Date 01 May 2024

VitolBunkers

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

VLSFO B30

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

Trade Name VERY LOW SULPHUR FUEL OIL Product code VLSFO B30 CAS No. 68476-33-5 EC No. 270-675-6 . . No Exposure Scenario Identified use(s) No Versultion and (re)packing of Fuel oil, residual 2 Formulation and (re)packing of Fuel oil, residual 3 Use as a fuel (Industrial) 4 Use as a fuel (Professional) Uses advised against Anything other than the above. 1.3 Details of the supplier of the safety data sheet Company Identification Vitol Bunkers B.V. Weena 690, 18th Floor 3012 CN Rotterdam The Netherlands	
Trade Name VERY LOW SULPHUR FUEL OIL Product code VLSFO B30 CAS No. 68476-33-5 EC No. 270-675-6 . . 1.2 Relevant identified uses of the substance or mixture and uses advised against Vertice Relevant identified uses of the substance or mixture and uses advised against No Exposure Scenario Pa Identified use(s) No Exposure Scenario Pa 1 Distribution of Fuel oil, residual 2 Formulation and (re)packing of Fuel oil, residual 2 Formulation and (re)packing of Fuel oil, residual 4 Use as a fuel (Industrial) 4 Use as a fuel (Professional) 4 Use as a fuel (Professional) Uses advised against Anything other than the above. 7 1.3 Details of the supplier of the safety data sheet Vitol Bunkers B.V. Weena 690, 18th Floor 3012 CN Rotterdam The Netherlands	
Product code VLSFO B30 CAS No. 68476-33-5 EC No. 270-675-6 1.2 Relevant identified uses of the substance or mixture and uses advised against Identified use(s) No Exposure Scenario Pa 1 Distribution of Fuel oil, residual 2 Formulation and (re)packing of Fuel oil, residual 3 Use as a fuel (Industrial) 4 Use as a fuel (Professional) Uses advised against Anything other than the above. 1.3 Details of the supplier of the safety data sheet Company Identification Vitol Bunkers B.V. Weena 690, 18th Floor 3012 CN Rotterdam The Netherlands	
CAS No. EC No. 270-675-6 1.2 Relevant identified uses of the substance or mixture and uses advised against ldentified use(s) No Exposure Scenario Pa 1 Distribution of Fuel oil, residual 2 Formulation and (re)packing of Fuel oil, residual 3 Use as a fuel (Industrial) 4 Use as a fuel (Industrial) 4 Use as a fuel (Professional) 1 Uses advised against Anything other than the above. 1.3 Details of the supplier of the safety data sheet Company Identification Vitol Bunkers B.V. Weena 690, 18th Floor 3012 CN Rotterdam The Netherlands	
EC No. EC No. 1.2 Relevant identified uses of the substance or mixture and uses advised against Identified use(s) Mo Exposure Scenario Pa 1 Distribution of Fuel oil, residual 2 Formulation and (re)packing of Fuel oil, residual 3 Use as a fuel (Industrial) 4 Use as a fuel (Professional) Uses advised against Anything other than the above. 1.3 Details of the supplier of the safety data sheet Company Identification Vitol Bunkers B.V. Weena 690, 18th Floor 3012 CN Rotterdam The Netherlands	
Instruction Relevant identified uses of the substance or mixture and uses advised against No Exposure Scenario Pathol Identified use(s) No Exposure Scenario Pathol Pat	
and uses advised against No Exposure Scenario Pa Identified use(s) 1 Distribution of Fuel oil, residual Pa 1 Distribution of Fuel oil, residual 2 Formulation and (re)packing of Fuel oil, residual Pa 2 Formulation and (re)packing of Fuel oil, residual 3 Use as a fuel (Industrial) 4 Use as a fuel (Professional) Uses advised against Anything other than the above. Anything other than the above. 1 1.3 Details of the supplier of the safety data sheet Company Identification Vitol Bunkers B.V. Vitol Bunkers B.V. Vitol Bunkers B.V. Weena 690, 18th Floor 3012 CN Rotterdam The Netherlands Not Rotterdam	
and uses advised against No Exposure Scenario Pa Identified use(s) 1 Distribution of Fuel oil, residual Pa 1 Distribution of Fuel oil, residual 2 Formulation and (re)packing of Fuel oil, residual Pa 2 Formulation and (re)packing of Fuel oil, residual 3 Use as a fuel (Industrial) 4 Use as a fuel (Professional) Uses advised against Anything other than the above. Anything other than the above. 1 1.3 Details of the supplier of the safety data sheet Company Identification Vitol Bunkers B.V. Vitol Bunkers B.V. Vitol Bunkers B.V. Weena 690, 18th Floor 3012 CN Rotterdam The Netherlands Not Rotterdam	
Identified use(s) No Exposure Scenario Pa 1 Distribution of Fuel oil, residual 1 Distribution and (re)packing of Fuel oil, residual 1 1 2 Formulation and (re)packing of Fuel oil, residual 3 Use as a fuel (Industrial) 1 </th <th></th>	
1 Distribution of Fuel oil, residual 2 Formulation and (re)packing of Fuel oil, residual 3 Use as a fuel (Industrial) 4 Use as a fuel (Professional) 5 Use as a fuel (Professional) 4 Use as a fuel (Professional) 5 Use as a fuel (Professional) 5 Use as a fuel (Professional) 6 Use as a fuel (Professional) 6 Use as a fuel (Professional) 7 Use as a fuel (Professional) 7 Use as a fuel (Professional) 8 Use as a fuel (Professional) 7 Use as a fuel (Professional)	ge:
3 Use as a fuel (Industrial) 4 Use as a fuel (Professional) Uses advised against Anything other than the above. 1.3 Details of the supplier of the safety data sheet Company Identification Vitol Bunkers B.V. Vitol Bunkers B.V. Weena 690, 18th Floor 3012 CN Rotterdam The Netherlands	12
3 Use as a fuel (Industrial) 4 Use as a fuel (Professional) Uses advised against Anything other than the above. 1.3 Details of the supplier of the safety data sheet Company Identification Vitol Bunkers B.V. Vitol Bunkers B.V. Weena 690, 18th Floor 3012 CN Rotterdam The Netherlands	16
Uses advised against Anything other than the above. 1.3 Details of the supplier of the safety data sheet Company Identification Vitol Bunkers B.V. Weena 690, 18th Floor 3012 CN Rotterdam The Netherlands	20
1.3 Details of the supplier of the safety data sheet Vitol Bunkers B.V. Company Identification Vitol Bunkers B.V. Weena 690, 18th Floor 3012 CN Rotterdam The Netherlands The Netherlands	24
Company Identification Vitol Bunkers B.V. Weena 690, 18th Floor 3012 CN Rotterdam The Netherlands	
Weena 690, 18th Floor 3012 CN Rotterdam The Netherlands	
3012 CN Rotterdam The Netherlands	
The Netherlands	
Telephone +31 10 498 7200	
Fax +31 10 452 9545	
E-mail (competent person) xreach@vitol.com	
1.4 Emergency Telephone Number	
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 Acute Tox. 4; H332 Carc. 1B; H350 Repr. 2; H361d STOT RE 2; H373 (Thymus, Liver, Blood effects) Aquatic Acute 1; H400 Aquatic Chronic 1; H410

2.2 Label elements Product description

Hazard Pictogram(s)

According to Regulation (EC) No. 1272/2008 (CLP) VLSFO B30 -VERY LOW SULPHUR FUEL OIL OIL-FUEL OIL, RESIDUAL



Date 01 May 2024

VitolBunkers

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

VLSFO B30

	Signal Word(s)	DANGER
	Hazard Statement(s)	 H304: May be fatal if swallowed and enters airways. H332: Harmful if inhaled. H350: May cause cancer. H361d: Suspected of damaging the unborn child. H373: May cause damage to organs through prolonged or repeated exposure: Thymus, Liver, Blood effects H410: Very toxic to aquatic life with long lasting effects.
	Precautionary Statement(s)	 P201: Obtain special instructions before use. P260: Do not breathe dust/fume/gas/mist/vapours/spray. P273: Avoid release to the environment. P280: Wear protective gloves/protective clothing/eye protection/face protection. P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P331: Do NOT induce vomiting.
	Supplemental information	EUH066: Repeated exposure may cause skin dryness or cracking.
3	Other hazards	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. Vapour may create explosive atmosphere. The vapour is heavier than air; beware of pits and confined spaces.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

2.3

SUBSTANCE	CAS No.	EC No.	REACH Registration No.	%W/W
Fuel oil, residual	68476-33-5	270-675-6	01-2119474894-22-xxxx	50%-99%
Fatty acids, vegetable- oil,Me esters	68990-52-3	273-606-8	01-2119485821-32-xxxx	1%-55%

SECTION 4: FIRST AID MEASURES



4.1

Description of first aid measures Self-protection of the first aider

H2S Warning:

Inhalation

The vapour is heavier than air; beware of pits and confined spaces. 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. Do not ingest. If swallowed then seek immediate medical assistance.

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

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

IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. If symptoms persist, obtain medical attention.

Date 01 May 2024

4.2

4.3

5.3

VitolBunkers

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

VLSFO B30

Skin contact	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.
Eye contact	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.
Ingestion	IF SWALLOWED: Do not induce vomiting because of risk of aspiration into the lungs. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. 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.
Most important symptoms and effects, both acute and delayed	Vapour may be irritant to the respiratory tract. Repeated and/or prolonged skin contact may cause irritation. May cause eye irritation. Aspiration into the lungs may cause chemical pneumonitis, which can be fatal.
Indication of any immediate medical attention and special treatment needed	If breathing is laboured, oxygen should be administered by qualified personnel. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
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

SECTION 5: FIREFIGHTING MEASURES

5.1	Extinguishing media
	Suitable extinguishing media
	Unsuitable extinguishing media
5.2	Special hazards arising from the substance or mixture

Advice for firefighters

Foam, Carbon dioxide, Water fog or dry powder.

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

Not flammable but will support combustion. The vapour is heavier than air; beware of pits and confined spaces. 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. If sulphur compounds are present in appreciable amounts, combustion products may include also H2S and SOx (sulfur oxides) or sulfuric acid.

occurs spontaneously, keep head below hips to prevent aspiration into the lungs.

