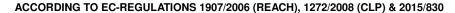
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## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product Name Gas Oils (petroleum), light vacuum

Product Description V3010-GASOIL-Gas Oils (petroleum), light vacuum

Trade Name GASOIL
Product code V3010, GASOIL
CAS No. 64741-58-8
EC No. 265-059-9

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 Gas oils (petroleum), light vacuum	11
2	Formulation and (re)packing of Gas oils (petroleum), light vacuum	14
3	Use as a fuel - Industrial	17
4	Use as a fuel - Professional	20
5	Use as a fuel - Consumer	23

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. 3; H226

Asp. Tox. 1; H304 Skin Irrit. 2; H315 Acute Tox. 4; H332 Carc. 2; H351

STOT RE 2; H373 (Thymus, Liver, Bone marrow)

Aquatic Chronic 2; H411

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

Product Description V3010-GASOIL-Gas Oils (petroleum), light vacuum

Hazard Pictogram(s)





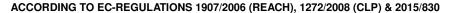




Signal Word(s) Danger

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Hazard Statement(s) H226: Flammable liquid and vapour.

H304: May be fatal if swallowed and enters airways.

H315: Causes skin irritation. H332: Harmful if inhaled.

H351: Suspected of causing cancer.

H373: May cause damage to organs through prolonged or repeated exposure:

Thymus, Liver, Bone marrow

H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s) P210: Keep away from heat, hot surfaces, sparks, open flames and other

> ignition sources. No smoking. P260: Do not breathe fume.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or

doctor/physician.

P331: Do NOT induce vomiting.

P273: Avoid release to the environment.

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
Gas oils (petroleum), light vacuum	64741-58-8	265-059-9	100

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



#### 4.1 Description of first aid measures

Self-protection of the first aider

swallowed then seek immediate medical assistance. H2S Warning: 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

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

a position comfortable for breathing. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Call a POISON CENTER/doctor

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

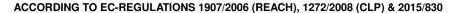
Inhalation

Skin Contact

Eye Contact

Ingestion

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4.2 Most important symptoms and effects, both acute and delayed

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: Irritation of the respiratory tract.

Skin Contact: Causes skin 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.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to a physician:

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.

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

H2S Warning:

Small spillages: Large spillages:

6.2 Environmental precautions

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.

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

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,

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Spillages onto land:





6.3 Methods and material for containment and cleaning 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

Spillages on water or at sea:

# Reference to other sections **SECTION 7: HANDLING AND STORAGE**

Precautions for safe handling 7.1

6.4

H2S Warning:

7.2 Conditions for safe storage, including any incompatibilities

> Storage temperature Storage measures

Incompatible materials 7.3 Specific end use(s)

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 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

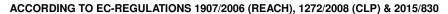
8.1 **Control parameters** 

**Occupational Exposure Limits** 8.1.1

No Occupational Exposure Limit assigned. Users are advised to consider

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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. Gas Oils (petroleum), light vacuum 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	-	68.3 mg/m <sup>3</sup>	2.9 mg/kg bw/day
Worker - Acute - Systemic effects	-	4300 mg/m <sup>3</sup>	-
Consumer - Long Term - Systemic effects	1.3 mg/kg bw/day	20 mg/m <sup>3</sup>	1.3 mg/kg bw/day
Consumer - Acute - Systemic effects	-	2600 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

Respiratory protection

Thermal hazards



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

type A1

Closed system(s): Not normally required.

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

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



Appearance Liquid. May be coloured.

Odour Diesel Odour Odour threshold Not established. PH Not established.

Melting point/freezing point - 40 °C - + 6 °C

Initial boiling point and boiling range

Flash point

> 56 °C @ 101 kPa

Evaporation rate

Flammability (solid, gas)

Upper/lower flammability or explosive limits

Vapour pressure

141 – 462 °C @ 101 kPa

> 56 °C @ 101 kPa

Not established.

Not established.

0 5 kPa @ 20°C

Vapour pressure

Vapour density

Not established.

Solubility(ies) Immiscible with water.

Partition coefficient: n-octanol/water Not established.

Auto-ignition temperature > 225 °C @ 101 kPa

Decomposition Temperature Not established.

Decomposition Temperature

Not established.

≥ 1.5 mm²/s @ 40 °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 Reactivity
 10.2 Chemical stability
 Stable under normal conditions. Reacts with - Strong oxidising agents
 Stable under normal conditions. Hazardous polymerisation will not one

2 Chemical stability Stable under normal conditions. Hazardous polymerisation will not occur. Product may release Hydrogen Sulphide.

10.3 Possibility of hazardous reactions 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**

Carcinogenicity

11.1 Information on toxicological effects All test data taken from existing ECHA registrations for the substances

mentioned.

