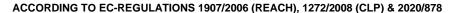
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SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

1.3

Product name Renewable hydrocarbons (diesel type fraction)

Product description V3019 – Hydrotreated Vegetable Oil, Renewable hydrocarbons (diesel

type fraction)

Trade Name Hydrotreated Vegetable Oil

 Product code
 HVO, V3019

 CAS No.
 928771-01-1

 EC No.
 700-571-2

REACH Registration No. 01-2120043692-58-XXXX

1.2 Relevant identified uses of the substance or mixture

and uses advised against

Identified Use(s) No. **Exposure Scenario** Page: Formulation & (re)packing of substances and mixtures 10 1 2 Distribution of substance 13 3 Use as an intermediate 16 Use as a fuel 19 Uses advised against Anything other than the above.

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

Fax +31 10 452 9545
E-mail (competent person) xreach@vitol.com

1.4 Emergency Telephone Number

Telephone

Emergency Phone No. +44 (0) 1235 239 670, 24/7 Language(s) 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) Asp. Tox. 1; H304

EUH066

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

Product name Renewable hydrocarbons (diesel type fraction)

Contains: Not applicable

Hazard Pictogram(s)



Signal Word(s) DANGER

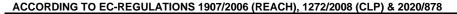
Hazard Statement(s) H304: May be fatal if swallowed and enters airways.

Precautionary Statement(s) P301+P310: IF SWALLOWED: Immediately call a doctor.

P331: Do NOT induce vomiting.

P405: Store locked up.

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P501: Dispose of contents/container to hazardous waste collection point.

Supplemental information EUH066: Repeated exposure may cause skin dryness or cracking.

2.3 Other hazards Not classified as PBT or vPvB. Does not cause endocrine disruption.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

SUBSTANCE	CAS No.	EC No.	REACH Registration No.	%W/W
Renewable hydrocarbons (diesel type fraction)	928771-01-1	700-571-2	01-2120043692-58-XXXX	100

SECTION 4: FIRST AID MEASURES



4.1 Description of first aid measures

Self-protection of the first aider

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

Eliminate sources of ignition. Do not breathe vapour. If it is suspected that fumes are still present, the responder should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Avoid all contact. Contaminated clothing should be laundered before reuse. Do not ingest. If swallowed then seek immediate medical assistance.

If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If irritation develops and persists, get medical attention. Remove clothing and wash thoroughly before use. Repeated exposure may cause skin dryness or cracking. Wash affected skin with soap and water. If skin irritation or rash occurs: Get medical advice/attention.

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

IF SWALLOWED: Immediately call a doctor. Do not induce vomiting because of risk of aspiration into the lungs. Do not give anything by mouth to an unconscious person. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. If unconscious, place in recovery position and get medical attention immediately.

May be fatal if swallowed and enters airways. Repeated exposure may cause skin dryness or cracking.

Treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Unsuitable extinguishing media

5.2 Special hazards arising from the substance or mixture

5.3 Advice for firefighters

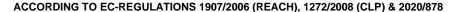
Extinguish with sand or dry chemical, Foam, Carbon dioxide, Water fog or dry powder.

Do not use water jet. Direct water jet may spread the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates and gases, including carbon monoxide and unidentified organic and inorganic compounds.

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.

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SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and

emergency procedures

Stop leak if safe to do so. Ensure suitable personal protection during removal of spillages. Avoid all contact. Keep upwind. Eliminate sources of ignition. Ensure suitable personal protection during removal of spillages. Keep away from fire,

sparks and heated surfaces - no smoking.

6.2 **Environmental precautions** Avoid release to the environment. Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body.

Methods and material for containment and cleaning 6.3

up

Sweep up and shovel into waste drums or plastic bags. Transfer to a lidded container for disposal or recovery. Ventilate the area and wash spill site after material pick-up is complete. Small amounts can be collected using absorbent material. Pay attention to the fire and health hazards caused by the product.

6.4 Reference to other sections See Section: 8, 13

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling Use only outdoors or in a well-ventilated area. Avoid all contact. Do not ingest. Use personal protective equipment as required. See Section: 8. Keep away from

fire, sparks and heated surfaces - no smoking. Keep good industrial hygiene. Wash hands thoroughly after handling. Contaminated clothing should be

thoroughly cleaned.

7.2 Conditions for safe storage, including any

incompatibilities

Ground/bond container and receiving equipment. Bund storage facilities to prevent soil and water pollution in the event of spillage. Keep only in the original container. 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.

Storage temperature Keep cool. Protect from sunlight. Storage measures Keep only in the original container.

Incompatible materials None Known Specific end use(s) See Section: 1.2

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

7.3

8.1.1 Occupational exposure limits Not established

Not established 8.1.2 **Biological limit value**

8.1.3 PNECs and DNELs

Human Health (DNEL)				
Workers	Long Term	Inhalation (mg/m³) Systemic effects	147mg/m³	
		Dermal (mg/kg bw/day) Systemic effects	42mg/kg bw/day	
Consumer	Long Term	Inhalation (mg/m³) Systemic effects	94mg/m³	
		Dermal (mg/kg bw/day) Systemic effects	18mg/kg bw/day	
		Oral (mg/kg bw/day) Systemic effects	18mg/kg bw/day	

Environmental Parameters (PNECs)	
Freshwater (mg/L)	Not applicable
Marine water (µg/L)	Not applicable
Freshwater Sediment (mg/kg Sediment dw)	Not applicable
Marine water Sediment (mg/kg Sediment dw)	Not applicable
Sewage treatment plant (mg/L)	Not applicable

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

Soil (mg/kg soil dw)	Not applicable
Air	0.00126
Secondary poisoning (g/kg food)	No indication of bioaccumulation potential.

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Ensure adequate ventilation to remove vapours, fumes, dust etc. 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

Keep good industrial hygiene. Wash contaminated clothing before reuse.

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.

Eye/ face protection

Wear eye protection with side protection (EN166).



Skin protection



Wear suitable chemical resistant protective gloves for frequent or prolonged operations tested to EN374 with an acceptable permeation test. Contaminated gloves should be carefully rinsed with water before reuse. Breakthrough time of the glove material: refer to the information provided by the gloves' producer.