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

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1	Personal precautions, protective equipment and emergency procedures	Caution - spillages may be slippery. Ensure operatives are trained to minimise exposures. Ensure suitable personal protection during removal of spillages. Eliminate sources of ignition. Shut off leaks if without risk. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid all contact with substance. Ensure adequate ventilation. Do not breathe vapour. Do not ingest. If swallowed then seek immediate medical assistance. Do not use sparking tools.
	H2S Warning:	Product may release Hydrogen Sulphide. Exposure controls - These controls may include: Segregation of areas, Access only to authorised persons, Permit to work systems, Confined space working procedures, Area H2S alarms, Personal H2S alarms, Personal escape sets, H2S awareness training. Please see section 8 for appropriate personal protection equipment.
	Small spillages:	Wear flame-resistant antistatic protective clothing.
	Large spillages:	Evacuate the area and keep personnel upwind. Drench contaminated clothing with water before removing to avoid risk of sparks from static electricity. Avoid all contact. Wear chemical protection suit and breathing apparatus. See Also Section: 8

Date 01 May 2024

VitolBunkers

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

6.2	Environmental precautions	Avoid release to the environment. Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body. If necessary: Dike area to contain the spill and prevent releases to sewers, drains, or other waterways.
6.3	Methods and material for containment and cleaning up	Provided it is safe to do so, isolate the source of the leak. 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.
	Spillages onto land:	In case of soil contamination, remove contaminated soil and treat in accordance with local regulations. Adsorb spillages onto sand, earth or any suitable adsorbent material. Transfer to a lidded container for disposal or recovery. Dispose of this material and its container as hazardous waste. Small spillages: Allow small spillages to evaporate provided there is adequate ventilation. Wear flame-resistant antistatic protective clothing. Large spillages: Cover spillage with foam to reduce evaporation. Do not use water jet.
	Spillages on water or at sea:	Collect as much as possible in clean container for reuse or disposal. Small spillages: Contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents. Large spillages: Open waters should be contained with floating barriers or other mechanical means and recovered, only if this is strictly necessary. Otherwise control the spreading of the spillage, and let the substance evaporate naturally.
6.4	Reference to other sections	See Section: 8,13

SECTION 7: HANDLING AND STORAGE			
7.1	Precautions for safe handling	Obtain special instructions before use. Keep away from sources of ignition No smoking. Use only outdoors or in a well-ventilated area. Prevent vapour build up by providing adequate ventilation during and after use. 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.	
	H2S Warning:	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.	
7.2	Conditions for safe storage, including any incompatibilities	Light hydrocarbon vapours can build up in the headspace of containers. These can cause flammability / explosion hazards. Bund storage facilities to prevent soil and water pollution in the event of spillage. Keep only in original packaging. Keep containers properly sealed when not in use. Protect from sunlight. Containers of this material may be hazardous when empty since they retain product residue. Empty container may contain product residue which may result in flammable or explosive vapours inside the container.	
	Storage temperature	Stable at ambient temperatures.	
	Storage measures	Suitable containers: Mild steel, Stainless steel.	
		Unsuitable containers: Synthetic materials	
	Incompatible materials	Keep away from oxidising agents. Strong acids and Alkalis.	
7.3	Specific end use(s)	See Section: 1.2 and/or Exposure Scenario	

Date 01 May 2024

VitolBunkers

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

VLSFO B30

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1	Control parameters	
-----	--------------------	--

- 8.1.1 Occupational exposure limits
- 8.1.2 Biological limit value
- 8.1.3 PNECs and DNELs

PNEC: Fuel Oil, Residual 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.

Fuel Oil, Residual Derived No-Effect Level	Oral	Inhalation	Dermal
Worker - Long Term - Systemic effects	0.015 mg/kg bw/day	0.015 mg/kg bw/day	0.015 mg/kg bw/day
Worker - Short term - Systemic effects	-	4700 mg/m³	-

Not established

Not established

8.2 Exposure controls

8.2.1 Appropriate engineering controls

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

8.2.2 Individual protection measures, such as personal protective equipment Fuels are typically used, exposure is likely (i.e. durin Koop good inductrial burging)

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.

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	Use eye protection according to EN 166, designed to protect against liquid splashes.
	Skin protection	Hand protection: Wear impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer. Recommended: Nitrile rubber
		Body protection: Wear anti-static clothing and shoes. Small scale: Wear suitable coveralls to prevent exposure to the skin. Large scale: Chemical protection suit
	Respiratory protection	When the product is heated/In case of inadequate ventilation wear respiratory protection. The use of a high efficiency filter (EN143) is recommended. Filter type A2.
		Closed system(s): Not normally required
	Thermal hazards	Not applicable
8.2.3	Environmental exposure controls	Avoid release to the environment.

Date 01 May 2024

VitolBunkers

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

VLSFO B30

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance Odour Odour threshold pH Melting point/freezing point Initial boiling point and boiling range Flash point Evaporation rate Flammability (solid, gas) Upper/lower flammability or explosive limits Vapour pressure

Vapour density Relative density Solubility(ies) Partition coefficient: n-octanol/water

Auto-ignition temperature Decomposition Temperature Viscosity Explosive properties Oxidising properties

9.2 Other information

Liquid, Viscous, May be coloured. Fuel oil-like Not established. $< 30 \degree C$ Typical value 140 - 400 $\degree C$ > 60 $\degree C$ Not established . Not applicable - Liquid Not established. $<= 0.4 \text{ kPa} (38,0 \degree \text{ C})$ Not established

0.850 - 0.9920 g/cm³ @ 15 °C Water: 0.4 mg/l @ 22 °C Slightly soluble. log Pow: 2 - 20

> 225 °C
Not established.
10 – 390 mm²/s @ 50 °C
Not explosive. (Vapour may create explosive atmosphere.)
Not oxidising.

None known.

SECTION 10: STABILITY AND REACTIVITY

10.1	Reactivity	Stable under normal conditions. Reacts with - Strong oxidising agents
10.2	Chemical stability	Stable under normal conditions. Hazardous polymerisation will not occur.
		Product may release Hydrogen Sulphide.
10.3	Possibility of hazardous reactions	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: > 50 °C
		Keep away from heat, sources of ignition and direct sunlight.
10.5	Incompatible materials	Keep away from oxidising agents. Strong acids and Alkalis.
10.6	Hazardous decomposition products	A mixture of solid and liquid particulates and gases including unidentified
		organic and inorganic compounds. Decomposes in a fire giving off toxic fumes:
		COx, H2S, Sox.

SECTI	ON 11: TOXICOLOGICAL INFORMATION	
11.1	Information on hazard classes as defined in	All test data taken from existing ECHA registrations for the substances
	Regulation (EC) No 1272/2008	mentioned.
	Acute toxicity - Ingestion	Based upon the available data, the classification criteria are not met.
		LD50 (oral,rat) mg/kg: >2000 (OECD 401)
	Acute toxicity - Inhalation	Acute Tox. 4: Harmful if inhaled.
		LC50 (inhalation,rat) mg/l/4h: 4.1 (EPA OTS 798.1150)
	Acute toxicity - Skin contact	Based upon the available data, the classification criteria are not met.
		LD50 (skin,rabbit) mg/kg: >2000 (OECD 434)
	Skin corrosion/irritation	Based upon the available data, the classification criteria are not met.
		Not irritating to skin. (rabbit) (OECD 404)
		EUH066: Repeated exposure may cause skin dryness or cracking. (rat) (OECD
		410)

Date 01 May 2024

VitolBunkers

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

VLSFO B30

	Serious eye damage/irritation	Based upon the available data, the classification criteria are not met.
		Not irritating to eyes. (rabbit) (EU Method B.5)
	Respiratory or skin sensitisation	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.
		ECHA Registration Endpoint summary:
		Not classified. Studies showed no consistent evidence of mutagenic activity
	Carcinogenicity	Carc. 1B; May cause cancer.
		ECHA Registration Endpoint summary:
		Positive (mouse)
	Reproductive toxicity	Repr. 2; H361d: Suspected of damaging the unborn child.
		Reproductive toxicity: No data available.
		Developmental toxicity: Positive (rat) EPA OTS 798.4900
	STOT - Single Exposure	Based upon the available data, the classification criteria are not met.
		Weight of evidence approach.
	STOT - Repeated Exposure	STOT RE 2; May cause damage to organs through prolonged or repeated
		exposure.
	(Dral: No data available.
	Inhala	tion: No data available.
	Der	mal: NOAEL: 1.06 mg/kg bw/day (rat) (OECD 410)
	Aspiration hazard	Asp. Tox. 1; May be fatal if swallowed and enters airways.
		Kinematic viscosity: 7 – 20.5 mm²/s at 40 °C (<60 mm²/s at 100 °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	Aquatic Acute 1; Very toxic to aquatic life.
		Aquatic Chronic 1; Very toxic to aquatic life with long lasting effects.
	Short Term (acute):	EL50: (48 hour) (Daphnia magna) 0.22 mg/l (OECD 202)
	Long term (chronic):	The aquatic toxicity was estimated using the PETROTOX computer model.
		Estimated: 0.1 mg/l (Fish)
12.2	Persistence and degradability	Substance is complex UVCB. Standard tests for this endpoint are intended for
		single substances and are not appropriate for this complex substance
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	Substance is complex UVCB. Standard tests for this endpoint are intended for
		single substances and are not appropriate for this complex substance
12.5	Results of PBT and vPvB assessment	Not classified as PBT or vPvB. None of the substances in this product fulfil the
		criteria for being regarded as a PBT or vPvB substance.
12.6	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.
12.7	Other adverse effects	None known

SECTION 13: DISPOSAL CONSIDERATIONS

13.1	Waste treatment methods	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: Fuel Oil (13 07 01)
	Waste classification according to Directive 2008/98/EC (Waste Framework Directive)	HP5, HP6, HP7, HP10, HP14

Date 01 May 2024

VitolBunkers

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

VLSFO B30

SECTION 14: TRANSPORT INFORMATION

14.1	UN number or ID number	ADR/RID UN 3082	IMDG/ADN UN 3082
14.2	UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, FUEL OIL, RESIDUAL	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, FUEL OIL, RESIDUAL
14.3	Transport hazard class(es)	9	9 (N1, CMR, F)
14.4	Packing group	111	
14.5	Environmental hazards	Environmentally hazardous substance	Classified as a Marine Pollutant.
14.6	Special precautions for user	See Section: 2	
14.7	Maritime transport in bulk according to IMO instruments	No information available.	No information available.
14.8	Additional information	HIN: 90	EmS: F-A, S-F
		Tunnel restriction code: 3 E	Limited Quantity: 5L
		Limited Quantity: 5L	
		Special provisions: 274, 335, 375, 601	

SECTION 15: REGULATORY INFORMATION

15.1	Safety, health and environmental regulations/legislation specific for the substance or mixture	
15.1.1	EU regulations	
	Annex XVII (Restrictions)	In accordance with REACH Annex XVII entry 30 (c) this substance is exempt from
		Entry 28 and 29 of REACH Annex XVII as it is to be sold as a fuel in a closed
		system.
	Seveso	Upper Tier: 25000 tonnes
		Lower Tier: 2500 tonnes
15.1.2	National regulations	
	Germany	Water hazard class: 3
15.2	Chemical Safety Assessment	A REACH chemical safety assessment (CSA) has been carried out. Refer to annexes for exposure scenarios detailing use specific exposure controls.

SECTION 16: OTHER INFORMATION

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

References:

Existing Safety Data Sheet (SDS). Harmonised Classification(s) for Fuel Oil, Residual (CAS No. 68476-33-5). Existing ECHA registration(s) for Fuel Oil, Residual (CAS No. 68476-33-5) and Chemical Safety Report.

