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ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830



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

1.1 Product identifier

Product Name Gasoline

Product Description V4021-EUROBOB-Gasoline

Trade Name EUROBOB
Product code EUROBOB
CAS No. 86290-81-5
EC No. 289-220-8

REACH Registration No. -

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

Identified Use(s)

No.	Exposure Scenario	Page:
1	Distribution of Gasoline (0 – 1 % benzene content)	12
2	Formulation and (re)packing of gasoline $(0 - 1\%$ benzene content)	15
3	Use of Gasoline (0 $-$ 1 % benzene content) as a fuel - Industrial	18
4	Use of Gasoline (0 – 1 % benzene content) as a fuel - Professional	21
5	Use of Gasoline (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 P.O. Box 2056 1211 Geneva 1 Switzerland

Telephone +31 10 498 7200
Fax +31 10 452 9545
E-Mail (competent person) xrea ch@vitol.com

1.4 Emergency telephone number

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)

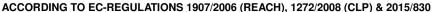
Aquatic Chronic 2; H411

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

Product Description V4021-EUROBOB-Gasoline

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Signal Word(s)

Hazard Statement(s)

Hazard Pictogram(s)

Danger

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

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.

2.3 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

### **Substances**

SUBSTANCE	CAS No.	EC No.	%W/W
Gasoline	86290-81-5	289-220-8	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

H2S Warning:

Inhalation

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Skin Contact

Eye Contact

Ingestion

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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.

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:

## **SECTION 5: FIREFIGHTING MEASURES**

5.1 Extinguishing media

Suitable Extinguishing media

Unsuitable extinguishing media

5.2 Special hazards arising from the substance or mixture 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.

# 5.3 Advice for fire-fighters

## **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

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work 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

Wear flame-resistant antistatic protective clothing.

Evacuate the area and keep personnel upwind. Drench contaminated clothing 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.

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.

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; 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.

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.

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

# 6.2 Environmental precautions

Small spillages:

Large spillages:

6.3 Methods and material for containment and cleaning up

Spillages onto land:

Spillages on water or at sea:

6.4 Reference to other sections

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

7.1 Precautions for safe handling

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 containers properly sealed when not in use. Protect from sunlight. Containers of this material may be hazardous when empty since they retain

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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.

### SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

7.3

8.1.1 Occupational Exposure Limits

Storage temperature

Incompatible materials

Specific end use(s)

Storage measures

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

8.1.2 Biological limit value

8.1.3 PNECs and DNELs

Not established.

PNEC: Not established. Gasoline 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.

Gasoline Derived No Effect Level	Oral	Inhalation	Dermal
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/m³	-
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, well-ventilated (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.

Body protection: Wear anti-static clothing and shoes.

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

large scale: Chemical protection suit.

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

Respiratory protection

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

type A1

Closed system(s): Not normally required.

Thermal hazards Not applicable.

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

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

# Information on basic physical and chemical

properties

Colourless liquid **Appearance** Odour Hydrocarbon Odour threshold Not established. Not established. < - 60 °C Melting point/freezing point

Initial boiling point and boiling range < 35 °C Flash point < 0 °C Evaporation rate Not established. Flammability (solid, gas) Not applicable - Liquid

Upper/lower flammability or explosive limits Flammable Limits (Lower) (%v/v) 1

Flammable Limits (Upper) (%v/v) 10 Vapour pressure 4 - 240 kPa @ 37.8°C

Vapour density > 2

Relative density 0.62 - 0.88 g/cm3 @ 15 °C Solubility(ies) Immiscible with water.

Partition coefficient: n-octanol/water Not applicable. Substance is complex UVCB.

> 220 °C Auto-ignition temperature **Decomposition Temperature** Not established. Viscosity 1 mm<sup>2</sup>/s @ 20 °C

Explosive properties Not explosive. (Vapour may create explosive atmosphere.)

Oxidising properties Not oxidising.

