

SAFETY DATA SHEET

Revision Date : 10.12.2009

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Engen Heavy Fuel Oil
 UN number : 1268

Supplier : Engen Petroleum Limited (Tel: 021-403 4911, a/h: 021-403 4099)
 Health Emergency Telephone : 021-689 5227 (Red Cross Poison Service)
 Transport Emergency Telephone : 011-975 1278/83 (Hazchemwise)
 Customer Service Centre : 0860 036 436 (Sales and Technical Information)
 Engen Website : <http://www.engen.co.za/>

2. HAZARDS IDENTIFICATION

Emergency response data : Dark brown Liquid. Flammable. The product can form flammable mixtures or will burn on heating above the flashpoint. However, contaminations by hydrocarbons of higher volatility may increase the hazard. DOT ERG No. : 128

GHS Classification:**Health**

Acute inhalation toxicity	Hazard category 3. Toxic if inhaled.	Danger
Acute oral toxicity	Hazard category 4. Harmful if swallowed.	Warning
Skin irritation	Hazard category 2. Irritation or more serious skin disorders.	Warning
Eye irritation	Hazard category 2B. Irritant.	Warning
Carcinogenicity	Hazard category 2. Under conditions of poor hygiene and long term exposure, this product should be considered a human carcinogen.	Warning
Reproductive toxicity (Teratogenicity)	Hazard category 2. May adversely affect foetal development.	Warning
STOT - repeated exposure	Hazard category 2. Causes damage to organs.	Warning

Environmental

Aquatic toxicity	: Hazard category 3. May cause long-term adverse effects in the aquatic environment.	Warning
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Physical

Flammability	: Hazard category 3. Flammable liquid and vapour.	Warning
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GHS Labels/Pictograms:**Hazard Statements**

Flammable liquid and vapour. Fumes from heated product may cause eye and lung irritation. May be fatal if swallowed and enters airways. Harmful in contact with skin.

Under conditions of poor hygiene, prolonged skin contact may produce serious toxic effects including skin cancer, liver damage, blood effects and effects on unborn.

Precautionary Statements

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Prevention

Do not breathe vapours. Wash exposed skin after handling this product. Do not eat, drink or smoke when using this product.

Response

IN CASE OF FIRE: use Carbon dioxide, foam or dry chemical for extinction. IF INHALED: Call a POISON CENTRE or doctor if you feel unwell. IF SWALLOWED: Immediately call a POISON CENTRE or doctor. IF IN EYES: Rinse cautiously with water for several minutes.

Disposal

Do not discharge into lakes, streams, ponds and ground water supply.

See Section 11 for further health effects/toxicological data.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS-No.	Weight%
Fuel oil, residual	68476-33-5	> 99,00
Naphthalene	91-20-3	< 2,00
Ethyl Benzene	100-41-4	< 1,00
Hydrogen Sulphide	7783-06-4	< 0,10

See Section 8 for Exposure Limits (if applicable).

4. FIRST AID MEASURES

- Inhalation : Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation with a mouthpiece.
- Skin contact : Remove contaminated clothing. Dry wipe exposed skin and cleanse with hand cleaner, soap and water. Launder contaminated clothing before reuse. (See Section 16 - Injection Injury)
- Eye contact : Flush thoroughly with water. If irritation occurs call a doctor.
- Ingestion : Seek immediate medical attention. If medical attention is delayed, contact a Regional Poison Centre or emergency medical professional regarding the induction of vomiting or use of activated charcoal. Do not induce vomiting or give anything by mouth to a groggy or unconscious person.
- Note to doctors : Hydrosulphide anion is strongly bound to haemoglobin in a manner similar to cyanide. Administration of sodium nitrite would produce methaemoglobin in the blood which MAY partially inactivate this poison.

5. FIRE-FIGHTING MEASURES

- Extinguishing media : Carbon dioxide, foam, dry chemical and water fog.
- Special fire fighting procedure : Water spray should only be used to keep fire-exposed containers cool, flush spills away from exposures, disperse vapours and protect personnel attempting to stop leak. Prevent runoff from fire control or dilution from entering streams, municipal sewers, or drinking water supply.

