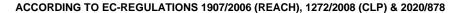
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SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product Name Gasoline

Product Description V4024-GASOLINE BLENDSTOCK-Gasoline

Trade Name GASOLINE BLENDSTOCK

 Product code
 GASBLEND

 CAS No.
 86290-81-5

 EC No.
 289-220-8

REACH Registration No. 01-2119471335-39-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 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 1201 Geneva Switzerland +31 10 498 7200 +31 10 452 9545 xreach@vitol.com

1.4 Emergency telephone number

E-Mail (competent person)

Telephone

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)

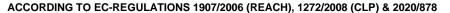
Aquatic Chronic 2; H411

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

Product Description V4024-GASOLINE BLENDSTOCK-Gasoline

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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.

 $\label{eq:H361fd:Suspected} \mbox{H361fd: Suspected of damaging fertility. Suspected of damaging the unborn}$

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.

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

3.1 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.

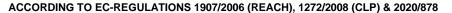
Hydrogen sulphide (H2S) can accumulate in the headspace of storage tanks and reach potentially hazardous concentrations.

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

H2S Warning:

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Inhalation

Skin Contact

Eye 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:

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 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 fire-fighters

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. Do not use sparking tools. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems.

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ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



H2S Warning: Product may release Hydrogen Sulphide. Exposure controls - 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. Please see section 8 for appropriate personal protection equipment Small spillages: Wear flame-resistant antistatic protective clothing. Large spillages: 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. 6.2 Avoid release to the environment. Do not allow to enter drains, sewers or **Environmental precautions** 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

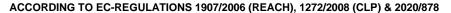
Obtain special instructions before use. Keep away from sources of ignition - No smoking. Use only outdoors or in a well-ventilated area. Prevent vapour build up by providing adequate ventilation during and after use. May form explosive mixtures with air. Take action to prevent static discharges. Use 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.

H2S Warning:

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Incompatible materials





7.2 Conditions for safe storage, including any incompatibilities

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 product residue. Empty container may contain product residue which may result in flammable or explosive vapours inside the container.

Storage temperature Stable at ambient temperatures.

Storage measures Suitable containers: Stainless steel, Mild steel

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

7.3 Specific end use(s) See Section: 1.2 and/or Exposure Scenario.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational Exposure LimitsNo 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. 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/m³	-
Worker - Long Term - Local effects	-	840 mg/m³	-
Worker - Acute - Local effects	-	1100 mg/m³	-
Consumer - Long Term - Systemic effects	-	1200 mg/m³	-
Consumer - Long Term - Local effects	-	180 mg/m³	-
Consumer - Acute - Local effects	-	640 mg/m³	-

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

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

Eye/ face protection

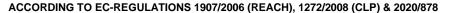


Skin protection

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.

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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.

Respiratory protection



When the product is heated /In case of inadequate ventilation wear respiratory protection. The use of a high efficiency filter (EN143) is recommended. Filter type

Α1

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

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 < 35 °C

Flammability

10.4

10.5

10.6

Not applicable - Liquid Lower and upper explosion limit Flammable Limits (Lower) (%v/v) 1

Flammable Limits (Upper) (%v/v) 10 < 0 °C Flash point

Auto-ignition temperature > 220 °C Decomposition temperature Not established. Not established. рΗ Kinematic viscosity 1 mm²/s @ 20 °C

Solubility Immiscible with water. Partition coefficient: n-octanol/water (log value) Not applicable. Substance is complex UVCB.

4 - 240 kPa @ 37.8°C Vapour pressure

Density and/or relative density 0.62 - 0.88 g/cm3 @ 15 °C

Relative vapour density > 2

Particle characteristics Not established.

9.2 Other information None known.

SECTION 10: STABILITY AND REACTIVITY

Hazardous decomposition products

Incompatible materials

10.1 Reactivity Stable under normal conditions. Reacts with - Strong oxidising agents 10.2 Chemical stability 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. 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. Keep away from oxidising agents. Strong Acids and Alkalis.

