MATERIAL SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

SDS # : 30234

MARINE DISTILLATE FUEL (DMA)

Date of the previous version: 2014-04-11 **Revision Date:** 2014-07-04 **Version** 2.05

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name **MARINE DISTILLATE FUEL (DMA)**
Pure substance/mixture Mixture

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

Identified uses Fuel for diesel engines: vessel, boat.

1.3. Details of the supplier of the safety data sheet

Supplier

TOTAL Marine Fuels Pte Ltd
250 North Bridge Road
#37-02 Raffles City Tower
Singapore 179101
Tel: +65 6849 5266
Fax: +65 6337 9483

For further information, please contact:

Contact Point HSE
E-mail Address rm.mkefr-fds@total.com

1.4. Emergency telephone number

France - ORFILA (INRS) Tél : +33 (0)1 45 42 59 59
In France : - PARIS : Hôpital Fernand Widal 200, rue du Faubourg Saint-Denis 75475 Paris Cédex 10 , Tel : 01.40.05.48.48. - MARSEILLE : Hopital Salvator, 249 bd Ste Marguerite 13274 Marseille cedex 5, Tel : 04.91.75.25.25. - LYON : Hopital Edouard Herriot, 5 place d'Arsonvol, 69437 Lyon cedex 3, Tel : 04.72.11.69.11. - NANCY : Hopital central, 29 Av du Mal De Lattre de Tassigny, 54000 Nancy, Tel : 03.83.32.36.36 ou le SAMU : Tel (15)

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

REGULATION (EC) No 1272/2008
For the full text of the H-Statements mentioned in this Section, see Section 2.2.

Classification
Flammable liquids - Category 3 - H226
Aspiration toxicity - Category 1 - H304
Acute inhalation toxicity - vapor - Category 4 - H332
Skin corrosion/irritation - Category 2 - H315
Carcinogenicity - Category 2 - H351
Specific target organ systemic toxicity (repeated exposure) - Category 2 - H373
Chronic aquatic toxicity - Category 2 - H411

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DIRECTIVE 67/548/EEC or 1999/45/EC
For the full text of the R-phrases mentioned in this Section, see Section 16

Classification
Carc. cat. 3;R40 -Xn;R20- Xn;R65 - Xi;R38 - N;R51-53

2.2. Label elements

Labelled according to REGULATION (EC) No 1272/2008

Signal Word
DANGER

H226 - Flammable liquid and vapor
H304 - May be fatal if swallowed and enters airways
H315 - Causes skin irritation
H332 - Harmful if inhaled
H351 - Suspected of causing cancer
H373 - May cause damage to organs through prolonged or repeated exposure
H411 - Toxic to aquatic life with long lasting effects

Precautionary Statements
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
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
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
P273 - Avoid release to the environment
P501 - Dispose of contents/ container to an approved incineration plant.

Contains Fuels, diesel.

2.3. Other hazards

Physical-Chemical Properties The product may form flammable mixtures with air when heated above the flash point. In the presence of hot spots, there is a special risk of fire or explosion under certain conditions involving accidental release of vapor or leaks of product under pressure.

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Properties Affecting Health

Prolonged or repeated contact may cause skin irritation.
Vapors or mists are irritating for mucous membranes, notably in the eyes. May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination.
If swallowed accidentally, the product may enter the lungs due to its low viscosity and lead to the rapid development of very serious pulmonary lesions (medical survey during 48 hours).

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixture

Chemical nature

Fuels, diesel. A complex combination of hydrocarbons produced by the distillation of crude oil. It consists of hydrocarbons having carbon chain lengths predominantly in the range of C9 to C20 and boiling in the range of approximately 163°C to 357°C.

Hazardous ingredients

Chemical Name	EC-No	REACH registration No	CAS-No	Weight %	Classification (Dir. 67/548)	Classification (Reg. 1272/2008)
Fuels, diesel	269-822-7	01-2119484664-27	68334-30-5	>90	Xn;R20-65 Xi;R38 Carc. Cat.3;R40 N;R51/53	Flam. Liq. 3 (H226) Acute Tox. 4 (H332) Skin Irrit. 2 (H315) Carc. 2 (H351) Asp. Tox. 1 (H304) STOT RE 2 (H373) Aquatic Chronic 2 (H411)

Additional information

Contains:
multi-purposes additives to boost performance.

For the full text of the R-phrases mentioned in this Section, see Section 16.
For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1. Description of first-aid measures

General advice

IN CASE OF SERIOUS OR PERSISTENT CONDITIONS, CALL A DOCTOR OR EMERGENCY MEDICAL CARE.
Before attempting to rescue casualties, isolate area from all potential sources of ignition including disconnecting electrical supply.
Ensure adequate ventilation and check that a safe, breathable atmosphere is present before entry into confined spaces.

Eye contact

Rinse thoroughly with plenty of water, also under the eyelids.
Check for and remove any contact lenses. Rinse eyes.
If eye irritation persists, consult a specialist.

Skin contact

Remove contaminated clothing and shoes. Wash skin with soap and water.
High pressure injection of the products under the skin may have very serious consequences even though no symptom or injury may be apparent.
In this case, the casualty should be sent immediately to hospital.
For minor thermal burns. Hold the burned area under cold running water for at least five minutes, or until the pain subsides. Wash off with soap and water.

Inhalation

Inhalation is unlikely because of the low vapour pressure of the substance at ambient temperature. Exposure to vapours may however occur when the substance is handled at high temperatures with poor ventilation. In case of exposure to intense concentrations of vapours, fumes or spray, transport the person away from the contaminated zone, keep warm and allow to rest.
Immediately begin artificial respiration if breathing has ceased. Call a physician immediately.
If there is any suspicion of inhalation of H2S. Rescuers must wear breathing apparatus, belt and safety rope, and follow rescue procedures. If not breathing, give artificial respiration. Provision of oxygen may help. Remove casualty to fresh air as quickly as possible. Obtain medical advice for further treatment.

