Revision: 1st March 2023 Version: 005





### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product Name Heavy Catalytic Reformed Mogas / Naphtha

Product Description V4051-REFORMATE HEAVY CATALYTIC-Heavy Catalytic Reformed

Mogas / Naphtha

Trade Name REFORMATE HEAVY CATALYTIC

Product code REFORHEA, V4051

CAS No. 68955-35-1 EC No. 273-271-8

REACH Registration No. 01-2119485927-18-xxxx

1.2 Relevant identified uses of the substance or mixture

and uses advised against Identified Use(s)

No.	Exposure Scenario	Page:	
1	Distribution of Naphtha (petroleum), catalytic reformed (0 – 1		
	% benzene content)		
2	Formulation and (re)packing of Naphtha (petroleum), catalytic reformed (0 – 1 % benzene content)	15	
3	Use of Naphtha (petroleum), catalytic reformed (0 – 1 %	18	
	benzene content) as a fuel - Industrial		
4	Use of Naphtha (petroleum), catalytic reformed (0 – 1 % benzene content) as a fuel - Professional	21	
5	Use of Naphtha (petroleum), catalytic reformed (0 – 1 % benzene content) as a fuel - Consumer	24	

Uses Advised Against Anything other than the above.

1.3 Details of the supplier of the safety data sheet

Company Identification Vitol SA

Place des Bergues 3 1201 Geneva Switzerland +31 10 498 7200 +31 10 452 9545 xreach@vitol.com

1.4 Emergency telephone number

E-Mail (competent person)

Telephone

Fax

Emergency Phone No. +44 (0) 1235 239 670, 24/7
Languages spoken All official European languages.

#### **SECTION 2: HAZARDS IDENTIFICATION**

2.1 Classification of the substance or mixture

**2.1.1 Regulation (EC) No. 1272/2008 (CLP)** Flam. Liq. 1; H224

Asp. Tox. 1; H304 Skin Irrit. 2; H315 Muta. 1B; H340 Carc. 1B; H350 Repr. 2; H361fd

STOT SE 3; H336 (central nervous system, inhalation)

Aquatic Chronic 2; H411

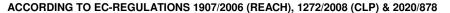
2.2 Label elements According to Regulation (EC) No. 1272/2008 (CLP)

Product description V4051-REFORMATE HEAVY CATALYTIC-Heavy Catalytic Reformed

Mogas / Naphtha

Page: 1 of 26

Revision: 1st March 2023 Version: 005





Hazard Pictogram(s)









Signal Word(s) **DANGER** 

Hazard Statement(s) H224: Extremely flammable liquid and vapour. H304: May be fatal if swallowed and enters airways.

> H315: Causes skin irritation. H340: May cause genetic defects. H350: May cause cancer.

H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.

H336: May cause drowsiness or dizziness. (Central nervous system, Inhalation)

H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s) P201: Obtain special instructions before use.

P210: Keep away from heat, hot surfaces, sparks, open flames and other

ignition sources. No smoking.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection. P301+P310: IF SWALLOWED: Immediately call a POISON CENTER/doctor.

P331: Do NOT induce vomiting.

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

23 Other hazards May form explosive mixture with air. The vapour is heavier than air; beware of pits

and confined spaces. May cause irritation to eyes and air passages.

Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances.

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1 Substances

SUBSTANCE	CAS No.	EC No.	%W/W
Naphtha (petroleum), catalytic reformed	68955-35-1	273-271-8	100

#### **SECTION 4: FIRST AID MEASURES**



4.1 Description of first aid measures

Self-protection of the first aider

Eliminate sources of ignition. If it is suspected that fumes are still present, the responder should wear an appropriate mask or self-contained breathing apparatus. Drench contaminated clothing with water before removing to avoid risk of sparks from static electricity. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Avoid all contact. Do not ingest. If swallowed then seek immediate medical assistance.

Hydrogen sulphide (H2S) can accumulate in the headspace of storage tanks and reach potentially hazardous concentrations.

If there is any suspicion of inhalation: A self contained breathing apparatus should be worn. Remove to fresh air immediately.

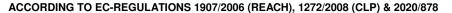
IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Maintain an open airway. Loosen tight

Inhalation

H2S Warning:

Page: 2 of 26

Revision: 1st March 2023 Version: 005





Skin Contact

**Eve Contact** 

Ingestion

4.2 Most important symptoms and effects, both acute and delayed

4.3 Indication of any immediate medical attention and special treatment needed

Notes to a physician:

clothing such as a collar, tie, belt or waistband. Get medical advice/attention if you feel unwell.

IF ON SKIN (or hair): Remove contaminated clothing immediately and wash affected skin with plenty of water or soap and water. If irritation (redness, rash, blistering) develops, get medical attention.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention.

IF SWALLOWED: Do not induce vomiting because of risk of aspiration into the lungs. If vomiting occurs spontaneously, keep head below hips to prevent aspiration into the lungs. If unconscious, place in recovery position and get medical attention immediately. Do not give anything by mouth to an unconscious person. Get medical attention immediately. Do not wait for symptoms to appear. Inhalation: May cause drowsiness or dizziness. Headache, nausea and vomiting. Skin Contact: Causes skin irritation.

Eye Contact: Causes serious eye irritation.

Ingestion: Aspiration into the lungs may cause chemical pneumonitis, which can be fatal. Ingestion may cause irritation of the gastrointestinal tract. Nausea, Vomiting and Diarrhoea.

Treat symptomatically.

IF INHALED: If unconscious, place in recovery position and get medical attention immediately. Administer oxygen if available and artificial respiration if necessary. IF SWALLOWED: Do not induce vomiting because of risk of aspiration into the lungs. If aspiration is suspected obtain immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration into the lungs.

### **SECTION 5: FIREFIGHTING MEASURES**

5.1 Extinguishing media

Suitable extinguishing media

Unsuitable extinguishing media

5.2 Special hazards arising from the substance or mixture

5.3 Advice for firefighters

Extinguish with sand or dry chemical. Foam, Carbon dioxide, Water fog or dry powder

Do not use water jet. Direct water jet may spread the fire.

Extremely flammable liquid and vapour. Will float and can be reignited on surface water. Decomposes in a fire giving off toxic fumes: A mixture of solid and liquid particulates and gases including unidentified organic and inorganic compounds. May form explosive mixture with air. Prevent liquid entering sewers, basements and any watercourses. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. If sulphur compounds are present in appreciable amounts, combustion products may include also H2S and SOx (sulfur oxides) or sulfuric acid

Fight fire with normal precautions from a reasonable distance. Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Keep containers cool by spraying with water if exposed to fire. Avoid release to the environment. Dike fire control water for later disposal.

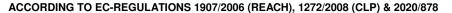
### **SECTION 6: ACCIDENTAL RELEASE MEASURES**

6.1 Personal precautions, protective equipment and emergency procedures Caution - spillages may be slippery. Ensure operatives are trained to minimise exposures. Ensure suitable personal protection during removal of spillages. Eliminate sources of ignition. Shut off leaks if without risk. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid all contact with substance. Ensure adequate ventilation. Do not breathe vapour. Do not ingest. If swallowed then seek immediate medical assistance. All official European languages. Do not use sparking tools. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems.