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
CAS	Chemical Abstracts Service
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
EC	European Community
ECHA	European Chemicals Agency
EL50	EL50: Loading rate of test substance (in dilution water) which causes adverse effects in 50% of exposed population
EU	European Union
DNEL	Derived no effect level
IATA	IATA: International Air Transport Association
ICAO	ICAO: International Civil Aviation Organization
IMDG	IMDG: International Maritime Dangerous Goods

Date 01 May 2024

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

VLSFO B30

VitolBunkers

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
NOAEL	No Observed Adverse Effect Level
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
STEL	Short term exposure limit
UN	United Nations
UVCB	Unknown or Variable Composition, Complex reaction products or Biological materials
vPvB	vPvB: very Persistent and very Bioaccumulative

Hazard classification / Classification code:	Hazard Statement(s)
	EUH066: Repeated exposure may cause skin dryness or cracking.
Asp. Tox. 1; Aspiration hazard, Category 1	H304: May be fatal if swallowed and enters airways.
Acute Tox. 4; Acute Toxicity, Category 4	H332: Harmful if inhaled.
Carc. 1B; Carcinogenicity, Category 1B	H350: May cause cancer.
Repr. 2; Reproductive toxicity, Category 2	H361d: Suspected of damaging the unborn child.
STOT RE 2; Specific target organ toxicity — repeated exposure,	H373: May cause damage to organs through prolonged or repeated
Category 2	exposure.
Aquatic Acute 1; Hazardous to the aquatic environment, Acute, Category	H400: Very toxic to aquatic life.
1	
Aquatic Chronic 1; Hazardous to the aquatic environment, Chronic,	H410: Very toxic to aquatic life with long lasting effects.
Category 1	

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

Disclaimers

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

Annex to the extended Safety Data Sheet (eSDS)

See below -

Date 01 May 2024

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

VLSFO B30

VitolBunkers

Fuel oil, residual	
CAS No.	68476-33-5
EINECS No.	270-675-6

Summary of Parameters

Physical Parame	eters		
Vapour pressure (Pa)			Value used for exposure assessment = 2.0E+02
Partition coefficie	ent (log K _{ow})		1.99 – 18.02
Aqueous solubilit	y (mg/l)		2.7E-12 – 2.0E+03 Value used for environmental exposure assessment = 7.3E+00
Molecular weight			Not applicable
Biodegradability			Standard tests for this endpoint are intended for single substances and are not appropriate for this complex substance
Human Health (I	DNEL)		
	Oh ant tanna	Inhalation (mg/m ³)	4700
	Short term	Dermal (mg/kg bw/day)	Not defined
Workers		Inhalation (mg/m ³)	0.18
	Long Term	Dermal (mg/kg bw/day)	0.065
		Inhalation (mg/m ³)	Not defined
Consumer		Dermal (mg/kg bw/day)	Not defined
		Oral (mg/kg bw/day)	0.015

Fuel oil, residual 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.

Date 01 May 2024

VitolBunkers

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

VLSFO B30

Contents		
Number	Title	Page:
Exposure scenario 1	Distribution of Fuel oil, residual	12
Exposure scenario 2	Formulation and (re)packing of Fuel oil, residual	16
Exposure scenario 3	Use as a fuel (Industrial)	20
Exposure scenario 4	Use as a fuel (Professional)	24

Contributing Scenarios

Workers

PROC1 Use in closed process, no likelihood of exposure

PROC2 Use in closed, continuous process with occasional controlled exposure

(Storage) Bulk product storage.

(Sampling) Product sampling.

(Fuel filtering) Operation of solids filtering equipment.

- PROC3 Use in closed batch process (synthesis or formulation)
- PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (Maintenance) Equipment cleaning and maintenance.
- PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (Marine) Marine vessel or barge loading.

(Road/Rail) Road tanker/rail car loading.

(Drum) Drum or batch transfers.

(Bulk) Bulk closed loading and unloading.

(Refuelling) Refuelling.

PROC15 Use as laboratory reagent.

PROC16 Using material as fuel sources, limited exposure to unburned product to be expected Click or tap here to enter text.

Environment

ERC2 Formulation of preparations

ERC4 Industrial use of processing aids in processes and products, not becoming part of articles

ERC5 Industrial use resulting in inclusion into or onto a matrix

ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)

ERC6b Industrial use of reactive processing aids

ERC6c Industrial use of monomers for manufacture of thermo-plastics

ERC6d Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

ERC7 Industrial use of substances in closed systems

ERC9a Wide dispersive indoor use of substances in closed systems

ERC9b Wide dispersive outdoor use of substances in closed systems

Date 01 May 2024

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

VLSFO B30

VitolBunkers

Exposure Scenario 1 – Distribution of Fuel oil, residual

1.0 Contributing scenarios	
Sector of Use [SU]	SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
	PROC1
	PROC2
	PROC2 (Storage)
	PROC2 (Sampling)
Process Category [PROC]	PROC3
	PROC8a (Maintenance)
	PROC8b (Marine)
	PROC8b (Road/Rail)
	PROC15
Chemical Product Category [PC]	Not applicable
Article Categories [AC]	Not applicable
	ERC4
	ERC5
	ERC6a
Environmental Release Categories [ERC]	ERC6b
	ERC6c
	ERC6d
	ERC7
Specific Environmental Release Categories [SPERC]	ESVOC SpERC 1.1b.v1

2.1 Control of worker exposure		
Product characteristics		
Physical form of product	Liquid	
Vapour pressure	<0.5 kPa @ STP	
Concentration of substance in product	Covers percentage substance	in the product up to 100 % (unless stated differently).
Human factors not influenced by risk n	nanagement	
Potential exposure area	Not defined	
Frequency and duration of use		
	PROC1, PROC8a (Maintenance), PROC15	Covers daily exposures up to 8 hours (unless stated differently).
Exposure duration per day	PROC2 (Storage), PROC3, PROC8b (Marine)	Covers exposure up to 1 - 4 hour(s)
	PROC8b (Road/Rail)	Covers exposure up to 15 min - 1 hour(s)
	PROC2, PROC2 (Sampling)	Covers exposure up to 15 min
Emission days (days/year):	300	·
Other operational conditions affecting	worker exposure	
Area of use	PROC2 (Sampling)	Outdoor
Alea of use	All other PROC's	Not defined (default = Indoor)
Characteristics of the surroundings	Not defined	·
General measures applicable to all active Assumes a good basic standard of occupations of the standard of the standard of the standard of the standard stand		sumes activities are at ambient temperature (unless stated differently).
as closed systems, dedicated facilities ar containment. Clean/flush equipment, when provide specific activity training to operato protection when its use is identified for ce	nd suitable general/local exhaust ve re possible, prior to maintenance Wh rs to minimise exposures; wear suita rtain contributing scenario; clear up	or the elimination of releases. minimise exposure using measures such ntilation. Drain down systems and clear transfer lines prior to breaking ere there is potential for exposure: restrict access to authorised persons ble gloves and coveralls to prevent skin contamination; wear respiratory spills immediately and dispose of waste safely. Ensure safe systems o pect, test and maintain all control measures. Consider the need for risk