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

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

Acute toxicity - Inhalation Acute Tox. 4; Harmful if inhaled.

LC50 Vapour 4.11 mg/l Air (rat) (OECD 403)

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

LD50 > 2000 mg/kg bw/day (rabbit) (OECD 434)

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

In vitro: Negative (OECD 476)

In vivo: Negative (mouse) (OECD 474)

Carc. 2; Suspected of causing cancer.

ECHA Registration Endpoint summary: According to EU CLP Classification (EC no. 1272/2008), VGO/Hydrocracked/Distillate fuels are classified for this

endpoint.

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

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Aspiration hazard

Other information

11.2

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



STOT - single exposure Based upon the available data, the classification criteria are not met.

STOT - repeated exposure STOT RE 2; May cause damage to organs through prolonged or repeated

exposure: Thymus, Liver, Bone marrow

Oral: No data

Chronic - Systemic effects NOAEC 1710 mg/m3

No adverse effect observed (rat) Inhalation:

Acute - Local effects NOAEC 880 mg/m<sup>3</sup>

Adverse effects observed (rat) (OECD 413)

Acute - Local effects NOAEL 30 mg/kg bw/day Dermal: Adverse effects observed (rat) (OECD 411)

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

Viscosity: ≥ 1.5 mm<sup>2</sup>/s @ 40 °C

None.

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

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

Short Term (acute): LL50 (Fish) (96hr) 21 mg/l (OCED 203)

Long Term (Chronic): The aquatic toxicity was estimated using the PETROTOX computer model.

> Estimated: NOEL (Fish) 0.083 mg/l Estimated: NOEL (Invertebrates) 0.2 mg/l Readily biodegradable. (OECD 301F)

12.2 Persistence and degradability 12.3 Bioaccumulative potential Substance is complex UVCB. Indirect exposure and resulting risk estimates

predicted by PETRORISK are likely to be overestimated.

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

IMDG/ADN

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

		ADR/RID	IMDG/ADN	
14.1	UN number	UN 1202	UN 1202	
14.2	Proper Shipping Name	GAS OIL	GAS OIL	
14.3	Transport hazard class(es)	3	3 (N2, F)	
14.4	Packing group	III	III	
14.5	Environmental hazards	MILIEUGEVAARLIJK / ENVIRONMENTALLY HAZARDOUS/ UMWELTGEFÄHREND /DANGEREUX POUR/ L'ENVIRONNEMENT		
14.6	Special precautions for user	See Section: 2		
14.7	Transport in bulk according to Annex	This product is being carried under the scope of MARPOL Annex 1. Special Precautions: Refer		
	II of MARPOL 73/78 and the IBC Code	,		
		or needs to comply with, in connection with tran	вроп.	
14.8	Additional Information			

HIN: 30 EmS: F-E, S-E, F-A, S-F Tunnel Code: 3 (D/E) Limited Quantity: 5L

Limited Quantity: 5L

### SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental

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



regulations/legislation specific for the substance or mixture

15.1.1 EU regulations

Seveso Upper Tier: 25000 tonnes

Lower Tier: 2500 tonnes

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 version and date. Please review SDS with care.

#### References:

Existing ECHA registration(s) for Gas Oils (petroleum), light vacuum (CAS No. 64741-58-8) and Chemical Safety Report.

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

#### **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

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

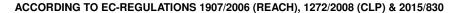
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#### Annex to the extended Safety Data Sheet (eSDS)

See below -

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Gas oils (petroleum), light vacuum

CAS Number 64741-58-8 EC Number 265-059-9

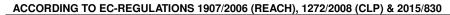
### **Summary of Parameters**

Physical Parameters			
Vapour pressure (Pa)			400 @ 40 °C
Partition Coefficien	t (log K <sub>ow</sub> )		Individual components vary between 2.00 and 21.41
Aqueous solubility	(mg L <sup>-1</sup> )		Individual components vary between 1.6E+03 mg L <sup>-1</sup> and 3.2E-19 mg L <sup>-1</sup>
Molecular weight			Not applicable
Biodegradability			Readily biodegradable.
Human health Parameter (DNELs)			
	Short term	Inhalation (mg/m³)	4300
Worker		Dermal (mg/kg bw/day)	Not applicable
vvorker	Long Term	Inhalation (mg/m³)	68
		Dermal (mg/kg bw/day)	2.9
Consumer		Inhalation (mg/m³)	20
		Dermal (mg/kg bw/day)	1.3
		Oral (mg/kg <sup>-1</sup> bw/day <sup>-1</sup> )	Not applicable