9.2 Other information None known.

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

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

10.2 Chemical stability Stable under normal conditions. Hazardous polymerisation will not occur.

Product may release Hydrogen Sulphide.

Possibility of hazardous reactions 10.3 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. 10.4

Conditions to avoid 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 product(s) 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 toxicological effects All test data taken from existing ECHA registrations for the substances

mentioned.

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

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

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.

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**EUROBOB V4021a** 

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

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 sensitization 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 SE 3; May cause drowsiness or dizziness.

Weight of evidence approach

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

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

No adverse effect observed (rat) (OECD 453) Inhalation:

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 mm2/s @ 20 °C

11.2 Other information None.

## **SECTION 12: ECOLOGICAL INFORMATION**

STOT - single exposure

STOT - repeated exposure

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

Short Term (acute): LL50 (Fish) (96hr) 10 mg/l (OCED 203)

According to the EU CLP Regulation (EC No. 1272/2008) criteria, substances in Long Term (Chronic): 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)

Substance is complex UVCB. The BCF (fish) of this substance components is 12.3 Bioaccumulative potential 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 12.5 Substance is complex UVCB. This substance does not contain PBT constituents

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

12.6 Other adverse effects None known.

## **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

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## **SECTION 14: TRANSPORT INFORMATION**

		ADR/RID	IMDG/ADN
14.1	UN number	UN 1203	UN 1203
14.2	Proper Shipping Name	BENZINE / GASOLINE / BENZIN / ESSENCE POUR MOTEURS D'AUTOMOBILES	BENZINE / GASOLINE / BENZIN / ESSENCE POUR MOTEURS D'AUTOMOBILES
14.3	Transport hazard class(es)	3 (N2, CMR, F)	3 (N2, CMR, F)
14.4	Packing group		II
14.5	Environmental hazards	MILEUGEVAARLIJK / ENVIRONMENTALLY DANGEREUX POUR L'ENVIRONNEMENT	HAZARDOUS / UMWELTGEFÄHRDEND /
14.6	Special precautions for user	Vapour may create explosive atmosphere. The confined spaces.	e vapour is heavier than air; beware of pits and
14.7	Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable	
14.8	Additional Information	ADR HIN: 33	EmS: F-E, S-E
		Tunnel Restriction Code: 2 (D/E) Limited Quantity: 1L	Limited Quantity: 1L

### **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**

Sections indicated with the following have been revised

Header and Section 1.3

Updated Header and Section 14.4.

#### References:

Existing ECHA registration(s) for Gasoline (CAS No. 86290-81-5) and Chemical Safety Report.

This Safety Data Sheet was prepared in accordance with EC Regulation (EC) 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830.

#### Literature References:

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

### **LEGEND**

LTEL Long Term Exposure Limit
STEL Short Term Exposure Limit
DNEL Derived No Effect Level

PNEC Predicted No Effect Concentration

PBT PBT: Persistent, Bioaccumulative and Toxic 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

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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**

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Annex to the extended Safety Data Sheet (eSDS)

See below -

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Gasoline (0 -1% benzene content)

CAS Number 86290-81-5 EC Number 289-220-8

## **Summary of Parameters**

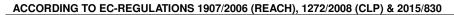
Physical Parameters				
Vapour pressure (Pa)			4 – 240 @ 37.8 °C (Value used for exposure assessment = 340)	
Partition Coefficien	t (log K <sub>OW</sub> )		2.00 - 20.43	
Aqueous solubility	(mg L <sup>-1</sup> )		1.6E+03 - 5.1E-18 (Value used for exposure assessment = 2.0E+02)	
Molecular weight			Not applicable	
Biodegradability			Not defined	
Human health Par	rameter (DNELs)			
	Short term	Inhalation (mg/m³)	1100	
Worker		Dermal (mg/kg bw/day)	Not applicable	
vvorker		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)**

Gasoline 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%).