Page: 12 of 27

Date 01 May 2024

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

VLSFO B30

VitolBunkers

PROC8b (Road/Rail) Ensure material transfers are under containment or extract ventilation (Efficiency of at least 80%). PROC15 Handle in a fume cupboard or under extract ventilation. (Efficiency of at least 80%). PROC25, PROC3 Sample via a closed loop or other system to avoid exposure. PROC26, Marine) Transfer via enclosed lines. Clear transfer line care transfer line activates are transfer line care transfer line activates are transfer line activates are required. PROC26 (Marine) Retain drain downs in sealed storage pending disposal or for subsequent recycle. PROC26 (Marine) Retain drain downs in sealed storage pending disposal or for subsequent recycle. PROC26 (Marine) Retain drain downs in sealed storage pending disposal or for subsequent recycle. PROC26 (Marine) No special measures are required. PROC36 (Marine), PROC3, PROC2, Storage), PROC2 (Storage), PROC2 (Storage), PROC2 (Storage), PROC3, PROC3, PROC64 (Marine), PR	PROC1, PROC2, PROC2 (Storage), PROC3	Handle substance	within a clos	sed system.	
PROC15 Handle in a tume cupboard or under extract ventilation. (Efficiency of at least 90 %). Organisational measures Sample via a closed loop or other system to avoid exposure. PROC25, PROC3 Sample via a closed loop or other system to avoid exposure. PROC36, (Maintenanca). Drain down and flush system prior to equipment treasi-in or maintenance. PROC38, (Maintenanca). Drain down and flush system prior to equipment treasi-in or maintenance. PROC38, (Maintenanca). Drain down and flush system prior to equipment treasi-in or maintenance. PROC38, (Maintenanca). PROC38, (Maintenance). PROC38, (Maintenance). PROC38, (Maintenance). PROC38, (Maintenance). PROC4. PROC38, (Maintenance). PROC3. PROC1, PROC3. PROC3. PROC61, (PROC2, PROC3. Wear chemically resistant gloves (tested to EN374) in combination with basic' employee training. (Efficiency of at least 80 %). PROC61 PROC61 Wear chemically resistant gloves (tested to EN374) in combination with basic' employee training. (Efficiency of at least 80 %). PROC61 PROC61 Wear chemically resistant gloves (tested to EN374) in combination with basic' employee training. (Efficiency of at least 90 %). Fraction of Egoinal tonage tensylewith 9.1.6 9.6.6		Ensure material tr	anefore aro i	under containment or extract ventilation (Efficiency of at least 80%)	
Organisational measures Ample via a closed loop or other system to avoid exposure. PROC2: PROC3: Maintenance) Drain down and flush system prior to equipment break in or maintenance. PROC8: (Maintenance) Drain down and flush system prior to equipment break in or maintenance. PROC8: (Maintenance) Retain drain downs is sealed storage pending disposal or for subsequent recycle. PROC8: (Maintenance) Retain drain downs is sealed storage pending disposal or for subsequent recycle. PROC8: (Maintenance) Retain drain downs is sealed storage pending disposal or for subsequent recycle. PROC8: (Maintenance) No special measures are required. Response to the sealed to thuran health Response to the sealed to thuran health Response to the sealed to thuran health Response to the sealed to thuran health Response to the sealed to thuran health Response to the sealed to thuran health Response to the sealed to thuran health Response to the sealed to thuran health Response to the sealed to thuran health Response to the sealed to thuran health Response to the sealed to thuran health Response to the sealed to thuran health sealed to thuran health Response to the sealed to thuran health Restathealth	, ,				
PROC2: PROC3 Sample via a closed loop or other system to avoid exposure. PROC3: (Maintenance) Transfer via enclosed lines. Clast transfer inserption to decoupling. PROC3: (Maintenance). Drain down and flush system prior to exploment threak-in or maintenance. PROC3: (Maintenance). Transfer via enclosed lines. Clast transfer lines prior to do threak-in for subsequent recycle. PROC3: (Maintenance). Transfer via enclosed lines. Clast transfer lines prior to do threak-in drain downs in seled strong pending disposal or for subsequent recycle. PROC3: (Maintenance). No special measures are required. Respiratory protection No special measures are required. PROC1: (Storge). PROC2: (Storge). PROC2: (Storge). PROC3: (PROC3: (Storge). PROC3: (PROC4: (Storge). PROC3: PROC5) Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. (Efficiency of at least 80 %). PROC5: (Maintenance) No special measures are required. 22 control of environmenta devises (Maintenance) Z control of environmenta conser 0.1 1 1 Annual set formage (tonsylvar): 9.3E+06 1 2.9E+04 Environment factors not influenced by risk management 10 1 1 Environment factors not influenced by risk management 10.E-04 1 <					
PROC36 (Marina) Transfer via anclosed lines. Clear transfer lines prior to de-couping. PROC36 (Marinance). Drain down and fush system port to cupiment break in or maintenance. PROC36 (Marinance). Retain drain down and fush system port to cupiment break in or maintenance. PROC36 (Marinance). Retain drain downs in sealed storage pending disposal or for subsequent recycle. PROC36 (Marinance). PROC36 (Marinance). Respiratory protection No special measures are required. PROC36 (Marinance). PROC36 (Marine). PROC36 (Marina). PROC36 (Marine). Waar chemically resistant gloves (tested to EN374) in combination with bacic employee training. (Efficiency of at least 80 %). PROC36 (Marine). PROC3 PROC36 (Marine). Wear suitable gloves tested to EN374. (Efficiency of at least 80 %). PROC36 (Marine). PROC3 PROC36 (Marine). Wear suitable gloves tested to EN374. (Efficiency of at least 80 %). PROC36 (Marine). PROC3 PROC36 (Marine). Wear suitable gloves tested to EN374. (Efficiency of at least 80 %). Protection No special measures are required. 2 contol of environmental exposure PROC3 PROC36 (Marine). No testested to EN374. (Sample via a close	ed loop or ot	her system to avoid exposure	
PROC8a (Maintenance) Drain down and flush system prior to equipment break-in or maintenance. PROC8a (Maintenance), PROC8b (Maine) Ensure material transfers are under containment or extract ventilation Risk management measures related to human health Ensure material transfers are under containment or extract ventilation Respiratory protection No special measures are required. PROC1, PROC2, PROC2 (Sampling), PROC3, PROC2 (Sampling), PROC3, PROC6b (Marine), PROC7b (M	-				
PROC3a (Maintenance), PROC3b (Maine) Retain drain downs in sealed storage pending disposal or for subsequent recycle. PROC3b (RodRai) Ensure material transfers are under containment or extract ventilation Risk management measures related to human health No special measures are required. Risk management measures related to human health No special measures are required. Risk management measures related to human health No special measures are required. PROC2b (Mainte), PROC2 (Storage), PROC2 (Storage), PROC3, PROC2 (Storage), PROC3b (Mainte), PROC3b (PROC3b					
PROCBA (Read/Rail) Ensure material transfers are under containment or extract ventilation Risk management measures related to human health No special measures are required. Respiratory protection No special measures are required. PROCE (Storage), PROC2 (Storage), PROC3 (Storage), PROC2 (Storage), PROC3 Wear chemically resistant gloves (tested to EN374) in combination with basic' employee training, (Efficiency of at least 90 %). PROC68 (Marine), ROC3B Wear suitable gloves tested to EN374. (Efficiency of at least 80 %). PROC15 Wear suitable gloves tested to EN374. (Efficiency of at least 80 %). PROC36 (Marine), ROC3B Wear chemically resistant gloves (tested to EN374) in combination with basic/ employee training. (Efficiency of at least 75%) PROC16 fention No special measures are required. Wear chemically resistant gloves (tested to EN374) in combination with basic/ employee training. (Efficiency of at least 75%) PROC16 fentional exposure 0.1 Respiratory of EU tornage used in region: 0.1 Praction of EU tornage used locally (tors/year): 2.0E-03 Annual site tornage (tors/year) 1.9E-04 Maximum daily site tornage (tors/year): 1.9E-04 Maximum daily site tornage (tors/year) 1.0E-04 Revinorent relation fon	· · · · · · · · · · · · · · · · · · ·				
Risk management measures related to human health Respiratory protection No spacial measures are required. Hand and/or Skin protection No Spacial measures are required. PROC1, PROC2 (Storage), PROC3 PROC56 (Mainle), PROC65 PROC56 (Mainle), PROC66 PROC68 (Mainle), PROC66 Wear chemically resistant gloves (tested to EN374) in combination with basic' employee training (Efficiency of at least 80 %). Eye Protection No special measures are required. Wear chemically resistant gloves (tested to EN374) in combination with basic' employee training (Efficiency of at least 80 %). Eye Protection No special measures are required. 22 22 Control of environmental exposure 0.1 Annual site tonnage (tonsiyear): 9.3E+06 Fraction of Roginal tonnage used in region: 0.1 Fraction of Roginal tonnage used locally (tonsiyear): 2.0E-03 Annual site tonnage (tonsiyear): 1.9E+04 Everonment factors not influenced by risk management 10 Coall reshwater dilution factor: 1.0E-04 Rielase fraction to wastewater from process (initial release prior t					
Respiratory protection No special measures are required. PROC1, PROC2, PROC2, (Storage), PROC3, (Sampling), PROC3, PROC2b (Marine), PROC3b (Road/Rail) Wear chemically resistant gloves (tested to EN374) in combination with basic employee training.(Efficiency of at least 80 %). PROC15 Wear suitable gloves tested to EN374) in combination with specific activity training. (Efficiency of at least 80 %). PROC35 PROC36 (Maintenance) Wear suitable gloves tested to EN374) in combination with specific activity training. (Efficiency of at least 75%) Z Control of environmental exposure 0.1 Regional use for activity training. (Efficiency of at least 75%) Regional use torange (norsyver): 9.3E+06 9.3E+06 Fraction of EU tornage used in region: 0.1 0.1 Regional use torange (norsyver): 9.3E+06 9.3E+04 Maximum dally set tornage (kg/dy): 1.9E+04 0.2E+04 Environment factors not influenced by risk management Flow rate of necesing surface warter (m ³ /d): Not defined (default = 18,000) 1.0E-04 Cacal marine water dilution factor: 100 1.0E-04 1.0E-04 Release fraction to wastewater from process (initial release prior to RMM); 1.0E-04 1.0E-04 Release fraction to soil from process (initial release prior to RMM); <	· · · · · · · · · · · · · · · · · · ·		ansiers are t		
PROC1, PROC2, PROC2 (Stargap), PROC3, PROC80 (Mainle), PROC80 (Rad/Rail) Wear chemically resistant gloves (tested to EN374) in combination with basic' employee training.(Efficiency of at least 90 %). Hand and/or Skin protection PROC80 (Mainle), PROC80 (PROC80 (Mainle), PROC80 PROC84 (Maintenance) Wear suitable gloves tested to EN374 in combination with specific activity training. (Efficiency of at least 80 %). Eye Protection No special measures are required. 22 22 Control of environmental exposure 0.1 Annual site tonnage (tons/year): 9.3E+006 Praction of Regional tonnage (tons/year): 9.3E+006 Praction of Regional tonnage (tons/year): 1.9E+04 Maximud abily site tonnage (tons/year): 1.9E+04 Environment factors not influenced by risk management 100 Operational conditions 100 Emission days (days/year): 300 Release fraction to usif from process (initial release prior to RMM); 1.0E-06 Release fraction to soll from process (initial release prior to RMM); 1.0E-06 Release fraction to soll from process (initial release prior to RMM); 1.0E-06 Treat ari emission days (days/year); 9 Release fraction to soll from process (initest release prior to RMM); 1.0E-06 <td></td> <td></td> <td></td> <td></td>					
Hand and/or Skin protection (Storage), PROC3, PROC3, PROC3, PROC3, PROC8, (RadRal) Wear chemically resistant gloves (tested to EN374) in combination with basic employee training.(Efficiency of at least 90 %). PROC15 Wear suitable gloves tested to EN374. (Efficiency of at least 80 %). PROC5 Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency of at least 80 %). Zotarol of environmental exposure No special measures are required. Za Control of environmental exposure 0.1 Regional uso tranage (tons/year): 9.3E+06 Fraction of Regional tostonage (tons/year): 1.9E+04 Maximum daily site tonnage (tog/year): 6.2E+04 Environment factors: 10 Colard materia water dilution factor: 10 Release fraction to air from process (initial release prior to RMM); 1.0E-06 Release fraction to air from process (initial release prior to RMM); 1.0E-05 Release fraction to air from process (initial release prior to RMM); 1.0E-06 Release fraction to air from process (initial release prior to RMM);	Respiratory protection				
PROC8a (Maintenance) Wear ohemically resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency of at least 75%) Eye Protection No special measures are required. Amounts used	Hand and/or Skin protection	(Storage), PROC2 (Sampling), PROC PROC8b (Marine)	2 C3,		
PROCBa (Maintenance) with specific activity training. (Efficiency of at least 75%) Eye Protection No special measures are required. 22 Control of environmental exposure 0.1 Fraction of EU tonnage used in region: 0.1 Regional use tonnage (uons/year): 9.3E+06 Fraction of Regional tonnage used locally (tons/year): 2.0E-03 Annual site tonnage (tons/year): 1.9E+04 Maximum daily site tonnage (tog/kay): 6.2E+04 Environment factors not influenced by risk management Flow rate of receiving surface water (mVd): Not defined (default = 16,000) Local marine water dilution factor: Local marine water dilution factor: 10 Local marine water dilution factor: 100 Operational conditions 1.0E-04 Release fraction to air from process (initial release prior to RMM); 1.0E-06 Release fraction to soli from process (initial release prior to RMM); 1.0E-05 Technical conditions and measures at process levial (source) to prevent release Common practices vary across sites thus conservative process release estimates used. Technical conditions and measures to reduce or limit discharges, air emissions and releases to soil Rincon environmental exposure is driven by humans via i		PROC15		Wear suitable gloves tested to EN374. (Efficiency of at least 80 %).	
2.2 Control of environmental exposure Amounts used Fraction of EU tonnage used in region: 0.1 Regional use tonnage (tons/year): 9.3E+06 Fraction of Regional tonnage used locally (tons/year): 2.0E-03 Annual site tonnage (tons/year): 1.9E+04 Maximum daily site tonnage (kg/day): 6.2E+04 Environment factors not influenced by risk management Flow rate of receiving surface water (m/d): Local marine water dilution factor: 10 Operational conditions Tool Brelase fraction to air from process (initial release prior to RMM): 1.0E-04 Release fraction to air from process (initial release prior to RMM): 1.0E-04 Release fraction to air from process (initial release prior to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-05 Release fraction to soil from process linitial release prior to RMM): 1.0E-05 Technical conditions and measures to reduce or limit discharges, air emissions and releases to soil Treat air emission provide a typical removal efficiency of (%): Treat air emission to provide a typical removal efficiency of (%): 0 0 Technical conditions and measures to reduce or limit discharges, air emissions and releases to soil 0		PROC8a (Mainter	nance)	Wear chemically resistant gloves (tested to EN374) in combination	
2.2 Control of environmental exposure Amounts used Fraction of EU tonnage used in region: 0.1 Regional use tonnage (tons/year): 9.3E+06 Fraction of Regional tonnage used locally (tons/year): 2.0E-03 Annual site tonnage (tons/year): 1.9E+04 Maximum daily site tonnage (kg/day): 6.2E+04 Environment factors not influenced by risk management Flow rate of receiving surface water (m/d): Local marine water dilution factor: 10 Operational conditions Tool Brelase fraction to air from process (initial release prior to RMM): 1.0E-04 Release fraction to air from process (initial release prior to RMM): 1.0E-04 Release fraction to air from process (initial release prior to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-05 Release fraction to soil from process linitial release prior to RMM): 1.0E-05 Technical conditions and measures to reduce or limit discharges, air emissions and releases to soil Treat air emission provide a typical removal efficiency of (%): Treat air emission to provide a typical removal efficiency of (%): 0 0 Technical conditions and measures to reduce or limit discharges, air emissions and releases to soil 0	Eye Protection	No special measu	res are requ	ired.	
Amounts used 0.1 Fraction of EU tonnage used in region: 0.1 Regional use tonnage (tons/year): 9.3E+06 Fraction of Regional tonnage used locally (tons/year): 2.0E-03 Annual site tonnage (tons/year): 1.9E+04 Maximum dialy site tonnage (tons/year): 6.2E+04 Environment factors not influenced by risk management File Flow rate of receiving surface water (m ³ /d): Not defined (default = 18,000) Local freshwater dilution factor: 10 Local freshwater dilution factor: 10 Coperational conditions 1.0E-04 Release fraction to ait from process (initial release prior to RMM); 1.0E-04 Release fraction to wastewater from process (initial release prior to RMM); 1.0E-06 Release fraction to soli from process (initial release prior to RMM); 1.0E-06 Release fraction to soli from process (initial release prior to RMM); 1.0E-06 Release fraction to soli from process lavel (source) to prevent release Common practices vary across sites thus conservative process release estimates used. Technical conditions and measures to reduce or limit discharges, air emissions and releases to soil Treat anie wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 90			1		
Fraction of EU tonnage used in region: 0.1 Regional use tonnage (tons/year): 9.3E+06 Fraction of Regional tonnage used locally (tons/year): 2.0E+03 Annual site tonnage (tons/year): 1.9E+04 Maximum daily site tonnage (kg/day): 6.2E+04 Environment factors not influenced by risk management 6.2E+04 Flow rate of receiving surface water (m³/d): Not defined (default = 18,000) Local marine water dilution factor: 10 Operational conditions 100 Perational conditions 1.0E-04 Release fraction to air from process (initial release prior to RMM); 1.0E-04 Release fraction to air from process (initial release prior to RMM); 1.0E-06 Release fraction to soil from process (initial release prior to RMM); 1.0E-06 Release fractions and measures at process release estimates used. 7echnical conditions and measures to reduce or limit discharges, air emissions and releases to soil Treat air emission to provide a typical removal efficiency of (%): 9 Oprive the required framewal efficiency of (%): 0 I discharging to domestic sewage treatment plant, provide the required onsite wastewater (prior to receiving water discharge) to provide the required onsite wastewater from soils. Sludge should be incinerated, contained or reclaimed. <td></td> <td></td> <td></td> <td></td>					