## **Environmental Parameter (PNECs)**

Gas oils (petroleum), light vacuum 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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Exposure Scenario 3	Use as a fuel - Industrial	17
Exposure Scenario 4	Use as a fuel - Professional	20
Exposure Scenario 5	Use as a fuel - Consumer	23

## **Contributing Scenarios**

Workers	
PROC1	Use in closed process, no likelihood of exposure
PROC2	Use in closed, continuous process with occasional controlled exposure
	Use in closed, continuous process with occasional controlled exposure.
PROC2 (Storage)	Bulk product storage.
PROC3	Use in closed, continuous process with occasional exposure
PROC3 (Sampling)	Use in closed, continuous process with occasional exposure.
Phocs (Sampling)	Sample collection
PROC3 (Fuel additive)	Use in closed, continuous process with occasional exposure.
,	Use as a fuel additive
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant
FR003	contact).
DD005 (1/	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant
PROC5 (Vapour)	contact). Substance in vapour phase.
	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8a (Manual)	Manual transfer/pouring from containers
DD000 (M: )	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8a (Maintenance)	Clean down and maintenance of vessels and containers.
DDCCOL (Dalla)	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC8b (Bulk)	Bulk transfer in a closed system
PROC8b (Bulk closed	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
loading)	Bulk closed loading and unloading (e.g. road/rail car bottom loading, marine vessel/barge loading)
PROC8b (Bulk open	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
loading)	Bulk open loading (e.g. road/rail car top loading)
PROC8b (Drum)	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
THOOD (Drain)	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
PROC9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC15	Use as laboratory reagent.
PROC16	Using material as fuel sources, limited exposure to unburned product to be expected.
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 ERC6a	Industrial use resulting in inclusion into or onto a matrix
ERC6b	Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6c	Industrial use of reactive processing aids Industrial use of monomers for manufacture of thermoplastics
ERC6d	Industrial use of monomers for manufacture of thermoplastics 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 indoor use of substances in closed systems  Wide dispersive outdoor use of substances in closed systems
Consumer	THICO GIOPOTOTTO OUTGOOT GOO OF SUDSTAINOOS III OIOSCU SYSTEMIS
PC13	Fuels
. 0.0	(Automotive refueling)
	(Garden equipment refueling)

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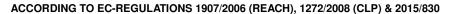


## Exposure Scenario 1 - Distribution of Gas oils (petroleum), light vacuum

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) PROC4 PROC8a (Maintenance) PROC8b (Bulk) PROC8b (Bulk closed loading) PROC8b (Bulk open loading) PROC9 PROC9 PROC15
Chemical product category [PC]	Not applicable
Article Categories [AC]	Not applicable
Environmental release categories [ERC]	ERC1 ERC2 ERC3 ERC4 ERC5 ERC6 ERC66 ERC60 ERC60 ERC6C
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 potential for aerosol ge				
Concentration of substance in product	Covers concentrations up to 100%				
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 ho	urs (unless stated differently).			
Frequency of use (days per year)	300				
Other operational conditions affecting worker expo					
Location of use (Indoor/Outdoor)	Not defined				
Characteristics of the surroundings	Not defined				
Assumes use at not more than 20°C above ambient te	mperature, unless stated differently	. Assumes a good basic standard of occupational hygiene			
is implemented. Avoid direct skin contact with produc	ct. Identify potential areas for indire	ect skin contact. Wear gloves (tested to EN374) if hand			
		sh off any skin contamination immediately. Provide basic			
employee training to prevent/minimise exposures and t	o report any skin problems that may	develop.			
Technical conditions of use					
PROC1, PROC2, PROC2 (Storage), PROC3, Handle substance within a closed system.					
PROC8b (Bulk)					
Organisational measures					
PROC8a (Maintenance)		to equipment break-in or maintenance. (Inhalation -			
,	efficiency of at least 80 %)				
Risk management measures related to human heal					
Respiratory protection	No special measures are required				
Hand and/or Skin protection	PROC4, PROC8b (Bulk), PROC8b (Bulk closed loading), PROC8b (Bulk open loading), PROC9	Wear suitable gloves tested to EN374. (Efficiency of at least 80 %)			
Trana anazor okin protection	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.					
Other operational conditions affecting worker exposure					
Wear suitable gloves tested to EN374.					
Ensure material transfers are under containment or extract ventilation.					

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Clear transfer lines prior to de-coupling.

Clear spills immediately.

Transfer via enclosed lines.

Avoid dip sampling. (PROC3 (Sampling))

Retain drain downs in sealed storage pending disposal or for subsequent recycle. Apply vessel entry procedures including use of forced supplied air.

