 mg/l
End point: Growth rate

Exposure time: 96 h
Method: OECD Test Guideline 201
Remarks: Read-across (Analogy)

Toxicity to fish (Chronic toxicity) : Remarks: No data available

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOELR: 2,6 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 211
Remarks: Read-across (Analogy)
toxic effects for reproduction

Toxicity to microorganisms : EC50 (Tetrahymena pyriformis): 15,41 mg/l
Exposure time: 40 h
Test Type: Growth inhibition
Method: QSAR

Ecotoxicology Assessment

Long-term (chronic) aquatic hazard : Toxic to aquatic life with long lasting effects.

Components:

n-heptane:

Toxicity to fish : LL50 (Rainbow trout): 5,7 mg/l
Exposure time: 96 h
Method: QSAR

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 1,5 mg/l
Exposure time: 48 h

Toxicity to fish (Chronic toxicity) : NOELR: 1,284 mg/l
Exposure time: 28 d
End point: Growth rate
Method: QSAR

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 0,17 mg/l
Exposure time: 21 d
Species: Daphnia (water flea)
Method: OECD Test Guideline 211

benzene:

Toxicity to fish (Chronic toxicity) : LOEC: 1,6 mg/l
Exposure time: 32 d
Species: Pimephales promelas (fathead minnow)
Test Type: flow-through test

Toxicity to daphnia and other aquatic invertebrates : NOEC: 3 mg/l
Exposure time: 7 d

(Chronic toxicity)	Species: Ceriodaphnia dubia (water flea) Test Type: semi-static test

12.2 Persistence and degradability

Product:

Biodegradability	:	Remarks: Not applicable Substance is complex UVCB.

Components:

benzene:

Biodegradability	:	Test Type: activated sludge Result: Readily biodegradable. Kinetic: 10 d: 88 % 28 d: 96 % Method: OECD Test Guideline 301F

12.3 Bioaccumulative potential

Product:

Bioaccumulation	:	Remarks: Not applicable Substance is complex UVCB.

Components:

benzene:

Bioaccumulation	:	Bioconcentration factor (BCF): 13 Method: QSAR Remarks: Bioaccumulation not expected. log Pow: 2,13

12.4 Mobility in soil

Product:

Mobility	:	Remarks: Not applicable

12.5 Results of PBT and vPvB assessment

Product:

Assessment	:	This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher..

12.6 Endocrine disrupting properties

Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Product:

Additional ecological information	:	Prone to photochemical degradation, reacting with OH radicals and ozone.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	Dispose of as hazardous waste in compliance with local and national regulations. List of suggested waste codes/waste designations in accordance with the EWC: 13 07 02 (petrol) 13 07 03 (other fuels (including mixtures))
Contaminated packaging	:	Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14: Transport information

14.1 UN number or ID number

ADR	:	UN 1268
IMDG	:	UN 1268

14.2 UN proper shipping name

ADR	:	PETROLEUM PRODUCTS, N.O.S. (Naphtha, petroleum, full-range straight-run)
IMDG	:	PETROLEUM PRODUCTS, N.O.S. (Naphtha, petroleum, full-range straight-run)

14.3 Transport hazard class(es)

ADR	:	3
IMDG	:	3

14.4 Packing group

ADR

Packing group	:	I
Classification Code	:	F1
Hazard Identification Number	:	33
Labels	:	3
Tunnel restriction code	:	(D/E)

IMDG

Packing group	:	I
Labels	:	3
EmS Code	:	F-E, S-E

14.5 Environmental hazards

ADR

Environmentally hazardous	:	yes

IMDG

Marine pollutant	:	yes

IATA (Cargo)

Environmentally hazardous	:	yes

14.6 Special precautions for user

Remarks : SDS: No specific instructions needed.
The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Maritime transport in bulk according to IMO instruments

Remarks : Not applicable

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	:	Conditions of restriction for the following entries should be considered: Number on list 3

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

Category		Quantity 1	Quantity 2
34	Petroleum products: (a) gasolines and naphthas, (b) kerosenes (including jet fuels), (c) gas oils (including diesel fuels, home heating oils and gas oil blending streams),(d) heavy fuel oils	2.500 t	25.000 t

Other regulations:

Europe. Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work
Take note of Dir 92/85/EEC on the safety and health at work of pregnant workers.
Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

EUH066	:	Repeated exposure may cause skin dryness or cracking.