H2S Warning:

Product may release Hydrogen Sulphide. Exposure controls - These controls may include: Segregation of areas, Access only to authorised persons, Permit to work

Revision: 1st March 2023 Version: 005





systems, Confined space working procedures, Area H2S alarms, Personal H2S alarms, Personal escape sets, H2S awareness training. Please see section 8 for appropriate personal protection equipment Small spillages: Wear flame-resistant antistatic protective clothing. Evacuate the area and keep personnel upwind. Drench contaminated clothing Large spillages: with water before removing to avoid risk of sparks from static electricity. Avoid all contact. Wear chemical protection suit and breathing apparatus. See Also Section: 8. 6.2 **Environmental precautions** Avoid release to the environment. Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body. If necessary: Dike area to contain the spill and prevent releases to sewers, drains, or other waterways. 6.3 Methods and material for containment and cleaning Provided it is safe to do so, isolate the source of the leak. Use non-sparking equipment when picking up flammable spill. The vapour is heavier than air; up beware of pits and confined spaces. Ensure that the equipment is adequately grounded. Allow small spillages to evaporate provided there is adequate ventilation. Wear flame-resistant antistatic protective clothing. Wear chemical protection suit and breathing apparatus. Spillages onto land: In case of soil contamination, remove contaminated soil and treat in accordance with local regulations. Adsorb spillages onto sand, earth or any suitable adsorbent material. Transfer to a lidded container for disposal or recovery. Dispose of this material and its container as hazardous waste. Small spillages: Allow small spillages to evaporate provided there is adequate ventilation. Wear flame-resistant antistatic protective clothing. Large spillages: Cover spillage with foam to reduce evaporation. Do not use water jet. Spillages on water or at sea: Collect as much as possible in clean container for reuse or disposal. Small spillages: Contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents. Large spillages: Open waters should be contained with floating barriers or other mechanical means and recovered, only if this is strictly necessary and if fire/explosion risks can be adequately prevented. Otherwise control the spreading of the spillage, and let the substance evaporate naturally.

See Section: 8,13

### **SECTION 7: HANDLING AND STORAGE**

Reference to other sections

#### 7.1 Precautions for safe handling

6.4

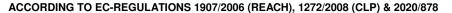
H2S Warning:

7.2 Conditions for safe storage, including any incompatibilities

Obtain special instructions before use. Keep away from sources of ignition - No smoking. Use only outdoors or in a well-ventilated area. Prevent vapour build up by providing adequate ventilation during and after use. May form explosive mixtures with air. Take action to prevent static discharges. Use non-sparking tools. All parts of the plant and equipment should be electrically bonded together and connected to earth. Electrical continuity should be checked at regular intervals. Antistatic clothing and footwear should be used. The vapour is heavier than air; beware of pits and confined spaces. Avoid all contact with substance. Do not ingest. If swallowed then seek immediate medical assistance. Do not breathe vapour. See Section: 8. Keep good industrial hygiene. Wash hands thoroughly after handling. Contaminated clothing should be thoroughly cleaned.

Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances. These controls may include: Segregation of areas, Access only to authorised persons, Permit to work systems, Confined space working procedures, Area H2S alarms, Personal H2S alarms, Personal escape sets, H2S awareness training. Light hydrocarbon vapours can build up in the headspace of containers. These can cause flammability / explosion hazards. Bund storage facilities to prevent soil and water pollution in the event of spillage. Keep only in original packaging. Keep

Revision: 1st March 2023 Version: 005





containers properly sealed when not in use. Protect from sunlight. Containers of this material may be hazardous when empty since they retain product residue. Empty container may contain product residue which may result in flammable or explosive vapours inside the container.

Stable at ambient temperatures.

Suitable containers: Stainless steel, Mild steel

Do not store in: Synthetic materials Keep away from oxidising agents.

See Section: 1.2 and/or Exposure Scenario.

Storage temperature Storage measures

Incompatible materials Specific end use(s)

7.3

### **SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

8.1 Control parameters

8.1.1 **Occupational Exposure Limits**  No Occupational Exposure Limit assigned. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

8.1.2 **Biological limit value**  Not established.

8.1.3 **PNECs and DNELs**  PNEC: Not established. Naphtha (petroleum), catalytic reformed is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the environmental toxicity (HC5) of each group of components in the substance. These are used to estimate the environmental risk for the substance. Therefore individual environmental compartments PNECs are not available for this product.

Naphtha (petroleum), catalytic reformed	Oral	Inhalation	Dermal
Derived No Effect Level			
Worker - Long Term - Systemic effects	-	1300 mg/m <sup>3</sup>	-
Worker - Long Term - Local effects	-	840 mg/m <sup>3</sup>	-
Worker - Acute - Local effects	-	1100 mg/m <sup>3</sup>	-
Consumer - Long Term - Systemic effects	-	1200 mg/m <sup>3</sup>	-
Consumer - Long Term - Local effects	-	180 mg/m <sup>3</sup>	-
Consumer - Acute - Local effects	-	640 mg/m <sup>3</sup>	-

#### 8.2 **Exposure controls**

#### 8.2.1 Appropriate engineering controls

Provide adequate ventilation, including appropriate local extraction if dusts, fumes or vapours are likely to be evolved. Store in a cool/low-temperature, wellventilated (dry) place away from heat and ignition sources. Guarantee that the eye flushing systems and safety showers are located close to the working place.

8.2.2 Individual protection measures, such as personal protective equipment (PPE)

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

Fuels are typically used, transferred and transported in closed systems. If exposure is likely (i.e. during sampling) the following advice may be appropriate. Keep good industrial hygiene. Always wash hands before smoking, eating and drinking. Do not eat, drink or smoke at the work place. Refer to annexes for exposure scenarios detailing use specific exposure controls

Eye/ face protection



Use eye protection according to EN 166, designed to protect against liquid splashes.

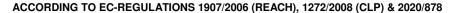
Skin protection



Hand protection: Wear impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer.

Recommended: Nitrile rubber.

Revision: 1st March 2023 Version: 005





Body protection: Wear anti-static clothing and shoes.

small scale: Wear suitable coveralls to prevent exposure to the skin.

large scale: Chemical protection suit.

Respiratory protection



protection. The use of a high efficiency filter (EN143) is recommended. Filter type

Thermal hazards Not applicable.

8.2.3 **Environmental Exposure Controls** Avoid release to the environment.

### **SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

9.1 Information on basic physical and chemical properties

> Physical state Liquid Colour Colourless Odour Hydrocarbon Melting point/freezing point < - 60 °C

Boiling point or initial boiling point and boiling range

Flammability

Flash point

Lower and upper explosion limit

Auto-ignition temperature Decomposition temperature

рΗ

10.4

Kinematic viscosity

Solubility

Partition coefficient: n-octanol/water (log value)

Vapour pressure

Density and/or relative density Particle characteristics

Relative vapour density

Conditions to avoid

When the product is heated /In case of inadequate ventilation wear respiratory

Α1

Closed system(s): Not normally required.

< 35 °C

Not applicable - Liquid

Flammable Limits (Lower) (%v/v) 1

Flammable Limits (Upper) (%v/v) 10

< 0 °C > 220 °C Not established. Not established. 1 mm<sup>2</sup>/s @ 20 °C Immiscible with water.

Not applicable. Substance is complex UVCB.

4 - 240 kPa @ 37.8°C 0.62 - 0.88 g/cm3 @ 15 °C 4 - 240 kPa @ 37.8°C Not established.

9.2 Other information None known.

### **SECTION 10: STABILITY AND REACTIVITY**

10.1 Reactivity Stable under normal conditions. Reacts with - Strong oxidising agents Chemical stability 10.2

Stable under normal conditions. Hazardous polymerisation will not occur.

Product may release Hydrogen Sulphide.

10.3 Possibility of hazardous reactions Extremely flammable liquid and vapour. May form explosive mixture with air.

Vapours are heavier than air and may travel considerable distances to a source

of ignition and flashback. Product may release Hydrogen Sulphide.

Elevated temperature. Keep away from heat, hot surfaces, sparks, open flames

and other ignition sources. No smoking. Keep away from direct sunlight.

10.5 Incompatible materials Keep away from oxidising agents. Strong Acids and Alkalis. 10.6 Hazardous decomposition products

A mixture of solid and liquid particulates and gases including unidentified organic and inorganic compounds. Decomposes in a fire giving off toxic fumes:

COx, H2S, SOx,

### SECTION 11: TOXICOLOGICAL INFORMATION

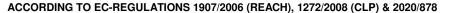
11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008 Acute toxicity - Ingestion

All test data taken from existing ECHA registrations for the substances

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

Page: 6 of 26

Revision: 1st March 2023 Version: 005





Acute toxicity - Inhalation Based upon the available data, the classification criteria are not met.

LC50 Vapour > 5600 mg/m<sup>3</sup> Air (rat) (OECD 403)

Acute toxicity - Skin contact Based upon the available data, the classification criteria are not met.

LD50 > 2000 mg/kg bw/day (rabbit) (OECD 402)

LD50 > 5000 mg/kg bw/day (rat) (OECD 401)

**Skin corrosion/irritation** Skin Irrit. 2; Causes skin irritation.

Irritating to skin. (rabbit) (OECD 404)

Serious eye damage/irritation Based upon the available data, the classification criteria are not met.