Wear suitable coveralls to prevent exposure to the skin. (PROC8a (Maintenance))

Fill containers/cans at dedicated fill points supplied with local extract ventilation. (PROC9)

Handle in a fume cupboard. (PROC15)				
2.2 Control of environmental exposure				
Amounts used				
Fraction of EU tonnage used in region:	0.1			
Regional use tonnage (tons/year):	9.6E+05			
Fraction of Regional tonnage used locally: tons/year	2.0E-03			
Annual site tonnage (tons/year):	1.9E+03			
Average daily use (kg/day)	1.9E+04			
Environment factors not influenced by risk management				
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):	100			
Release fraction to air from process (initial release prior to RMM):	1.0E-04			
Release fraction to wastewater from process (initial release prior to RMM):	1.0E-07			
Release fraction to soil from process (initial release prior to RMM):	1.0E-05			
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 (%):	90			
Treat onsite wastewater (prior to receiving water discharge) to provide the	0			
required removal efficiency of (%):	U			
Treat soil emission to provide a typical removal efficiency of (%):	Not defined			
Common practices vary across sites thus conservative process release estimates	ates used. If discharging to domestic sewage treatment plant, no onsite			
wastewater treatment required.				
Organisational measures to prevent/limit release from site				
Prevent discharge of undissolved substance to or recover from onsite wastew	ater. Do not apply industrial sludge to natural soils. Sludge should be			
incinerated, contained or reclaimed.				
Conditions and measures related to municipal sewage treatment plant	1			
Size of municipal sewage system/treatment plant (m³/d)	2000			
Degradation effectiveness (%) 88.2				
Conditions and measures related to external treatment of waste for disp				
This substance is consumed during use and no waste of the substance is ger	nerated.			
Substance release quantities after risk management measures				
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	9.6E+04			

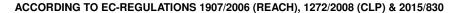
3.1	Human	exposure	prediction

Exposure assessment (method/calculation model) **ECETOC TRA** 

	Inhalation		Der	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	0.01	0.00	0.34	0.12	0.12
PROC2	1.0	0.01	1.37	0.47	0.49
PROC2 (Storage)	1.0	0.01	1.37	0.47	0.49
PROC3	3.0	0.04	0.34	0.12	0.16
PROC3 (Sampling)	3.0	0.04	0.34	0.12	0.16
PROC4	5.0	0.07	1.37	0.47	0.55
PROC8a (Maintenance)	2.0	0.03	1.37	0.47	0.50
PROC8b (Bulk)	5.0	0.07	1.37	0.47	0.55
PROC8b (Bulk closed loading)	5.0	0.07	1.37	0.47	0.55

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PROC8b (Bulk open loading)	5.0	0.07	1.37	0.47	0.55
PROC9	5.0	0.07	1.37	0.47	0.55
PROC15	5.0	0.07	0.34	0.12	0.19

#### 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.

Gas oils (petroleum), light vacuum 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.

Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment
Predicted Environmental Exposure (PEC)	1.2E-04 mg/l	1.2E-05 mg/l	1.2E-06 mg/l	0.1	0.8	0.021
Risk characterisation ratio (RCR)	1.5E-03	5.1E-03	5.1E-04	2.8E-05	8.6E-03	6.3E-04

Human exposure prediction:

Route of Exposu	re Exposure (μg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)
Oral	21	0.016
Inhalation	0.027	4.8E-06

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 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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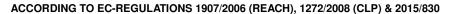
## Exposure Scenario 2 - Formulation and (re)packing of Gas oils (petroleum), light vacuum

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) PROC4 PROC5 PROC5 (Vapour) PROC8a (Manual) PROC8a (Maintenance) PROC8b (Drum) PROC8b (Bulk) PROC9 PROC9 PROC14
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 potential for aerosol	generation		
Concentration of substance in product	Covers concentrations up to 100			
Human factors not influenced by risk manageme	ent			
Potential exposure area	Not defined			
Frequency and duration of use	•			
Exposure duration per day	Covers daily exposures up to 8 h	hours (unless stated differently).		
Frequency of use (days per year)	300			
Other operational conditions affecting worker ex	posure			
Anna aforas	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 use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented. 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.				
Technical conditions of use				
PROC1, PROC2, PROC2 (Storage), PROC3, PROC8b (Bulk)	Handle substance within a close	d system.		
PROC5 (Vapour)	Provide extract ventilation to poi	nts where emissions occur. (Efficiency of at least 90 %)		
Organisational measures				
PROC8a (Manual)	Use drum pumps. (Efficiency of	at least 80 %)		
	Drain down and flush system pri	or to equipment break-in or maintenance. Retain drain		
PROC8a (Maintenance)		g disposal or for subsequent recycle. Clear spills		
Trioda (Maintonanos)	immediately. (Efficiency of at lea	9 1 7 1		
Risk management measures related to human he		0100 70)		
Respiratory protection	No special measures are require	ad		
	PROC4, PROC8b (Bulk), PROC8b (Drum), PROC9, PROC14	Wear suitable gloves tested to EN374. (Efficiency of at least 80 %)		
Hand and/or Skin protection	PROC5, PROC8a (Manual))	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	ed.		
Other operational conditions affecting worker ex	posure			
Wear suitable gloves tested to EN374. Ensure material transfers are under containment or of Clear transfer lines prior to de-coupling. Clear spills immediately.				