Respiratory protection



Thermal hazards

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

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 Not established
Melting point/freezing point 20 °C

Melting point/freezing point $$-20\ ^{\circ}\text{C}$$ Boiling point or initial boiling point and boiling range 242°C

Flammability Not established Lower and upper explosion limit Not established

Flash point 64°C at 1013 hPa [Closed cup]

Auto-ignition temperature 204°C at 1013 hPa
Decomposition temperature Not established
pH Not established

Kinematic viscosity
3.97mm²/s (static) at 20°C
Solubility(ies)
0.075mg/L at 25°C (in water)
Partition coefficient: n-octanol/water (log value)
Log Kow (Log Pow): 8.4 at 20°C

Vapour pressure 87.1Pa at 25°C
Density and/or relative density 0.772 at 20°C

Relative vapour density

Not established
Particle characteristics

Not established

9.2 Other information None known

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SECTION 10: STABILITY AND REACTIVITY

10.1	Reactivity	Stable under normal conditions
10.2	Chemical stability	Stable under normal conditions
10.3	Possibility of hazardous reactions	Hazardous polymerisation will not occur.
10.4	Conditions to avoid	Keep away from heat, sources of ignition and direct sunlight.
10.5	Incompatible materials	None Known
10.6	Hazardous decomposition products	Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates and gases, including carbon monoxide and

SECTION 11: TOXICOLOGICAL INFORMATION

11.1	Information on hazard classes as defined in	
	Regulation (EC) No 1272/2008	
	Acute toxicity - Ingestion	Based upon the available data, the classification criteria are not met.
		LD50: >2000 (Rat) mg/kg bw/day (guideline EU Method B.1)

Based upon the available data, the classification criteria are not met. Acute toxicity - Inhalation LC50: 4467 ppm (rat) (OECD 403)

Acute toxicity - Skin contact Based upon the available data, the classification criteria are not met. LD50 (dermal) mg/kg: > 2000 mg/kg bw/day (guideline EU Method B.3) Skin corrosion/irritation Based upon the available data, the classification criteria are not met.

Non-irritant (rabbit) (EU Method B.4)

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

Non-irritant (rabbit) (EU Method B.5)

unidentified organic and inorganic compounds.

Respiratory or skin sensitisation Repeated exposure may cause skin dryness or cracking. Sensitisation (guinea pig) - Negative (EU Method B.6)

Germ cell mutagenicity Based upon the available data, the classification criteria are not met. There is no evidence of mutagenic potential. (EU Method B.13/14)

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

No evidence of carcinogenicity.

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

No evidence of reproductive effects. (NOAEL (rat) (PO) 1000 mg/kg bw/day

(nominal)) (OECD Guideline 416)

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

NOAEL (rat): 1000 mg/kg bw/day

Aspiration hazard Asp. Tox. 1; H304: May be fatal if swallowed and enters airways.

Kinematic viscosity: 3.97mm²/s (static) at 20°C

11.2 Information on other hazards 11.2.1

Endocrine disrupting properties This product does not contain a substance that has endocrine disrupting properties with respect to humans as no components meets the criteria.

11.2.2 Other information None known

SECTION 12: ECOLOGICAL INFORMATION

12.1 **Toxicity** Based upon the available data, the classification criteria are not met. LL50 (Oncorhynchus mykiss (Rainbow trout)) (96h): >1000 mg/L LC50 (Oncorhynchus mykiss (Rainbow trout)) (96h): >1000 mg/L

12.2 Persistence and degradability Readily biodegradable.

Degradation rate (%): 82 after 28d (% degradation (CO2 evolution)) (OECD

Guideline 301 B)

12.3 Bioaccumulative potential Substance is complex UVCB. Standard tests for this endpoint are intended for

single substances and are not appropriate for this complex substance

12.4 Mobility in soil Immobile Koc: >4.27

log Koc: >5.63 EU Method C.19

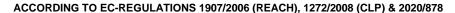
Not classified as PBT or vPvB. 12.5 Results of PBT and vPvB assessment

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Other adverse effects

12.7





12.6 Endocrine disrupting propertiesThis product does not contain a substance that has endocrine disrupting

properties with respect to non-target organisms as no components meets the

criteria.

None known

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods 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.

Hazardous waste according to Directive 2008/98/EC

(waste framework directive).

HP5 - Specific Target Organ Toxicity (STOT)/Aspiration Toxicity

SECTION 14: TRANSPORT INFORMATION

		ADR/RID	ADN	IMDG	IATA/ICAO
14.1	UN number or ID number	1202	1202	1202	1202
14.2	UN proper shipping name	DIESEL FUEL	DIESEL FUEL	DIESEL FUEL	DIESEL FUEL
		(Flash point more	(Flash point more	(Flash point more	(Flash point more
		than 60 °C and not	than 60 °C and not	than 60 °C and not	than 60 °C and not
		more than 100 °C)	more than 100 °C)	more than 100 °C)	more than 100 °C)
14.3	Transport hazard class(es)	3	3	3	3
14.4	Packing group	III	III	III	III
14.5	Environmental hazards	Not classified	Not classified	Not classified as a	Not classified
				Marine Pollutant.	
14.6	Special precautions for user	See Section: 2			
14.7	Maritime transport in bulk according to IMO	Not applicable			
	instruments				
14.8	Additional information	None			

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental

regulations/legislation specific for the substance or

mixture

15.1.1 EU regulations

Authorisations and/or restrictions on use None assigned

15.1.2 National regulations

Germany Water hazard class: slightly hazardous to water (WGK 1)

15.2 Chemical Safety Assessment For this substance a chemical safety assessment has been carried out.

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Not applicable – V1.0

References:

Chemical Safety Report

Existing ECHA registration for Renewable hydrocarbons (diesel type fraction) (CAS No. 928771-01-1)

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: European Agreement on the International Transport of Dangerous Goods by Inland Waterways

CAS Chemical Abstracts Service

CLP Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures

DNEL Derived no effect level EC European Community EU European Union

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

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

LC50 Lethal Concentration at which 50% of the population is killed

LD50 Lethal Dose at which 50% of the population is killed

LTEL Long term exposure limit

MARPOL The International Convention for the Prevention of Pollution from Ships

OECD Organisation for Economic Cooperation and Development

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

UN United Nations

vPvB vPvB: very Persistent and very Bioaccumulative

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.