Not irritating to eyes (rabbit) (OECD 405)

Respiratory or skin sensitisation Based upon the available data, the classification criteria are not met.

Sensitisation (guinea pig) - Negative (OECD 406)

Germ cell mutagenicity Muta. 1B; May cause genetic defects. Harmonised Classification.

ECHA Registration Endpoint summary: According to EU CLP Classification (EC no. 1272/2008), there is a regulatory requirement to classify Gasoline and naphtha streams as hazardous for this endpoint when they contain >0.1%

benzene

Carcinogenicity Carc. 1B; May cause cancer. Harmonised Classification.

ECHA Registration Endpoint summary: According to EU CLP Classification (EC no. 1272/2008), there is a regulatory requirement to classify Gasoline and naphtha streams as hazardous for this endpoint when they contain >0.1%

benzene

Reproductive toxicity Repr. 2; Suspected of damaging fertility or the unborn child.

ECHA Registration Endpoint summary According to EU CLP Classification (EC no. 1272/2008), there is a regulatory requirement to classify Gasoline and naphtha streams as hazardous for this endpoint when they contain >0.1%

Toluene and/or n-hexane

**STOT - Single Exposure** STOT SE 3; May cause drowsiness or dizziness.

Weight of evidence approach

STOT - Repeated Exposure Based upon the available data, the classification criteria are not met.

Oral: No adverse effect observed (rat) (Halder CA, et al. (1985))

Inhalation: No adverse effect observed (rat) (OECD 453)
Chronic - Systemic effects NOAEC 1402 mg/m³

No adverse effect observed. (mouse) (OECD TG 410)

Dermal: Chronic - Systemic effects NOAEL 375 mg/kg bw/day

Aspiration hazard Asp. Tox. 1; May be fatal if swallowed and enters airways. Harmonised

Classification.

Viscosity: 1 mm<sup>2</sup>/s @ 20 °C

11.2 Information on other hazards

Other information

11.2.2

12.5

**11.2.1** Endocrine disrupting properties This substance does not have endocrine disrupting properties with respect to

humans.

None.

#### **SECTION 12: ECOLOGICAL INFORMATION**

**12.1 Toxicity** Aquatic Chronic 2; Toxic to aquatic life with long lasting effects.

Short Term (acute): LL50 (Fish) (96hr) 10 mg/l (OCED 203)
Long Term (Chronic): According to the EU CLP Regulation (E

ic): According to the EU CLP Regulation (EC No. 1272/2008) criteria, substances in the low boiling point naphtha category are classified as Chronic Category 2

(H411) for the environment based on acute invertebrate and alga toxicity.

**12.2** Persistence and degradability Readily biodegradable. (OECD 301F)

**12.3** Bioaccumulative potential Substance is complex UVCB. The BCF (fish) of this substance components is

well below the criteria for bioaccumulation. Therefore, this substance is not considered as bioaccumulative substance. (ECHA registration dossier: PBT

assessment 2)

**12.4 Mobility in soil** The product is predicted to have low mobility in soil. Immiscible with water.

Results of PBT and vPvB assessment

Substance is complex UVCB. This substance does not contain PBT constituents

included in the SVHC candidate list at concentrations above 0.1%.

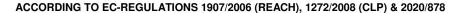
**12.6 Endocrine disrupting properties**This substance does not have endocrine disrupting properties with respect to

non-target organisms.

12.7 Other adverse effects None known.

Page: 7 of 26

Revision: 1st March 2023 Version: 005





### **SECTION 13: DISPOSAL CONSIDERATIONS**

**13.1** Waste treatment methods Dispose of this material and its container as hazardous waste. Do not empty into

drains, dispose of this material and its container at hazardous or special waste collection point. Disposal should be in accordance with local, state or national legislation. Containers of this material may be hazardous when empty since they retain product residue. Containers must not be punctured or destroyed by burning, even when empty. Allocation of a waste code number, according to the European Waste Catalogue, should be carried out in agreement with the

regional waste disposal company. Waste code: 13 07 01 EU Waste Codes: HP3, HP4, HP7, HP10, HP11, HP14

Waste classification according to Directive 2008/98/EC

(Waste Framework Directive)

### **SECTION 14: TRANSPORT INFORMATION**

		ADR/RID	IMDG/ADN		
14.1	UN number	UN 1268	UN 1268		
14.2	Proper Shipping Name	PETROLEUM DISTILLATES N.O.S.	PETROLEUM DISTILLATES N.O.S.		
14.3	Transport hazard class(es)	3	3+(N2, CMR,F)		
14.4	Packing group	1	1		
14.5	Environmental hazards	MILEUGEVAARLIJK / ENVIRONMENTALLY	HAZARDOUS / UMWELTGEFÄHRDEND /		
		DANGEREUX POUR L'ENVIRONNEMENT			
14.6	Special precautions for user	Vapour may create explosive atmosphere. The vapour is heavier than air; beware of pits and confined spaces.			
14.7	Maritime transport in bulk according to IMO instruments	This product is being carried under the scope of to Chapter 7 'Handling and Storage' for special or needs to comply with, in connection with tran	precautions which a user needs to be aware of,		
14.8	Additional Information	ADR HIN: 33	EmS: F-E, S-E		
		Tunnel Restriction Code: 3 (D/E)	Limited Quantity: 500ml		
		Limited Quantity: 500 ml			
	Special Provisions	664			

### **SECTION 15: REGULATORY INFORMATION**

15.1 Safety, health and environmental

regulations/legislation specific for the substance or

mixture

15.1.1 EU regulations

Seveso Upper Tier: 25000 tonnes

Lower Tier: 2500 tonnes

Annex XVII (Restrictions)

In accordance with REACH Annex XVII entry 30 (c) this substance is exempt from Entry 28 and 29 of REACH Annex XVII as it is to be sold as a fuel in a closed

system.

15.1.2 National regulations

**Germany** Wassergefährdungsklasse (Germany). WGK number: 3

15.2 Chemical Safety Assessment A REACH chemical safety assessment (CSA) has been carried out. Refer to

annexes for exposure scenarios detailing use specific exposure controls.

### **SECTION 16: OTHER INFORMATION**

The following sections contain revisions or new statements: New SDS Regulation 2020/878 format, all sections have been updated to include new information. Please review SDS with care.

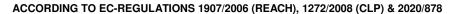
#### References:

Existing ECHA registration(s) for Naphtha (petroleum), catalytic reformed (CAS No. 68955-35-1) and Chemical Safety Report.

#### Literature References:

Page: 8 of 26

Revision: 1st March 2023 Version: 005





 Halder CA, et al., 1985, Hydrocarbon nephropathy in male rats: identification of the nephrotoxic components of unleaded gasoline., Toxicol. Ind. Health 1:67-87

EU Classification: This Safety Data Sheet was prepared in accordance with EC Regulation (EC) 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878

#### Legend

ADR ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
ADN ADN: European Agreement on the International Transport of Dangerous Goods by Inland Waterways
CLP Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures

DNEL Derived no effect level

IATA IATA: International Air Transport Association
ICAO ICAO: International Civil Aviation Organization
IMDG IMDG: International Maritime Dangerous Goods

LTEL Long term exposure limit

PBT PBT: Persistent, Bioaccumulative and Toxic

PNEC Predicted No Effect Concentration

REACH Registration, Evaluation, Authorisation and Restriction of Chemicals

RID: Regulations concerning the international railway transport of dangerous goods

STEL Short term exposure limit

vPvB vPvB: very Persistent and very Bioaccumulative

OECD Organisation for Economic Cooperation and Development

ES Exposure Scenario

NOAEC no observed adverse effect concentration
NOAEL No Observed Adverse Effect Level

#### Hazard classification / Classification code:

Flam. Liq. 1, Flammable liquid, Category 1 Asp. Tox. 1, Aspiration Toxicity, Category 1 Skin Irrit. 2, Skin irritation, Category 2

Muta. 1B, Germ cell mutagen, Sub-category 1B

Carc. 1B, Carcinogen, Category 1B

Repr. 2, Reproductive toxicant, Category 2

STOT SE 3, Specific target organ toxicity - Single exposure, Category 3

Aquatic Chronic 2, Hazardous to the aquatic environment (Chronic),

Category 2

### Hazard Statement(s)

H224: Extremely flammable liquid and vapour. H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation.