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Transfer via enclosed lines.

Avoid dip sampling. (PROC3 (Sampling))

Retain drain downs in sealed storage pending disposal or for subsequent recycle. Apply vessel entry procedures including use of forced supplied air.

Wear suitable coveralls to prevent exposure to the skin. (PROC8a (Maintenance)) Fill containers/cans at dedicated fill points supplied with local extract ventilation. (PROC9)

Handle in a fume cupboard. (PROC15)

Handle in a tume cupboard. (PROC15)					
2.2 Control of environmental exposure					
Amounts used					
Fraction of EU tonnage used in region:	0.1				
Regional use tonnage (tons/year):	6.1E+05				
Fraction of Regional tonnage used locally: (tons/year)	4.9E-02				
Annual site tonnage (tons/year):	3.0E+04				
Average daily use (kg/day):	1.0E+05				
Environment factors not influenced by risk management					
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-03				
Release fraction to wastewater from process (initial release prior to RMM):	2.9E-03				
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				
Treat onsite wastewater (prior to receiving water discharge) to provide the	87.0				
required removal efficiency of (%):	67.0				
Treat soil emission to provide a typical removal efficiency of (%):	0				
Common practices vary across sites thus conservative process release estimates	ates used. If discharging to domestic sewage treatment plant, no onsite				
wastewater treatment required.					
Organisational measures to prevent/limit release from site					
Do not apply industrial sludge to natural soils. Sludge should be incinerated, or	ontained or reclaimed.				
Conditions and measures related to municipal sewage treatment plant	<u></u>				
Size of municipal sewage system/treatment plant (m³/d)	2000				
Degradation effectiveness (%)	88.2				
Conditions and measures related to external treatment of waste for disp	osal				
External treatment and disposal of waste should comply with applicable local and/or national regulations.					
Substance release quantities after risk management measures					
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	1.1E+05				

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

#### 3.1 Human exposure prediction

	Inha	lation	Der	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	0.01	0.00	0.03	0.01	0.01
PROC2	1.0	0.01	1.37	0.47	0.49
PROC2 (Storage)	1.0	0.01	1.37	0.47	0.49
PROC3	3.0	0.04	0.34	0.12	0.16
PROC3 (Sampling)	3.0	0.04	0.34	0.12	
PROC4	5.0	0.07	1.37	0.47	0.55
PROC5	5.0	0.07	1.37	0.47	0.55
PROC5 (Vapour)	2.5	0.36	0.07	0.02	0.38
PROC8a (Manual)	2.0	0.03	1.37	0.47	0.50
PROC8a (Maintenance)	2.0	0.03	1.37	0.47	0.50
PROC8b	5.0	0.07	1.37	0.47	0.55

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(Bulk)					
PROC8b (Drum)	5.0	0.07	1.37	0.47	0.55
PROC9	5.0	0.07	1.37	0.47	0.55
PROC14	5.0	0.07	0.69	0.24	0.31
PROC15	5.0	0.07	0.34	0.12	0.19

## 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.

Gas oils (petroleum), light vacuum 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.

Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment	
Predicted Environmental Exposure (PEC)	1.8E-02 mg/L	1.8E-03 mg/L	1.8E-04 mg/L	0.11 mg/kg ww	1.4 mg/kg ww	0.058 mg/kg ww	
Risk characterisation ratio (RCR)	0.23	0.78	0.078	4.4E-03	0.91	0.091	

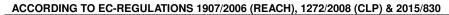
Human exposure prediction:

Route of Exposure	Exposure (μg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)
Oral	44	0.034
Inhalation	16	0.003

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 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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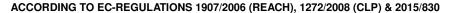


## Exposure Scenario 3 – Use as a fuel - Industrial

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 (Fuel additive) PROC8a (Maintenance) PROC8b (Bulk) PROC8b (Drum) PROC16		
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 v.1		