Ingestion

Give nothing to drink.
Do NOT induce vomiting, as there is high risk of aspiration. The fluid can enter the lungs and cause damage (chemical pneumonitis, potentially fatal).
Take victim immediately to hospital.
Do not wait for symptoms to develop.

Protection of First-aiders

CAUTION! First aid personnel must be aware of personal risk during rescue!. Use personal protective equipment. See Section 8 for more detail.

4.2. Most important symptoms and effects, both acute and delayed

Eye contact

May cause slight irritation.

Skin contact

May cause skin irritation and/or dermatitis.

Inhalation

Inhalation of vapors in high concentration may cause irritation of respiratory system. May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination.

Ingestion

Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May cause central nervous system depression.
Harmful: If swallowed accidentally, the product may enter the lungs due to its low viscosity and lead to the rapid development of very serious inhalation pulmonary lesions (medical survey during 48 hours).

4.3. Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician

Treat symptomatically.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media

Extinguishing media - small fires: Carbon dioxide (CO_2). Dry powder. Sand or earth.
Extinguishing media - large fires: Foam. Water fog (trained personnel only).

Unsuitable Extinguishing Media

Do not use a solid water stream as it may scatter and spread fire.
Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

5.2. Special hazards arising from the substance or mixture

Special Hazard

Incomplete combustion and thermolysis may produce gases of varying toxicity such as carbon monoxide, carbon dioxide, various hydrocarbons, aldehydes and soot. These may be highly dangerous if inhaled in confined spaces or at high concentration. Vapors may form explosive mixtures with air.
If sulphur compounds are present in appreciable amounts, combustion products may include also H2S and SOx (sulfur oxides) or sulfuric acid.

5.3. Advice for fire-fighters

Special protective equipment for fire-fighters

In case of a large fire or in confined or poorly ventilated spaces, wear full fire resistant protective clothing and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Other information

Cool down any tanks and surfaces exposed to fire by spraying abundantly with water. Use water to cool tanks and parts exposed to the thermal flux not caught up in the flames.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. Cool containers / tanks with water spray.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

General Information

Except in case of small spillages, The feasibility of any actions should always be assessed and advised, if possible, by a trained, competent person in charge of managing the emergency.
If required, notify relevant authorities according to all applicable regulations.
Avoid direct contact with released material. Evacuate non-essential personnel. For personal protection see section 8.
If spilled, take caution, as material can cause surfaces to become very slippery. Ensure adequate ventilation, especially in confined areas.
Stay upwind. In case of large spillages, alert occupants in downwind areas. Stop or contain leak at the source, if safe to do so. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Cover discharges with foam in order to reduce the risks of ignition.

Advice for non-emergency personnel

Do not touch or walk through spilled material. Ensure adequate ventilation. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). For personal protection see section 8.

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Advice for emergency responders	In case of: Small spillages: normal antistatic working clothes are usually adequate. Large spillages: full body suit of chemically resistant and antistatic material. Work gloves (preferably gauntlets) providing adequate chemical resistance. Remarks:. Gloves made of PVA are not water-resistant, and are not suitable for emergency use. Work helmet. Antistatic non-skid safety shoes or boots. Goggles and/or face shield, if splashes or contact with eyes is possible or anticipated. Respiratory protection: A half or full-face respirator with filter(s) for organic vapours (and when applicable: for H2S). A Self-Contained Breathing Apparatus (SCBA) can be used according to the extent of spill and predictable amount of exposure. If the situation cannot be completely assessed, or if an oxygen deficiency is possible, only SCBA's should be used.

6.2. Environmental precautions

General Information	The product should not be allowed to enter drains, water courses or the soil. Do not allow material to contaminate ground water system. If necessary, Consult an expert. Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and materials for containment and cleaning up

Methods for Containment	Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see Section 13). Large spillages may be cautiously covered with foam, if available, to limit fire risk. In case of spillage in the water, contain product with floating barriers or other equipment. The use of dispersants should be advised by an expert, and, if required, approved by local authorities.
Methods for cleaning up	Never use dispersing agents. Do not use direct jets. Do not flush into surface water or sanitary sewer system. Transfer recovered product and other materials to suitable tanks or containers and store/dispose according to relevant regulations.

6.4. Reference to other sections

Personal Protective Equipment	See Section 8 for more detail.
Waste treatment	See section 13.

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Other information

Recommended measures are based on the most likely spillage scenarios for this material. However, local conditions (wind, air temperature, wave/current direction and speed) may significantly influence the choice of appropriate actions. For this reason, local experts should be consulted when necessary. Local regulations may also prescribe or limit actions to be taken.
Concentration of H2S in tank headspaces may reach hazardous values, especially in case of prolonged storage. This situation is especially relevant for those operations which involve direct exposure to the vapours in the tank.
Spillages of limited amounts of products, especially in the open air when vapours will be usually quickly dispersed, are dynamic situations, which presumably do not entail exposure to dangerous concentrations. As H2S has a density greater than ambient air, a possible exception may regard the build-up of dangerous concentrations in specific spots, like trenches, depressions or confined spaces. In all these circumstances, however, the correct actions should be assessed on a case-by-case basis.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Advice on safe handling

Take precautionary measures against static electricity.
The inspection, cleaning and maintenance of storage containers require the application of strict procedures and must be entrusted to qualified personnel (internal or external).
Ensure adequate ventilation. Vapors may form explosive mixtures with air. Do not smoke.
Avoid breathing vapors or mists. Avoid contact with skin, eyes and clothing.
NEVER ATTEMPT TO PRIME THE CONTAINER SIPHON BY SUCKING WITH THE MOUTH. Prevent the formation of vapors, mists and aerosols.
Do not use compressed air for filling, discharging, or handling operations. Never pierce, drill, grind, cut, saw or weld any empty container.
Do not use mobile phones during handling. For personal protection see section 8.

Technical measures

Ensure adequate ventilation.
WHILE MOVING THE PRODUCT:. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.
Take all necessary precautions to prevent water from entering the containers, tanks, transfer lines etc...