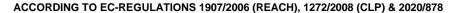
A mixture of solid and liquid particulates and gases including unidentified

organic and inorganic compounds. Decomposes in a fire giving off toxic fumes:

COx, H2S, SOx,

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SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on hazard classes as defined in

Regulation (EC) No 1272/2008

Acute toxicity - Ingestion

Acute toxicity - Inhalation

Acute toxicity - Skin contact

Skin corrosion/irritation

Serious eye damage/irritation

Respiratory or skin sensitisation

Germ cell mutagenicity

Carcinogenicity

Reproductive toxicity

STOT - Single Exposure

STOT - Repeated Exposure

Aspiration hazard

11.2 Information on other hazards11.2.1 Endocrine disrupting properties

Short Term (acute):

Long Term (Chronic):

11.2.2 Other information

All test data taken from existing ECHA registrations for the substances

mentioned.

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

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

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

LC50 Vapour > $5600 \text{ mg/m}^3 \text{ Air (rat) (OECD 403)}$

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

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

Skin Irrit. 2; Causes skin irritation. Irritating to skin. (rabbit) (OECD 404)

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

Not irritating to eyes (rabbit) (OECD 405)

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

Sensitisation (guinea pig) - Negative (OECD 406)

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

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

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))

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

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

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

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

Classification.

Viscosity: 1 mm²/s @ 20 °C

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.

Dermal:

LL50 (Fish) (96hr) 10 mg/l (OCED 203)

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.

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ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



12.5 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.

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

Waste classification according to Directive 2008/98/EC

EU Waste Codes: HP3, HP4, HP7, HP10, HP11, HP14

(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 DANGEREUX POUR L'ENVIRONNEMENT	HAZARDOUS / UMWELTGEFÄHRDEND /		
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 MARPOL Annex 1. Special Precautions: Refer to Chapter 7 'Handling and Storage' for special precautions which a user needs to be aware of, or needs to comply with, in connection with transport.			
14.8	Additional Information	ADR HIN: 33 Tunnel Restriction Code: 1 (D/E) Limited Quantity: 500 ml	EmS: F-E, S-E Limited Quantity: 500ml		
	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

Upper Tier: 25000 tonnes Seveso 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

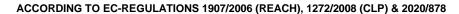
Germany Wassergefährdungsklasse (Germany). WGK number: 3

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.

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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 Gasoline (CAS No. 86290-81-5) and Chemical Safety Report.

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

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 RID: Regulations concerning the international railway transport of dangerous goods

Short term exposure limit STEL

vPvB: very Persistent and very Bioaccumulative vPvB

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,

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.

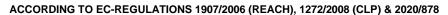
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Annex to the extended Safety Data Sheet (eSDS)

See helow -

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Gasoline (0 -1% benzene content)

CAS No. 86290-81-5 EC No. 289-220-8

Summary of Parameters

Physical Parameters				
Vapour pressure (Pa)			4 – 240 @ 37.8 °C (Value used for exposure assessment = 340)	
Partition Coefficier	nt (log K _{OW})		2.00 - 20.43	
Aqueous solubility	(mg L ⁻¹)		1.6E+03 - 5.1E-18 (Value used for exposure assessment = 2.0E+02)	
Molecular weight			Not applicable	
Biodegradability			Not defined	
Human health Parameter (DNELs)				
	Short term	Inhalation (mg/m³)	1100	
Worker		Dermal (mg/kg bw/day)	Not applicable	
vvoikei	Long Torm	Inhalation (mg/m³)	3.2 (= 1 ppm)*	
Long Term		Dermal (mg/kg bw/day)	0.234*	
Inhalation (mg/m³)		Inhalation (mg/m³)	0.0032 (=1 ppb)* (0.93 mg/kg bw/day)	
Consumer		Dermal (mg/kg bw/day)	0.234*	
Oral		Oral (mg/kg ⁻¹ bw/day ⁻¹)	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.