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Special protective equipment for firefighters	:	For fires in enclosed areas, fire fighters must use Self-Contained Breathing Apparatus.
Unusual fire and explosive hazards	:	On rare occasions, Hydrogen Sulphide may be present which can accumulate to hazardous levels in enclosed spaces.
Products of decomposition	:	Fumes, smoke, carbon monoxide, sulphur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.
Flash Point	:	> 55 °C (ASTM D-93)
NFPA Hazard Id	:	Health: 3; Flammability: 2; Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

Procedure if material is released or spilled	:	Report spills/releases as required to appropriate authorities.
Methods for cleaning up	:	LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping using explosion-proof equipment or contain spilled liquid with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of absorbed residues as directed in Section 13. WATER SPILL: Notify port and relevant authorities. Confine with booms if skimming equipment is available to recover the spill for later recycling or disposal. Warn other ships in the vicinity. If allowed by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.
Personal precautions	:	See Section 8.
Environmental precautions	:	Prevent spill from entering municipal sewers, water sources or low lying areas. Advise the relevant authorities if contaminations have occurred.

7. HANDLING AND STORAGE

Safe handling advice	:	Harmful in contact with or if absorbed through the skin. Avoid all personal contact. Significant amounts of Hydrogen sulphide may be present. Keep face clear of tank and/or tank car openings. Avoid inhalation of vapours or mists. See Section 8 for additional personal protection advice when handling this product.
Storage information	:	Store in a cool area. Under extreme temperatures or extended storage periods, hydrogen sulphide gas may accumulate in the head-space of storage containers. Enclosed areas must be tested for hydrogen sulphide concentration before entry.
Storage and handling procedures	:	To minimize the risk of fire or explosion from discharges, static and/or vapour accumulation, effectively bond and ground product storage and transfer systems. Electrical equipment and fittings must comply with local fire prevention regulations for this class of product. Refer to national or local regulations covering safety at petroleum handling and storage areas for this product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits (OELs)

Components	CAS-No.	Source	TWA	Value	Notations
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Naphthalene	91-20-3	ACGIH TLV	LTEL	52 mg/m ³	10 ppm	Skin; A4
		OSHA PEL	STEL	79 mg/m ³	15 ppm	
Ethyl Benzene	100-41-4	ACGIH TLV	LTEL	434 mg/m ³	100 ppm	A3; BEI
		OSHA PEL	STEL	543 mg/m ³	125 ppm	
Hydrogen Sulphide	7783-06-4	ACGIH	LTEL	14 mg/m ³	10 ppm	
		OSHA	STEL	21 mg/m ³	15 ppm	

Note : The residual oil component does not have recognised exposure limits. An estimated LTEL of 0.2 mg/m³ is recommended.

LTEL: Long Term Exposure Limits - Time Weight Average (TWA) over 8 hours.

STEL: Short Term Exposure Limits - Time Weight Average (TWA) over 15 Minutes

Note: Limits Shown for guidance only. Follow applicable regulations.

Personal Protection Equipment (PPE)

- Engineering controls : Use in well ventilated area. Explosive-proof ventilation equipment with local exhaust is desirable.
- Respiratory protection : Approved respiratory equipment must be used when airborne concentrations are unknown or exceed the recommended exposure limit. Self-Contained Breathing Apparatus may be required for use in confined or enclosed spaces.
- Eye protection : If splash with liquid is possible, chemical type goggles should be worn.
- Skin and body protection : Impervious gloves must be worn. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : Liquid.
- Colour : Dark brown
- Odour : Hydrocarbon
- Solubility : Negligible
- Boiling point : > 204 °C
- Flash Point : > 55 °C (ASTM D-93)
- Density : 0,9850 g/cm³ @ 20 °C (ASTM D-4052)
- Viscosity, kinematic : 150 mm²/s @ 50 °C (ASTM D-445)