Prevention of fire and explosion

Handle away from any source of ignition (open flame and sparks) and heat (hot manifolds or casings). Take precautionary measures against static discharges. Ground/bond containers, tanks and transfer/receiving equipment. Friction generated by product discharge can create static charges of sufficient magnitude to cause SPARKS WHICH MAY LEAD TO FIRE OR EXPLOSION. Do not allow splash loading and ensure that the product is poured slowly, particularly at the beginning of the operation.
Empty containers may contain flammable or explosive vapors. Never weld any container or empty pipe that has not been degassed.
OPERATE ONLY ON COLD AND DEGASSED TANKS IN VENTILATED PREMISES (TO AVOID RISK OF EXPLOSION).
Design installations (machinery and equipment) to prevent burning product from spreading (tanks, retention systems, interceptors (traps) in drainage systems).

Hygiene measures

When using, do not eat, drink or smoke. Avoid contact with skin, eyes and clothing. Do not put product contaminated rags into workwear pockets. Wash hands before breaks and immediately after handling the product. IF ON SKIN: Wash skin with soap and water. Remove contaminated clothing and shoes.
Gloves must be periodically inspected and changed in case of wear, perforations or contaminations.
Provide regular cleaning of equipment, work area and clothing. Keep away from food, drink and animal feeding stuffs.
Ensure the application of strict rules of hygiene by the personnel exposed to the risk of contact with the product. Use personal protective equipment as required.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions

Storage area layout, tank design, equipment and operating procedures must comply with the relevant European, national or local legislation. Before entering storage tanks and commencing any operation in a confined area, check the atmosphere for oxygen content and flammability. If sulphur compounds are suspected to be present in the product, check the atmosphere for H2S content. Take precautionary measures against static discharges. Ensure all equipment is electrically grounded before beginning transfer operations. Storage installations should be designed with adequate bunds so as to prevent ground or water pollution in case of leaks or spills. Do not remove the hazard labels of the containers (even if they are empty).
Store the packed products (drums, samples, cans ...) in properly ventilated rooms, away from damp, heat and any potential source of ignition.
Keep preferably in the original container. Otherwise reproduce all indication of the regulation label on the new container.
Keep containers tightly closed and properly labelled. Store separately from oxidising agents.
Store in accordance with the particular national regulations.

Materials to Avoid

Strong oxidizing agents. Strong acids. Strong bases. (herbicides...). Halogens.

Packaging material

Use only containers, seals, pipes, etc... made in a material suitable for use with aromatic hydrocarbons. Recommended materials for containers, or container linings use mild steel, stainless steel. High density polyethylene (HDPE). Some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Compatibility should be checked with the manufacturer.

7.3. Specific end uses

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits

Not relevant

Legend

See section 16

DNEL Worker (Industrial/Professional)

Chemical Name	Short term, systemic effects	Short term, local effects	Long term, systemic effects	Long term, local effects

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Fuels, diesel 68334-30-5	4300 mg/m³/15min (aerosol - inhalation)		2.9 mg/kg/8h (dermal) 68 mg/m³/8h (aerosol - inhalation)	

DNEL Consumer

Chemical Name	Short term, systemic effects	Short term, local effects	Long term, systemic effects	Long term, local effects
Fuels, diesel 68334-30-5	2600 mg/m³/15min (aerosol - inhalation)		1.3 mg/kg/24h (dermal) 20 mg/m³/24h (aerosol - inhalation)	

8.2. Exposure controls

Occupational Exposure Controls

Engineering Measures

Ensure adequate ventilation. Do not enter empty storage tanks until measurements of available oxygen have been carried out.
When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment.

Personal Protective Equipment

General Information

Protective engineering solutions should be implemented and in use before personal protective equipment is considered.

Respiratory protection

To enter tankers, tanks, reservoirs where the oxygen content is too low, wear insulating respiratory apparatus.
In an emergency or for exceptional short-lasting jobs in an atmosphere polluted by the product, it is necessary to wear protective respiratory equipment. When using a mask or half mask :. Full face piece respirator with organic vapor/acid gas cartridge or canister, Type A. The use of breathing apparatus must comply strictly with the manufacturer's instructions and the regulations governing their choices and uses.

Eye Protection

If splashes are likely to occur, wear:. Safety glasses with side-shields. or. Face-shield.

Skin and body protection

Wear suitable protective clothing: hydrocarbon-proof clothing. Protective shoes or boots.

Hand Protection

Hydrocarbon-proof gloves for aromatic hydrocarbons. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.
Note: Gloves made of PVA are not water-resistant, and are not suitable for emergency use.

Repeated or prolonged exposure			
Glove material	Glove thickness	Break through time	Remarks
PVA	(*)	> 480 min	EN 374 (*) any thickness
Fluorinated rubber	(*)	> 480 min	EN 374 (*) any thickness
Nitrile rubber	> 0.3 mm	> 480 min	EN 374

In case of contact through splashing:			
Glove material	Glove thickness	Break through time	Remarks
Neoprene	> 0.5 mm	> 60 min	EN 374
PVC	> 0.2 mm	> 60 mn	EN 374

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Environmental exposure controls

General Information The product should not be allowed to enter drains, water courses or the soil.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	limpid
Color	yellow To brown
Physical State @20°C	liquid
Odor	Characteristic

Property	Values	Remarks	Method
pH		Not applicable	
Boiling point/boiling range	**150 - 380 °C**		ASTM D 86
	302 - 716 °F		ASTM D 86
Flash point	**>= 60 °C**		ISO 2719
	>= 140 °F		ISO 2719
Evaporation rate		Not applicable	
Flammability Limits in Air			
upper	5 %		
Lower	0.5 %		
Vapor Pressure	< 1 kPa @ 37.8 °C		EN 13016-1
Vapor density	> 5		
Density	<= 890 kg/m³	@ 15 °C	
Water solubility		Not applicable	
Solubility in other solvents		Soluble in many common organic solvents	
logPow		Not applicable	
Autoignition temperature	**> 250 °C**		ASTM E659-78
	> 482 °F		ASTM E659-78
Viscosity, kinematic	2 - 6 mm2/s	@ 40 °C	ISO 3104
Explosive properties	Not considered explosive based on chemical structure and oxygen balance considerations		
Oxidizing Properties	This product is not considered oxidising based on chemical structure considerations		
Possibility of hazardous reactions	No data available		

9.2. Other information

10. STABILITY AND REACTIVITY

10.1. Reactivity

General Information No information available.