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^{*} Concentration: benzene (Worst case assumption. Contains benzene. @1%).

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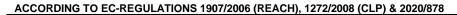




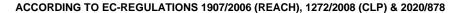
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Contributing Scenarios

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	Pouls
PC13	Fuels (Automotive refueling)
	(Automotive refueling)
	(Scooter refueling)
	(Garden equipment refueling)
	(Garden equipment use)

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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 ERC60 ERC6C6 ERC6C6 ERC6C6 ERC6C7
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 10	0% (≤ 1 % benzene content)		
Human factors not influenced by risk manageme	ent			
Potential exposure area	Not defined			
Frequency and duration of use				
Exposure duration per day	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 worker ex	posure			
Area of use	PROC3, PROC2 (Storage)	Outdoor		
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)

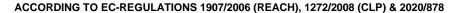
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise 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, 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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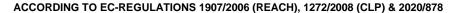
Risk management measures related to human hea				
Respiratory protection	No special measures	are require		
	PROC2		Wear suitable gloves tested to EN374. (Efficiency of a least 80 %)	
Hand and/or Skin protection	PROC8a (Maintenand	ce)	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficience of at least 90 %)	
Eye Protection	No special measures	are require	d.	
Other operational conditions affecting worker exp	osure			
Wear suitable coveralls to prevent exposure to the sk	in. Clear transfer lines p	orior 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):		1.11E+07	,	
Fraction of Regional tonnage used locally: tons/ye	ear	2.0E-03		
Annual site tonnage (tons/year):		21,202		
Average daily use (kg/day)		70,675		
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		1		
Emission days (days/year):		300		
Release fraction to air from process (initial release prior to RMM):		1.0E-03		
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	uce or limit discharges	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 treatmen				
wastewater (prior to receiving water discharge) to pro removal efficiency of (%):	vide the required	0		
If discharging to domestic sewage treatment plant, pr	ovide the required			
onsite wastewater removal efficiency of (%):		0		
Treat soil emission to provide a typical removal efficie		0		
onsite wastewater treatment required.	·	imates used	d. If discharging to domestic sewage treatment plant, n	
Organisational measures to prevent/limit release				
Do not apply industrial sludge to natural soils. Sludge		contained o	r reclaimed.	
Conditions and measures related to municipal se		1		
Size of municipal sewage system/treatment plant (m³	/d)	2000		
Degradation effectiveness (%)		96.1		
Conditions and measures related to external treat	ment of waste for disp	oosal		
External treatment and disposal of waste should com	. ,	and/or nation	onal regulations.	
Substance release quantities after risk manageme				
Maximum allowable site tonnage (MSafe) based on rewastewater treatment removal (kg/d):	elease following total	2.58E+06		

3. Exposure estimation and reference to its source

3.1 Human exposure prediction

	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)	0.35	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

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PROC8a (Maintenance)	0.25	0.25	0.14	0.57	0.84	
PROC8b (Bulk)	0.15	0.15	0.07	0.30	0.45	
PROC15	0.05	0.05	0.00	0.01	0.06	Ī

	110013	0.05	0.05	0.00	0.01	0.00	
3.2 Enviro	nmental exposure pre	diction					
Exposure a	assessment (method/cal	lculation model)	,	oon Block Method exposure with the Pe		calculate	

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.

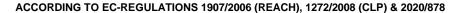
Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment
Predicted Environmental Exposure (PEC)	1.44 mg/L	5.06E-03 mg/L	1.45E-04 mg/L	1,68E-4 mg/kg ww	9.88E-03 mg/kg ww	9.88E-04 mg/kg ww
Risk characterisation ratio (RCR)	1.64E-03	2.74E-02	7.50E-04	7.99E-05	9.98E-03	9.93E-03

Human exposure prediction:

Route of Exposure	Exposure (μg/kg ⁻¹ day ⁻¹)	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	risks are managed to Available hazard data Further details on sca for-industries-libraries Exposure calculated	for benzene and assumes that the substance contains 1 % benzene. Arithmetic scaling a 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 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.	Liquid with high volatility.				
Concentration of substance in product	Covers concentrations up	Covers concentrations up to 100% (≤ 1 % benzene content)				
Human factors not influenced by risk management						
Potential exposure area	Not defined	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 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.