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Та	ble	ot	Con	ten	ts

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Exposure Scenario 2	Formulation and (re)packing of gasoline $(0-1\%)$ benzene content)	15
Exposure Scenario 3	Use of Gasoline (0 – 1 % benzene content) as a fuel - Industrial	18
Exposure Scenario 4	Use of Gasoline (0 – 1 % benzene content) as a fuel - Professional	21
Exposure Scenario 5	Use of Gasoline (0 – 1 % benzene content) as a fuel - Consumer	24

## **Contributing Scenarios**

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)

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ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830



## Exposure Scenario 1 – Distribution of gasoline (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]	ERC1 ERC2 ERC3 ERC4 ERC5 ERC66 ERC66 ERC66 ERC66 ERC67
Specific Environmental Release Categories SPERC	ESVOC SpERC 1.1b v.1

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	Covers concentrations up to 10	00% (≤ 1 % benzene content)	
Human factors not influenced by risk mana	gement		
Potential exposure area	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 work	cer exposure		
Avanafina	PROC3, PROC2 (Storage)	Outdoor	
Area of use	All other PROC's	Not defined (default = Indoor)	
Characteristics of the surroundings	aracteristics of the surroundings Not defined		
0 1 " 11 1 " " "	•		

## 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)

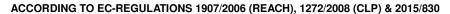
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise 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, PROC3	Handle substance within a closed system.		
PROC8b (Bulk)	Ensure material transfers are under containment or extract ventilation. (Efficiency of at 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 %)		
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. (Inhalation - efficiency of at least 90 %)		

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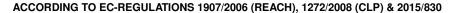
Risk management measures related to human hear				
Respiratory protection	ction No special measures are required.			
	PROC2		Wear suitable gloves tested to EN374. (Efficiency of at least 80 %)	
Hand and/or Skin protection	PROC8a (Maintenan	ce)	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90 %)	
Eye Protection	No special measures	are required		
Other operational conditions affecting worker expo	osure			
Wear suitable coveralls to prevent exposure to the skir	n. Clear transfer lines pr	ior to de-cou	pling. 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):		1.11E+07		
Fraction of Regional tonnage used locally: tons/year		2.0E-03		
Annual site tonnage (tons/year):		21,202		
Average daily use (kg/day)		70,675		
Environment factors not influenced by risk manage	ement	•		
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		1.00		
Emission days (days/year):		300		
Release fraction to air from process (initial release price	or to RMM):	1.0E-03		
Release fraction to wastewater from process (initial rel	ease 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		air emissio	ns and releases to soil	
Treat air emission to provide a typical removal efficience	• ,	90		
If there is no discharge to domestic sewage treatment				
wastewater (prior to receiving water discharge) to prov	ride the required	0		
removal efficiency of (%):				
If discharging to domestic sewage treatment plant, pro	vide the required	0		
onsite wastewater removal efficiency of >= (%)		Ů		
Treat soil emission to provide a typical removal efficier	. ,	0		
wastewater treatment required.		ates used. If	discharging to domestic sewage treatment plant, no onsite	
Organisational measures to prevent/limit release for				
Do not apply industrial sludge to natural soils. Sludge s		ontained or r	eclaimed.	
Conditions and measures related to municipal sew	-	T		
Size of municipal sewage system/treatment plant (m³/d)		2000		
Degradation effectiveness (%)		96.1		
Conditions and measures related to external treatment				
External treatment and disposal of waste should comp		and/or nation	al regulations.	
Substance release quantities after risk management	nt measures	T		
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):		2.58E+06		

3.1 Human exposure prediction

	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	0.25	0.25	0.14	0.57	0.84

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(Maintenance)					
PROC8b (Bulk)	0.15	0.15	0.07	0.30	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.