10.2. Chemical stability

Stability Stable under recommended storage conditions.

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10.3. Possibility of hazardous reactions

Hazardous Reactions None under normal processing.

10.4. Conditions to Avoid

Conditions to Avoid Heat (temperatures above flash point), sparks, ignition points, flames, static electricity.

10.5. Incompatible Materials

Materials to Avoid Strong oxidizing agents. Strong acids. Strong bases. (herbicides...). Halogens.

10.6. Hazardous Decomposition Products

Hazardous Decomposition Products None under normal use.

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity Local effects Product Information

General Information The acute toxicity has been adequately characterised in a large number of GLP-compliant guideline investigations following oral, dermal or inhalation exposure. Findings from an acute inhalation study support classification.

Skin contact Samples of the substance have been tested in skin irritation studies.
Based on a mean erythema score of 3.9 and 2.5 (24, 72 hours)and a mean oedema score of 2.96 and 1.5 (24, 72 hours), distillate fuels oils are irritating to the skin. May cause skin irritation and/or dermatitis.

Eye contact This substance does not meet the EU criteria for classification. Key study indicated that the material is not irritating to the eye.
May cause slight irritation.

Inhalation . Inhalation of vapors in high concentration may cause irritation of respiratory system. May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination.

Ingestion . Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May cause central nervous system depression.
Harmful: If swallowed accidentally, the product may enter the lungs due to its low viscosity and lead to the rapid development of very serious inhalation pulmonary lesions (medical survey during 48 hours).

Acute toxicity - Component Information

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Fuels, diesel	LD50 > 2000 mg/kg bw (rat - OECD 401)	LD50 > 5000 mg/kg bw (rabbit - OECD 434)	LC50 (4h) > 4.10 mg/l (aerosol) (rat - OECD 403)

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Sensitization There are no reports available to indicate that the substance has the potential to cause skin and respiratory sensitisation.

Specific effects

Carcinogenicity Carcinogenic activity is reported in the presence of repeated dermal irritation. Based on this information and PAH analysis, this kind of gas oil can show a low carcinogenic potential. Findings from different studies support classification.

Chemical Name	European Union
Fuels, diesel 68334-30-5	Carc. 2 (H351)

Mutagenicity .

Germ Cell Mutagenicity The mutagenic potential of the substance has been extensively studied in a range of in-vivo and in-vitro assays. Based on in vivo and in vitro mutagenic studies and based on the poor bioavailability, distillate fuel oils do not meet the criteria for classification under EU . Based on modified Ames test, distillate fuels oils containing cracked materials are likely to have some genotoxic potential.

Reproductive toxicity . All animals studies show that this substance has no effect on development and has no adverse reproductive effect. This product does not meet the EU criteria for classification.

Other constituents required for disclosure

Repeated Dose Toxicity

Target Organ Effects (STOT)

Specific target organ systemic toxicity (single exposure) Studies do not lead to acute toxic severe systemic effects.

Specific target organ systemic toxicity (repeated exposure) The repeat dose toxicity of the substance has been studied following dermal and inhalation exposure for different periods. Data from repeated dose dermal or inhalation toxicity studies, showed no significant effect toxicity.

Aspiration toxicity The fluid can enter the lungs and cause damage (chemical pneumonitis, potentially fatal).

Other information

12. ECOLOGICAL INFORMATION

12.1. Toxicity

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Acute aquatic toxicity - Product Information

Acute aquatic toxicity - Component Information

Chemical Name	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates	Toxicity to fish	Toxicity to microorganisms

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Fuels, diesel 68334-30-5	EL50 (72 h) 22 mg/l (Pseudokirchnerella subcapitata - OECD 201) EL50 (72 h) 2.9 mg/l (Pseudokirchnerella subcapitata - OECD 201)	EL50 (48 h) 68 mg/l (Daphnia magna - OECD 202) EL50 (48 h) 5.3 mg/l (Daphnia magna - OECD 202)	LL50 (96 h) 21 mg/l (Oncorhynchus mykiss - OECD 203) LL50 (96 h) 3.2 mg/l (Menidia beryllina – US EPA/600/4-85/013)	

Chronic aquatic toxicity - Product Information

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Chronic aquatic toxicity - Component Information

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Chemical Name	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates	Toxicity to fish	Toxicity to microorganisms
Fuels, diesel 68334-30-5		NOEL (21d) 0.2 mg/l (Daphnia magna - OECD 211)	NOEL (14/28d) 0.083 mg/l (Oncorhynchus mykiss - QSAR Petrotox)	

Effects on terrestrial organisms

No information available.

12.2. Persistence and degradability

General Information

Substance is a UVCB. Standard tests for this endpoint are not appropriate.

12.3. Bioaccumulative potential

Product Information Substance is a UVCB. Standard tests for this endpoint are not appropriate.

logPow Not applicable

Component Information .

12.4. Mobility in soil

Mobility				
Method	Compartment	Result	(%)	Remarks
Percent distribution in media (Calculation according to Mackay, Level III)	Soil		62.86	
Percent distribution in media (Calculation according to Mackay, Level III)	Sediment		12.64	
Percent distribution in media (Calculation according to Mackay, Level III)	Water		0.14	
Percent distribution in media (Calculation according to Mackay, Level III)	Air		24.36	

Soil Given its physical and chemical characteristics, the product is generally mobile in the ground. It may contaminate ground water.