10. STABILITY AND REACTIVITY

- Stability : Stable.
- Conditions to avoid : Extreme heat and high energy sources of ignition, such as sparks and static electricity.
- Materials to avoid : Halogens, strong acids, alkalis and oxidizers.
- Hazardous decomposition products : Fumes, smoke, carbon monoxide, sulphur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

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11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	:	(Rats): Harmful (LD50: Greater than 300 but 2000 mg/kg or less). Based on testing of similar products and/or components. Warning Hazard category 4. Harmful if swallowed.
Acute dermal toxicity	:	(Rabbits): Practically non-toxic (LD50: greater than 2000 mg/kg). Based on testing of similar products and/or the components. Warning Hazard category 5. May be harmful in contact with skin.
Acute inhalation toxicity	:	(Rats): Toxic (LC50: greater than 2 but 10mg/l or less) 4 hours. Based on testing products and/or components. Danger Hazard category 3. Toxic if inhaled.
Skin irritation	:	(Rabbits): Irritant. (Primary Irritation Index: greater than 3 but less than 6). Based on testing of similar products and/or the components. Warning Hazard category 2. Causes skin irritation.
Eye irritation	:	(Rabbits): Irritant. (Draize score: greater than 15 but less than 35). Based on testing of similar products and/or the components. Warning Hazard category 2B. Causes eye irritation.
Respiratory and skin sensitization	:	Aromatic oils contain polycyclic compounds implicated in allergic skin sensitization and photosensitization studies in both animals and humans.
Germ cell mutagenicity	:	Modified Ames Test indicates that fuel oils containing significant levels of carcinogenic polycyclic aromatic compounds are mutagenic.
Carcinogenicity	:	Aromatic oils and extracts are carcinogenic in lifetime mouse skin painting bioassays. Hazard category 2. Warning
Reproductive toxicity (Teratogenicity)	:	Repeated dermal application to rats using similar aromatic oils resulted in maternal toxicity, decreased foetal body weights and survival. In some cases male rats showed malformations and decreased sperm count. Warning Hazard category 2. May adversely affect foetal development.
Specific target organ toxicity (STOT) - single exposure	:	Respiratory irritation, dizziness, nausea and loss of consciousness. Warning Hazard category 3. Narcotic effect.
Specific target organ toxicity (STOT) - repeated exposure	:	Repeated dermal application to rats for 13 weeks was carried out with aromatic oils similar to components used in this product. Resulting effects included increased mortality, increased liver weight, decreased thymus gland weight and lymphoid tissue and blood disorders. Kidney and bone marrow toxicity and skin irritation were also observed in some cases. Skin cleansing studies show that toxic effects are not likely to occur if the aromatic oil is removed using guidance in Section 4. See Section 8 for recommended protection and precautions
Aspiration hazard	:	Viscous liquid. Not expected to occur in normal industrial use.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Toxicity to fish	:	(Salmon) LC/EC50: 8.1 mg/l at 96 hours.
Toxicity to aquatic organisms	:	(Daphnia magna) LC/EC50: 6 mg/l at 48 hours. (Green algae) LC/EC50: 9.4 mg/l at 8 hours.

Elimination information (persistence and degradability)

Biodegradability	:	The majority of the components in this product would be expected to be
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inherently biodegradable through photodegradation.

- Mobility : Dissolution of the higher molecular weight hydrocarbon components in water will be limited, but losses through sediment adsorption may be significant.
- Bioaccumulation : Log Kow values above 3 have been estimated for residual fuels constituents. Persistence in the environment is low based on volatility and biodegradability, hence, the long-term aquatic effects are minimal.

Further information on ecology

- Remarks : This environmental assessment is based on test data for this product (or estimated data).

13. DISPOSAL CONSIDERATIONS

- Waste disposal : Product is suitable for burning for fuel value in compliance with applicable laws and regulations, and consideration of product characteristics at time of disposal.
- Contaminated packaging : Empty containers retain residue (liquid and/or vapour) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.
- Other regulations : Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity, or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP).
- Flash Point : > 55 °C (ASTM D-93)

14. TRANSPORT INFORMATION

- Note : The flash point of this material is > 55 °C, and hence regulatory classifications for flammability may vary.