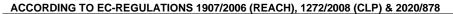
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Annex to the extended Safety Data Sheet (eSDS)

See below -

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NAME - Renewable hydrocarbons (diesel type fraction)

CAS No. : 928771-01-1 EC No. : 700-571-2

Summary of Parameters

			Physical parameters				
Vapour pressure (Pa)			87.1 Pa at 25°C				
Partition Coefficient (log	g K _{ow})		Log Kow (Log Pow): 8.4 at 20°C				
Solubility (Water) (mg/l))		0.075mg/L at 25°C (in water)				
Molecular weight			>142.3 - <285.5				
Biodegradability			Readily biodegradable. Degradation rate (%): 82 after 28d (% degradation (CO2 evolution)) (OECD Guideline 301 B)				
Human Health (DNEL))						
Warlana	Langua Tanna	Inhalation (mg/m³) Systemic effects	147mg/m³				
Workers	Long Term	Dermal (mg/kg bw/day) Systemic effects	42mg/kg bw/day				
		Inhalation (mg/m³) Systemic effects	94mg/m³				
Consumer	Long Term	Dermal (mg/kg bw/day) Systemic effects	18mg/kg bw/day				
		Oral (mg/kg bw/day) Systemic effects	18mg/kg bw/day				
Environmental Param	Environmental Parameters (PNECs)						
Freshwater (mg/L) Not			lot applicable				
			Not applicable				
1 0 0			Not applicable				
1 0 0 7		nt dw)	Not applicable				
			Not applicable				
			Not applicable				
	· ···		0.00126 No indication of bioaccumulation potential.				

Contents

Number	Title	Page:
Exposure scenario 1	Formulation & (re)packing of substances and mixtures	10
Exposure scenario 2	Use as a fuel (Use at industrial sites)	13
Exposure scenario 3	Use as a fuel (Widespread use by professional workers)	16
Exposure scenario 4	Use as a fuel (Consumer uses)	19

Contributing Scenarios

PROC Codes

PROC1 Use in closed process, no likelihood of exposure

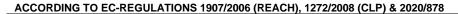
PROC2 Use in closed, continuous process with occasional controlled exposure

PROC3 Use in closed batch process (synthesis or formulation)

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 contact)

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PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

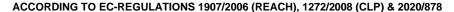
PROC14 Production of preparations or articles by tabletting, compression, extrusion, pelletisation

PROC15 Use as laboratory reagent

PROC16 Using material as fuel sources, limited exposure to unburned product to be expected

PROC28 Manual maintenance (cleaning and repair) of machinery

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Exposure Scenario 1 - Formulation & (re)packing of substances and mixtures

1.0 Contributing Scenarios	
Process category [PROC]	PROC1 Use in closed process, no likelihood of exposure (closed systems) PROC1 Use in closed process, no likelihood of exposure (Storage) PROC2 Use in closed, continuous process with occasional controlled exposure (closed systems) PROC2 Use in closed, continuous process with occasional controlled exposure (Storage) PROC3 Use in closed batch process (synthesis or formulation) PROC3 Use in closed batch process (synthesis or formulation) 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 contact) PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (Transfer from/pouring from containers) PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (Cleaning) PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Bulk transfers) PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Drum/batch transfers) PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing) PROC14 Production of preparations or articles by tabletting, compression, extrusion, pelletisation PROC15 Use as laboratory reagent PROC28 Manual maintenance (cleaning and repair) of machinery
Environmental release categories [ERC]	ERC2 Formulation of preparations
Specific Environmental Release Categories SPERC	ESVOC SPERC 2.2.v2

2.1 Control of worker exposure				
Product characteristics				
Physical form of product	Liquid - paste/slurry/suspension			
Concentration of substance in product	100%			
Frequency and duration of use				
Exposure duration per day	PROC1 (closed systems) PROC1 (Storage) PROC2 (closed systems) PROC2 (Storage) PROC3 (closed systems) PROC3 (Elevated temperature) PROC4 PROC5 PROC8a (Transfer from/pouring from containers) PROC8b (Bulk transfers) PROC9 PROC15 PROC28	<= 8 h/day		
	PROC8b (Drum/batch transfers)	<= 4 h/day		
Exposure duration per year 300				
Other operational conditions affecting worker exposure				
Area of use	All PROC's	Indoor use		
Operating temperature	All other PROC's	<= 25 °C		
Operating temperature	PROC3 (Elevated temperature)	<= 60 °C		

General measures applicable to all activities

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.

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

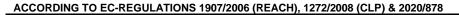
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systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance. Organisational measures Consider technical advances and process 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 All PROC's 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 Occupational Health and Safety Management System: Advanced PROC1 (closed systems) Use in closed process, no likelihood of exposure. PROC1 (Storage) Room ventilation: Good (3 to 5 ACH) Occupational Health and Safety Management System: Advanced PROC2 (closed systems) Closed continuous process with occasional controlled exposure PROC2 (Storage) Room ventilation: Good (3 to 5 ACH) Occupational Health and Safety Management System: Advanced PROC3 (closed systems) Closed batch process with occasional controlled exposure Room ventilation: Good (3 to 5 ACH) PROC4 PROC5 PROC8a (Transfer from/pouring from containers) Occupational Health and Safety Management System: Advanced PROC8b (Bulk transfers) Room ventilation: Good (3 to 5 ACH) PROC8b (Drum/batch transfers) PROC9 PROC14 PROC15 Occupational Health and Safety Management System: Advanced PROC3 (Elevated temperature) Local exhaust ventilation: Yes, specifically designed fixed capturing hood, on tool extraction or PROC8a (Cleaning) enclosing hoods (assumed effectiveness >= 90-95%) PROC28 Room ventilation: Good (3 to 5 ACH) Risk management measures related to human health Respiratory protection All PROC's Not required Chemical resistant dermal protection with All PROC's basic employee training. Hand and/or Skin protection (effectiveness >= 90%) Not required Eye Protection All PROC's 2.2 Control of environmental exposure Amounts used Fraction of EU tonnage used in region: 100 % Percentage of tonnage used at regional scale 100 % Regional use tonnage (tons/year): 1.5E6 Local fraction (%) 1 Annual site tonnage (tons/year): <= 3E4 Maximum daily site tonnage (kg/day): 100,000 Environment factors not influenced by risk management 2.00E+06 Flow rate of receiving surface water (m³/d): 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 2.25 Release fraction to water from process (initial release prior to 4.80E-04 RMM Release fraction to soil from process (initial release prior to 0.01 RMM): Release fraction to waste from process (initial release prior to 4 **RMM** Release fraction to air from process 2.3 Release fraction to water from process 6.35E-06 Release fraction to waste from process 4.0