Regional use tonnage (tons/year): 9.3E+06 Fraction of Regional tonnage used locally (tons/year): 1.9E+04 Annual site tonnage (togs/year): 1.9E+04 Maximum daily site tonnage (kg/day): 6.2E+04 Environment factors not influenced by risk management 10 Local freshwater dilution factor: 10 Local arrine water dilution factor: 100 Operational conditions 900 Emission days (days/year): 300 Release fraction to air from process (initial release prior to RMM): 1.0E-04 Release fraction to soil from process (initial release prior to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-05 Technical conditions and measures at process level (source) to prevent release cool Common practices vary across sites thus conservative process release estimates used. Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exerce used efficiency of (%): 90 Treat air emission to provide a typical removal efficiency of (%): 90 Treat air emission to provide a typical removal efficiency of (%): 0 If discharging to domestic sewage treatment plant, provide the required envide a typical remo			0.1		
Fraction of Regional tonnage used locally (tons/year): 2.0E-03 Annual site tonnage (tons/year): 1.9E+04 Maximum daily site tonnage (kg/day): 6.2E+04 Environment factors not influenced by risk management 6.2E+04 Flow rate of receiving surface water (m³/d): Not defined (default = 18,000) Local freshwater dilution factor: 10 Colar maine water dilution factor: 100 Operational conditions 100 Release fraction to air from process (initial release prior to RMM): 1.0E-04 Release fraction to soil from process (initial release prior to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-05 Technical conditions and measures to reduce or limid discharges, air emissions and releases to soil 7 Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. 7 Treat ari emission to provide a typical removal efficiency of (%): 90 0 Orreat onsite wastewater removal efficiency of (%): 0 0 Treat onie masures to prevent efficiency of (%): 0 0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater (froir to receiving water discharge) to o <td< td=""><td></td><td></td><td>-</td><td></td></td<>			-		
Annual site tonnage (tons/year): 1.9E+04 Maximum daily site tonnage (kg/day): 6.2E+04 Environment factors not influenced by risk management Not defined (default = 18,000) Local freshwater dilution factor: 10 Operational conditions 100 Emission days (days/year): 300 Release fraction to vastewater from process (initial release prior to RMM): 1.0E-04 Release fraction to wastewater from process (initial release prior to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-05 Technical conditions and measures at process level (source) to prevent release 1.0E-05 Common practices vary across sites thus conservative process release estimates used. Technical conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. Treat oile mission to provide a typical removal efficiency of (%): 90 Treat osite wastewater (prior to receiving water discharge) to provide the required nemoval efficiency of (%): 0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): </td <td></td> <td>ns/vear).</td> <td></td> <td colspan="2"></td>		ns/vear).			
Maximum daily site tonnage (kg/day): 6.2E+04 Environment factors not influenced by risk management Not defined (default = 18,000) Local reshwater dilution factor: 10 Departional conditions 100 Emission days (days/year): 300 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-06 Release fraction to soli from process (initial release prior to RMM): 1.0E-05 Common practices vary across sites thus conservative process release estimates used. Technical conditions and measures to produce or limit discharges, air emissions and release to solf Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. 0 Treat ari emission to provide a typical removal efficiency of (%): 90 Treat soile wastewater removal efficiency of (%): 0 If discharging to domestic sewage treatment plant, provide the required onsite sole as typical removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): 0 0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater (prior to receiving water discharge) to provide the required moster seladet to municipal sewage treatment plant <		10, your).			
Environment factors not influenced by risk management Not defined (default = 18,000) Flow rate of receiving surface water (m³/d): Not defined (default = 18,000) Local reshwater dilution factor: 10 Local marine water dilution factor: 100 Operational conditions 100 Release fraction to air from process (initial release prior to RMM): 300 Release fraction to soil from process (initial release prior to to RMM): 1.0E-04 Release fraction to soil from process (initial release prior to to RMM): 1.0E-06 Technical conditions and measures at process level (source) to prevent release 1.0E-05 Common practices vary across sites thus conservative process release estimates used. Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. Treat are imission to provide a typical removal efficiency of (%): If discharging to domestic sewage treatment plant, provide the required removal efficiency of (%): 0 0 Organisational measures to prevent/limit release from site 0 0 On apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant					
Flow rate of receiving surface water (m³/d): Not defined (default = 18,000) Local marine water dilution factor: 10 Local marine water dilution factor: 100 Operational conditions 300 Emission days (days/year): 300 Release fraction to air from process (initial release prior to RMM): 1.0E-04 Release fraction to soil from process (initial release prior to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-05 Technical conditions and measures at process level (source) to prevent release Common practices vary across sites thus conservative process release estimates used. Technical consite conditions and measures to reduce or limit discharges, air emissions and releases to soil Present release Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. Present release Treat onsite wastewater (prior to receiving water discharge) to provide the required nexes to proval efficiency of (%): 90 Present release If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0 0 If discharginal budge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant		k managamant	6.2E+04		
Local freshwater dilution factor: 10 Operational conditions 100 Operational conditions 100 Emission days (days/year): 300 Release fraction to air from process (initial release prior to RMM): 1.0E-04 Release fraction to soil from process (initial release prior to to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to to prevent release 1.0E-06 Technical conditions and measures at process level (source) to prevent release 1.0E-05 Technical conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. Treat air emission to provide a typical removal efficiency of (%): 90 Treat air ensistic out oprovide a typical removal efficiency of (%): 0 If discharging to domestic sewage treatment plant, provide the required removal efficiency of (%): 0 Organisational measures to prevent/limit release from site 0 On ot apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. 0 Conditions and measures related to external treatment plant 94.2		k management	Not de Com		
Local marine water dilution factor: 100 Operational conditions 100 Emission days (days/year): 300 Release fraction to air from process (initial release prior to RMM): 1.0E-04 Release fraction to soil from process (initial release prior to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-05 Technical conditions and measures at process level (source) to prevent release Common practices vary across sites thus conservative process release estimates used. Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. Treat air emission to provide a typical removal efficiency of (%): 90 I discharging to domesit sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0 I discharging to domesit so to prevent/limit release from site 0 On at ply industrial sludge to natural solis. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to external treatment plant (m³/d): Size of municipal sewage system/treatment plant (m³/d): 2.0E+03 94.2 Conditions an				d (default = 18,000)	
Operational conditions 300 Emission days (days/year): 300 Release fraction to air from process (initial release prior to RMM): 1.0E-04 Release fraction to soil from process (initial release prior to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-05 Technical conditions and measures at process level (source) to prevent release 1.0E-05 Common practices vary across sites thus conservative process release estimates used. Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. 90 Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 90 If discharging to domestic sewage treatment plant, provide the required removal efficiency of (%): 0 Organisational measures to prevent/limit release from site 0 Organisational measures to release from site 0 On ot apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant Size					
Emission days (days/year): 300 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-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-06 Rendesse fraction to soil from process (initial release prior to RMM): 1.0E-06 Technical conditions and measures at process level (source) to prevent release 1.0E-05 Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil 1.0E-06 Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. 1.0E-06 Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 90 Treat onsite wastewater removal efficiency of (%): 0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0 Organisational measures to prevent/limit release from site 0 Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant (m³/d): Size of municipal sewage system/treatment plant (m³/d): 2.0E+03 2.0E+03 Degradation effectivenes			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-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-05 Rendemative fraction to soil from process (initial release prior to RMM): 1.0E-05 Common practices vary across sites thus conservative process release estimates used. 1.0E-05 Technical conditions and measures to reduce or limit discharges, air emissions and releases to soil 1.0E-05 Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. 0 Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 90 If discharging to domestic sewage treatment plant, provide the required nensures to prevent/limit release from site 0 Organisational measures to prevent/limit release from site 0 Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant Size of municipal sewage system/treatment plant (m ³ /d): 2.0E+03 94.2 Conditions and measures related to external treatment of waste for disposal 94.2 Conditions.					
RMM): 1.0E-04 Release fraction to wastewater from process (initial release prior to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-05 Technical conditions and measures at process level (source) to prevent release 1.0E-05 Common practices vary across sites thus conservative process release estimates used. Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. 90 Treat air emission to provide a typical removal efficiency of (%): 90 If discharging to domestic sewage treatment plant, provide the required onsite wastewater (moral efficiency of (%): 0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): 0 Conditions and measures related to municipal sewage treatment plant 0 Conditions and measures related to municipal sewage treatment plant 1.0E-04 Size of municipal sewage system/treatment plant (m³/d): 2.0E+			300		
to RMM): 1.0E-06 Release fraction to soil from process (initial release prior to RMM): 1.0E-05 Technical conditions and measures at process level (source) to prevent release Common practices vary across sites thus conservative process release estimates used. Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. Treat air emission to provide a typical removal efficiency of (%): 90 Treat onsite wastewater (prior to receiving water discharge) to provide the required nomestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0 If discharging to domestic sewage treatment plant, provide the required onsite a typical removal efficiency of (%): 0 Organisational measures to prevent/limit release from site 0 Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant Size of municipal sewage system/treatment plant (m³/d): Size of municipal sewage system/treatment plant (m³/d): 2.0E+03 Degradation effectiveness (%): 94.2 Conditions and measures related to external treatment of waste for disposal External treatment and disposal of waste should comply with applicab	RMM):	•	1.0E-04		
RMM): INE-03 Technical conditions and measures at process level (source) to prevent release Common practices vary across sites thus conservative process release estimates used. Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. Treat air emission to provide a typical removal efficiency of (%): 90 Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0 Treat oni emission to provide a typical removal efficiency of (%): 0 Organisational measures to prevent/limit release from site 0 O not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant Size of municipal sewage system/treatment plant (m³/d): 2.0E+03 2.0E+03 Degradation effectiveness (%): 94.2 0 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.	to RMM):		1.0E-06		
Common practices vary across sites thus conservative process release estimates used. Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. Treat air emission to provide a typical removal efficiency of (%): 90 Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 90 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): 0 Organisational measures to prevent/limit release from site 0 Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant Size of municipal sewage system/treatment plant (m³/d): 2.0E+03 94.2 Conditions and measures related to external treatment of waste for disposal 94.2 Conditions and measures related to external treatment of waste for disposal 94.2	RMM):				
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. Treat air emission to provide a typical removal efficiency of (%): 90 Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): Not defined Organisational measures to prevent/limit release from site 0 Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant (m³/d): Size of municipal sewage system/treatment plant (m³/d): 2.0E+03 Degradation effectiveness (%): 94.2 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.					
Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion). No wastewater treatment required. Treat air emission to provide a typical removal efficiency of (%): 90 Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 90 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): Not defined Ognanisational measures to prevent/limit release from site 0 Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant Size of municipal sewage system/treatment plant (m³/d): 2.0E+03 Degradation effectiveness (%): 94.2 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.					
Treat air emission to provide a typical removal efficiency of (%): 90 Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): Not defined Organisational measures to prevent/limit release from site 0 Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant Size of municipal sewage system/treatment plant (m³/d): 2.0E+03 Degradation effectiveness (%): 94.2 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.					
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): 0 Organisational measures to prevent/limit release from site 0 Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. 0 Conditions and measures related to municipal sewage treatment plant 2.0E+03 Degradation effectiveness (%): 94.2 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.				primarily ingestion). No wastewater treatment required.	
provide the required removal efficiency of (%): 0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): Not defined Organisational measures to prevent/limit release from site 0 Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. 0 Conditions and measures related to municipal sewage treatment plant 2.0E+03 Degradation effectiveness (%): 94.2 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.	Treat air emission to provide a typical removal efficiency of (%):		90		
required onsite wastewater removal efficiency of (%): 0 Treat soil emission to provide a typical removal efficiency of (%): Not defined Organisational measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant 2.0E+03 Degradation effectiveness (%): 94.2 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.			0		
Treat soil emission to provide a typical removal efficiency of (%): Not defined Organisational measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant Size of municipal sewage system/treatment plant (m³/d): 2.0E+03 Degradation effectiveness (%): 94.2 Size for disposal External treatment and disposal of waste should comply with applicable local and/or national regulations. External regulations.			0		
Organisational measures to prevent/limit release from site Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant Size of municipal sewage system/treatment plant (m³/d): 2.0E+03 Degradation effectiveness (%): 94.2 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.	•		Not define	d	
Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Conditions and measures related to municipal sewage treatment plant Size of municipal sewage system/treatment plant (m³/d): 2.0E+03 Degradation effectiveness (%): 94.2 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.			Not denne	u	
Conditions and measures related to municipal sewage treatment plant Size of municipal sewage system/treatment plant (m³/d): 2.0E+03 Degradation effectiveness (%): 94.2 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.			cinerated o	ontained or reclaimed	
Size of municipal sewage system/treatment plant (m³/d): 2.0E+03 Degradation effectiveness (%): 94.2 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.					
Degradation effectiveness (%): 94.2 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.			-		
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.					
External treatment and disposal of waste should comply with applicable local and/or national regulations.					
			-		
				and/or national regulations.	