ADR

- Proper shipping name : PETROLEUM DISTILLATES, n.o.s. (contains RESIDUAL FUEL OIL-and-HYDROGEN SULPHIDE)
- UN number : 1268
- Class : 3
- Letter : F
- Packing group : III
- Labelling number : 3

CFR

- Proper shipping name : PETROLEUM DISTILLATES, n.o.s. (contains RESIDUAL FUEL OIL-and-HYDROGEN SULPHIDE)
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IATA_C

Proper shipping name : PETROLEUM DISTILLATES, n.o.s. (contains RESIDUAL FUEL OIL-and-HYDROGEN SULPHIDE)
UN number : 1268
Class : 3
Letter : F
Packing group : III
Labelling number : 3

IMDG

Proper shipping name : PETROLEUM DISTILLATES, n.o.s. (contains RESIDUAL FUEL OIL-and-HYDROGEN SULPHIDE)
UN number : 1268
Class : 3
Letter : F
Packing group : III
Labelling number : 3
Marine pollutant : Marine Pollutant
Medical First Aid Guide (MFAG) table : 311
Emergency Schedule (EmS) number : 3-07
IMDG code page number : 3375

15. REGULATORY INFORMATION

US OSHA Hazard Communication Standard : Product assessed in accordance with OSHA 29 CFR 1910.1200 and determined to be hazardous.

Governmental Inventory Status : All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL, KECI, ENCS, PICCS and IECSC.

EU Labelling : Product is dangerous as defined by the European Union Dangerous Substances/Preparations Directives.

Symbols : T
Toxic

R-Phrase(s) : R45, R63, R48/21, R52
May cause cancer., Possible risk of harm to the unborn child., Harmful: danger of serious damage to health by prolonged exposure in contact with skin., Harmful to aquatic organisms.

S-phrase(s) : S53, S45
Avoid exposure - obtain special instructions before use., In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Note : Contains Aromatic Oils.

SARA

U.S. Superfund Amendments and Reauthorization Act SARA Title III : This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) Reportable : Fire Chronic

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Hazard Categories

SARA (313) Toxic Release : Ethyl Benzene (100-41-4) - Conc < 1 %.
Chemicals: Polynuclear Aromatic Hydrocarbons - Conc 0.1%.

The following product ingredients are cited on the lists below

Chemical name	CAS-No.	Concentration [%]	List Citations
Fuel oil, residual	68476-33-5	> 99,00	8, 17, 21
Naphthalene	91-20-3	< 2,00	16, 22
Ethyl Benzene	100-41-4	< 1,00	1, 8, 10, 18, 19, 20, 21, 23, 24, 25, 26
Hydrogen Sulphide	7783-06-4	< 0,10	1, 10, 18, 19, 20, 21, 22, 23, 24, 25, 26

Regulatory List Searched

1 = ACGIH ALL	6 = IARC 1	11 = TSCA 4	17 = CA P65	22 = MI 293
2 = ACGIH A1	7 = IARC 2A	12 = TSCA 5a2	18 = CA RTK	23 = MN RTK
3 = ACGIH A2	8 = IARC 2B	13 = TSCA 5e	19 = FL RTK	24 = NJ RTK
4 = NTP CARC	9 = OSHA CARC	14 = TSCA 6	20 = IL RTK	25 = PA RTK
5 = NTP SUS	10 = OSHA Z	15 = TSCA 12b	21 = LA RTK	26 = RI RTK

Code Key: CARC = Carcinogen; SUS = Suspected Carcinogen

16. OTHER INFORMATION

Note: Engen products do not contain PCBs.

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a doctor as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Note: No significant changes have been made to this Safety Data Sheet since the previous date.

Disclaimer

Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and we expressly disclaim all warranties of every kind and nature, including warranties of merchantability and fitness for a particular purpose in respect to the use or suitability of the product. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.

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