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Technical and organisational conditions and measures					
Oil-water separation (e.g. via oil water separators, oil skimmers, or					
dissolved air flotation) is required					
Treat air emission to provide a typical removal efficiency of (%): 0					
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%):	98.7				
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of m³ (%):	2.00E+06				
Conditions and measures related to municipal sewage treatment	nent plant				
Discharge rate of STP					
Application of the STP sludge on agricultural soil					
Degradation effectiveness (%) 94.63% (Water)					
Conditions and measures related to external treatment of wa	ste for disposal				
Residual raw materials and are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications (EU, 2016). Wastewater generated during cleaning and maintenance operations is directed to a waste water treatment plant for biological degradation. Atmospheric release of waste vapor may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapours. All unrecovered waste is handled as an industrial waste that can be incinerated or in some cases re-distilled.					
Substance release quantities after risk management measure	es				
Release to waste water from process (mg/l)	0%				
Maximum allowable site tonnage (MSafe) (kg/d):	5.51E+06				
Release to waste water from process	Estimated release factor (%)	5E-4%			
Release to waste water from process	Local release rate (kg/day)	0.5 kg/day			
Release to air from process	Estimated release factor (%)	0.5%			
Nelease to all Hottl process	Local release rate (kg/day)	500			
Delegas to sail from process	Estimated release factor (%)	0.01%			
Release to soil from process	Local release rate (kg/day)	-			

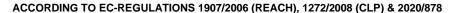
3. Exposure estimation and reference to its source

3.1 Human exposure prediction

	Inhalation		Derma		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 (closed systems)	0.083	< 0.01	3.4E-3	< 0.01	< 0.01
PROC1 (Storage)	0.083	< 0.01	3.4E-3	< 0.01	< 0.01
PROC2 (closed systems)	8.327	0.057	0.137	< 0.01	0.06
PROC2 (Storage)	8.327	0.057	0.137	< 0.01	0.06
PROC3 (closed systems)	24.98	0.17	0.069	< 0.01	0.172
PROC3 (Elevated temperature)	41.63	0.283	0.069	< 0.01	0.285
PROC4	41.63	0.283	0.686	0.016	0.3
PROC5	41.63	0.283	1.371	0.033	0.316
PROC8a (Transfer from/pouring from containers)	83.27	0.566	1.371	0.033	0.599
PROC8a (Cleaning)	8.327	0.057	1.371	0.033	0.089
PROC8b (Bulk transfers)	41.63	0.283	1.371	0.033	0.316
PROC8b (Drum/batch transfers)	41.63	0.283	1.371	0.033	0.316
PROC9	41.63	0.283	0.686	0.016	0.3
PROC14	41.63	0.283	0.343	< 0.01	0.291
PROC15	41.63	0.283	0.034	< 0.01	0.284
PROC28	8.327	0.057	1.371	0.033	0.089

3.2 Environmental exposure prediction	
Exposure assessment (method/calculation model)	PETRORISK

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environmental exposure	air	freshwater	marine water	soil	freshwater sediment	marine sediment
PEC	3.13E+01	1.59E-02	1.59E-03	1.04E-01	2.51E-01	2.53E-02

Indirect exposure to humans via the environment:

Exposure route	Exposure estimation (μg/kg/day)	Risk characterisation ratio (RCR)
Oral	3.94E-02	0.00E+00
Inhalation	1.41E+01	5.00E-04
Dermal	-	5.00E-04

4. Evaluation guidance to c	4. Evaluation guidance to downstream user						
For scaling see	are managed to at least equivalent Available hazard data do not supp	easures/Operational Conditions are adopted, then users should ensure that risks at levels. Fort the need for a DNEL to be established for other health effects. Fortitrol technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-					
Exposure assessment	Workers TRA Workers 3.0						
instrument/tool/method	environmental exposure	PETRORISK					

Exposure Scenario 2 - Use as a fuel (Use at industrial sites)

1.0 Contributing Scenarios	
Process category [PROC]	PROC1 Use in closed process, no likelihood of exposure (closed systems) PROC1 Use in closed process, no likelihood of exposure (Storage) PROC2 Use in closed, continuous process with occasional controlled exposure (closed systems) PROC2 Use in closed, continuous process with occasional controlled exposure (Storage) PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Bulk transfers) PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Drum/batch transfers) PROC16 Using material as fuel sources, limited exposure to unburned product to be expected PROC28 Manual maintenance (cleaning and repair) of machinery
Chemical product category [PC]	PC13 Fuels
Environmental release categories [ERC]	ERC7 Industrial use of substances in closed systems
Specific Environmental Release Categories SPERC	ESVOC SPERC 7.12a.v3

2.0 Operational conditions and risk management measures						
2.1 Control of worker exposure	2.1 Control of worker exposure					
Product characteristics						
Physical form of product	Liquid - paste/slurry/suspension					
Concentration of substance in product	100%					
Frequency and duration of use						
Exposure duration per day	All PROC's	<= 8 h/day				
Exposure duration per year	300 days	•				
Other operational conditions affecting worker exposure						
Area of use	All PROC's	Indoor use				
Operating temperature	All PROC's	<= 25 °C				

General measures applicable to all activities

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.