Consider the field for fish based fically salvellarise.							
Technical conditions of use	Technical conditions of use						
PROC1, PROC2, PROC2 (Storage), PROC3	e), 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 %)						
PROC8b (Bulk), PROC8b (Drum/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	No special measures are required	d.					
Hand and/or Skin protection	PP000 PP000 (0()	Wear suitable gloves tested to EN374. (Efficiency of at					
Hand and/or Skin protection	PROC2, PROC2 (Storage)	least 80 %)					

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	PROC8a (Maintenand	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 require	d.		
Other operational conditions affecting worker exp	oosure				
Wear suitable coveralls to prevent exposure to the sk	tin. Clear transfer lines p	rior to de-co	oupling. Avoid dip sampling.		
2.2 Control of environmental exposure					
Amounts used		1			
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 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	ior to RMM):	2.5E-02			
Release fraction to wastewater from process (initial re		6.4E-04			
Release fraction to soil from process (initial release p		1.0E-04			
Technical onsite conditions and measures to redu		, air emiss	ions and releases to soil		
Treat air emission to provide a typical removal efficier		0			
If there is no discharge to domestic sewage treatmen wastewater (prior to receiving water discharge) to pro removal efficiency of (%):		95.7			
If discharging to domestic sewage treatment plant, pronsite wastewater removal efficiency of (%):	ovide the required	0			
Treat soil emission to provide a typical removal efficie	ency of (%):	0			
onsite wastewater treatment required.		imates used	d. If discharging to domestic sewage treatment plant, no		
Organisational measures to prevent/limit release			r radaimad		
Do not apply industrial sludge to natural soils. Sludge Conditions and measures related to municipal se		contained o	r reciaimed.		
		2000			
Size of municipal sewage system/treatment plant (m³/d)					
Degradation effectiveness (%)	tmant of wasts for all-	96.1			
Conditions and measures related to external treat					
External treatment and disposal of waste should com		and/or nation	onal regulations.		
Substance release quantities after risk manageme Maximum allowable site tonnage (MSafe) based on re wastewater treatment removal (kg/d):		1.0E+05			

3. Exposure estimation and reference to its source

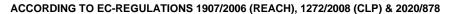
3.1 Human exposure prediction

Exposure assessment (method/calculation model)

ECETOC TRA (benzene content)

	Inha	lation	Der	Combined		
Process category [PROC]	inhalation Risk exposure characterisation (mg/m³) 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)	0.25	0.25	0.14	0.59	0.84	
PROC8b (Bulk)	0.05	0.05	0.07	0.30	0.35	

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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

3.2 Environmental exposure prediction								
Exposure assessment (method/calculation model)	The Hydrocarbo	n Block	Method	has	been	used	to	calculate

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.

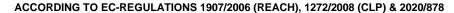
Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment
Predicted Environmental Exposure (PEC)	1.31E+00 mg/L	1.32E-01 mg/L	1.32E-02 mg/L	1.67E-03 mg/kg ww	9.00E-01 mg/kg ww	9.00E-02 mg/kg ww
Risk characterisation ratio (RCR)	1.49E-01	6.83E-01	6.83E-02	4.99E-03	9.09E-01	9.09E-02

Human exposure prediction:

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

4.0 Evaluation guidance to d	ownstream user	
For scaling see	risks are managed to at lead Available hazard data do n Further details on scaling a for-industries-libraries.html	ot support the need for a DNEL to be established for other health effects. nd control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-). In a sume of 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 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	Not defined	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 wor	ker exposure				
Area of use	PROC3	Outdoor			
Area or 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)