Date 01 May 2024

VitolBunkers

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

VLSFO B30

External recovery and recycling of waste should comply with applicable local and/or national regulations.		
Substance release quantities after risk management measures		
Release to waste water from process (mg/l):	Not defined	
Maximum allowable site tonnage (MSafe) based on release		
following total wastewater treatment removal (kg/d):		

3. Exposure estimation and reference to its source	
3.1 Human exposure prediction	
Exposure assessment (method/calculation model)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. (PROC1, PROC2, PROC2 (Sampling), PROC15) The Advanced REACH Tool (ART) has been used to estimate workplace exposures unless otherwise indicated. (PROC2 (Storage), PROC3, PROC8a (Maintenance), PROC8b (Marine), PROC8b (Road/Rail)).

	Inhalation		Dermal		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	0.04	0.03	0.57	0.61
PROC2	0.04	0.19	0.03	0.57	0.76
PROC2 (Storage)	0.04	0.21	0.03	0.57	0.78
PROC2 (Sampling)	0.04	0.19	0.03	0.57	0.76
PROC3	0.04	0.21	0.03	0.57	0.78
PROC8a (Maintenance)	0.00	0.01	0.05	0.83	0.85
PROC8b (Marine)	0.06	0.35	0.03	0.57	0.92
PROC8b (Road/Rail)	0.03	0.19	0.03	0.57	0.76
PROC15	0.05	0.28	0.01	0.10	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.

Fuel oil, residual 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)	1.9E-03 mg/l	1.9E-04 mg/l	1.9E-05 mg/l	6.2E-02 mg/kg ww	1.4E+00 mg/kg ww	3.7E-02 mg/kg ww
Risk characterisation ratio (RCR)	2.0E-03	7.6E-03	7.6E-04	3.3E-05	1.3E-02	9.9E-04

Human exposure prediction:

Route of Exposure	Exposure (µg/kg/Day)	Risk characterisation ratio (RCR)
Oral	2.0E+01	7.7E-01
Inhalation	1.6E-01	3.2E-03

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
For scaling see	managed to at least equivalent levels. Available hazard data do not support the need for a DNEL to be established for other health effects.

Date 01 May 2024

VitolBunkers

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

	Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-industries-libraries.html).		
Exposure assessment instrument/tool/method	Worker	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. (PROC1, PROC2, PROC2 (Sampling), PROC15) The Advanced REACH Tool (ART) has been used to estimate workplace exposures unless otherwise indicated. (PROC2 (Storage), PROC3, PROC8a (Maintenance), PROC8b (Marine), PROC8b (Road/Rail)).	
	Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.	

Date 01 May 2024

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

VLSFO B30

VitolBunkers

Exposure Scenario 2 – Formulation and (re)packing of Fuel oil, residual

1.0 Contributing scenarios			
Sector of Use [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) PROC2 (Sampling) PROC3 PROC8a (Maintenance) PROC8b (Marine) PROC8b (Road/Rail) PROC8b (Drum) PROC15		
Chemical Product Category [PC]	Not applicable		
Article Categories [AC]	Not applicable		
Environmental Release Categories [ERC]	ERC2		
Specific Environmental Release Categories [SPERC]	ESVOC SpERC 2.2.v1		

2.1 Control of worker exposure					
Product characteristics					
Physical form of product	Liquid				
Vapour pressure	<0.5 kPa @ STP				
Concentration of substance in product	Covers percentage substance	in the product up to 100 % (unless stated differently).			
Human factors not influenced by risk	management				
Potential exposure area	Not defined				
Frequency and duration of use					
	PROC1, PROC8a (Maintenance), PROC15	Covers daily exposures up to 8 hours (unless stated differently).			
Exposure duration per day	PROC2 (Storage), PROC3, PROC8b (Marine)	Covers exposure up to 1 - 4 hour(s)			
	PROC8b (Road/Rail), PROC8b (Drum)	Covers exposure up to 15 min - 1 hour(s)			
	PROC2, PROC2 (Sampling)	Covers exposure up to 15 min			
Emission days (days/year):	300				
Other operational conditions affecting	worker exposure				
Area of use	All contributing scenarios	Not defined (default = Indoor)			
Characteristics of the surroundings	Not defined	Not defined			
		sumes activities are at ambient temperature (unless stated differently).			
as closed systems, dedicated facilities a containment. Clean/flush equipment, whe provide specific activity training to operate protection when its use is identified for ca	nd suitable general/local exhaust ve ere possible, prior to maintenance Wh ors to minimise exposures; wear suita ertain contributing scenario; clear up	or the elimination of releases. minimise exposure using measures such ntilation. Drain down systems and clear transfer lines prior to breaking ere there is potential for exposure: restrict access to authorised persons ble gloves and coveralls to prevent skin contamination; wear respiratory spills immediately and dispose of waste safely. Ensure safe systems of pect, test and maintain all control measures. Consider the need for risk			
Technical conditions of use					
	Handla substance within a ala	Handle substance within a closed system.			
	Handle Substance within a ciu	Ensure material transfers are under containment or extract ventilation. (Efficiency of at least 97%).			
PROC1, PROC2, PROC3 PROC8b (Drum)					