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Air	Volatilisation is dependent on Henry's Constant which is not applicable to UVCB.
Water	The product spreads on the surface of the water. May exhibit slight solubility in water. In water, the majority of components of this product will be absorbed on sediments. The product are resistant to hydrolysis because they lack a functional group that is hydrolytically reactive.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment	Anthracene is not present in this substance at greater than 0.1% (CONCAWE 2010). No other representative hydrocarbon structure were found to meet the PBT/vPvB criteria. This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).

12.6. Other adverse effects

General Information	No information available.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from Residues / Unused Products	Dispose of in accordance with the European Directives on waste and hazardous waste.
Contaminated packaging	Empty containers may contain flammable or explosive vapors. Do not cut, weld, bore, burn or incinerate emptied containers, unless they have been cleaned and declared safe. Empty containers should be taken to an approved waste handling site for recycling or disposal.
EWC Waste Disposal No.	According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used.

14. TRANSPORT INFORMATION

ADR/RID

UN/ID No	UN1202
Proper shipping name	GAS OIL
Proper shipping name	GAS OIL
Hazard class	3
Packing Group	III
ADR/RID-Labels	3
Environmental hazard	Yes
Classification Code	F1
Special Provisions	640M, 363
Tunnel Restriction Code	(D/E)
ADR Hazard Id (Kemmler Number)	30
Description	UN1202, GAS OIL, 3, III, (D/E)
Excepted Quantity	E1

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Limited quantity	5 L

IMDG/IMO

UN/ID No	UN1202
Proper shipping name	Gas oil
Hazard class	3
Packing Group	III
Marine pollutant	P
EmS No.	F-E, S-E
Description	UN1202, Gas oil, 3, III, (60°C c.c.)
Special Provisions	363
Excepted Quantity	E1
Limited quantity	5 L

ICAO/IATA

UN/ID No	UN1202
Proper shipping name	Gas oil
Hazard class	3
Packing Group	III
ERG Code	3L
Special Provisions	A3
Description	UN1202, Gas oil, 3, III
Excepted Quantity	E1
Limited quantity	10 L

ADN

UN/ID No	UN1202
Proper shipping name	GAS OIL
Proper shipping name	GAS OIL
Hazard class	3
Packing Group	III
Environmental hazard	Yes
Classification Code	F1
Special Provisions	363, 640M
Description	UN1202, GAS OIL, 3, III
Excepted Quantity	E1
Limited quantity	5 L
Ventilation	VE01

15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

European Union

REACH
This substance has been registered according to Regulation (EU) No. 1907/2006 (REACH).

SDS # : 30234

MARINE DISTILLATE FUEL (DMA)

Revision Date: 2014-07-04 **Version** 2.05

International Inventories

All the substances contained in this product are listed or exempted from listing in the following inventories:
Europe (EINECS/ELINCS/NLP)
U.S.A. (TSCA)
Canada (DSL/NDSL)
China (IECSC)
Korea (KECL)
Philippines (PICCS)
Australia (AICS)
New Zealand (NZIoC)

Further information

15.2. Chemical Safety Assessment

Chemical Safety Assessment See exposure scenarios

16. OTHER INFORMATION

Full text of R-phrases referred to under sections 2 and 3
R20 - Harmful by inhalation
R38 - Irritating to skin
R40 - Limited evidence of a carcinogenic effect
R65 - Harmful: may cause lung damage if swallowed
R51/53 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Full text of H-Statements referred to under sections 2 and 3
H226 - Flammable liquid and vapor
H304 - May be fatal if swallowed and enters airways
H315 - Causes skin irritation
H332 - Harmful if inhaled
H351 - Suspected of causing cancer
H373 - May cause damage to organs through prolonged or repeated exposure
H411 - Toxic to aquatic life with long lasting effects

Abbreviations, acronyms
GLP = Good Laboratory Practice
bw = body weight
bw/day = body weight/day

Legend Section 8

+	Sensitizer	*	Skin designation
**	Hazard Designation	C:	Carcinogen
M:	Mutagen	R:	Toxic to reproduction

Revision Date: 2014-07-04
Revision Note (M)SDS sections updated: 9. 15.

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

SDS # : 30234

MARINE DISTILLATE FUEL (DMA)

Revision Date: 2014-07-04 **Version** 2.05

This safety data sheet serves to complete but not to replace the technical product sheets. The information contained herein is given in good faith and is accurate to the best of knowledge at the date indicated above.It is understood by the user that any use of the product for purposes other than those for which it was designed entails potential risk.The information given herein in no way dispenses the user from knowing and applying all provisions regulating his activity.The user bears sole liability for the precautions required when using the product.The regulatory texts indicated herein are intended to aid the user to fulfil his obligations. This list is not to be considered complete and exhaustive.It is the user's responsibility to ensure that he is subject to no other obligations than those mentioned.

End of the safety data sheet

ES05003
Version 1.0
Trade name / designation VHGO

1. Exposure scenario

Industrial, Distribution of substance.

Use Descriptor
Sector of use
SU3 - Industrial Manufacturing (all)

Process Category
PROC1 - Use in closed process, no likelihood of exposure
PROC2 - Use in closed, continuous process with occasional controlled exposure
PROC3 - Use in closed batch process (synthesis or formulation)
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
PROC8a - Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9 - Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC15 - Use as a laboratory reagent

Environmental Release Category
ERC1 - Manufacture of substances
ERC2 - Formulation of mixtures
ERC3 - Formulation in materials
ERC4 - Industrial use of processing aids in processes and products, not becoming part of articles
ERC5 - Industrial use resulting in inclusion into or onto a matrix
ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6b - Industrial use of reactive processing aids
ERC6c - Industrial use of monomers for manufacture of thermoplastics
ERC6d - Industrial use of process regulators for polymerization processes in production of resins, rubbers, polymers
ERC7 - Industrial use of substances in closed systems
Specific Environmental Release Category
ESVOC SpERC 1.1b. v1.