H340: May cause genetic defects. H350: May cause cancer.

H361fd: Suspected of damaging fertility. Suspected of damaging the

unborn child.

H336: May cause drowsiness or dizziness. (central nervous system,

inhalation)

H411: Toxic to aquatic life with long lasting effects.

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

#### Disclaimers

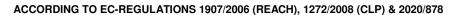
Information contained in this publication or as otherwise supplied to Users is believed to be accurate and is given in good faith, but it is for the Users to satisfy themselves of the suitability of the product for their own particular purpose. Vitol SA gives no warranty as to the fitness of the product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that exclusion is prevented by law. Vitol SA accepts no liability for loss or damage (other than that arising from death or personal injury caused by defective product, if proved), resulting from reliance on this information. Freedom under Patents, Copyright and Designs cannot be assumed.

Annex to the extended Safety Data Sheet (eSDS)

See below -

Page: 9 of 26

Revision: 1st March 2023 Version: 005





# Naphtha (petroleum), catalytic reformed (0 -1% benzene content)

CAS No. 68955-35-1 EC No. 273-271-8

### **Summary of Parameters**

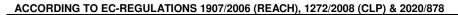
Physical Par	ameters		
Vapour pressure (Pa)			4 – 240 @ 37.8 °C (Value used for exposure assessment = 340)
Partition Coef	fficient (log K <sub>ow</sub> )		2.00 - 20.43
Aqueous solu	ibility (mg L <sup>-1</sup> )		1.6E+03 - 5.1E-18 (Value used for exposure assessment = 2.0E+02)
Molecular wei	ight		Not applicable
Biodegradabil	lity		Not defined
Human healt	th Parameter (DNELs	<del>)</del>	
	Short term	Inhalation (mg/m³)	1100
Worker	Short term	Dermal (mg/kg bw/day)	Not applicable
vvorker	Long Torm	Inhalation (mg/m³)	3.2 (= 1 ppm)*
	Long Term	Dermal (mg/kg bw/day)	0.234*
,		Inhalation (mg/m³)	0.0032 (=1 ppb)* (0.93 mg/kg bw/day)
Consumer		Dermal (mg/kg bw/day)	0.234*
		Oral (mg/kg <sup>-1</sup> bw/day <sup>-1</sup> )	8.8

### **Environmental Parameter (PNECs)**

Naphtha (petroleum), catalytic reformed is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the environmental toxicity (HC5) of each group of components in the substance. These are used to estimate the environmental risk for the substance. Therefore individual environmental compartments PNECs are not available for this product.

<sup>\*</sup> Concentration: benzene (Worst case assumption. Contains benzene. @1%).

Revision: 1st March 2023 Version: 005





### **Table of Contents**

Number	Title	Page:
Exposure Scenario 1	Distribution of Naphtha (petroleum), catalytic reformed (0 – 1 % benzene content)	12
Exposure Scenario 2	Formulation and (re)packing of Naphtha (petroleum), catalytic reformed (0 – 1 % benzene content)	15
Exposure Scenario 3	Use of Naphtha (petroleum), catalytic reformed $(0 - 1)$ % benzene content) as a fuel - Industrial	18
Exposure Scenario 4	Use of Naphtha (petroleum), catalytic reformed $(0-1\%$ benzene content) as a fuel - Professional	21
Exposure Scenario 5	Use of Naphtha (petroleum), catalytic reformed (0 – 1 % benzene content) as a fuel - Consumer	24

### **Contributing Scenarios**

Markers	
Workers	
PROC1	Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
PROC2	Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
PROC2 (Storage)	Use in closed, continuous process with occasional controlled exposure. Bulk product storage.
PROC3	Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
PROC3 (Sampling)	Use in closed, continuous process with occasional exposure. Sample collection
PROC8a (Maintenance)	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
	Clean down and maintenance of vessels and containers.
PROC8b (Bulk)	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Bulk transfer in a closed system
PROC8b (Drum)	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Drum or batch transfers.
PROC8b (Refueling)	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Refueling vehicles, light aircraft or marine craft
PROC8b (aircraft)	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Refueling aircraft
PROC15	Use as laboratory reagent.
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected.
PROC16 (Additive)	Using material as fuel sources, limited exposure to unburned product to be expected. Use as a fuel additive.
Environment	
ERC1	Manufacture of substance
ERC2	Formulation of preparations
ERC3	Formulation in materials
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 thermoplastics
ERC6d	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ERC7	Industrial use of substances in closed systems
ERC9a	Wide dispersive indoor use of substances in closed systems
ERC9b	Wide dispersive outdoor use of substances in closed systems
Consumer	
PC13	Fuels
	(Automotive refueling)
	(Scooter refueling)
	(Garden equipment refueling)
	(Garden equipment use)

Revision: 1st March 2023 Version: 005





### Exposure Scenario 1 – Distribution of Naphtha (petroleum), catalytic reformed (0 – 1 % benzene content)

1.0 Contributing Scenarios	
Sector of uses SU	SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
Process category [PROC]	PROC1 PROC2 PROC2 (Storage) PROC3 PROC3 (Sampling) PROC8a (Maintenance) PROC8b (Bulk) PROC15
Chemical product category [PC]	Not applicable
Article Categories [AC]	Not applicable
Environmental release categories [ERC]	ERC4 ERC5 ERC6a ERC6b ERC6c ERC6d ERC7
Specific Environmental Release Categories SPERC	ESVOC SpERC 1.1b v.1

2.0 Operational conditions and risk management measures						
2.1 Control of worker exposure						
Product characteristics						
Physical form of product	Liquid with high volatility.					
Concentration of substance in product	Covers concentrations up to 100	% (≤ 1 % benzene content)				
Human factors not influenced by risk management	nt					
Potential exposure area	otential exposure area Not defined					
Frequency and duration of use						
Exposure duration per day	Covers daily exposures up to 8 h	ours (unless stated differently).				
Frequency of use (days per year)	300					
Other operational conditions affecting worker exp	Other operational conditions affecting worker exposure					
Area of upo	PROC3, PROC2 (Storage)	Outdoor				
Area of use	All other PROC's	Not defined (default = Indoor)				
Characteristics of the surroundings Not defined						

#### General measures applicable to all activities

Assumes a good basic standard of occupational hygiene is implemented. Assumes activities are at ambient temperature (unless stated differently).

#### General measures (skin irritants)

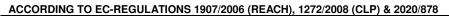
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise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

	4.1001
Technical conditions of use	
PROC1, PROC2, PROC3	Handle substance within a closed system.
PROC8b (Bulk)	Ensure material transfers are under containment or extract ventilation. (Efficiency of at
1 110000 (Bulk)	least 90 %)
PROC15	Use fume cupboard. (Efficiency of at least 90 %)
Organisational measures	
PROC3 (Sampling)	Sample via a closed loop or other system to avoid exposure. (Efficiency of at least 95 %)
	Drain down and flush system prior to equipment break-in or maintenance. Retain drain
PROC8a (Maintenance)	downs in sealed storage pending disposal or for subsequent recycle. Clear spills
	immediately. (Inhalation - efficiency of at least 90 %)
Risk management measures related to huma	an health
Respiratory protection	No special measures are required.