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

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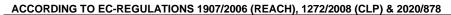




containment. Clean/flush equipment, where possible, prior to maintenance Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory 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

Organisational measures				
All PROC's	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	1.000 10. 11011 0000	a		
PROC1 (closed systems) PROC1 (Storage)	Use in closed prod	Ith and Safety Management Systoess, no likelihood of exposure. Good (3 to 5 ACH)	em: Advanced	
PROC2 (closed systems) PROC2 (Storage)	Occupational Hea Closed continuous	Ith and Safety Management System of Systems of Safety Management Systems of Systems (South Safety)	em: Advanced led exposure	
PROC8b (Bulk transfers) PROC8b (Drum/batch transfers) PROC16		Ith and Safety Management Syst Good (3 to 5 ACH)	em: Advanced	
PROC8a PROC28	Local exhaust ven enclosing hoods (a Room ventilation:	Ith and Safety Management Sysitilation: Yes, specifically designe assumed effectiveness >= 90-95 Good (3 to 5 ACH)	d fixed capturing hood, on tool extraction or	
Risk management measures related to hu	nan health			
Respiratory protection Hand and/or Skin protection	All PROC's All PROC's		Not required Chemical resistant dermal protection with basic employee training. (effectiveness >= 90%)	
Eye Protection	All PROC's		Not required	
2.2 Control of environmental exposure	711111000		Not required	
Amounts used				
Fraction of EU tonnage used in region:		100 %		
Percentage of tonnage used at regional scale		100 %		
Regional use tonnage (tons/year):		10000		
Annual site tonnage (tons/year):		<= 1E4		
Maximum daily site tonnage (kg/day):		5,000,000		
Environment factors not influenced by risk	management	T		
Flow rate of receiving surface water (m³/d):				
Local freehwater dilution feater:		2.00E+06		
Local freshwater dilution factor:		10		
Local marine water dilution factor:			_	
Local marine water dilution factor: Operational conditions		10 100		
Local marine water dilution factor: Operational conditions Emission days (days/year):	ease prior to	10 100 300		
Local marine water dilution factor: Operational conditions	ease prior to	10 100		
Local marine water dilution factor: Operational conditions Emission days (days/year): Release fraction to air from process (initial rel		10 100 300		
Local marine water dilution factor: Operational conditions Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to water from process (initial RMM) Release fraction to soil from process (initial rel RMM):	release prior to	10 100 300 5		
Local marine water dilution factor: Operational conditions Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to water from process (initial RMM) Release fraction to soil from process (initial rel RMM): Release fraction to waste from process (initial rel RMM):	release prior to	10 100 300 5 1.00E-03 0		
Local marine water dilution factor: Operational conditions Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to water from process (initial RMM) Release fraction to soil from process (initial rel RMM): Release fraction to waste from process (initial rel RMM): Release fraction to waste from process (initial RMM) Release fraction to air from process	release prior to	10 100 300 5 1.00E-03 0 2		
Local marine water dilution factor: Operational conditions Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to water from process (initial RMM) Release fraction to soil from process (initial rel RMM): Release fraction to waste from process (initial rel RMM): Release fraction to waste from process (initial RMM) Release fraction to air from process Release fraction to water from process	release prior to	10 100 300 5 1.00E-03 0 2 5 0		
Local marine water dilution factor: Operational conditions Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to water from process (initial RMM) Release fraction to soil from process (initial rel RMM): Release fraction to waste from process (initial rel RMM): Release fraction to waste from process (initial RMM) Release fraction to air from process Release fraction to water from process Release fraction to waste from process	release prior to elease prior to release prior to	10 100 300 5 1.00E-03 0 2		
Local marine water dilution factor: Operational conditions Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to water from process (initial RMM) Release fraction to soil from process (initial rel RMM): Release fraction to waste from process (initial RMM): Release fraction to waste from process (initial RMM) Release fraction to air from process Release fraction to water from process Release fraction to waste from process Release fraction to waste from process Release fraction to waste from process	release prior to elease prior to release prior to	10 100 300 5 1.00E-03 0 2 5 0 2		
Local marine water dilution factor: Operational conditions Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to water from process (initial RMM) Release fraction to soil from process (initial rel RMM): Release fraction to waste from process (initial RMM): Release fraction to waste from process (initial RMM) Release fraction to air from process Release fraction to water from process Release fraction to waste from process	release prior to release prior to release prior to release prior to	10 100 300 5 1.00E-03 0 2 5 0 2 r dissolved air flotation) is require	ed	
Local marine water dilution factor: Operational conditions Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to water from process (initial RMM) Release fraction to soil from process (initial rel RMM): Release fraction to waste from process (initial rel RMM): Release fraction to waste from process (initial RMM) Release fraction to air from process Release fraction to water from process Release fraction to waste from process Release fraction to waste from process Release fraction to waste from process Technical and organisational conditions a Oil-water separation (e.g. via oil water separation treat air emission to provide a typical removal reat onsite wastewater (prior to receiving wastewater)	release prior to lease prior to release prior to	10 100 300 5 1.00E-03 0 2 5 0 2 r dissolved air flotation) is require	ed	
Local marine water dilution factor: Operational conditions Emission days (days/year): Release fraction to air from process (initial rel RMM): Release fraction to water from process (initial RMM) Release fraction to soil from process (initial rel RMM): Release fraction to waste from process (initial rel RMM): Release fraction to waste from process (initial RMM) Release fraction to air from process Release fraction to water from process Release fraction to waste from process Technical and organisational conditions a Oil-water separation (e.g. via oil water separator treat air emission to provide a typical removal	release prior to release prior to release prior to release prior to nd measures tors, oil skimmers, o l efficiency of (%): ter discharge) to :	10 100 300 5 1.00E-03 0 2 5 0 2 r dissolved air flotation) is require	ed	

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Conditions and measures related to municipal sewage treatment plant					
Discharge rate of STP	>= 2E3 m³/day				
Application of the STP sludge on agricultural soil	No				
Degradation effectiveness (%)	94.63% (Water)				
Conditions and measures related to external treatment of	waste for disposal				
Residual raw materials and are in some cases recycled and fed back into the process reactor to improve efficiencies. In other cases, residues and by-products are used as raw materials for other downstream applications (EEA, 2016). Wastewater generated during cleaning and maintenance operations is directed to a waste water treatment plant for biological degradation. Atmospheric release of waste vapour may be ameliorated using wet scrubbers, thermal oxidizers, solid adsorbents, membrane separators, biofilters, and/or cold oxidizers for trapping residual vapours. All unrecovered waste is handled as an industrial waste that can be incinerated. Substance release quantities after risk management measures					
Release to waste water from process (mg/l)	0%				
Maximum allowable site tonnage (MSafe) (kg/d):	1.80E+06				
Release to surface water from process (%)	Estimated release factor	1E-3%			
Release to surface water from process (70)	Local release rate (kg/day)	50 kg/day			
Pologo to air from process (%)	Estimated release factor	0.6%			
Release to air from process (%)	Local release rate (kg/day)	3E4 kg/day			
Delegas to sail from process	Estimated release factor	0%			
Release to soil from process	Local release rate (kg/day)	-			