Page: 16 of 27

Date 01 May 2024

VitolBunkers

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

PROC2, PROC2 (Sampling)	Minimise the volur	me and frequ	uency of sampling. Ensure dedicated sample points are provided.				
PROC8b (Marine)		sed lines. Clear transfer lines prior to de-coupling.					
PROC8a (Maintenance)	Drain down and flush system prior to equipment break-in or maintenance.						
PROC8a (Maintenance), PROC8b (Marine)	Retain drain downs in sealed storage pending disposal or for subsequent recycle.						
PROC8b (Road/Rail), PROC8b (Drum)			ansfers are under containment or extract ventilation				
Risk management measures related to hur							
Respiratory protection			ired				
Respiratory protection	No special measu PROC1, PROC2,						
Hand and/or Skin protection	(Storage), PROC2 (Sampling), PROC2 (Sampling), PROC PROC8b (Marine) (Road/Rail), PROC (Drum)	2 3, , PROC8b	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.(Efficiency of at least 90 %).				
	PROC8a (Mainter	iance)	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training. (Efficiency of at least 75%)				
	PROC15		Wear suitable gloves tested to EN374. (Efficiency of at least 80 %).				
Eye Protection	No special measu	res are requ					
2.2 Control of environmental exposure		20 0.0 1090	····				
Amounts used							
Fraction of EU tonnage used in region:		0.1					
		0.1					
Regional use tonnage (tons/year):		7.5E+06					
Fraction of Regional tonnage used locally (tor	is/year):	4.0E-03					
Annual site tonnage (tons/year):		3.0E+04					
Maximum daily site tonnage (kg/day):		1.0E+05					
Environment factors not influenced by risk	a management	-					
Flow rate of receiving surface water (m ³ /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 (after typi consistent with EU Solvent Emissions Directiv		1.0E-03					
Release fraction to wastewater from process (to RMM):		2.0E-05					
Release fraction to soil from process (initial re RMM):	lease prior to	1.0E-04					
Technical conditions and measures at pro	cess level (source)	to prevent	release				
Common practices vary across sites thus con	servative process re	lease estima	ates used.				
Technical onsite conditions and measures							
			primarily ingestion). No wastewater treatment required.				
Treat air emission to provide a typical remova			, , , , , , , , , , , , , , , , , , , ,				
Treat onsite wastewater (prior to receiving wa provide the required removal efficiency of (%)	ter discharge) to	81.3					
If discharging to domestic sewage treatment p	plant, provide the	0					
required onsite wastewater removal efficiency		Not defined					
Treat soil emission to provide a typical remova		Not defined					
Common practices vary across sites thus com		iease estima	ales useu.				
Organisational measures to prevent/limit re Do not apply industrial sludge to natural soils.	Sludge should be in		ontained or reclaimed.				
Conditions and measures related to munic	ipal sewage treatm	ent plant					
Size of municipal sewage system/treatment p	lant (m ³ /d):	2.0E+03					
Degradation effectiveness (%):		94.2					
Conditions and measures related to extern	al treatment of was	ste for disp	osal				
External treatment and disposal of waste show							
Conditions and measures related to extern			~				
External recovery and recycling of waste shou			and/or national regulations.				
Substance release quantities after risk ma							
Release to waste water from process (mg/l):		Not define	d				
			·				

Date 01 May 2024

VitolBunkers

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

VLSFO B30

Maximum allowable site tonnage (MSafe) based on release	1 1E±05
following total wastewater treatment removal (kg/d):	1.12+03

3. Exposure estimation and reference to its source								
3.1 Human exposure prediction								
Exposure assessment (method/calculation model)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. (PROC1, PROC2, PROC2 (Sampling), PROC8b (Drum), PROC15) The Advanced REACH Tool (ART) has been used to estimate workplace exposures unless otherwise indicated. (PROC2 (Storage), PROC3, PROC8a (Maintenance), PROC8b (Marine), PROC8b (Road/Rail)).							

	Inhal	ation	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	0.04	0.03	0.57	0.61	
PROC2	0.04	0.19	0.03	0.57	0.76	
PROC2 (Storage)	0.04	0.21	0.03	0.57	0.78	
PROC2 (Sampling)	0.04	0.19	0.03	0.57	0.76	
PROC3	0.04	0.21	0.03	0.57	0.78	
PROC8a (Maintenance)	0.00	0.01	0.05	0.83	0.85	
PROC8b (Marine)	0.06	0.36	0.03	0.57	0.92	
PROC8b (Road/Rail)	0.03	0.20	0.03	0.57	0.76	
PROC8b (Drum)	0.02	0.12	0.03	0.57	0.68	
PROC15	0.05	0.28	0.01	0.10	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.

Fuel oil, residual 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)	6.1E-02 mg/l	6.1E-03 mg/l	6.1E-04 mg/l	6.3E-02 mg/kg ww	1.5E+00 mg/kg ww	5.5E-02 mg/kg ww
Risk characterisation ratio (RCR)	6.4E-02	2.4E-01	2.4E-02	5.3E-04	3.1E-01	3.1E-02

Human exposure prediction:

Route of Exposure	Exposure (µg/kg/Day)	Risk characterisation ratio (RCR)			
Oral	2.1E+01	8.1E-01			
Inhalation	6.6E+00	1.3E-01			

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.

Date 01 May 2024

VitolBunkers

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

		not support the need for a DNEL to be established for other health effects. and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-for-
Exposure assessment instrument/tool/method	Worker	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. (PROC1, PROC2, PROC2 (Sampling), PROC8b (Drum), PROC15) The Advanced REACH Tool (ART) has been used to estimate workplace exposures unless otherwise indicated. (PROC2 (Storage), PROC3, PROC8a (Maintenance), PROC8b (Marine), PROC8b (Road/Rail)).
	Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.

Date 01 May 2024

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

VLSFO B30

VitolBunkers

Exposure Scenario 3 – Use as a fuel (Industrial)

1.0 Contributing scenarios	
Sector of Use [SU]	SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
	PROC1
	PROC2
	PROC2 (Fuel filtering)
	PROC2 (Storage)
Process Category [PROC]	PROC3
	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.v1

2.0 Operational conditions and risk mar	agement measures						
2.1 Control of worker exposure							
Product characteristics							
Physical form of product	Liquid						
Vapour pressure	<0.5 kPa @ STP						
Concentration of substance in product	Covers percentage substance	e in the product up to 100 % (unless stated differently).					
Human factors not influenced by risk m	anagement						
Potential exposure area	Not defined						
Frequency and duration of use							
Exposure duration per day	PROC1, PROC8a (Maintenance), PROC8b (Bulk), PROC16 PROC2 (Fuel filtering),	Covers daily exposures up to 8 hours (unless stated differently).					
	PROC2 (Fider Internity), PROC2 (Storage), PROC3	Covers exposure up to 1 - 4 hour(s)					
	PROC2, PROC8b (Drum)	Covers exposure up to 15 min - 1 hour(s)					
Emission days (days/year):	300						
Other operational conditions affecting w	vorker exposure						
Area of use	PROC8b (Bulk)	Outdoor					
Alea of use	All other PROC's	Not defined (default = Indoor)					
Characteristics of the surroundings	Not defined						
		sumes activities are at ambient temperature (unless stated differently).					
as closed systems, dedicated facilities and containment. Clean/flush equipment, where provide specific activity training to operator protection when its use is identified for cer- work or equivalent arrangements are in pla	d suitable general/local exhaust ve e possible, prior to maintenance Wh s to minimise exposures; wear suita tain contributing scenario; clear up	or the elimination of releases. minimise exposure using measures such entilation. Drain down systems and clear transfer lines prior to breaking here there is potential for exposure: restrict access to authorised persons; able gloves and coveralls to prevent skin contamination; wear respiratory spills immediately and dispose of waste safely. Ensure safe systems of pect, test and maintain all control measures. Consider the need for risk					
based health surveillance. Technical conditions of use							
PROC1, PROC2, PROC3	Handle substance within a clo	osed system.					
Organisational measures							
PROC2		Provide a good standard of controlled ventilation (10 to 15 air changes per hour).					
PROC8b (Bulk)	Transfer via enclosed lines.	Transfer via enclosed lines.					

Date 01 May 2024

VitolBunkers

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

VLSFO B30

PROC8b (Drum), PROC2 (Fuel filtering), PROC2 (Storage), PROC16	Provide a good sta	andard of ge	neral ventilation (not less than 3 to 5 air changes per hour).					
PROC8a (Maintenance)	Potain drain down	c in cooled a	storage pending disposal or for subsequent re					
Risk management measures related to hun		is in sealed s	sorage perioring disposal of for subsequent re					
			irad					
Respiratory protection	No special measu PROC1, PROC2,							
Hand and/or Skin protection	(Fuel filtering), PR (Storage), PROC3 (Bulk), PROC8b (I PROC16	OC2 3, PROC8b	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training (Efficiency of at least 90 %).					
	PROC8a (Mainter	nance)	Wear chemically resistant gloves (tested to EN374) in combination with specific activity training (Efficiency of at least 75 %).					
Eye Protection	No special measu	res are requ	ired.					
2.2 Control of environmental exposure								
Amounts used								
Fraction of EU tonnage used in region:		0.1						
Regional use tonnage (tons/year):		5.9E+06						
Fraction of Regional tonnage used locally (ton	s/year):	2.6E-01						
Annual site tonnage (tons/year):		1.5E+06						
Maximum daily site tonnage (kg/day):		5.0E+06						
Environment factors not influenced by risk	management							
Flow rate of receiving surface water (m ³ /d):	J. J.	Not define	d (default = 18,000)					
Local freshwater dilution factor:		10						
Local marine water dilution factor:		100						
Operational conditions		100						
Emission days (days/year):		300						
Release fraction to air from process (initial rele	ease prior to	2.0E-04						
RMM): Release fraction to wastewater from process (initial release prior								
to RMM): Release fraction to soil from process (initial rel		1.0E-06						
RMM): Technical conditions and measures at proo	•	0 to prevent release						
Common practices vary across sites thus cons		-						
Technical onsite conditions and measures								
			primarily ingestion). No wastewater treatment required.					
			prinality ingestion). No wastewater treatment required.					
Treat air emission to provide a typical removal Treat onsite wastewater (prior to receiving wat		95						
provide the required removal efficiency of (%):		92.5						
If discharging to domestic sewage treatment p required onsite wastewater removal efficiency		0						
Treat soil emission to provide a typical remova	al efficiency of (%):	Not defined						
Common practices vary across sites thus cons	servative process re	lease estima	ates used.					
Organisational measures to prevent/limit re	elease from site							
Do not apply industrial sludge to natural soils.		cinerated, c	ontained or reclaimed.					
Conditions and measures related to munic	-							
Size of municipal sewage system/treatment pl		2.0E+03						
Degradation effectiveness (%)		94.2						
Conditions and measures related to extern	al treatment of was		osal					
			tion emissions considered in regional exposure assessment. External					
treatment and disposal of waste should compl								
Substance release quantities after risk mai			~ ~					
Release to waste water from process (mg/l)		Not define	d					
Maximum allowable site tonnage (MSafe) bas	ed on release							
following total wastewater treatment removal (5.4E+06						

3. Exposure estimation and reference to its source

3.1 Human exposure prediction

Exposure assessment (method/calculation model)

Date 01 May 2024

VitolBunkers

The ECETOC TRA tool has been used to estimate workplace exposures unless

otherwise indicated. (PROC1, PROC2, PROC16)