Processes, tasks, activities covered
Bulk loading (including marine vessel/barge, rail/road car and IBC loading) of substance within closed or contained systems, including incidental exposures during its sampling, storage, unloading, maintenance and associated laboratory activities.

2. Operational conditions and risk management measures

2.1. Control of environmental exposure

Product characteristics
Substance is complex UVCB. Predominantly hydrophobic.

Amounts used
:
Fraction of EU tonnage used in region: 0.1
Regional use tonnage (tonnes/year): 2.8E+7
Fraction of Regional tonnage used locally: 0.002
Annual site tonnage (tonnes/year): 5.6E+4
Maximum daily site tonnage (kg/day): 1.9E+5

Frequency and duration of use Continuous release
Emission Days (days/year): 300

Environment factors not influenced by risk management -
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Other operational conditions of use affecting environmental exposure
.
Release fraction to air from process (initial release prior to RMM): 1.0E-3
Release fraction to wastewater from process (initial release prior to RMM): 1.0E-6
Release fraction to soil from process (initial release prior to RMM): 0.00001

Technical conditions and measures at process level 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)
Prevent discharge of undissolved substance to or recover from onsite wastewater
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

Organizational measures to prevent/limit release from the site
Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant :
Estimated substance removal from wastewater via domestic sewage treatment (%): 94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%): 94.1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 2.9E+6
Assumed domestic sewage treatment plant flow (m3/d): 2000
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 recovery of waste
External treatment and disposal of waste should comply with applicable local and/or national regulations.

Remarks
Additional information on the basis for the allocation of the identified OCs (operating conditions) and RMMs (Risk Management Measures) is contained in Petrorisk file

2.2. Control of exposure - Workers / Consumers

Product characteristics
Physical State
Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product
Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use
Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure
Operation is carried out at elevated temperature (> 20°C above ambient temperature). Assumes a good basic standard of occupational hygiene is implemented.

2.2a. Control of worker exposure	
Contributing Scenarios	**Operational conditions and risk management measures.**
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Bulk closed loading and unloading	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Bulk open loading and unloading	Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Laboratory activities	No other specific measures identified.
Drum and small package filling	Wear suitable gloves tested to EN374.
Storage	Handle substance within a closed system.

2.2b. Control of consumer exposure	
Product Category(ies)	**Operational conditions and risk management measures.**
Not applicable	

3. Exposure estimation and references

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

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

4. Guidance for Downstream User to check compliance with the Exposure scenario

Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. 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 enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic org/en/reach-for-industries-libraries html).

ES05004
Version 1.0
Trade name / designation VHGO

1. Exposure scenario

Formulation & (re)packing of substances and mixtures, Industrial.

Use Descriptor
Sector of use
SU3 - Industrial Manufacturing (all)
SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys)

Process Category
PROC1 - Use in closed process, no likelihood of exposure
PROC2 - Use in closed, continuous process with occasional controlled exposure
PROC3 - Use in closed batch process (synthesis or formulation)
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8a - Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9 - Transfer of substance or mixture into small containers (dedicated filling line, including weighing)
PROC14 - Production of mixtures or articles by tabletting, compression, extrusion, pelletization
PROC15 - Use as a laboratory reagent

Environmental Release Category
ERC2 - Formulation of mixtures
Specific Environmental Release Category
ESVOC SpERC 2.2.v1.

Processes, tasks, activities covered
Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tabletting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

2. Operational conditions and risk management measures

2.1. Control of environmental exposure

Product characteristics
Substance is complex UVCB. Predominantly hydrophobic.

Amounts used
:
Fraction of EU tonnage used in region: 0.1
Regional use tonnage (tonnes/year): 2.8E+7
Fraction of Regional tonnage used locally: 0.0011
Annual site tonnage (tonnes/year): 3.0E+4
Maximum daily site tonnage (kg/day): 1.0E+5

Frequency and duration of use Continuous release
Emission Days (days/year): 300

Environment factors not influenced by risk management -
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Other operational conditions of use affecting environmental exposure

.

Release fraction to air from process (initial release prior to RMM): 1.0E-2
Release fraction to wastewater from process (initial release prior to RMM): 2.0E-5
Release fraction to soil from process (initial release prior to RMM): 0.0001

Technical conditions and measures at process level 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 freshwater sediment
Prevent discharge of undissolved substance to or recover from onsite wastewater
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required
Treat air emission to provide a typical removal efficiency of (%): 0
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): >=59.9
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): >= 0

Organizational measures to prevent/limit release from the site

Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant :

Estimated substance removal from wastewater via domestic sewage treatment (%): 94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%): 94.1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 6.8E+5
Assumed domestic sewage treatment plant flow (m3/d): 2000

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 recovery of waste

External treatment and disposal of waste should comply with applicable local and/or national regulations.

Remarks

Additional information on the basis for the allocation of the identified OCs (operating conditions) and RMMs (Risk Management Measures) is contained in Petrorisk file

2.2. Control of exposure - Workers / Consumers

Product characteristics

Physical State

Liquid, vapour pressure < 0.5 kPa at STP

Concentration of substance in product

Covers percentage substance in the product up to 100 % (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently)

Other operational conditions affecting exposure

Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

2.2a. Control of worker exposure	
Contributing Scenarios	**Operational conditions and risk management measures.**
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
General exposures (closed systems)	Handle substance within a closed system.
General exposures (open systems)	Wear suitable gloves tested to EN374.
Process sampling	No other specific measures identified.
Drum/batch transfers	Use drum pumps or carefully pour from container. Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.
Bulk transfers	Handle substance within a closed system. Wear suitable gloves tested to EN374.
Mixing operations (open systems)	Provide extract ventilation to points where emissions occur. Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.
Laboratory activities	No other specific measures identified.
Production or preparation of articles by tabletting, compression, extrusion or pelletisation	Wear suitable gloves tested to EN374.
Drum and small package filling	Wear suitable gloves tested to EN374.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training.
Storage	Store substance within a closed system.