Gasoline 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)	1.44 mg/L	5.06E-03 mg/L	1.45E-04 mg/L	1,68E-4 mg/kg ww	9.88E-03 mg/kg ww	9.88E-04 mg/kg ww
Risk characterisation ratio (RCR)	1.64E-03	2.74E-02	7.50E-04	7.99E-05	9.98E-03	9.93E-03

Human exposure prediction:

Route of Exposure	Exposure (μg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)
Oral	0.36	3.62E-03
Inhalation	5.66	6.10E-3

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.						

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ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830



## Exposure Scenario 2 – Formulation and (re)packing of gasoline (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 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 1009	% (≤ 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 up to 8 h	ours (unless stated differently).				
Frequency of use (days per year)	300					
Other operational conditions affecting worker expenses	osure					
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)

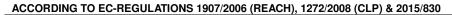
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise 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	Handle substance within a closed system.						
PROC3 (Sampling)	Sample via a closed loop or other system to avoid exposure. (Efficiency of at least 95 %)						
DDOCOb (Dully) DDOCOb (Duum/batab transfers)	Ensure material transfers are u	nder containment or extract ventilation. (Efficiency of at least					
PROC8b (Bulk), PROC8b (Drum/batch transfers)	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 he	alth						
Respiratory protection	No special measures are require	red.					
	PROC2, PROC2 (Storage)	Wear suitable gloves tested to EN374. (Efficiency of at					
	(Storage)	least 80 %)					
Hand and/or Skin protection		Wear chemically resistant gloves (tested to EN374) in					
	PROC8a (Maintenance)	combination with 'basic' employee training. (Efficiency of					
		at least 90 %)					

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ye Protection No special measures are required.							
Other operational conditions affecting worker exposure							
Wear suitable coveralls to prevent exposure to the skin. Clear transfer lines prior to de-coupling. 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):	9.97E+06						
Fraction of Regional tonnage used locally: (tons/year)	3.0E-03						
Annual site tonnage (tons/year):	3.0E+04						
Average daily use (kg/day):	1.0E+05						
Environment factors not influenced by risk management	1						
Flow rate of receiving surface water (m³/d):	Not defined (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 prior to RMM):	2.5E-02						
Release fraction to wastewater from process (initial release prior to RMM):	6.4E-04						
Release fraction to soil from process (initial release prior to RMM):	1.0E-04						
Technical onsite conditions and measures to reduce or limit discharges,	air emissions and releases to soil						
Treat air emission to provide a typical removal efficiency of (%):	0						
If there is no discharge to domestic sewage treatment plant, Treat onsite							
wastewater (prior to receiving water discharge) to provide the required	95.7						
removal efficiency of (%):							
If discharging to domestic sewage treatment plant, provide the required	0						
onsite wastewater removal efficiency of >= (%)	U						
Treat soil emission to provide a typical removal efficiency of (%):	0						
Common practices vary across sites thus conservative process release estimates wastewater treatment required.	ates used. If discharging to domestic sewage treatment plant, no onsite						
Organisational measures to prevent/limit release from site							
Do not apply industrial sludge to natural soils. Sludge should be incinerated, c	ontained or reclaimed.						
Conditions and measures related to municipal sewage treatment plant							
Size of municipal sewage system/treatment plant (m³/d) 2000							
Degradation effectiveness (%) 96.1							
Conditions and measures related to external treatment of waste for disp							
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):  1.0E+05							

# 3. Exposure estimation and reference to its source $% \left( 1\right) =\left( 1\right) \left( 1\right) \left($

## 3.1 Human exposure prediction

	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)	0.50	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	0.25	0.14	0.59	0.84
PROC8b (Bulk)	0.05	0.05	0.07	0.30	0.35
PROC8b (Drum/batch transfers)	0.05	0.05	0.07	0.30	0.35
PROC15	0.05	0.05	0.00	0.01	0.06

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## 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.