Full text of other abbreviations

2000/39/EC	:	Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values
2004/37/EC	:	Europe. Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work
2006/15/EC	:	Europe. Indicative occupational exposure limit values
FI BAT	:	Finland. Biological limit values
FI OEL	:	Finland. HTP Values - Concentrations Known to be Harmful
FI OEL CM	:	Finland. Government Decree combating the risk of work-related cancer
2000/39/EC / TWA	:	Limit Value - eight hours
2004/37/EC / TWA	:	Long term exposure limit
2006/15/EC / TWA	:	Limit Value - eight hours
2006/15/EC / STEL	:	Short term exposure limit
FI OEL / HTP-arvot 8h	:	Long term exposure limit
FI OEL / HTP-arvot 15 min	:	Short term exposure limit
FI OEL CM / TWA	:	Long term exposure limit

Further information

Issuer	:	Borealis, Group Product Stewardship

Sources of key data used to compile the Safety Data Sheet	:	Chemical Safety Report, Naphthas (petroleum), full-range straight-run, CONCAWE REACH Consortium, 2020

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Disclaimer

To the best of our knowledge, the information contained herein is accurate and reliable as of the date of publication; however we do not assume any liability whatsoever for the accuracy and completeness of such information.

Borealis makes no warranties which extend beyond the description contained herein. Nothing herein shall constitute any warranty of merchantability or fitness for a particular purpose.

It is the customer's responsibility to inspect and test our products in order to satisfy itself as to the suitability of the products for the customer's particular purpose. The customer is responsible for the appropriate, safe and legal use, processing and handling of our products.

No liability can be accepted in respect of the use of Borealis' products in conjunction with other materials. The information contained herein relates exclusively to our products when not used in conjunction with any third party materials.

Annex: Exposure Scenarios

Table of Contents

ES1: Use as an intermediate

1.1. Title section

Structured Short Title	:	Use at industrial sites, Use as an intermediate

Environment		
CS1	**Environment**	ERC6a
Worker		
CS2	**General measures (flammability), General measures (aspiration), General measures (skin irritants), General measures (carcinogens), General measures applicable to all activities**	PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15, PROC28
CS3	**General exposures (closed systems)**	PROC1
CS4	**General exposures (closed systems)**	PROC2
CS5	**General exposures, Batch process, Closed systems**	PROC3
CS6	**Laboratory activities**	PROC15
CS7	**Bulk transfers, Closed systems, Loading and unloading**	PROC8b
CS8	**Equipment cleaning and maintenance**	PROC8a, PROC28
CS9	**Storage**	PROC1
CS10	**Storage**	PROC2

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Use of intermediate (ERC6a)

Amount used, frequency and duration of use (or from service life)		
Annual amount per site	:	15000 t
Daily amount per site	:	50000 kg

Maximum allowable site tonnage (MSafe)	:	68.000 kg
Emission days	:	300
Technical and organisational conditions and measures		
Treat air emission to provide a typical removal efficiency of (%): Air - minimum efficiency of 80 %		
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): Water - minimum efficiency of 94,2 %		
Risk from environmental exposure is driven by freshwater sediment.		
Prevent discharge of undissolved substance to or recover from onsite wastewater.		
If discharging to domestic sewage treatment plant, no on-site wastewater treatment required.		
Do not apply industrial sludge to natural soils.		
Sewage sludge should be incinerated, contained or reclaimed.		
Conditions and measures related to sewage treatment plant		
STP type	:	Municipal Sewage Treatment Plant
STP effluent	:	2.000 m³/d
Not applicable as there is no release to wastewater.		
Estimated substance removal from wastewater via domestic sewage treatment: Water - minimum efficiency of 95,7 %		
Other conditions affecting environmental exposure		
Local freshwater dilution factor	:	10
Local marine water dilution factor	:	100

1.2.2. Control of worker exposure: General measures (flammability), General measures (aspiration), General measures (skin irritants), General measures (carcinogens), General measures applicable to all activities

Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Use as laboratory reagent (PROC15) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Product (article) characteristics		
Covers concentrations up to 100 %		
Physical form of product	:	Liquid
Vapour pressure	:	Liquid, vapour pressure > 10 kPa at Standard Temperature and Pressure
Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Covers use up to 8 hours/day
Technical and organisational conditions and measures		
Provide a basic standard of general ventilation (1 to 3 air changes per hour).		
Occupational Health and Safety Management System: Advanced		
Conditions and measures related to personal protection, hygiene and health evaluation		
General measures (flammability) Use in contained systems Keep away from sources of ignition - No smoking. Use only in well-ventilated areas. To avoid ignition of vapours by static electricity discharge, all metal parts of the equipment must be grounded. No sparking tools should be used.		
General measures (aspiration) Do not ingest. If swallowed then seek immediate medical assistance.		
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. Use suitable eye protection and gloves.		
General measures (carcinogens) Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local		

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

1.2.3. Control of worker exposure: General exposures (closed systems)
Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Technical and organisational conditions and measures		
Handle substance within a closed system.		
Sample via a closed loop or other system to avoid exposure.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. Dermal - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 20 °C

1.2.4. Control of worker exposure: General exposures (closed systems)
Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Technical and organisational conditions and measures
Handle substance within a closed system.
Sample via a closed loop or other system to avoid exposure.
Local exhaust ventilation Inhalation - minimum efficiency of 90 %
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.

Dermal - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 20 °C

1.2.5. Control of worker exposure: General exposures, Batch process, Closed systems
Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Handle substance within a closed system.		
Sample via a closed loop or other system to avoid exposure.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 20 °C

1.2.6. Control of worker exposure: Laboratory activities
Use as laboratory reagent (PROC15)

Technical and organisational conditions and measures		
Local exhaust ventilation Handle within a fume cupboard or implement suitable equivalent methods to minimise exposure. Inhalation - minimum efficiency of 99 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %		
Other conditions affecting workers exposure		

Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 20 °C
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Put lids on containers immediately after use.		

1.2.7. Control of worker exposure: Bulk transfers, Closed systems, Loading and unloading Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 95 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 20 °C

1.2.8. Control of worker exposure: Equipment cleaning and maintenance Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Amount used, frequency and duration of use (or from service life)		
Use frequency	:	Covers use up to 4 hours/day
Technical and organisational conditions and measures		
Local exhaust ventilation Inhalation - minimum efficiency of 90 %		
Drain down and flush system prior to equipment break-in or maintenance. Inhalation - minimum efficiency of 90 %		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %		

Wear suitable coveralls to prevent exposure to the skin.		
Wear suitable respiratory protection. Efficiency: APF 10 Inhalation - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 20 °C
Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply		
Clear spills immediately.		

1.2.9. Control of worker exposure: Storage
Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Technical and organisational conditions and measures		
Store substance within a closed system.		
Conditions and measures related to personal protection, hygiene and health evaluation		
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 20 °C

1.2.10. Control of worker exposure: Storage
Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Technical and organisational conditions and measures
Local exhaust ventilation Inhalation - minimum efficiency of 90 %
Store substance within a closed system.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.

Dermal - minimum efficiency of 90 %		
Other conditions affecting workers exposure		
Indoor or outdoor use	:	Indoor use
Temperature	:	Assumes process temperature up to 20 °C

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: Use of intermediate (ERC6a)

Compartment	Exposure level	RCR
Air	0,068 mg/m³ (Petrorisk)	
Freshwater	0,22 mg/L (Petrorisk)	0,55
Marine water	0,022 mg/L (Petrorisk)	0,055
Freshwater sediment	0,78 mg/kg wet weight (Petrorisk)	0,74
Marine sediment	0,078 mg/kg wet weight (Petrorisk)	0,074
Agricultural soil	0,00027 mg/kg wet weight (Petrorisk)	< 0,001
Top predator's prey (marine water)	0,033 mg/kg wet weight (Petrorisk)	< 0,004

Additional information on exposure estimation
The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

1.3.3. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR	Remarks
inhalative	systemic	long-term	0,00163 mg/m³ (ECETOC TRA worker v3)	< 0,01	Benzene
inhalative	systemic	short-term	0,167 mg/m³ (ECETOC TRA worker v3)	< 0,01	

inhalative	systemic	short-term	0,00651 mg/m³ (ECETOC TRA worker v3)	< 0,01	Benzene
inhalative	local	long-term	0,042 mg/m³ (ECETOC TRA worker v3)	< 0,01	
inhalative	local	short-term	0,167 mg/m³ (ECETOC TRA worker v3)	< 0,01	
dermal	systemic	long-term	0,00017 mg/kg bw/day (ECETOC TRA worker v3)		Benzene
dermal	local	long-term	0,000992 mg/cm2 (ECETOC TRA worker v3)		
dermal	local	long-term	0,0000496 mg/cm2 (ECETOC TRA worker v3)		Benzene
dermal	local	short-term	0,000992 mg/cm2 (ECETOC TRA worker v3)		
dermal	local	short-term	0,0000496 mg/cm2 (ECETOC TRA worker v3)		Benzene
combined routes	systemic	short-term		< 0,01	