SPERG					
2.0 Operational conditions and visk management	magauraa				
2.0 Operational conditions and risk management r 2.1 Control of worker exposure	neasures				
Product characteristics	Lieurial With a phosphial fo		an anaklana		
Physical form of product	Liquid With potential fo				
Concentration of substance in product	Covers concentrations	up to 100%	0		
Human factors not influenced by risk managemen					
Potential exposure area	Not defined				
Frequency and duration of use	Course deile composition	- · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
Exposure duration per day		s up to 8 no	ours (unless stated differently).		
Frequency of use (days per year)	300				
Other operational conditions affecting worker exp			0.41		
Area of use	PROC3		Outdoor		
	All other PROC's		Not defined (default = Indoor)		
Characteristics of the surroundings	Not defined				
General measures applicable to all activities	•				
is implemented. Avoid direct skin contact with produ	uct. Identify potential are on/spills as soon as they	as for indirection	<ul> <li>Assumes a good basic standard of occupational hygiene ect skin contact. Wear gloves (tested to EN374) if hand sh off any skin contamination immediately. Provide basic develop.</li> </ul>		
PROC2 (Storage)	Handle substance with	in a closed	evetem		
Organisational measures	Transic Substance With	iii a ciosca	System.		
Organisational measures	Drain down and flush	votom prior	to aguinment brook in ar maintananae Patain drain		
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 80 %)				
Risk management measures related to human hea	alth	-	·		
Respiratory protection	No special measures a	are required			
	PROC8b (Bulk), PROC (Drum)		Wear suitable gloves tested to EN374. (Efficiency of at least 80 %)		
Hand and/or Skin protection	PROC8a (Maintenance	e)	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 90 %)		
Eye Protection	No special measures a	are required			
Other operational conditions affecting worker exp	osure				
Retain drain downs in sealed storage pending disposa	al or for subsequent recyc	le. Wear su	itable coveralls to prevent exposure to the skin.		
2.2 Control of environmental exposure					
Amounts used					
Fraction of EU tonnage used in region:		0.1			
Regional use tonnage (tons/year):		5.0E+05			
Fraction of Regional tonnage used locally: (tons/year)			1		
Annual site tonnage (tons/year):			5.0E+05		
Average daily use (kg/day):			1.7E+06		
Environment factors not influenced by risk manage	gement				
Flow rate of receiving surface water (m <sup>3</sup> /d):			d (default = 18,000)		
Local freshwater dilution factor:			10		
2004 Coator anation factor.		10			

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Local marine water dilution factor:	100				
Operational conditions					
Emission days (days/year):	300				
Release fraction to air from process (initial release prior to RMM):	5.0E-03				
Release fraction to wastewater from process (initial release prior to RMM):	1.8E-07				
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				
Treat onsite wastewater (prior to receiving water discharge) to provide the	07.0				
required removal efficiency of (%):	87.0				
Treat soil emission to provide a typical removal efficiency of (%):	0				
Common practices vary across sites thus conservative process release estimates	ates used. If discharging to domestic sewage treatment plant, no onsite				
wastewater treatment required.					
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 (%)	88.2				
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	1.8E+06				
wastewater treatment removal (kg/d):					

3. Exposure estimation and reference to its source	
3.1 Human exposure prediction	
Exposure assessment (method/calculation model)	ECETOC TRA

	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	1.0	0.01	1.37	0.47	0.49
PROC2	1.0	0.01	1.37	0.47	0.49
PROC2 (Storage)	1.0	0.01	0.14	0.05	0.06
PROC3	1.0	0.01	0.34	0.12	0.13
PROC8a (Maintenance)	1.0	0.01	1.37	0.47	0.49
PROC8b (Bulk)	5.0	0.07	1.37	0.47	0.55
PROC8b (Drum)	5.0	0.07	1.37	0.47	0.55
PROC16	1.0	0.1	0.03	0.01	0.02

# 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

environmental exposure with the Petrorisk model.

Gas oils (petroleum), light vacuum 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.

Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment
Predicted Environmental Exposure (PEC)	1.8E-02 mg/L	1.8E-03 mg/L	1.8E-04 mg/L	0.11 mg/kg ww	1.4 mg/kg ww	0.058 mg/kg ww
Risk characterisation ratio (RCR)	0.23	0.78	0.078	7.3E-03	0.91	0.091

Human exposure prediction:

Pouts of Exposure	Exposure (ug/kg:1 doxs1)	Risk characterisation ratio
Route of Exposure	Exposure (µg/kg <sup>-1</sup> day <sup>-1</sup> )	(RCR)

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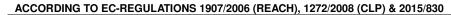


Oral	72.6	5.6E-02	
Inhalation	27	4.7E-03	

4.0 Evaluation guidance to downstream user				
For scaling see	risks are managed to Available hazard data Further details on sca	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 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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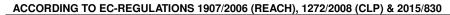