2.2b. Control of consumer exposure	
Product Category(ies)	**Operational conditions and risk management measures.**
Not applicable	

3. Exposure estimation and references

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

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

4. Guidance for Downstream User to check compliance with the Exposure scenario

Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. 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 enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic org/en/reach-for-industries-libraries html).

ES05015
Version 1.0
Trade name / designation VHGO

1. Exposure scenario

Use as a fuel, Industrial.

Use Descriptor
Sector of use
SU3 - Industrial Manufacturing (all)

Process Category
PROC1 - Use in closed process, no likelihood of exposure
PROC2 - Use in closed, continuous process with occasional controlled exposure
PROC3 - Use in closed batch process (synthesis or formulation)
PROC8a - Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16 - Using material as fuel sources, limited exposure to unburned product to be expected

Environmental Release Category
ERC7 - Industrial use of substances in closed systems
Specific Environmental Release Category
ESVOC SpERC 7.12a.v1.

Processes, tasks, activities covered
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

2. Operational conditions and risk management measures

2.1. Control of environmental exposure

Product characteristics
Substance is complex UVCB. Predominantly hydrophobic.

Amounts used
:
Fraction of EU tonnage used in region: 0.1
Regional use tonnage (tonnes/year): 4.5E+6
Fraction of Regional tonnage used locally: 0.34
Annual site tonnage (tonnes/year): 1.5E+6
Maximum daily site tonnage (kg/day): 5.0E+6

Frequency and duration of use Continuous release
Emission Days (days/year): 300

Environment factors not influenced by risk management
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Other operational conditions of use affecting environmental exposure
.
Release fraction to air from process (initial release prior to RMM): 5.0E-3
Release fraction to wastewater from process (initial release prior to RMM): 0.00001
Release fraction to soil from process (initial release prior to RMM): 0

Technical conditions and measures at process level 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 freshwater sediment
If discharging to domestic sewage treatment plant, no onsite wastewater treatment required
Treat air emission to provide a typical removal efficiency of (%): 95
Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): >=97.7
If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): >=60.4

Organizational measures to prevent/limit release from the site
Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant
Estimated substance removal from wastewater via domestic sewage treatment (%): 94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%): 97.7
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 5.0E+6
Assumed domestic sewage treatment plant flow (m3/d): 2000
Conditions and measures related to external treatment of waste for disposal
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.

Conditions and measures related to external recovery of waste
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Remarks
Additional information on the basis for the allocation of the identified OCs (operating conditions) and RMMs (Risk Management Measures) is contained in Petrorisk file

2.2. Control of exposure - Workers / Consumers

Product characteristics
Physical State
Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product
Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use
Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure
Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

2.2a. Control of worker exposure	
Contributing Scenarios	**Operational conditions and risk management measures.**
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Bulk transfers	Wear suitable gloves tested to EN374.
Drum/batch transfers	Wear suitable gloves tested to EN374.
Use as a fuel (closed systems)	No other specific measures identified.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Handle substance within a closed system.

2.2b. Control of consumer exposure	
Product Category(ies)	**Operational conditions and risk management measures.**
Not applicable	

3. Exposure estimation and references

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

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

4. Guidance for Downstream User to check compliance with the Exposure scenario

Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. 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 enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

Environment

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic org/en/reach-for-industries-libraries html).

ES05016
Version 1.0
Trade name / designation VHGO

1. Exposure scenario

Use as a fuel, Professional.

Use Descriptor
Sector of use
SU22 - Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process Category
PROC1 - Use in closed process, no likelihood of exposure
PROC2 - Use in closed, continuous process with occasional controlled exposure
PROC3 - Use in closed batch process (synthesis or formulation)
PROC8a - Transfer of substance or mixture (charging/discharging) from/to vessels/large containers at non dedicated facilities
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC16 - Using material as fuel sources, limited exposure to unburned product to be expected

Environmental Release Category
ERC9a - Wide dispersive indoor use of substances in closed systems
ERC9b - Wide dispersive outdoor use of substances in closed systems
Specific Environmental Release Category
ESVOC SpERC 9.12.v1.

Processes, tasks, activities covered
Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

2. Operational conditions and risk management measures

2.1. Control of environmental exposure

Product characteristics
Substance is complex UVCB. Predominantly hydrophobic.

Amounts used
:
Fraction of EU tonnage used in region: 0.1
Regional use tonnage (tonnes/year): 6.7E+6
Fraction of Regional tonnage used locally: 0.0005
Annual site tonnage (tonnes/year): 3.3E+3
Maximum daily site tonnage (kg/day): 9.2E+3

Frequency and duration of use Continuous release
Emission Days (days/year): 365

Environment factors not influenced by risk management
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Other operational conditions of use affecting environmental exposure
.
Release fraction to air from process (initial release prior to RMM): 1.0E-4
Release fraction to wastewater from process (initial release prior to RMM): 0.00001
Release fraction to soil from process (initial release prior to RMM): 0.00001

Technical conditions and measures at process level 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 (%): N/A
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

Organizational measures to prevent/limit release from the site
Prevent discharge of undissolved substance to or recover from onsite wastewater. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to municipal sewage treatment plant :
Estimated substance removal from wastewater via domestic sewage treatment (%): 94.1
Total efficiency of removal from wastewater after onsite and offsite (domestic treatment plant) RMMs (%): 94.1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 1.4E+5
Assumed domestic sewage treatment plant flow (m3/d): 2000
Conditions and measures related to external treatment of waste for disposal
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.