1.3.4. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR	Remarks
inhalative	systemic	long-term	0,407 mg/m³ (ECETOC TRA worker v3)	0,212	Benzene
inhalative	systemic	short-term	41,67 mg/m³ (ECETOC TRA worker v3)	0,032	
inhalative	systemic	short-term	1,627 mg/m³ (ECETOC TRA worker v3)		Benzene
inhalative	local	long-term	10,42 mg/m³ (ECETOC TRA	0,012	

			worker v3)		
inhalative	local	short-term	41,67 mg/m³ (ECETOC TRA worker v3)	0,039	
dermal	systemic	long-term	0,00685 mg/kg bw/day (ECETOC TRA worker v3)		Benzene
dermal	local	long-term	0,02 mg/cm2 (ECETOC TRA worker v3)		
dermal	local	long-term	0,000999 mg/cm2 (ECETOC TRA worker v3)		Benzene
dermal	local	short-term	0,02 mg/cm2 (ECETOC TRA worker v3)		
dermal	local	short-term	0,000999 mg/cm2 (ECETOC TRA worker v3)		Benzene
combined routes				0,032	

1.3.5. Worker exposure: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR	Remarks
inhalative	systemic	long-term	0,814 mg/m³ (ECETOC TRA worker v3)	0,424	Benzene
inhalative	systemic	short-term	83,33 mg/m³ (ECETOC TRA worker v3)	0,065	
inhalative	systemic	short-term	3,255 mg/m³ (ECETOC TRA worker v3)		Benzene
inhalative	local	long-term	20,83 mg/m³ (ECETOC TRA worker v3)	0,025	
inhalative	local	short-term	83,33 mg/m³ (ECETOC TRA worker v3)	0,078	

dermal	systemic	long-term	0,00345 mg/kg bw/day (ECETOC TRA worker v3)		Benzene
dermal	local	long-term	0,02 mg/cm2 (ECETOC TRA worker v3)		
dermal	local	long-term	0,00101 mg/cm2 (ECETOC TRA worker v3)		Benzene
dermal	local	short-term	0,02 mg/m³ (ECETOC TRA worker v3)		
dermal	local	short-term	0,00101 mg/cm2 (ECETOC TRA worker v3)		Benzene
combined routes	systemic	short-term		0,065	

1.3.6. Worker exposure: Use as laboratory reagent (PROC15)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR	Remarks
inhalative	systemic	long-term	0,814 mg/m³ (ECETOC TRA worker v3)	0,424	Benzene
inhalative	systemic	short-term	83,33 mg/m³ (ECETOC TRA worker v3)	0,065	
inhalative	systemic	short-term	3,255 mg/m³ (ECETOC TRA worker v3)		Benzene
inhalative	local	long-term	20,83 mg/m³ (ECETOC TRA worker v3)	0,025	
inhalative	local	short-term	83,33 mg/m³ (ECETOC TRA worker v3)	0,078	
dermal	systemic	long-term	0,0017 mg/kg bw/day (ECETOC TRA worker v3)		Benzene
dermal	local	long-term	0,00992 mg/cm2 (ECETOC TRA worker v3)		

dermal	local	long-term	0,000496 mg/cm2 (ECETOC TRA worker v3)		Benzene
dermal	local	short-term	0,00992 mg/cm2 (ECETOC TRA worker v3)		
dermal	local	short-term	0,000496 mg/cm2 (ECETOC TRA worker v3)		Benzene
combined routes	systemic	short-term		0,065	