Gasoline 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)	1.31E+00 mg/L	1.32E-01 mg/L	1.32E-02 mg/L	1.67E-03 mg/kg ww	9.00E-01 mg/kg ww	9.00E-02 mg/kg ww
Risk characterisation ratio (RCR)	1.49E-01	6.83E-01	6.83E-02	4.99E-03	9.09E-01	9.09E-02

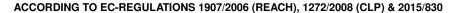
Human exposure prediction:

Route of Exposure	Exposure (μg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)
Oral	7.79	7.79E-02
Inhalation	165	1.78E-01

4.0 Evaluation guidance to downstream user				
For scaling see	risks are managed to at least Available hazard data do not Further details on scaling an for-industries-libraries.html). Exposure calculated for ben	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.		

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## Exposure Scenario 3 – Use of Gasoline (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 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					
Potential exposure area	Potential exposure area 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 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.

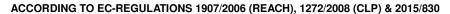
## General measures (carcinogens)

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, PROC16 (Additive)	Handle substance within a closed	e within a closed system.		
PROC8b (Bulk), PROC8b (Drum/batch transfers), PROC8b (refuelling), PROC8b (refuelling aircraft)	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 86 %)			
Risk management measures related to human hea	lth			
Respiratory protection	No special measures are required	d.		
Hand and/or Skin protection	PROC2	Wear suitable gloves tested to EN374. (Efficiency of at least 80 %)		
Francial and of Skill protection	PROC8a (Maintenance)	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of		

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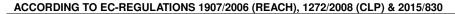
		at least 90 %)			
Eye Protection	No special measures a	are required.			
Other operational conditions affecting worker exposure					
Wear suitable coveralls to prevent exposure to the skin	Wear suitable coveralls to prevent exposure to the skin. Clear transfer lines prior to de-coupling. Avoid dip sampling.				
2.2 Control of environmental exposure					
Amounts used					
Fraction of EU tonnage used in region:		0.1			
Regional use tonnage (tons/year):		9.38E+05			
Fraction of Regional tonnage used locally: (tons/year)		1			
Annual site tonnage (tons/year):		9.38E+05			
Average daily use (kg/day):		3.13E+06			
Environment factors not influenced by risk manage	ement				
Flow rate of receiving surface water (m³/d):		Not defined (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 prio	r to RMM):	5.00E-02			
Release fraction to wastewater from process (initial rele		1.0E-05			
Release fraction to soil from process (initial release prior to RMM):  0					
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil					
Treat air emission to provide a typical removal efficiency of (%):		95.0			
If there is no discharge to domestic sewage treatment					
wastewater (prior to receiving water discharge) to provi	ide the required	91.1			
removal efficiency of (%):					
If discharging to domestic sewage treatment plant, pro-	vide the required	0			
onsite wastewater removal efficiency of >= (%)					
Treat soil emission to provide a typical removal efficien		0			
Common practices vary across sites thus conservative wastewater treatment required.	process release estimat	ates used. If discharging to domestic sewage treatment plant, no or	nsite		
Organisational measures to prevent/limit release fr					
Do not apply industrial sludge to natural soils. Sludge s		ontained or reclaimed.			
Conditions and measures related to municipal sewage treatment plant					
Size of municipal sewage system/treatment plant (m³/d)		2000			
Degradation effectiveness (%)		96.1			
Conditions and measures related to external treatn	nent of waste for dispos	osal			
External treatment and disposal of waste should compl		and/or national regulations.			
Substance release quantities after risk managemen					
Maximum allowable site tonnage (MSafe) based on rel wastewater treatment removal (kg/d):	ease following total	5.30E+06			

3.1 Human exposure prediction

	Inhalation		Der	rmal	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	0.59	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 (Drum/batch transfers)	0.15	0.15	0.07	0.30	0.45
PROC8b (refuelling)	0.15	0.15	0.07	0.30	0.45
PROC8b	0.15	0.15	0.07	0.30	0.45

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(refuelling aircraft)					
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.