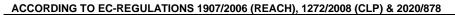
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise 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, PROC16, PROC16 (Additive)	Handle substance 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.					
Hand and/or Skin protection	PROC2	Wear suitable gloves tested to EN374. (Efficiency of at least 80 %)			

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	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 exposure							
Wear suitable coveralls to prevent exposure to the ski	n. Clear transfer lines p	rior to de-co	oupling. Avoid dip sampling.				
2.2 Control of environmental exposure							
Amounts used	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 manag	gement						
Flow rate of receiving surface water (m³/d):		Not define	ed (default = 18,000)				
Local freshwater dilution factor:		10	1				
Local marine water dilution factor:		100					
Operational conditions		.00					
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		1.0E-05					
Release fraction to soil from process (initial release pr	ior to RMM):	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	plant, Treat onsite						
wastewater (prior to receiving water discharge) to pro- removal efficiency of (%):	vide the required	91.1					
If discharging to domestic sewage treatment plant, pro	ovide the required	0					
onsite wastewater removal efficiency of (%):		0					
Treat soil emission to provide a typical removal efficie	ncy of (%):	0					
onsite wastewater treatment required.		mates used	I. 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	r reclaimed.				
Conditions and measures related to municipal sev							
Size of municipal sewage system/treatment plant (m³/d)			2000				
Degradation effectiveness (%)			96.1				
Conditions and measures related to external treat							
External treatment and disposal of waste should comp	, ,,	and/or natio	onal regulations.				
Substance release quantities after risk manageme		ı					
Maximum allowable site tonnage (MSafe) based on rewastewater treatment removal (kg/d):	elease following total	5.30E+06					

3. Exposure estimation and reference to its source

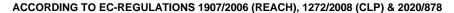
3.1 Human exposure prediction

Exposure assessment (method/calculation model)

ECETOC TRA (benzene content)

	Inha	lation	Der	Combined	
Process category	inhalation	Risk	dermal	Risk	Risk
[PROC]	exposure	characterisation	exposure	characterisation	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	0.35	0.35	0.14	0.59	0.94
(Storage)	0.33	0.33	0.14	0.59	0.94
PROC3	0.70	0.70	0.03	0.15	0.85
PROC8a	0.35	0.35	0.14	0.59	0.94
(Maintenance)	0.33	0.33	0.14	0.59	0.94
PROC8b	0.09	0.09	0.07	0.30	0.39
(Bulk)	0.09	0.09	0.07	0.30	0.39
PROC8b	0.15	0.15	0.07	0.30	0.45

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(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.

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.

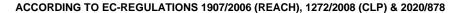
Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment
Predicted Environmental Exposure (PEC)	6.39E-01 mg/L	6.40E-02 mg/L	6.40E-02 mg/L	5.07E-03 mg/kg ww	4.37E-01 mg/kg ww	4.37E-02 mg/kg ww
Risk characterisation ratio (RCR)	7.24E-02	3.32E-01	3.32E-02	1.52E-02	4.41E-01	4.41E-02

Human exposure prediction:

Route of Exposure	Exposure (μg/kg ⁻¹ day ⁻¹)	Risk characterisation ratio (RCR)
Oral	3.90	3.90E-02
Inhalation	511	5.51E-01

4.0 Evaluation guidance to downstream user						
For scaling see	risks are managed to at leas Available hazard data do not Further details on scaling and for-industries-libraries.html).	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-				
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	
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 manag	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 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	Covers daily exposures up to 8 hours (unless stated differently).		
Frequency of use (days per year)	300	300		
Other operational conditions affecting wor	ker exposure			
Anna at was	PROC3	Outdoor		
Area of use	All other PROC's	All other PROC's Not defined (default = Indoor)		
Characteristics of the surroundings	Not defined			
Conoral magaziros applicable to all activitiv				

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)

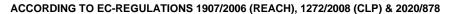
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise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