1.3.7. Worker exposure: Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR	Remarks
inhalative	systemic	long-term	1,22 mg/m³ (ECETOC TRA worker v3)	0,636	Benzene
inhalative	systemic	short-term	125 mg/m³ (ECETOC TRA worker v3)	0,097	
inhalative	systemic	short-term	4,882 mg/m³ (ECETOC TRA worker v3)		Benzene
inhalative	local	long-term	31,25 mg/m³ (ECETOC TRA worker v3)	0,037	
inhalative	local	short-term	125 mg/m³ (ECETOC TRA worker v3)	0,117	
dermal	systemic	long-term	0,069 mg/kg bw/day (ECETOC TRA worker v3)		Benzene
dermal	local	long-term	0,1 mg/cm2 (ECETOC TRA worker v3)		
dermal	local	long-term	0,005 mg/cm2 (ECETOC TRA worker v3)		Benzene
dermal	local	short-term	0,1 mg/cm2 (ECETOC TRA		

			worker v3)		
dermal	local	short-term	0,005 mg/cm2		Benzene
combined routes	systemic	short-term		0,097	

1.3.8. Worker exposure: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Manual maintenance (cleaning and repair) of machinery (PROC28)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR	Remarks
inhalative	systemic	long-term	0,244 mg/m³ (ECETOC TRA worker v3)	0,127	Benzene
inhalative	systemic	short-term	41,67 mg/m³ (ECETOC TRA worker v3)	0,032	
inhalative	systemic	short-term	1,627 mg/m³ (ECETOC TRA worker v3)		Benzene
inhalative	local	long-term	6,25 mg/m³ (ECETOC TRA worker v3)	< 0,01	
inhalative	local	short-term	41,67 mg/m³ (ECETOC TRA worker v3)	0,039	
dermal	systemic	long-term	0,041 mg/kg bw/day (ECETOC TRA worker v3)		Benzene
dermal	local	long-term	0,06 mg/cm2 (ECETOC TRA worker v3)		
dermal	local	long-term	0,003 mg/cm2 (ECETOC TRA worker v3)		Benzene
dermal	local	short-term	0,06 mg/cm2 (ECETOC TRA worker v3)		
dermal	local	short-term	0,003 mg/cm2 (ECETOC TRA worker v3)		Benzene
combined routes	systemic	short-term	(ECETOC TRA worker v3)	0,032	

1.3.9. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR	Remarks
inhalative	systemic	long-term	0,00163 mg/m³ (ECETOC TRA worker v3)	< 0,01	Benzene
inhalative	systemic	short-term	0,167 mg/m³ (ECETOC TRA worker v3)	< 0,01	
inhalative	systemic	short-term	0,00651 mg/m³ (ECETOC TRA worker v3)		Benzene
inhalative	local	long-term	0,042 mg/m³ (ECETOC TRA worker v3)	< 0,01	
inhalative	local	short-term	0,167 mg/m³ (ECETOC TRA worker v3)	< 0,01	
dermal	systemic	long-term	0,00017 mg/kg bw/day (ECETOC TRA worker v3)		Benzene
dermal	local	long-term	0,000992 mg/cm2 (ECETOC TRA worker v3)		
dermal	local	long-term	0,0000496 mg/cm2 (ECETOC TRA worker v3)		Benzene
dermal	local	short-term	0,000992 mg/cm2 (ECETOC TRA worker v3)		
dermal	local	short-term	0,0000496 mg/cm2 (ECETOC TRA worker v3)		
combined routes	systemic	short-term		< 0,01	

1.3.10. Worker exposure: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2)

Exposure route	Health effect	Exposure indicator	Exposure level	RCR	Remarks

inhalative	systemic	long-term	0,407 mg/m³ (ECETOC TRA worker v3)	0,212	Benzene
inhalative	systemic	short-term	41,67 mg/m³ (ECETOC TRA worker v3)	0,032	
inhalative	systemic	short-term	1,627 mg/m³ (ECETOC TRA worker v3)		Benzene
inhalative	local	long-term	10,42 mg/m³ (ECETOC TRA worker v3)	0,012	
inhalative	local	short-term	41,67 mg/m³ (ECETOC TRA worker v3)	0,039	
dermal	systemic	long-term	0,00685 mg/kg bw/day (ECETOC TRA worker v3)		Benzene
dermal	local	long-term	0,02 mg/cm2 (ECETOC TRA worker v3)		
dermal	local	long-term	0,000999 mg/cm2 (ECETOC TRA worker v3)		Benzene
dermal	local	short-term	0,02 mg/cm2 (ECETOC TRA worker v3)		
dermal	local	short-term	0,000999 mg/cm2 (ECETOC TRA worker v3)		
combined routes	systemic	short-term		0,032	

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

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).
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.