Conditions and measures related to external recovery of waste
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Remarks
Additional information on the basis for the allocation of the identified OCs (operating conditions) and RMMs (Risk Management Measures) is contained in Petrorisk file

2.2. Control of exposure - Workers / Consumers

Product characteristics
Physical State
Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product
Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use
Covers daily exposures up to 8 hours (unless stated differently)
Other operational conditions affecting exposure
Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

2.2a. Control of worker exposure	
Contributing Scenarios	**Operational conditions and risk management measures.**
General measures applicable to all activities	Control any potential exposure using measures such as contained or enclosed systems, properly designed and maintained facilities and a good standard of general ventilation. Drain down systems and transfer lines prior to breaking containment. Drain down and flush equipment where possible prior to maintenance. Where there is potential for exposure: ensure relevant staff are informed of the nature of exposure and aware of basic actions to minimise exposures; ensure suitable personal protective equipment is available; clear up spills and dispose of waste in accordance with regulatory requirements; monitor effectiveness of control measures; consider the need for health surveillance; identify and implement corrective actions.
General measures (skin irritants)	Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.
Bulk transfers	Wear suitable gloves tested to EN374.
Drum/batch transfers	Use drum pumps or carefully pour from container. Wear suitable gloves tested to EN374.
Refuelling	Wear suitable gloves tested to EN374.
Use as a fuel (closed systems)	Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Or. Ensure operation is undertaken outdoors.
Equipment cleaning and maintenance	Drain down system prior to equipment break-in or maintenance. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training.
Storage	Store substance within a closed system.

2.2b. Control of consumer exposure	
Product Category(ies)	**Operational conditions and risk management measures.**
Not applicable	

3. Exposure estimation and references

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

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

4. Guidance for Downstream User to check compliance with the Exposure scenario

Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. 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 enable the derivation of a DNEL for dermal irritant effects. Available hazard data do not support the need for a DNEL to be established for other health effects. Risk Management Measures are based on qualitative risk characterisation.

Environment
Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using on-site technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic org/en/reach-for-industries-libraries html).

ES05017
Version 1.0
Trade name / designation VHGO

1. Exposure scenario

Use as a fuel, Consumer.

Use Descriptor
Sector of use
SU21 - Private households (=general public = consumers)

Product Category
PC13 - Fuels

Environmental Release Category
ERC9a - Wide dispersive indoor use of substances in closed systems
ERC9b - Wide dispersive outdoor use of substances in closed systems
Specific Environmental Release Category
ESVOC SpERC 9.12c.v1.

Processes, tasks, activities covered
Covers consumer uses in liquid fuels.

2. Operational conditions and risk management measures

2.1. Control of environmental exposure

Product characteristics
Substance is complex UVCB. Predominantly hydrophobic.

Amounts used
:
Fraction of EU tonnage used in region: 0.1
Regional use tonnage (tonnes/year): 1.6E+7
Fraction of Regional tonnage used locally: 0.0005
Annual site tonnage (tonnes/year): 8.2E+3
Maximum daily site tonnage (kg/day): 2.3E+4

Frequency and duration of use Continuous release
Emission Days (days/year): 365

Environment factors not influenced by risk management -
Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Other operational conditions of use affecting environmental exposure
Risk from environmental exposure is driven by humans via indirect exposure (primarily ingestion).
Release fraction to air from wide dispersive use (regional only): 1.0E-4
Release fraction to wastewater from wide dispersive use: 0.00001

Release fraction to soil from wide dispersive use (regional only): 0.00001

Conditions and measures related to municipal sewage treatment plant
Estimated substance removal from wastewater via domestic sewage treatment (%): 94.1
Maximum allowable site tonnage (MSafe) based on release following total wastewater treatment removal (kg/d): 3.5E+5
Assumed domestic sewage treatment plant flow (m3/d): 2000

Conditions and measures related to external treatment of waste for disposal
Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.

Conditions and measures related to external recovery of waste
External recovery and recycling of waste should comply with applicable local and/or national regulations.

Remarks
Additional information on the basis for the allocation of the identified OCs (operating conditions) and RMMs (Risk Management Measures) is contained in Petrorisk file

2.2. Control of exposure - Workers / Consumers

Product characteristics
Physical State
Liquid, vapour pressure > 10 kPa at STP
Concentration of substance in product
Covers percentage substance in the product up to 100 % (unless stated differently).
Frequency and duration of use
Unless otherwise stated
Covers use amounts up to (g) : 37500g
Covers skin contact area up to (cm2): 420
Other operational conditions affecting exposure
Unless otherwise stated. Covers use up to (times/day of use): .
Covers exposure up to (hours/event): 2.

2.2a. Control of worker exposure

Contributing Scenarios	Operational conditions and risk management measures.
not applicable	

2.2b. Control of consumer exposure	
Product Category(ies)	**Operational conditions and risk management measures.**
PC13 - Fuels Liquid: Automotive Refuelling	Unless otherwise stated Covers concentrations up to (%):100 Covers use up to (days/year):52 Covers use up to (times/day of use):1 Covers skin contact area up to (cm2): 210 For each use event, covers use amounts up to (g):37500 Covers outdoor use Covers use in room size of (m3):100 For each use event Covers exposure up to (hours/event):0.05 No specific risk management measure identified beyond those operational conditions stated
PC13 - Fuels Liquid Garden Equipment - Use	Unless otherwise stated Covers concentrations up to (%):100 Covers use up to (days/year):26 Covers use up to (times/day of use):1 For each use event, covers use amounts up to (g):750 Covers outdoor use Covers use in room size of (m3):100 For each use event Covers exposure up to (hours/event):2.0 No specific risk management measure identified beyond those operational conditions stated
PC13 - Fuels Liquid: Garden Equipment - Refueling	Unless otherwise stated Covers concentrations up to (%): 100 Covers use up to (times/day of use):1 Covers use up to (days/year):26 Covers skin contact area up to (cm2): 420 For each use event, covers use amounts up to (g):750 Covers use in a one car garage (34 m3) under typical ventilation Covers use in room size of (m3):34 For each use event Covers exposure up to (hours/event):0.03 No specific risk management measure identified beyond those operational conditions stated

3. Exposure estimation and references

Health
The ECETOC TRA tool has been used to estimate consumer exposures, consistent with the content of ECETOC report #107 and the Chapter R15 of the IR&CSA TGD Where exposure determinants differ to these sources, then they are indicated

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

4. Guidance for Downstream User to check compliance with the Exposure scenario

Health
Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Environment
Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic org/en/reach-for-industries-libraries html).