3. Exposure estimation and reference to its source

3.1 Human exposure prediction

	Inhalation		Derma	l	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 (closed systems)	0.083	< 0.01	3.4E-3	< 0.01	< 0.01
PROC1 (Storage)	0.083	< 0.01	3.4E-3	< 0.01	< 0.01
PROC2 (closed systems)	8.327	0.057	0.137	< 0.01	0.06
PROC2 (Storage)	8.327	0.057	0.137	< 0.01	0.06
PROC8a	8.327	0.057	1.371	0.033	0.089
PROC8b (Bulk transfers)	41.63	0.283	1.371	0.033	0.316
PROC8b (Drum/batch transfers)	41.63	0.283	1.371	0.033	0.316
PROC16	8.327	0.057	0.034	< 0.01	0.057
PROC28	8.327	0.057	1.371	0.033	0.089

3.2 Environmental exposure prediction

Exposure assessment (method/calculation model) PETRORISK

environmental exposure	air	freshwater	marine water	soil	freshwater sediment	marine sediment
PEC	4.65E-01	2.23E-04	2.22E-05	1.60E-03	7.07E-03	8.22E-04

Indirect exposure to humans via the environment:

Exposure route	Exposure estimation (μg/kg/day)	Risk characterisation ratio (RCR)
Oral	6.26E-04	3.48E-08
Inhalation	2.10E-01	7.82E-06
Dermal	-	7.85E-06

4. Evaluation guidance to de	ownstream 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 bazard data do not support the need for a DNEL to be established for other health effects.

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	Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).			
Exposure assessment	Workers	TRA Workers 3.0		
instrument/tool/method	environmental exposure	PETRORISK		

Exposure Scenario 3 - Use as a fuel (Widespread use by professional workers)

1.0 Contributing Scenarios	
Process category [PROC]	PROC1 Use in closed process, no likelihood of exposure (closed systems) PROC1 Use in closed process, no likelihood of exposure (Storage) PROC2 Use in closed, continuous process with occasional controlled exposure (closed systems) PROC2 Use in closed, continuous process with occasional controlled exposure PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Bulk transfers) PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Drum/batch transfers) PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Refuelling) PROC16 Using material as fuel sources, limited exposure to unburned product to be expected PROC28 Manual maintenance (cleaning and repair) of machinery
Environmental release categories [ERC]	ERC9a Wide dispersive indoor use of substances in closed systems ERC9b Wide dispersive outdoor use of substances in closed systems
Specific Environmental Release Categories SPERC	ESVOC SPERC 9.12b.v3

2.1 Control of worker exposure		
Product characteristics		
Physical form of product	Liquid - paste/slurry/suspension	
Concentration of substance in product	100%	
Frequency and duration of use		
Exposure duration per day	All PROC's	<= 8 h/day
Exposure duration per year	365 days	
Other operational conditions affecting v	vorker exposure	
<u>, , , , , , , , , , , , , , , , , , , </u>	PROC8b (Bulk transfers) PROC8b (Refuelling)	Outdoor
Area of use	PROC1 (closed systems) PROC1 (Storage) PROC2 (closed systems) PROC2 (Storage) PROC8b (Drum/batch transfers) PROC8a PROC16 PROC28	Indoor
Operating temperature	All PROC's	<= 25 °C

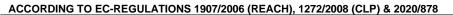
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise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

Organisational measures

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

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threats.



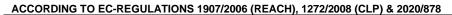


	wear respiratory p immediately and o are in place to ma	protection when its use is identified dispose of waste safely. Ensure s	oves and coveralls to prevent skin contamination; do for certain contributing scenario; clear up spills safe systems of work or equivalent arrangements at and maintain all control measures. Consider the	
Technical conditions of use	•			
PROC1 (closed systems) PROC1 (Storage)	Use in closed pro- Room ventilation:	Ith and Safety Management Systoess, no likelihood of exposure. Good (3 to 5 ACH)		
PROC2 (closed systems) PROC2 (Storage)	Closed continuous	lth and Safety Management Sys s process with occasional control Good (3 to 5 ACH)		
PROC8b (Bulk transfers) PROC8b (Refuelling)	*	lth and Safety Management Syst		
PROC8b (Drum/batch transfers) PROC16	Room ventilation:	Ith and Safety Management Syst Good (3 to 5 ACH)		
PROC8a PROC28	Local exhaust ver type). (assumed	Ith and Safety Management Sysitilation: Yes, Provide specifically effectiveness >= 80-90%) Good (3 to 5 ACH)	tem: Basic designed and maintained LEV (receiving hood	
Risk management measures related to		2004 (0 10 0 7 1011)		
Respiratory protection	All PROC's		Not required	
Hand and/or Skin protection	All PROC's		Chemical resistant dermal protection with basic employee training. (effectiveness >= 80%)	
Eye Protection	All PROC's		Not required	
2.2 Control of environmental exposur	e			
Amounts used				
Fraction of EU tonnage used in region:		10 %		
Percentage of tonnage used at regional	scale	0.05 %		
Regional use tonnage (tons/year):		30000		
Daily local widespread use amount (toni	nes/day)	<= 0.041		
Annual site tonnage (tons/year):	,	270000		
Environment factors not influenced by	v risk management	2.0000		
Local freshwater dilution factor:	y non management	10		
Local marine water dilution factor:		100		
Operational conditions		100		
Emission days (days/year):		365 days		
Release fraction to air from process (init RMM):	ial release prior to	0.5		
Release fraction to water from process (RMM	initial release prior to	1.00E-04		
Release fraction to soil from process (in RMM):	itial release prior to	0.025		
Release fraction to waste from process RMM	(initial release prior to	2		
Release fraction to air from process		0		
Release fraction to water from process		1.00E-04		
Release fraction to waste from process		2		
Technical and organisational condition				
m3 /day		ndard municipal sewage treatme	ent plant (STP) with an effluent flow rate of 2,000	
Treat air emission to provide a typical re	moval efficiency of (%):	0		
Treat onsite wastewater (prior to receiving		0		
provide the required removal efficiency of If discharging to domestic sewage treatr	nent plant, provide the	2.00E+06		
required onsite wastewater removal effic				
Conditions and measures related to r	nunicipal sewage treatn			
Degradation effectiveness (%)		94.63% (Water)		
Conditions and measures related to e				
suitable unbreakable and closable conta compatible, leakproof, and free of any d	niner should be used when efects. Contaminated deb	n storing and shipping hazardous ris such as disposable paper tow	recovery or disposal as hazardous waste. A materials. The containers must be solvent vels, brushes, rollers, masks, transfer vessels, and	
			and properly disposed of in a manner that is	

laws and regulations. A spill plan needs to be available that outlines the steps to be taken to minimize any potential health and environmental

consistent with local, regional, and national regulations. Direct disposal of waste into a municipal sewer system needs to conform with all applicable