Gasoline 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)	6.39E-01 mg/L	6.40E-02 mg/L	6.40E-02 mg/L	5.07E-03 mg/kg ww	4.37E-01 mg/kg ww	4.37E-02 mg/kg ww
Risk characterisation ratio (RCR)	7.24E-02	3.32E-01	3.32E-02	1.52E-02	4.41E-01	4.41E-02

Human exposure prediction:

	Route of Exposure	Exposure (µg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)
ſ	Oral	3.90	3.90E-02
Ī	Inhalation	511	5.51F-01

4.0 Evaluation guidance to downstream user					
For scaling see	Where other Risk Management Measures/Operational Conditions are adopted, then users should earlies 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.				
Exposure assessment	Worker	ECETOC TRA			
instrument/tool/method	Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.			

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### Exposure Scenario 4 – Use of Gasoline (0 – 1 % benzene content) as a fuel - Professional

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

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 mana	agement				
Potential exposure area	Not defined				
Frequency and duration of use					
Exposure duration per day	Covers daily exposures u	o to 8 hours (unless stated differently).			
Frequency of use (days per year)	300				
Other operational conditions affecting work	ker exposure				
Avec of	PROC3	Outdoor			
Area of use	All other PROC's	Not defined (default = Indoor)			
Characteristics of the surroundings	Not defined	Not defined			
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#### 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)

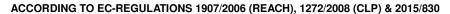
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise 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					
	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 83 %)				
Risk management measures related to human health					
Respiratory protection	No special measures are required.				
Hand and/or Skin protection	PROC2	Wear suitable gloves tested to EN374. (Efficiency of at			

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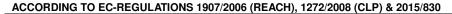
			least 80 %)
	PROC8a (Maintenanc	•	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 98 %)
Eye Protection	No special measures	are required	
Other operational conditions affecting worker expo	sure		
Wear suitable coveralls to prevent exposure to the skin	. Clear transfer lines prid	or to de-cou	pling. 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):		8.85E+05	
Fraction of Regional tonnage used locally: (tons/year)		5.0E-04	
Annual site tonnage (tons/year):		442	
Average daily use (kg/day):		1211	
Environment factors not influenced by risk manage	ement	1	
Flow rate of receiving surface water (m³/d):		Not define	d (default = 18,000)
Local freshwater dilution factor:		10	- (
Local marine water dilution factor:		100	
Operational conditions		1.00	
Emission days (days/year):		365	
Release fraction to air from process (initial release prio	r to RMM):	1.0E-02	
Release fraction to wastewater from process (initial rele		1.0E-05	
Release fraction to soil from process (initial release prid		1.0E-05	
Technical onsite conditions and measures to reduce	e or limit discharges,	air emissio	ns and releases to soil
Treat air emission to provide a typical removal efficience	y of (%):	0	
If there is no discharge to domestic sewage treatment p	olant, Treat onsite		
wastewater (prior to receiving water discharge) to provi	de the required	0m	
removal efficiency of (%):			
If discharging to domestic sewage treatment plant, prov	vide the required	0	
onsite wastewater removal efficiency of >= (%)	·		
Treat soil emission to provide a typical removal efficien	cy of (%):	0	
Common practices vary across sites thus conservative wastewater treatment required.	process release estima	tes used. If	discharging to domestic sewage treatment plant, no onsite
Organisational measures to prevent/limit release from	om site		
Do not apply industrial sludge to natural soils. Sludge s		ntained or r	eclaimed.
Conditions and measures related to municipal sew	•		
Size of municipal sewage system/treatment plant (m³/d)		2000	
Degradation effectiveness (%)		96.1	
Conditions and measures related to external treatm	nent of waste for dispo	sal	
External treatment and disposal of waste should compl	y with applicable local a	nd/or nation	al regulations.
Substance release quantities after risk managemen			
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):		6.06E+04	

## 3. Exposure estimation and reference to its source

## 3.1 Human exposure prediction

	Inhalation		Dei	mal	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	0.59	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
PROC8b (Drum/batch transfers)	0.25	0.25	0.07	0.30	0.55

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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.