Revision: 1st March 2023 Version: 005





	PROC2		Wear suitable gloves tested to EN374. (Efficiency of at least 80 %)		
Hand and/or Skin protection  PROC8a (Maintenance)		ce)	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90 %)		
Eye Protection	No special measures	are required	d.		
Other operational conditions affecting worker exp	osure				
Wear suitable coveralls to prevent exposure to the sk	in. Clear transfer lines p	rior to de-co	oupling. Avoid dip sampling.		
2.2 Control of environmental exposure					
Amounts used					
Fraction of EU tonnage used in region:		0.1			
Regional use tonnage (tons/year):		1.0E+06			
Fraction of Regional tonnage used locally: tons/ye	ear	2.0E-03			
Annual site tonnage (tons/year):		2,000			
Average daily use (kg/day)		20,000			
Environment factors not influenced by risk manage	gement				
Flow rate of receiving surface water (m³/d):		Not define	ed (default = 18,000)		
Local freshwater dilution factor:		10			
Local marine water dilution factor:		100			
Operational conditions					
Emission days (days/year):		100			
Release fraction to air from process (initial release prior to RMM):			1.0E-03 1.0E-05		
Release fraction to wastewater from process (initial release prior to RMM):					
Release fraction to soil from process (initial release prior to RMM):					
Technical onsite conditions and measures to redu		s, air emiss	ions and releases to soil		
Treat air emission to provide a typical removal efficier		90			
If there is no discharge to domestic sewage treatment					
wastewater (prior to receiving water discharge) to pro	vide the required	0			
removal efficiency of (%):					
If discharging to domestic sewage treatment plant, pro	ovide the required	0			
onsite wastewater removal efficiency of (%):		U			
Treat soil emission to provide a typical removal efficie		0			
onsite wastewater treatment required.		imates used	d. If discharging to domestic sewage treatment plant, no		
Organisational measures to prevent/limit release					
Do not apply industrial sludge to natural soils. Sludge	should be incinerated,	contained or	r reclaimed.		
Conditions and measures related to municipal set	<u> </u>				
Size of municipal sewage system/treatment plant (m³/d)		2000			
Degradation effectiveness (%)		95.1			
Conditions and measures related to external treatment of waste for disposal					
External treatment and disposal of waste should com	ply with applicable local	and/or natio	onal regulations.		
Substance release quantities after risk manageme					
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):			5.3E+06		

### 3. Exposure estimation and reference to its source

### 3.1 Human exposure prediction

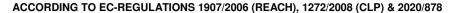
Exposure assessment (method/calculation model)

ECETOC TRA (benzene content)

	Inhalation		Dei	Combined	
Process category [PROC]	inhalation exposure (mg/m³)	Risk characterisation ratio (RCR)	dermal exposure (mg/kg bw/day)	Risk characterisation ratio (RCR)	Risk characterisation ratio (RCR)
PROC1	0.00	0.00	0.03	0.15	0.15
PROC2	0.50	0.50	0.03	0.12	0.62
PROC2 (Storage)	0.35	0.35	0.14	0.57	0.94
PROC3	0.70	0.70	0.03	0.15	0.85
PROC3 (Sampling)	0.05	0.05	0.03	0.15	0.20
PROC8a (Maintenance)	0.25	0.25	0.14	0.57	0.84

Page: 13 of 26

Revision: 1st March 2023 Version: 005





PROC8b (Bulk) 0.15		0.15	0.15 0.07		0.45		
PROC15	0.05	0.05	0.00	0.01	0.06		

3.2 Environmental exposure prediction	
Exposure assessment (method/calculation model)	The Hydrocarbon Block Method has been used to calculate
	environmental exposure with the Petrorisk model.

Naphtha (petroleum), catalytic reformed is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the PEC of each group of components in the substance. These are used to estimate the environmental risk for the substance As the model assumes fractionation before entering the environment, the PEC is not of the substance as manufactured but is a some of the constituents expected to be present in the environmental compartment

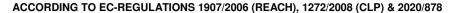
Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment		
Predicted Environmental Exposure (PEC)	ental 5.0E-03 ure 5.0E-03 n		5.0E-05 1.6E-05 mg/kg ww		3.1E-03 mg/kg ww	1.4E-04 mg/kg ww		
Risk characterisation ratio (RCR)	on 1.8E-04 3.8E-03		8.8E-05	6.4E-06	2.5E-03	1.1E-04		

Human exposure prediction:

	Route of Exposure	Exposure (μg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)
	Oral	0.059	5.9E-04
ſ	Inhalation	0.27	2.9F-04

4.0 Evaluation guidance to downstream user							
For scaling see	risks are managed to at leas Available hazard data do no Further details on scaling an for-industries-libraries.html).	t support the need for a DNEL to be established for other health effects. d control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-zene and assumes that the substance contains 1 % benzene. Arithmetic scaling					
Exposure assessment	Worker	ECETOC TRA					
instrument/tool/method	Environment  The Hydrocarbon Block Method has been used to calculate environ exposure with the Petrorisk model.						

Revision: 1st March 2023 Version: 005





Exposure Scenario 2 – Formulation and (re)packing of Naphtha (petroleum), catalytic reformed (0 - 1 % benzene content)

1.0 Contributing Scenarios	
Sector of uses SU	SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
Process category [PROC]	PROC1 PROC2 PROC2 (Storage) PROC3 PROC3 (Sampling) PROC8a (Maintenance) PROC8b (Bulk) PROC8b (Drum/batch transfers) PROC15
Chemical product category [PC]	Not applicable
Article Categories [AC]	Not applicable
Environmental release categories [ERC]	ERC2
Specific Environmental Release Categories SPERC	ESVOC SpERC 2.2.v1

2.0 Operational conditions and risk manager	nent measures					
2.1 Control of worker exposure						
Product characteristics						
Physical form of product	Liquid with high volatility.					
Concentration of substance in product	Covers concentrations up	to 100% (≤ 1 % benzene content)				
Human factors not influenced by risk management						
Potential exposure area	Not defined					
Frequency and duration of use						
Exposure duration per day	Covers daily exposures u	p to 8 hours (unless stated differently).				
Frequency of use (days per year)	300					
Other operational conditions affecting works	er exposure					
American	PROC3	Outdoor				
Area of use	All other PROC's	Not defined (default = Indoor)				
Characteristics of the surroundings	Not defined	Not defined				

#### General measures applicable to all activities

Assumes a good basic standard of occupational hygiene is implemented. Assumes activities are at ambient temperature (unless stated differently).

#### General measures (skin irritants)

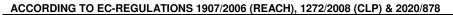
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise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

Technical conditions of use						
PROC1, PROC2, PROC2 (Storage), PROC3	Handle substance within a closed	l system.				
PROC3 (Sampling) Sample via a closed loop or other system to avoid exposure. (Efficiency of at least 95 %)						
PROC8b (Bulk), PROC8b (Drum/batch transfers)	/batch transfers)  Ensure material transfers are under containment or extract ventilation. (Efficiency of at least 97 %)					
PROC15 Use fume cupboard. (Efficiency of at least 90 %)						
Organisational measures						
	Drain down and flush system prior to equipment break-in or maintenance. Retain drain					
PROC8a (Maintenance)	downs in sealed storage pending disposal or for subsequent recycle. Clear spills					
	immediately. (Efficiency of at least 90 %)					
Risk management measures related to human hea	alth					
Respiratory protection	Respiratory protection No special measures are required.					
Hand and/or Skin protection	PROC2, PROC2 (Storage)	Wear suitable gloves tested to EN374. (Efficiency of at least 80 %)				

Revision: 1st March 2023 Version: 005





	PROC8a (Maintenance)		Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90 %)				
Eye Protection	No special measures	are required	d.				
Other operational conditions affecting worker exp	osure						
Wear suitable coveralls to prevent exposure to the sk	in. Clear transfer lines p	rior to de-co	oupling. Avoid dip sampling.				
2.2 Control of environmental exposure							
Amounts used							
Fraction of EU tonnage used in region: 0.1							
Regional use tonnage (tons/year):		2.4E+05					
Fraction of Regional tonnage used locally: (tons/year)	)	0.12					
Annual site tonnage (tons/year):		3.0E+04					
Average daily use (kg/day):		1.0E+05					
Environment factors not influenced by risk manage	gement	•					
Flow rate of receiving surface water (m³/d):		Not define	ed (default = 18,000)				
Local freshwater dilution factor:		10	,				
Local marine water dilution factor:		100					
Operational conditions							
Emission days (days/year):		300					
Release fraction to air from process (initial release pri	or to RMM):	2.5E-02					
Release fraction to wastewater from process (initial re	elease prior to RMM):	1.6E-03					
Release fraction to soil from process (initial release p		1.0E-04					
Technical onsite conditions and measures to redu		, air emissi	ions and releases to soil				
Treat air emission to provide a typical removal efficier		0					
If there is no discharge to domestic sewage treatment							
wastewater (prior to receiving water discharge) to pro	vide the required	94.6					
removal efficiency of (%):							
If discharging to domestic sewage treatment plant, pro	ovide the required	0					
onsite wastewater removal efficiency of (%):		U					
Treat soil emission to provide a typical removal efficie	ency of (%):	0					
Common practices vary across sites thus conservationsite wastewater treatment required.	ve process release est	imates used	d. If discharging to domestic sewage treatment plant, no				
Organisational measures to prevent/limit release							
Do not apply industrial sludge to natural soils. Sludge		contained or	reclaimed.				
Conditions and measures related to municipal set	-						
Size of municipal sewage system/treatment plant (m³/d)  Degradation effectiveness (%)  95.1							
Degradation effectiveness (%)							
Conditions and measures related to external treat							
External treatment and disposal of waste should com	ply with applicable local	and/or natio	onal regulations.				
Substance release quantities after risk manageme							
Maximum allowable site tonnage (MSafe) based on rewastewater treatment removal (kg/d):	elease following total	1.1E+05					