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Substance release quantities after risk management measures					
Release to waste water from process 2%					
Maximum allowable site tonnage (MSafe) (kg/d):	8.41E+03				
Delegas to waste water from a record	Estimated release factor (%)	1E-4%			
Release to waste water from process	Local release rate (kg/day)	4.11E-5 kg/day			
Delegas to air from process	Estimated release factor (%)	0.5%			
Release to air from process	Local release rate (kg/day)	- kg/day			
Delegas to sail from process	Estimated release factor (%)	0.025%			
Release to soil from process	Local release rate (kg/day)	-			

3. Exposure estimation and reference to its source

3.1 Human exposure prediction

Exposure assessment (method/calculation model) ECETOC TRA

	In	halation	Derma	l	Combined
Process category [PROC]	inhalation exposure (mg/m³)	exposure characterisation exposure(mg/kg characterisation		Risk characterisation ratio (RCR)	
PROC1 (closed systems)	0.083	< 0.01	6.8E-3	< 0.01	< 0.01
PROC1 (Storage)	0.083	< 0.01	6.8E-3	< 0.01	< 0.01
PROC2 (closed systems)	41.63	0.283	0.274	< 0.01	0.29
PROC2 (Storage)	41.63	0.283	0.274	< 0.01	0.29
PROC8a	41.63	0.283	2.742	0.065	0.349
PROC8b (Bulk transfers)	83.27	0.566	2.742	0.065	0.632
PROC8b (Drum/batch transfers)	83.27	0.566	2.742	0.065	0.632
PROC8b (Refuelling)	83.27	0.566	2.742	0.065	0.632
PROC16	8.327	0.057	0.068	< 0.01	0.058
PROC28	41.63	0.283	2.742	0.065	0.349

3.2 Environmental exposure prediction

Exposure assessment (method/calculation model) PETRORISK

	environmental exposure	air	freshwater	marine water	soil	freshwater sediment	marine sediment
ΗĪ	PEC	1.85E-03	2.90E-06	2.09E-07	6.47E-05	3.63E-03	4.78E-04

Indirect exposure to humans via the environment:

Exposure route	Exposure estimation (μg/kg/day)	Risk characterisation ratio (RCR)
Oral	4.89E-05	2.72E-09
Inhalation	1.02E-03	3.79E-08
Dermal	-	4.06E-08

4. Evaluation guidance to d	ownstream user	
For scaling see	are managed to at least equivalent Available hazard data do not support	easures/Operational Conditions are adopted, then users should ensure that risks t levels. ort the need for a DNEL to be established for other health effects. trol technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-
Exposure assessment	Workers	TRA Workers 3.0
instrument/tool/method	environmental exposure	PETRORISK

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Exposure Scenario 4 - (Consumer) Use as a fuel (Consumer uses)

1.0 Contributing Scenarios	
Chemical product category [PC]	PC13 Fuels
Environmental release categories [ERC]	ERC9a Wide dispersive indoor use of substances in closed systems ERC9b Wide dispersive outdoor use of substances in closed systems
Specific Environmental Release Categories SPERC	ESVOC SPERC 9.12c.v3

2.0 Operational conditions and risk management measures							
2.1 Control of worker exposure	_				_	_	
Product characteristics							
Physical form of product	Liquid - pa	aste/slurry/suspension					
Concentration of substance in product	100%	, ,					
Other operational conditions affecting we	orker exposu	ire					
•	PC13 (Au	tomotive refuelling)					
	PC13 (Li	quid Scooter Refuelling)		Outdoor			
Area of use		arden equipment use)					
71100 01 000		PC13 (Garden equipment refueling)					
	PC13 (Lic	luid: Home space heater	fuel)	Indoor			
A 1 1/2 / 1 11 1		uid: Lamp oil)		0 11			
Adults/children use	All PROC	´S		Covers adult	use.		
Human factors not influenced by risk ma	nagement						
		Chemical product					
		category [PC]	Categ	ory	Skin Contact (cm²)		
		, , , , , , , , , , , , , , , , , , ,	A		210 (Palm of one		
			Automotive	rerueiling	hand)		
			Liquid Scoote	r Refuelling	210 (Palm of one		
Detected on a company			Liquid Scooter Refuelling		hand)		
Potential exposure area			Garden equipment use		0		
		PC13	Garden equipment		420		
			refueling Liquid: Home space		•		
					210 (Palm of one		
			heater fuel		hand) 210 (Palm of one		
			Liquid: La	amp oil	hand)		
					Hariu)		
		Chemical product	Category		Amount (mg)		
		category [PC]	•		` •,		
			Automotive refuelling		0		
			Liquid Scooter Refuelling		0		
Amount of product swallowed			Garden equipment use		0		
		PC13	Garden equipment		0		
			refueling Liquid: Home space		0		
			heater fuel				
			Liquid: Lamp oil		0		
Frequency and duration of use			Liquid. Et	arrip on	Ŭ		
requency and duration of use							
		Chemical product category [PC]	Category		Duration (h/event)		
			Automotive	refuelling	0.05		
			Liquid Scooter Refuelling		0.033		
Exposure duration (hours/Event)			Garden equi	pment use	2		
,		PC13	Garden eq	uipment	0.03		
		PU13	refuel	ing	0.03		
			Liquid: Hon		0.03		
			heater fuel				
			Liquid: Lamp oil 0.013				