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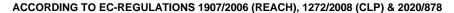
	PROC2		Wear suitable gloves tested to EN374. (Efficiency of at least 80 %)
Hand and/or Skin protection			Wear chemically resistant gloves (tested to EN374) in
	PROC8a (Maintenand	ce)	combination with 'basic' employee training. (Efficiency
	,	,	of at least 98 %)
Eye Protection	No special measures	are required	1.
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	upling. 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	gement	l	
Flow rate of receiving surface water (m³/d):	<u>, </u>	Not define	rd (default = 18,000)
Local freshwater dilution factor:		10	(doladit = 10,000)
Local marine water dilution factor:		100	
Operational conditions		100	
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 re		1.0E-05	
Release fraction to soil from process (initial release process)		1.0E-05	
Technical onsite conditions and measures to redu		, air emissi	ons and releases to soil
Treat air emission to provide a typical removal efficier	ncy of (%):	0	
If there is no discharge to domestic sewage treatment			
wastewater (prior to receiving water discharge) to pro-	•	0m	
removal efficiency of (%):	·		
If discharging to domestic sewage treatment plant, pro	ovide the required		
onsite wastewater removal efficiency of (%):	·	0	
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	. If discharging to domestic sewage treatment plant, no
Organisational measures to prevent/limit release	from site		
Do not apply industrial sludge to natural soils. Sludge		contained or	reclaimed.
Conditions and measures related to municipal ser	wage treatment plant		
Size of municipal sewage system/treatment plant (m³/d)		2000	
Degradation effectiveness (%)		96.1	
Conditions and measures related to external treat	ment of waste for disp	osal	
External treatment and disposal of waste should comp			onal regulations.
Substance release quantities after risk manageme			-
Maximum allowable site tonnage (MSafe) based on re		6.06E+04	
wastewater treatment removal (kg/d):		0.00LT04	

3. Exposure estimation and reference to its source

3.1 Human exposure prediction

	Inhalation		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)	0.35	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

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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.

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.

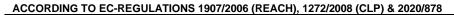
Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment
Predicted Environmental Exposure (PEC)	2.48E-05 mg/L	3.64E-03 mg/L	1.42E-04 mg/L	2.18E-04 mg/kg ww	7.20E-03 mg/kg ww	3.60E-05 mg/kg ww
Risk characterisation ratio (RCR)	2.81E-05	2.00E-02	7.56E-05	1.99E-04	7.33E-03	3.59E-05

Human exposure prediction:

Route of Exposure	Exposure (µg/kg ⁻¹ day ⁻¹)	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 Available hazard data do Further details on scaling for-industries-libraries.htt	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/reach-ml). 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.

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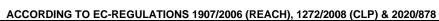


Exposure Scenario 5 - Use of Gasoline (0 - 1 % benzene content) as a fuel - Consumer

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 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 con	Liquid with high volatility. Covers concentrations up to 100% (≤ 1 % benzene content)		
Human factors not influenced by risk mana	nement	certifations up to 100% (= 1 % berizerie	content	
Potential exposure area (Skin Contact)	PC13	Automotive refueling; Scooter refueling	210 cm ²	
, , ,	1 0 10	Garden equipment use; Garden equipment refueling	420 cm ²	
Frequency and duration of use				
Exposure duration (hours/Event)	PC13	Automotive refueling; Scooter refueling	0.05	
Exposure duration (nodic/Eventy	1 0 10	Garden equipment use	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)	
	1010	Garden equipment use; Garden equipment refueling	26 (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 work				
Area of use	Not defined			
		Automotive refueling;		
Characteristics of the surroundings	PC13	Scooter refueling;	Outdoor	
Characteristics of the surroundings	FC13	Garden equipment use		
		Garden equipment refueling	34 m³	
Risk Management Measures	<u>.</u>	·	•	
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):		8.15E+06	8.15E+06	
Fraction of Regional tonnage used locally: (ton	s/year)	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	management			
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		
0 4 1 14		'		
Operational conditions				
Emission days (days/year):		365		

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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):	51512105		

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.

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 ⁻¹ day ⁻¹)	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 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.			
For scaling see	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			

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ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878



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