### 3. Exposure estimation and reference to its source

### 3.1 Human exposure prediction

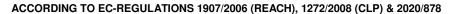
Exposure assessment (method/calculation model)

ECETOC TRA (benzene content)

	Inha	lation	Der	Combined	
Process category [PROC]	inhalation exposure (mg/m³)	Risk characterisation ratio (RCR)	dermal exposure (mg/kg bw/day)	Risk characterisation ratio (RCR)	Risk characterisation ratio (RCR)
PROC1	0.00	0.00	0.03	0.15	0.15
PROC2	0.50	0.50	0.03	0.12	0.62
PROC2 (Storage)	0.50	0.50	0.03	0.12	0.62
PROC3	0.70	0.70	0.03	0.15	0.85
PROC3 (Sampling)	0.05	0.05	0.03	0.15	0.20
PROC8a (Maintenance)	1 025 1 025		0.14	0.59	0.84
PROC8b (Bulk)	0.05	0.05	0.07	0.30	0.35

Page: 16 of 26

Revision: 1st March 2023 Version: 005





PROC8b (Drum/batch transfers)	(Drum/batch 0.05 transfers)		0.07	0.30	0.35
PROC15	0.05	0.05	0.00	0.01	0.06

3.2 Environmental exposure prediction										
	Exposure assessment (method/calculation model)	The	Hydrocarbon	Block	Method	has	been	used	to	calculate
		envir	onmental expo	sure w	ith the Pe	etroris	sk mod	el.		

Naphtha (petroleum), catalytic reformed is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the PEC of each group of components in the substance. These are used to estimate the environmental risk for the substance As the model assumes fractionation before entering the environment, the PEC is not of the substance as manufactured but is a some of the constituents expected to be present in the environmental compartment.

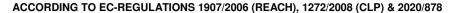
Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment
Predicted Environmental Exposure (PEC)	4.0 mg/L	0.4 mg/L	0.04 mg/L	0.002 mg/kg ww	1.1 mg/kg ww	0.1 mg/kg ww
Risk characterisation ratio (RCR)	0.14	0.7	0.07	0.005	0.9	0.09

Human exposure prediction:

Route of Exposure	Exposure (μg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)
Oral	11	0.11
Inhalation	170	0.18

4.0 Evaluation guidance to downstream user						
	Where other Risk Manage	ment Measures/Operational Conditions are adopted, then users should ensure that				
	risks are managed to at le	ast equivalent levels.				
	Available hazard data do i	Available hazard data do not support the need for a DNEL to be established for other health effects.				
For scaling see	Further details on scaling	Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-				
	for-industries-libraries.html).					
	Exposure calculated for benzene and assumes that the substance contains 1 % benzene. Arithmetic scaling					
	may be possible if the batch contains < 1 % benzene					
Exposure assessment	Worker	ECETOC TRA				
instrument/tool/method	Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.				

Revision: 1st March 2023 Version: 005





# Exposure Scenario 3 – Use of Naphtha (petroleum), catalytic reformed (0 – 1 % benzene content) as a fuel-Industrial

1.0 Contributing Scenarios	
Sector of uses SU	SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
Process category [PROC]	PROC1 PROC2 PROC2 (Storage) PROC3 PROC8a (Maintenance) PROC8b (Bulk) PROC8b (Drum/batch transfers) PROC8b (refuelling) PROC8b (refuelling aircraft) PROC16 PROC16 (Additive)
Chemical product category [PC]	Not applicable
Article Categories [AC]	Not applicable
Environmental release categories [ERC]	ERC7
Specific Environmental Release Categories SPERC	ESVOC SpERC 7.12a.v1

2.0 Operational conditions and risk manag	ement measures					
2.1 Control of worker exposure						
Product characteristics						
Physical form of product	Liquid with high volatility.	Liquid with high volatility.				
Concentration of substance in product	Covers concentrations up	to 100% (≤ 1 % benzene content)				
Human factors not influenced by risk man	agement					
Potential exposure area	Not defined	Not defined				
Frequency and duration of use						
Exposure duration per day	Covers daily exposures up to 8 hours (unless stated differently).					
Frequency of use (days per year)	300					
Other operational conditions affecting wor	ker exposure					
Avec of use	PROC3	Outdoor				
Area of use	All other PROC's	Not defined (default = Indoor)				
Characteristics of the surroundings	Not defined	Not defined				
O						

### General measures applicable to all activities

Assumes a good basic standard of occupational hygiene is implemented. Assumes activities are at ambient temperature (unless stated differently).

#### General measures (skin irritants)

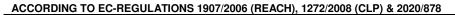
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise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

Technical conditions of use				
PROC1, PROC2, PROC2 (Storage), PROC3, PROC16, PROC16 (Additive)	Handle substance within a closed system.			
PROC8b (Bulk), PROC8b (Drum/batch transfers), PROC8b (refuelling), PROC8b (refuelling aircraft)				
Organisational measures	•			
PROC8a (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. (Efficiency of at least 86 %)			
Risk management measures related to human h	ealth			
Respiratory protection	No special measures are required.			
Hand and/or Skin protection	PROC2	Wear suitable gloves tested to EN374. (Efficiency of at least 80 %)		

Revision: 1st March 2023 Version: 005





	PROC8a (Maintenance)		Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90 %)		
Eye Protection	No special measures	are required	d.		
Other operational conditions affecting worker exp	osure				
Wear suitable coveralls to prevent exposure to the ski	in. Clear transfer lines p	rior to de-co	oupling. Avoid dip sampling.		
2.2 Control of environmental exposure					
Amounts used					
Fraction of EU tonnage used in region:		0.1			
Regional use tonnage (tons/year):		1.7E+05			
Fraction of Regional tonnage used locally: (tons/year)	)	1			
Annual site tonnage (tons/year):		1.7E+05			
Average daily use (kg/day):		5.7E+05			
Environment factors not influenced by risk manage	gement				
Flow rate of receiving surface water (m <sup>3</sup> /d):	-	Not define	ed (default = 18,000)		
Local freshwater dilution factor:		10	1 - 7 7		
Local marine water dilution factor:		100			
Operational conditions		1 1 1 1			
Emission days (days/year):		300			
Release fraction to air from process (initial release pri	or to RMM):	5.00E-02			
Release fraction to wastewater from process (initial re	elease prior to RMM):	1.0E-05			
Release fraction to soil from process (initial release pr		0			
Technical onsite conditions and measures to redu	ıce or limit discharges	, air emissi	ions and releases to soil		
Treat air emission to provide a typical removal efficier	ncy of (%):	95.0			
If there is no discharge to domestic sewage treatment					
wastewater (prior to receiving water discharge) to pro- removal efficiency of (%):	vide the required	0			
If discharging to domestic sewage treatment plant, proonsite wastewater removal efficiency of (%):	ovide the required	0			
Treat soil emission to provide a typical removal efficie	ency of (%):	0			
		imates used	d. If discharging to domestic sewage treatment plant, no		
Organisational measures to prevent/limit release to					
Do not apply industrial sludge to natural soils. Sludge		contained or	reclaimed.		
Conditions and measures related to municipal sev	wage treatment plant				
Size of municipal sewage system/treatment plant (m³/d)			2000		
Degradation effectiveness (%)			95.1		
Conditions and measures related to external treat	ment of waste for disp	osal			
External treatment and disposal of waste should comply with applicable local and/or national regulations.					
Substance release quantities after risk manageme					
Maximum allowable site tonnage (MSafe) based on rewastewater treatment removal (kg/d):	elease following total	5.40E+06			