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		nical product egory [PC]	Category	Use frequency (events per day)	
			Automotive refuelling	1	
Frequency of use (events per day)			Liquid Scooter Refuelling	1	
			Garden equipment use	1	
		PC13	Garden equipment refueling	1	
			Liquid: Home space heater fuel	1	
			Liquid: Lamp oil	1	
		nical product egory [PC]	Category	Mass (g)	
			Automotive refuelling	<= 3.75E4	
Amounta used (a/Eyent)			Liquid Scooter Refuelling	<= 3.75E3	
Amounts used (g/Event)			Garden equipment use	<= 750	
		PC13	Garden equipment refueling	<= 750	
			Liquid: Home space heater fuel	<= 3E3	
			Liquid: Lamp oil	<= 100	
Operational conditions					
		alaal waadaast			
		nical product egory [PC]	Category	Use Dilution Factor	
			Automotive refuelling	1	
			Liquid Scooter Refuelling	1	
Use Dilution Factor			Garden equipment use	1	
		PC13	Garden equipment refueling	1	
			Liquid: Home space heater fuel	1	
			Liquid: Lamp oil	1	
			Elquia. Earrip on	·	
		nical product egory [PC]	Category	Room size (m³)	
			Automotive refuelling	100	
			Liquid Scooter Refuelling	100	
Characteristics of the surroundings			Garden equipment use	100	
		PC13	Garden equipment refueling	34	
			Liquid: Home space heater fuel	20	
			Liquid: Lamp oil	20	
	Chen	nical product egory [PC]	Category	air exchange rate (L/h)	
			Automotive refuelling	2.5	
A:			Liquid Scooter Refuelling	2.5	
Air exchange rate			Garden equipment use	2.5	
		PC13	Garden equipment refueling	1.5	
			Liquid: Home space heater fuel	0.61	
			Liquid: Lamp oil	0.6	
Respiratory protection	Use self-contained breathing apparatus.				
Hand/Skin protection	Wear chemical resistant apron, chemical protection suit.				
Eye Protection	Not required				
				·	
Amounts used		1			
Amounts used Fraction of EU tonnage used in region:		10			
Amounts used Fraction of EU tonnage used in region: Percentage of tonnage used at regional sca	ale	0.05			
Amounts used Fraction of EU tonnage used in region: Percentage of tonnage used at regional sca Regional use tonnage (tons/year):		0.05 100000			
2.2 Control of environmental exposure Amounts used Fraction of EU tonnage used in region: Percentage of tonnage used at regional sca Regional use tonnage (tons/year): Daily local widespread use amount (tonnes Annual site tonnage (tons/year):		0.05			

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

Maximum daily site tonnage (kg/day):	137				
Environment factors not influenced by risk management					
Local freshwater dilution factor:	10				
Local marine water dilution factor:	100				
Operational conditions					
Emission days (days/year):	365 days				
Release fraction to air from process (initial release prior to RMM):	0.2				
Release fraction to water from process (initial release prior to RMM	2.00E-05				
Release fraction to soil from process (initial release prior to RMM):	0.005				
Release fraction to waste from process (initial release prior to RMM	2				
Release fraction to air from process 0					
Release fraction to water from process	2.00E-05				
Release fraction to waste from process	2				
Technical and organisational conditions and measures					
Release to wastewater from process	The release to water is modified after biological treatment at a standard municipal sewage treatment plant (STP) with an effluent flow rate of 2,000 m3 /day				
Treat air emission to provide a typical removal efficiency of (%):	0				
Treat onsite wastewater (prior to receiving water discharge) to	0				
provide the required removal efficiency of (%):	U				
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of m³ (%):	of m ³ (%):				
Conditions and measures related to municipal sewage treatment plant					
Degradation effectiveness (%) 94.63% (Water)					
Conditions and measures related to external treatment of was					
produced by consumers, it needs to be separated from normal trash and amassed for special handling. Many regional municipalities have established voluntary procedures for the identification, collection, and disposal of HHW in a safe and efficient manner. Once amassed, the HHW can be transported to collection sites where it is reused, recycled, or incinerated. The handling and disposal of hazardous waste needs to conform with established practices and local/regional regulations in order to minimize environmental release and the potential for ecological harm.					
Substance release quantities after risk management measures					
Release to waste water from process (mg/l)	0%				
Maximum allowable site tonnage (MSafe) (kg/d):	2.81E+04				
Release to waste water from process	Estimated release factor (%)	2E-5%			
Total to made mater from process	Local release rate (kg/day)	2.74E-11 kg/day			
Release to air from process	Estimated release factor (%)	0.01%			
Troise to all from process	Local release rate (kg/day)	- kg/day			
Release to soil from process	Estimated release factor (%)	5E-3%			
The same of the sa	Local release rate (kg/day)	-			

3. Exposure estimation and reference to its source

3.1 Human exposure prediction

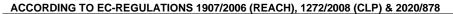
Exposure assessment (method/calculation model) EGRET 2.0

	Inhalation		Dermal		Oral		Combined
Chemical product category [PC]	inhalation exposure (mg/m³)	Risk characterisation ratio (RCR)	dermal exposure (mg/kg bw/day)	characterisation	oral exposure mg/kg bw/day	Risk characterisatio n ratio (RCR)	inhalation exposure (mg/m³)
PC13 CS2	0.734	< 0.01	13.51	0.751	0	< 0.01	0.758
PC13 CS3	0.495	< 0.01	13.51	0.751	0	< 0.01	0.756
PC13 CS4	2.483	0.026	0	< 0.01	0	< 0.01	0.026
PC13 CS5	0.162	< 0.01	10.80	0.6	0	< 0.01	0.602
PC13 CS6	0.116	< 0.01	13.51	0.751	0	< 0.01	0.752
PC13 CS7	0.067	< 0.01	13.51	0.751	0	< 0.01	0.751

Exposure assessment (method/calculation model) PETRORISK

environmental exposure	air	freshwater	marine water	soil	freshwater sediment	marine sediment
PEC	1.85E-03	2.88E-06	2.08E-07	6.45E-05	3.63E-03	4.78E-04

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Indirect exposure to humans via the environment:

Exposure route	Exposure estimation (µg/kg/day)	Risk characterisation ratio (RCR)
Oral	4.89E-05	2.72E-09
Inhalation	1.02E-03	3.79E-08
Dermal	-	4.06E-08

4. 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/reach-for-industries-libraries.html).			
Exposure assessment	Consumer	EGRET 2.0		
instrument/tool/method	environmental exposure	PETRORISK		