Gasoline 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)	2.48E-05 mg/L	3.64E-03 mg/L	1.42E-04 mg/L	2.18E-04 mg/kg ww	7.20E-03 mg/kg ww	3.60E-05 mg/kg ww	
Risk characterisation ratio (RCR)	2.81E-05	2.00E-02	7.56E-05	1.99E-04	7.33E-03	3.59E-05	

Human exposure prediction:

Route of Exposure	Exposure (μg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)
Oral	2.79	2.79E-03
Inhalation	5.18	5.58E-03

4.0 Evaluation guidance to downstream user					
For scaling see	risks are managed to at lea Available hazard data do no Further details on scaling a for-industries-libraries.html) Exposure calculated for be	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.			

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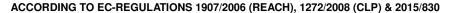


## Exposure Scenario 5 - Use of Gasoline (0 - 1 % benzene content) as a fuel - Consumer

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 management measures						
2.1 Control of worker exposure	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 managemen	nt					
Potential exposure area (Skin Contact)	PC13	Automotive refueling; Scooter refueling	210 cm <sup>2</sup>			
Potential exposure area (Skiri Contact)	F013	Garden equipment use; Garden equipment refueling	420 cm <sup>2</sup>			
Frequency and duration of use			•			
Exposure duration (hours/Event)	PC13	Automotive refueling; Scooter refueling Garden equipment use	0.05 0.03			
		Garden equipment refueling	2.00			
Frequency of use (days per year)	PC13	Automotive refueling; Scooter refueling	52 (Covers frequency up to: weekly use)			
		Garden equipment use; Garden equipment refueling	(Covers frequency up to: once in two weeks.)			
		Automotive refueling	37500			
Amounts used (g/Event)	PC13	Scooter refueling	3750			
,		Garden equipment use; Garden equipment refueling	750			
Other operational conditions affecting worker exp						
Area of use	Not defined					
		Automotive refueling;				
Characteristics of the surroundings	PC13	Scooter refueling;	Outdoor			
Onarable of the samounaings	1 010	Garden equipment use				
		Garden equipment refueling	34 m³			
Risk Management Measures						
Respiratory protection	-	easures identified.				
Hand and/or Skin protection		easures identified.				
Eye Protection	No specific m	easures identified.				
2.2 Control of environmental exposure						
Amounts used Fraction of EU tonnage used in region:		0.1				
Regional use tonnage (tons/year):						
Fraction of Regional tonnage used locally: (tons/year)	1	8.15E+06				
	)	5.0E-04				
Annual site tonnage (tons/year):			4.08E+03			
Average daily use (kg/day):		1.12E+04				
Environment factors not influenced by risk manage	gement					
Flow rate of receiving surface water (m³/d):		Not defined (default = 18,00	0)			
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 pr	ior to RMM):	1.0E-02				

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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 (%)	96.1			
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	5.31E+05			
wastewater treatment removal (kg/d):	0.012100			

3. Exposure estimation and reference to its so	urce
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### 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.

Gasoline 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)	2.28E-03 mg/L	3.85E-03 mg/L	2.29E-05 mg/L	5.04E-04 mg/kg ww	8.59E-03 mg/kg ww	1.56E-04 mg/kg ww
Risk characterisation ratio (RCR)	2.59E-04	2.10E-02	1.18E-04	1.24E-03	8.73E-03	1.58E-04

Human exposure prediction:

Route of Exposure	Exposure (μg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)
Oral	0.30	2.95E-03
Inhalation	5.18	5.58E-03

4.0 Evaluation guidance to downstream user				
Where other Risk Management Measures/Operational Conditions are adopted, then users should 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.or 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	Consumer	ECETOC TRA		

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instrument/tool/method Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.
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