# Exposure Scenario 4 – Use as a fuel - Professional

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) PROC8a (Cleaning) PROC8b (Bulk) PROC8b (Drum) PROC8b (Refueling) PROC8b (Refueling) 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 v.1		

Specific Environmental Release Categories SPERC	ESVOC SpERC 9.12b v.1			
2.0 Operational conditions and risk manag	ement measures			
2.1 Control of worker exposure				
Product characteristics				
Physical form of product	Liquid With potential for aeros			
Concentration of substance in product	Covers concentrations up to	100%		
Human factors not influenced by risk man				
Potential exposure area	Not defined			
Frequency and duration of use				
Exposure duration per day		8 hours (unless stated differently).		
Frequency of use (days per year)	300			
Other operational conditions affecting wo				
Area of use	PROC16	Outdoor		
Area or use	All other PROC's	Not defined (default = Indoor)		
Characteristics of the surroundings	Not defined	· · · · · · · · · · · · · · · · · · ·		
General measures applicable to all activiti				
is implemented. Avoid direct skin contact w contact with substance likely. Clean up con- employee training to prevent/minimise exposi Technical conditions of use	tamination/spills as soon as they occur.	indirect skin contact. Wear gloves (tested to EN374) if hand Wash off any skin contamination immediately. Provide basic may develop.		
PROC2 (Storage)	Handle substance within a clo	nsed system		
THOOZ (Glorage)		Handle substance within a closed system.		
PROC16	If operational measures are not practicable, Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). (Efficiency of at least 30 %)			
Organisational measures				
PROC8a (Maintenance)	Drain down and flush system	prior to equipment break-in or maintenance.		
PROC8b (Drum)	Use drum pumps. (Efficiency	of at least 80 %)		
Risk management measures related to hu	man health	·		
Respiratory protection	No special measures are requ	uired.		
	PROC8b (Bulk), PROC8b	Wear suitable gloves tested to EN374. (Efficiency of at		
	(Drum), PROC8b (Refueling)	least 80 %)		
Hand and/or Skin protection	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 requ	uired.		
Other operational conditions affecting wo	rker exposure			
Retain drain downs in sealed storage pending Wear suitable coveralls to prevent exposure to Avoid spillage when withdrawing pump.  Transfer via enclosed lines.  Avoid dip sampling.	g disposal or for subsequent recycle.			
2.2 Control of environmental exposure				
Amounts used				
Fraction of EU tonnage used in region:	0.1			
Traction of Lo torniago about in region.	0.1			

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Regional use tonnage (tons/year):	3.4E+04				
Fraction of Regional tonnage used locally: (tons/year)	5.0E-04				
Annual site tonnage (tons/year):	17				
Average daily use (kg/day):	47				
Environment factors not influenced by risk management					
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):	365				
Release fraction to air from process (initial release prior to RMM):	1.0E-04				
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):	5.0E-05				
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 (%):	Not applicable				
Treat onsite wastewater (prior to receiving water discharge) to provide the					
required removal efficiency of (%):	0				
Treat soil emission to provide a typical removal efficiency of (%):	0				
Common practices vary across sites thus conservative process release estim	ates used. If discharging to domestic sewage treatment plant, no onsite				
wastewater treatment required.					
Organisational measures to prevent/limit release from site					
Do not apply industrial sludge to natural soils. Sludge should be incinerated, or	ontained or reclaimed.				
Conditions and measures related to municipal sewage treatment plant					
Size of municipal sewage system/treatment plant (m³/d)	2000				
Degradation effectiveness (%)	88.2				
Conditions and measures related to external treatment of waste for disposal					
External treatment and disposal of waste should comply with applicable local	and/or national regulations.				
Substance release quantities after risk management measures					
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d):	2.9E+-03				

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

## 3.1 Human exposure prediction

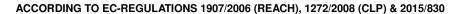
Exposure assessment (method/calculation model)

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	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	1.0	0.01	1.37	0.47	0.49
PROC2	1.0	0.01	1.37	0.47	0.49
PROC2 (Storage)	0.01	0.00	0.34	0.12	0.12
PROC3	1.0	0.01	0.34	0.12	0.13
PROC8a (Maintenance)	1.0	0.01	1.37	0.47	0.49
PROC8a (Cleaning)	5.0	0.07	1.37	0.47	0.55
PROC8b (Bulk)	5.0	0.07	1.37	0.47	0.55
PROC8b (Drum)	1.0	0.01	1.37	0.47	0.49
PROC8b (Refueling)	5.0	0.07	1.37	0.47	0.55
PROC16	14.0	0.20	0.34	0.12	0.32

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.			

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Gas oils (petroleum), light vacuum 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.