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

VLSFO B30

				The expo		REACH	Tool (ART) ise indicated.	has bee (PROC2	en used to (Storage), l	o estimate workpla PROC2 (Fuel filterin b (Drum))
		Inhalation				Der	rmal		(Combined
Process Catego [PROC]	y exposi	Inhalation exposure (mg/m³) Risk characteris ratio (RCR		sation	sation Dermal exposure		Risk characterisation ratio (RCR)		Risk characterisation ratio (RCR)	
PROC1	0.01		0.04		0.03	0.5		7		0.61
PROC2	0.03		0.17		0.03		0.57	,		0.73
PROC2 (Fuel filtering)	0.04		0.21		0.03		0.57	,		0.78
PROC2 (Storage)	0.04		0.21		0.03		0.57	,		0.78
PROC3	0.04		0.21		0.03		0.57	,		0.78
PROC8a (Maintenance)	0.00		0.01		0.05		0.83			0.85
PROC8b (Bulk)	0.06		0.36		0.03		0.57	,		0.92
PROC8b (Drum)	0.03		0.19		0.03		0.57	,		0.76
PROC16	0.01		0.06		0.03		0.57	,		0.62
Environmental	are not available for STP		oduct. shwater	Mari	ine water		Soil		hwater	Marine sedimer
exposure Predicted Environmental Exposure (PEC)	1.5E-01 mg/l	1.58	E-02 mg/l	1.58	E-03 mg/l	6.3E	-02 mg/kg ww	1.8E+00 mg/kg ww		4.6E-02 mg/kg ww
Risk characterisation ratio (RCR)	1.6E-01	6	.1E-01	6	.1E-02	3	8.0E-04	0E-04 7.7E		7.7E-02
ıman exposure predi	ction:									
	Route of Expos	ure	Ехро	sure (µ	ıg/kg/Day)		Risk characterisation ratio (RCR)			
F	Oral Inhalation			2.2E+ 3.4E+			8	6.7E-01 6.6E-02		
Evaluation guidanc		ser	1	<u>3.4</u> LT						
or scaling see	are manag Available h Further det	 Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that 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/reactindustries-libraries.html). 						ects. c.org/en/reach-for-		
<pre>cposure assessment strument/tool/method</pre>	Worker		The ECETOC TRA tool has been used to estimate workplace exposure otherwise indicated. (PROC1, PROC2, PROC16) The Advanced REACH Tool (ART) has been used to estimate exposures unless otherwise indicated. (PROC2 (Storage), PROC2 (Fue PROC3, PROC8a (Maintenance), PROC8b (Bulk), PROC8b (Drum))						o estimate workpl PROC2 (Fuel filteri	

Date 01 May 2024

VitolBunkers

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

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

Date 01 May 2024

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

VLSFO B30

VitolBunkers

Exposure Scenario 4 – Use as a fuel (Professional)

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

2.1 Control of worker exposure						
Product characteristics						
Physical form of product	Liquid	Liquid				
Vapour pressure	<0.5 kPa @ STP					
Concentration of substance in product	Covers percentage substance	e in the product up to 100 % (unless stated differently).				
Human factors not influenced by risk m	anagement					
Potential exposure area	Not defined					
Frequency and duration of use						
	PROC1, PROC8a (Maintenance), PROC16	Covers daily exposures up to 8 hours (unless stated differently).				
	PROC2 (Storage)	Covers exposure up to 1 - 4 hour(s)				
Exposure duration per day	PROC2, PROC8b (Bulk), PROC8b (Drum), PROC8b (Refuelling)	Covers exposure up to 15 min - 1 hour(s)				
	PROC3	Covers exposure up to 15 min				
Exposure duration (days/year)	365					
Other operational conditions affecting	worker exposure					
Area of use	All PROC's	Not defined (default = Indoor)				
Characteristics of the surroundings	Not defined					
General measures applicable to all acti Assumes a good basic standard of occupa		sumes activities are at ambient temperature (unless stated differently).				
as closed systems, dedicated facilities an containment. Clean/flush equipment, when provide specific activity training to operator protection when its use is identified for cer	d suitable general/local exhaust ve e possible, prior to maintenance Wh is to minimise exposures; wear suita tain contributing scenario; clear up	or the elimination of releases. minimise exposure using measures such entilation. Drain down systems and clear transfer lines prior to breaking here there is potential for exposure: restrict access to authorised persons; able gloves and coveralls to prevent skin contamination; wear respiratory spills immediately and dispose of waste safely. Ensure safe systems of pect, test and maintain all control measures. Consider the need for risk				
Technical conditions of use						
PROC1, PROC2, PROC3	Handle substance within a clo	osed system.				
Organisational measures	•					
PROC2, PROC3, PROC8b (Bulk), PROC8 (Drum)	Bb Provide a good standard of c	ontrolled ventilation (10 to 15 air changes per hour).				

Date 01 May 2024

VitolBunkers

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

PROC16	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).			
PROC8b (Bulk), PROC8b (Drum)	Ensure material transfers are under containment or extract ventilation. Clear transfer lines prior to de-coupling.			
PROC8b (Bulk), PROC8b (Drum), PROC8a (Maintenance)	Retain drain downs in sealed storage pending disposal or for subsequent recycle.			
Risk management measures related to hu	man health			
Respiratory protection	No special measu	res are requ	ired.	
	PROC1, PROC2 (• /		
	PROC3, PROC8b	. ,	Wear chemically resistant gloves (tested to EN374) in combination	
Hand and/or Skin protection	PROC8b (Drum), PROC8b (Refuelling),		with 'basic' employee training (Efficiency of at least 90 %).	
	PROC2, PROC8a		Wear chemically resistant gloves (tested to EN374) in combination	
	(Maintenance)		with specific activity training (Efficiency of at least 95 %).	
Eye Protection	No special measu	es are required.		
2.2 Control of environmental exposure				
Amounts used				
Fraction of EU tonnage used in region:		0.1		
Regional use tonnage (tons/year):		1.7E+06		
Fraction of Regional tonnage used locally (to	ns/year):	5.0E-04		
Annual site tonnage (tons/year):		8.5E+02		
Maximum daily site tonnage (kg/day):		2.3E+03		
Environment factors not influenced by ris	k management	1		
Flow rate of receiving surface water (m ³ /d):	¥	Not defined (default = 18,000)		
Local freshwater dilution factor:		10		
Local marine water dilution factor:		100		
Operational conditions		100		
Emission days (days/year):		365		
Release fraction to air from wide dispersive use (regional only):				
Release fraction to wastewater from wide dispersive e		1.0E-05 1.0E-07		
Release fraction to soil from wide dispersive		1.0E-05		
Technical conditions and measures at pro		to prevent	release	
Common practices vary across sites thus cor	servative process re	lease estima	ates used.	
Technical onsite conditions and measure	s to reduce or limit of	discharges,	air emissions and releases to soil	
		-	primarily ingestion). No wastewater treatment required.	
Treat air emission to provide a typical remova		Not applic		
Treat onsite wastewater (prior to receiving wa				
provide the required removal efficiency of (%		0		
If discharging to domestic sewage treatment				
required onsite wastewater removal efficiency		0		
Treat soil emission to provide a typical remov		Not defined		
Common practices vary across sites thus cor				
Organisational measures to prevent/limit				
Do not apply industrial sludge to natural soils		cinerated o	ontained or reclaimed	
Conditions and measures related to muni-				
Size of municipal sewage system/treatment p	· · · · · ·	2.0E+03		
Degradation effectiveness (%):		94.2		
Conditions and measures related to extern	nal treatment of way		nsal	
			tion emissions considered in regional exposure assessment. Externa	
treatment and disposal of waste should comp	nal treatment of was	no ioi uispu		
treatment and disposal of waste should comp Conditions and measures related to extern			aratad	
treatment and disposal of waste should comp Conditions and measures related to extern This substance is consumed during use and	no waste of the subst	ance is gen	erated.	
treatment and disposal of waste should comp Conditions and measures related to extern This substance is consumed during use and Substance release quantities after risk ma	no waste of the subst	ance is gen s		
treatment and disposal of waste should comp Conditions and measures related to exter This substance is consumed during use and Substance release quantities after risk ma Release to waste water from process (mg/l):	no waste of the subst anagement measure	ance is gen		
treatment and disposal of waste should comp Conditions and measures related to extern This substance is consumed during use and Substance release quantities after risk ma	no waste of the subst anagement measure sed on release	ance is gen s		

Date 01 May 2024

VitolBunkers

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

VLSFO B30

3. Exposure estimation and reference to its source

3.1 Human exposure prediction

3.1 Human exposure prediction	
Exposure assessment (method/calculation model)	The ECETOC TRA tool has been used to estimate workplace exposures unless
	otherwise indicated. (PROC1, PROC2, PROC3, PROC16).
	The Advanced REACH Tool (ART) has been used to estimate workplace
	exposures unless otherwise indicated. (PROC2 (Storage), PROC8a
	(Maintenance), PROC8b (Bulk), PROC8b (Drum) and PROC8b (Refuelling))

	Inhalation		Dermal		Combined	
Process Category [PROC]	Inhalation exposure (mg/m³)	Risk characterisation ratio (RCR)	Dermal exposure (mg/kg bw/day)	Risk characterisation ratio (RCR)	Risk characterisation ration (RCR)	
PROC1	0.01	0.06	0.03	0.57	0.62	
PROC2	0.06	0.33	0.02	0.28	0.62	
PROC2 (Storage)	0.04	0.21	0.03	0.57	0.78	
PROC3	0.03	0.17	0.03	0.57	0.73	
PROC8a (Maintenance)	0.01	0.05	0.05	0.83	0.88	
PROC8b (Bulk)	0.03	0.19	0.03	0.57	0.76	
PROC8b (Drum)	0.03	0.19	0.03	0.57	0.76	
PROC8b (Refuelling)	0.03	0.19	0.03	0.57	0.76	
PROC16	0.01	0.06	0.03	0.57	0.62	

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.

Fuel oil, residual 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)	7.2E-06 mg/l	1.1E-04 mg/l	7.3E-07 mg/l	6.2E-02 mg/kg ww	1.4E+00 mg/kg ww	3.6E-02 mg/kg ww
Risk characterisation ratio (RCR)	7.5E-06	4.7E-03	6.2E-05	5.7E-05	3.5E-03	4.1E-05

Human exposure prediction:

Route of Exposure	Exposure (µg/kg/Day)	Risk characterisation ratio (RCR)
Oral	2.0E+01	7.7E-01
Inhalation	1.2E-01	2.3E-03

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 instrument/tool/method	Worker	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated. (PROC1, PROC2, PROC3, PROC16).		

Date 01 May 2024

VitolBunkers

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

	The Advanced REACH Tool (ART) has been used to estimate workplace exposures unless otherwise indicated. (PROC2 (Storage), PROC8a (Maintenance), PROC8b (Bulk), PROC8b (Drum) and PROC8b (Refuelling))
Environment	The Hydrocarbon Block Method has been used to calculate environmental exposure with the Petrorisk model.