### 3. Exposure estimation and reference to its source

### 3.1 Human exposure prediction

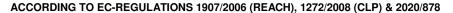
Exposure assessment (method/calculation model)

ECETOC TRA (benzene content)

	Inha	Inhalation		Dermal		
Process category [PROC]	inhalation exposure	Risk characterisation	dermal exposure	Risk characterisation	Risk characterisation	
[]	(mg/m³)	ratio (RCR)	(mg/kg bw/day)	ratio (RCR)	ratio (RCR)	
PROC1	0.00	0.00	0.03	0.15	0.15	
PROC2	0.50	0.50	0.03	0.12	0.62	
PROC2 (Storage)	0.35	0.35	0.14	0.59	0.94	
PROC3	0.70	0.70	0.03	0.15	0.85	
PROC8a (Maintenance)	0.35	0.35	0.14	0.59	0.94	
PROC8b (Bulk)	0.09	0.09	0.07	0.30	0.39	
PROC8b	0.15	0.15	0.07	0.30	0.45	

Page: 19 of 26

Revision: 1st March 2023 Version: 005





(Drum/batch transfers)					
PROC8b (refuelling)	0.15	0.15	0.07	0.30	0.45
PROC8b (refuelling aircraft)	0.15	0.15	0.07	0.30	0.45
PROC16	0.25	0.25	0.03	0.15	0.40
PROC16 (Additive)	0.25	0.25	0.03	0.15	0.40

3.2 Environmental exposure prediction

Exposure assessment (method/calculation model)

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

Naphtha (petroleum), catalytic reformed is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the PEC of each group of components in the substance. These are used to estimate the environmental risk for the substance As the model assumes fractionation before entering the environment, the PEC is not of the substance as manufactured but is a some of the constituents expected to be present in the environmental compartment.

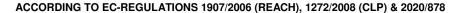
Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment
Predicted Environmental Exposure (PEC)	0.14 mg/L	0.014 mg/L	0.0014 mg/L	0.001 mg/kg ww	0.038 mg/kg ww	0.0038 mg/kg ww
Risk characterisation ratio (RCR)	0.005	0.02	0.002	0.003	0.03	0.003

Human exposure prediction:

Route of Exposure	Exposure (µg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)
Oral	0.42	0.004
Inhalation	92.5	0.1

4.0 Evaluation guidance to downstream user						
For scaling see	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.  Available hazard data do not support the need for a DNEL to be established for other health effects.  Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reachfor-industries-libraries.html).  Exposure calculated for benzene and assumes that the substance contains 1 % benzene. Arithmetic scaling may be possible if the batch contains < 1 % benzene					
Exposure assessment	Worker	ECETOC TRA				
instrument/tool/method	Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.				

Revision: 1st March 2023 Version: 005





Exposure Scenario 4 – Use of Naphtha (petroleum), catalytic reformed (0 – 1 % benzene content) as a fuel - Professional

1.0 Contributing Scenarios	
Sector of uses SU	SU22 Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Process category [PROC]	PROC1 PROC2 PROC2 (Storage) PROC3 PROC8a (Maintenance) PROC8b (Bulk) PROC8b (Drum/batch transfers) PROC8b (refuelling) PROC16
Chemical product category [PC]	Not applicable
Article Categories [AC]	Not applicable
Environmental release categories [ERC]	ERC9a ERC9b
Specific Environmental Release Categories SPERC	ESVOC SpERC 9.12b.v1

2.0 Operational conditions and risk manage	ement measures			
2.1 Control of worker exposure				
Product characteristics				
Physical form of product	Liquid with high volatility.			
Concentration of substance in product		to 100% (≤ 1 % benzene content)		
Human factors not influenced by risk mana	Human factors not influenced by risk management			
Potential exposure area	Not defined			
Frequency and duration of use				
Exposure duration per day	Covers daily exposures u	Covers daily exposures up to 8 hours (unless stated differently).		
Frequency of use (days per year)	300	300		
Other operational conditions affecting work	er exposure			
Area of use	PROC3	Outdoor		
Area of use	All other PROC's	Not defined (default = Indoor)		
Characteristics of the surroundings	Not defined			

### General measures applicable to all activities

Assumes a good basic standard of occupational hygiene is implemented. Assumes activities are at ambient temperature (unless stated differently).

### General measures (skin irritants)

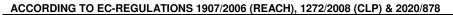
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise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

Technical conditions of use			
PROC1, PROC2, PROC2 (Storage), PROC3, PROC16	Handle substance within a closed system.		
PROC2 (Storage)	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. (Efficiency of at least 30 %)		
PROC8b (Bulk), PROC8b (Drum/batch transfers), PROC8b (refuelling)	Ensure material transfers are under containment or extract ventilation. (Efficiency of at least 90 %)		
Organisational measures	•		
PROC8a (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. (Efficiency of at least 83 %)		
Risk management measures related to human he	alth		
Respiratory protection	No special measures are required.		

Revision: 1st March 2023 Version: 005





	PROC2		Wear suitable gloves tested to EN374. (Efficiency of at least 80 %)	
Hand and/or Skin protection	PROC8a (Maintenand	ce)	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 98 %)	
Eye Protection	No special measures	are required	d.	
Other operational conditions affecting worker exp	osure			
Wear suitable coveralls to prevent exposure to the sk	in. Clear transfer lines p	rior to de-co	oupling. Avoid dip sampling.	
2.2 Control of environmental exposure				
Amounts used				
Fraction of EU tonnage used in region:		0.1		
Regional use tonnage (tons/year):		3.7E+03		
Fraction of Regional tonnage used locally: (tons/year)		5.0E-04		
Annual site tonnage (tons/year):		1.8		
Average daily use (kg/day):		5.0		
Environment factors not influenced by risk manage	gement			
Flow rate of receiving surface water (m³/d):		Not define	ed (default = 18,000)	
Local freshwater dilution factor:		10	, ,	
Local marine water dilution factor:		100		
Operational conditions				
Emission days (days/year):		365		
Release fraction to air from process (initial release pri	or to RMM):	1.0E-02		
Release fraction to wastewater from process (initial release prior to RMM):		1.0E-05		
Release fraction to soil from process (initial release prior to RMM):		1.0E-05		
Technical onsite conditions and measures to redu		s, air emissi	ions and releases to soil	
Treat air emission to provide a typical removal efficiency of (%):		Not applic	able	
If there is no discharge to domestic sewage treatment plant, Treat onsite				
wastewater (prior to receiving water discharge) to provide the required		0		
removal efficiency of (%):				
If discharging to domestic sewage treatment plant, pro	ovide the required	0		
onsite wastewater removal efficiency of (%):		U		
Treat soil emission to provide a typical removal efficie	ency of (%):	0		
	ve process release est	imates used	d. If discharging to domestic sewage treatment plant, no	
onsite wastewater treatment required.				
Organisational measures to prevent/limit release				
Do not apply industrial sludge to natural soils. Sludge		contained oi	reciaimed.	
Conditions and measures related to municipal sewage treatment plant		2000		
	Size of municipal sewage system/treatment plant (m³/d)		95.1	
Degradation effectiveness (%)	mont of woote for dis-			
Conditions and measures related to external treat	-		and an addition	
External treatment and disposal of waste should com		and/or natio	onal regulations.	
Substance release quantities after risk management measures  Maximum allowable site tonnage (MSafe) based on release following total				
wastewater treatment removal (kg/d):	elease following total	1716		

### 3. Exposure estimation and reference to its source

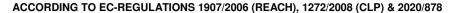
3.1 Human exposure prediction

Exposure assessment (method/calculation model)

ECETOC TRA (benzene content)

	Inhalation		Dei	Dermal		
Process category [PROC]	inhalation exposure (mg/m³)	Risk characterisation ratio (RCR)	dermal exposure (mg/kg bw/day)	Risk characterisation ratio (RCR)	Risk characterisation ratio (RCR)	
PROC1	0.00	0.00	0.03	0.15	0.15	
PROC2	0.50	0.50	0.03	0.12	0.62	
PROC2 (Storage)	0.35	0.35	0.14	0.59	0.94	
PROC3	0.70	0.70	0.03	0.15	0.85	
PROC8a (Maintenance)	0.85	0.85	0.03	0.12	0.97	
PROC8b (Bulk)	0.25	0.25	0.07	0.30	0.55	

Revision: 1st March 2023 Version: 005





PROC8b (Drum/batch transfers)	0.25	0.25	0.07	0.30	0.55
PROC8b (refuelling)	0.25	0.25	0.07	0.30	0.55
PROC16	0.50	0.50	0.03	0.15	0.65

#### 3.2 Environmental exposure prediction

Exposure assessment (method/calculation model)

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

Naphtha (petroleum), catalytic reformed is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the PEC of each group of components in the substance. These are used to estimate the environmental risk for the substance As the model assumes fractionation before entering the environment, the PEC is not of the substance as manufactured but is a some of the constituents expected to be present in the environmental compartment.

Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment
Predicted Environmental Exposure (PEC)	1.25 mg/L	0.0014 mg/L	5.4 mg/L	1.5E-05 mg/kg ww	0.0017 mg/kg ww	5.7 mg/kg ww
Risk characterisation ratio (RCR)	4.5E-08	0.003	9.1E-06	5.0E-06	0.0014	4.4E-06

Human exposure prediction:

Route of Exposure	Exposure (μg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)
Oral	0.054	5.4E-04
Inhalation	0.22	2.4E-04

4.0 Evaluation guidance to	downstream user	
For scaling see	risks are managed to at I Available hazard data do Further details on scaling for-industries-libraries.ht Exposure calculated for	o not support the need for a DNEL to be established for other health effects. g and control technologies are provided in SpERC factsheet (http://cefic.org/en/reachml).  benzene and assumes that the substance contains 1 % benzene. Arithmetic scaling atch contains < 1 % benzene
Exposure assessment	Worker	ECETOC TRA
instrument/tool/method	Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Revision: 1st March 2023 Version: 005



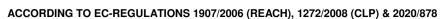


Exposure Scenario 5 – Use of Naphtha (petroleum), catalytic reformed (0 – 1 % benzene content) as a fuel - Consumer

1.0 Contributing Scenarios			
Sector of uses SU	SU21 Consumer uses: Private households (= general public = consumers)		
Process category [PROC]	Not applicable		
Chemical product category [PC]	PC13 PC13 (Automotive refueling) PC13 (Scooter refueling) PC13 (Garden equipment refueling) PC13 (Garden equipment use)		
Article Categories [AC]	Not applicable		
Environmental release categories [ERC]	ERC9a ERC9b		
Specific Environmental Release Categories SPERC	ESVOC SpERC 9.12c.v1		

2.0 Operational conditions and risk manag	ement measures			
2.1 Control of worker exposure				
Product characteristics	1			
Physical form of product		Liquid with high volatility.		
Concentration of substance in product		centrations up to 100% (≤ 1 % benzene of	content)	
Human factors not influenced by risk mana	agement			
		Automotive refueling;	210 cm <sup>2</sup>	
Potential exposure area (Skin Contact)	PC13	Scooter refueling Garden equipment use;		
		Garden equipment use, Garden equipment refueling	420 cm <sup>2</sup>	
Frequency and duration of use		Garden equipment refueling		
requerity and duration of use		Automotive refueling;		
		Scooter refueling	0.05	
Exposure duration (hours/Event)	PC13	Garden equipment use	0.03	
		Garden equipment refueling	2.00	
			52	
		Automotive refueling;	(Covers frequency up to:	
[	PC13	Scooter refueling	weekly use)	
Frequency of use (days per year)	PC13	Cardan aguinment usas	26	
		Garden equipment use; Garden equipment refueling	(Covers frequency up to: once	
		Garden equipment relidening	in two weeks.)	
		Automotive refueling	37500	
Amounts used (g/Event)	PC13	Scooter refueling	3750	
Amounts used (g/Event)	1 010	Garden equipment use;	750	
		Garden equipment refueling	700	
Other operational conditions affecting wor				
Area of use	Not defined			
		Automotive refueling;		
Characteristics of the surroundings	PC13	Scooter refueling;	Outdoor	
Characteristics of the surroundings	1 010	Garden equipment use		
		Garden equipment refueling	34 m³	
Risk Management Measures				
Respiratory protection	No specific	measures identified.		
Hand and/or Skin protection	No specific	measures identified.		
Eye Protection	No specific	measures identified.		
2.2 Control of environmental exposure				
Amounts used				
Fraction of EU tonnage used in region:		0.1		
Regional use tonnage (tons/year):		7.1E+04	7.1E+04	
Fraction of Regional tonnage used locally: (tons/year)		5.0E-04	5.0E-04	
Annual site tonnage (tons/year):		36		
Average daily use (kg/day):		97		
Environment factors not influenced by risk	management	ı		
Flow rate of receiving surface water (m³/d):	<u> </u>	Not defined (default = 18,000	0)	
Local freshwater dilution factor:		10	-,	
Local marine water dilution factor:		100		
Operational conditions		100		
operational continuitions				

Revision: 1st March 2023 Version: 005





Emission days (days/year):	365	
Release fraction to air from process (initial release prior to RMM):	1.0E-02	
Release fraction to wastewater from process (initial release prior to RMM):	1.0E-05	
Release fraction to soil from process (initial release prior to RMM):	1.0E-05	
Conditions and measures related to municipal sewage treatment plant		
Size of municipal sewage system/treatment plant (m³/d)	2000	
Degradation effectiveness (%)	95.1	
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.		
Substance release quantities after risk management measures		
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	3.3E+04	

#### 3. Exposure estimation and reference to its source

### 3.1 Human exposure prediction

Exposure assessment (method/calculation model)

ECETOC TRA (benzene content)

Yearly Use (Chronic)

Inhalation		Dermal		Combined	
Chemical product category [PC]	inhalation exposure (mg/m³)	Risk characterisation ratio (RCR)	dermal exposure (mg/kg bw/day)	Risk characterisation ratio (RCR)	Risk characterisation ratio (RCR)
PC13 (Automotive refueling)	0.002	0.69	0.00	0.01	0.70
PC13 (Scooter refueling)	0.001	0.46	0.00	0.01	0.47
PC13 (Garden equipment use)	0.003	0.87	0.00	0.00	0.87
PC13 (Garden equipment refueling)	0.001	0.18	0.00	0.02	0.20

### 3.2 Environmental exposure prediction

Exposure assessment (method/calculation model)

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

Naphtha (petroleum), catalytic reformed is a hydrocarbon UVCB. The hydrocarbon block method is used in PETRORISK to calculate the PEC of each group of components in the substance. These are used to estimate the environmental risk for the substance As the model assumes fractionation before entering the environment, the PEC is not of the substance as manufactured but is a some of the constituents expected to be present in the environmental compartment.

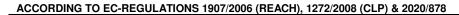
Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment
Predicted Environmental Exposure (PEC)	2.4E-05 mg/L	0.0014 mg/L	5.6E-06 mg/L	1.6E-05 mg/kg ww	0.0017 mg/kg ww	6.3E-06 mg/kg ww
Risk characterisation ratio (RCR)	8.8E-07	0.003	9.5E-06	7.2E-06	0.0014	4.9E-06

Human exposure prediction:

Route of Exposure	Exposure (µg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)
Oral	0.054	5.4E-04
Inhalation	0.22	2.4E-04

4.0 Evaluation guidance to downstream user			
	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that		
	risks are managed to at least equivalent levels.		
For scaling see	Available hazard data do not support the need for a DNEL to be established for other health effects.		
	Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-		
	for-industries-libraries.html).		

Revision: 1st March 2023 Version: 005





	Exposure calculated for benzene and assumes that the substance contains 1 % benzene. Arithmetic scaling may be possible if the batch contains < 1 % benzene	
Exposure assessment instrument/tool/method	Consumer	ECETOC TRA
	Environment	The Hydrocarbon Block Method has been used to calculate environm exposure with the Petrorisk model.