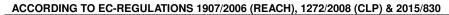
Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment
Predicted Environmental Exposure (PEC)	2.9E-05 mg/L	8.4E-06 mg/L	2.9E-07 mg/L	0.1 mg/kg ww	0.79 mg/kg ww	0.02 mg/kg ww
Risk characterisation ratio (RCR)	3.7E-04	4.2E-03	1.2E-04	8.0E-04	4.2E-03	1.8E-04

Human exposure prediction:

Route of Exposure	Exposure (μg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)
Oral	21	0.016
Inhalation	0.023	4.0E-06

4.0 Evaluation guidance to downstream user					
For scaling see	Where other Risk Marisks are managed to Available hazard data Further details on sca	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).			
Evacure accomment	Worker	ECETOC TRA			
Exposure assessment instrument/tool/method	Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.			

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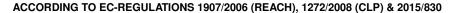


## Exposure Scenario 5 – Use as a fuel - Consumer

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 (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 managem	nent measures				
2.1 Control of worker exposure					
Product characteristics	1.2 2.4				
Physical form of product	Liquid		1 1000/		
Concentration of substance in product		centration	s up to 100%		
Human factors not influenced by risk manage	ement	1		1 040 0	
Potential exposure area (Skin Contact)	PC13	Aut	omotive refueling	210 cm <sup>2</sup> (Palm of one hand)	
· , , , , ,	1 313	Gar	rden equipment refueling	420 cm <sup>2</sup> (Palm of both hands)	
Frequency and duration of use					
			omotive refueling	0.05	
Exposure duration (hours/Event)	PC13		rden equipment use	2.00	
		Gar	rden equipment refueling	0.03	
Frequency of use (days per year)	PC13	Aut	omotive refueling	52 (Covers frequency up to: weekly use)	
rrequeries of use (days per year)	1 010	Gar	rden equipment use; rden equipment refueling	26 (Covers frequency up to: once in two weeks.)	
			omotive refueling	37500	
Amounts used (g/Event)	PC13	Garden equipment use; Garden equipment refueling		750	
Other operational conditions affecting worke					
Area of use	Not defined				
		Aut	omotive refueling;	100 m3	
Characteristics of the surroundings	PC13	Gar	rden equipment use	100 m³	
ŭ		Gar	rden equipment refueling	34 m³	
Risk Management Measures	t	ı			
Respiratory protection	No specific	measures	identified.		
Hand and/or Skin protection	No specific				
Eye Protection	No specific				
2.2 Control of environmental exposure	140 Specific I	measares	nacritinea.		
Amounts used					
Fraction of EU tonnage used in region:			0.1		
Regional use tonnage (tons/year):			7.7E+04		
Fraction of Regional tonnage used locally: (tons/	(voor)				
	year)		5.0E-04		
Annual site tonnage (tons/year):			38		
Average daily use (kg/day):			105		
Environment factors not influenced by risk m	nanagement		·		
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):			365		
Release fraction to air from process (initial release	se prior to RMM):		1.0E-04		
Release fraction to wastewater from process (initial release		RMM):	1.0E-05		
Release fraction to soil from process (initial release prior to RMM): 1.0E-05					
	al sewage treatmen		•		

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Size of municipal sewage system/treatment plant (m³/d)	2000		
Degradation effectiveness (%)	88.2		
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 6.5E+03			
wastewater treatment removal (kg/d):	5.52.55		

3. Exposure estimation and reference to its source
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3.1 Human exposure prediction

Exposure assessment (method/calculation model)

ECETOC TRA (benzene content)

Yearly Use (Chronic)

	Inhalation		Der	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)	1.10	0.02	0.50	0.39	0.40
PC13 (Garden equipment use)	0.51	0.01	0.00	0.00	0.01
PC13 (Garden equipment refueling)	0.06	0.00	0.49	0.38	0.38

## 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.

Gas oils (petroleum), light vacuum 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.

Environmental exposure	STP	freshwater	marine water	Soil	freshwater sediment	marine sediment
Predicted Environmental Exposure (PEC)	6.5E-05 mg/L	6.4E-06 mg/L	6.4E-07 mg/L	0.1 mg/kg ww	0.8 mg/kg ww	0.02 mg/kg ww
Risk characterisation ratio (RCR)	8.3E-04	0.002	2.8E-04	1.7E-03	6.0E-03	3.6E-04

Human exposure prediction:

Route of Exposure	Exposure (μg/kg <sup>-1</sup> day <sup>-1</sup> )	Risk characterisation ratio (RCR)	
Oral	21	1.6E-02	
Inhalation	0.023	4.0E-06	

4.0 Evaluation guidance to downstream user					
For scaling see	risks are managed to a Available hazard data Further details on sca	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 assessment instrument/tool/method	Consumer	ECETOC TRA			
	Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.			

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