

SAFETY DATA SHEET**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

Product name	Fuel oil, residual
Other means of identification	RMG 380, RMG 380LS RMG 500 RMG 700 RMH 380, RMH 380LS RMH 700 RMK 380, RMK 380LS RMK 500 RMK 700
Proper shipping name	fuel and residual oils, including ship's bunkers
SDS no.	SMI2111
EC number	270-675-6
CAS number	68476-33-5
REACH Registration number	01-2119474894-22
Product type	Liquid.

1.2 Relevant identified uses of the substance or mixture and uses advised against**1.3 Details of the supplier of the safety data sheet**

Supplier	BP Global Investments Salalah & Co LLC PO Box 2309 Postal Code 211 Salalah Sultanate of Oman
E-mail address	MSDSadvice@bp.com

1.4 Emergency telephone number

EMERGENCY TELEPHONE NUMBER	+968 23219350 (24 hours)
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SECTION 2: Hazards identification**2.1 Classification of the substance or mixture**

Product definition UVCB

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Acute Tox. 4, H332

Carc. 1B, H350

Repr. 2, H361d

STOT RE 2, H373

Aquatic Chronic 1, H410

Classification according to Directive 67/548/EEC [DSD]

Carc. Cat. 2; R45

Repr. Cat. 3; R63

Xn; R20, R48/21

R66

N; R50/53

See Section 16 for the full text of the R phrases or H statements declared above.

See sections 11 and 12 for more detailed information on health effects and symptoms and environmental hazards.

2.2 Label elements

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SECTION 2: Hazards identification

Hazard pictograms



Signal word

Danger

Hazard statements

H332 - Harmful if inhaled.
 H350 - May cause cancer.
 H361d - Suspected of damaging the unborn child.
 H373 - May cause damage to organs through prolonged or repeated exposure.
 H410 - Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention

P201 - Obtain special instructions before use.
 P260 - Do not breathe dust/fume/gas/mist/vapours/spray.
 P281 - Use personal protective equipment as required.
 P273 - Avoid release to the environment.

Response

P308 - IF exposed or concerned:
 P313 - Get medical advice/attention.

Storage

- Not applicable

Disposal

P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements

Repeated exposure may cause skin dryness or cracking.

Special packaging requirements

Containers to be fitted with child-resistant fastenings

Not applicable.

Tactile warning of danger

Not applicable.

2.3 Other hazards

Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII

Not available.

Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

Not available.

Other hazards which do not result in classification

Prolonged or repeated contact may dry skin and cause irritation.
 This material can contain hydrogen sulphide (H₂S), a very toxic and extremely flammable gas.
 Will cause burns if hot material contacts eyes.
 Will cause burns if hot material contacts skin.
 This material may contain significant quantities of polycyclic aromatic hydrocarbons (PCAs), some of which have been shown by experimental studies to induce skin cancer.
 Note: High Pressure Applications
 Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency.
 See 'Notes to physician' under First-Aid Measures, Section 4 of this Safety Data Sheet.

SECTION 3: Composition/information on ingredients

Substance/mixture

UVCB

Heavy fuel oil Complex hydrocarbon substance

Classification

Product/ingredient name	CAS no.	%	67/548/EEC	Regulation (EC) No. 1272/2008 [CLP]	Type
Fuel oil, residual	68476-33-5	100	Carc. Cat. 2; R45 Repr. Cat. 3; R63 Xn; R20, R48/21 R66 N; R50/53	Acute Tox. 4, H332 Carc. 1B, H350 Repr. 2, H361d STOT RE 2, H373 Aquatic Chronic 1, H410	[A]

See Section 16 for the full text of the R-phrases declared above.

See Section 16 for the full text of the H statements declared above.

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SECTION 3: Composition/information on ingredients

Type

[*] Substance

[A] Constituent

[B] Impurity

[C] Stabilising additive

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact

Hot product - Flood with water to dissipate heat. In the event of any product remaining, do not try to remove it other than by continued irrigation with water. Obtain medical attention immediately.

Cold product - Wash eye thoroughly with copious quantities of water, ensuring eyelids are held open. Obtain medical advice if any pain or redness develops or persists.

Skin contact

Hot Product - Flood skin with cold water to dissipate heat, cover with clean cotton or gauze, obtain medical advice immediately.

Cold Product - Wash contaminated skin with soap and water. Remove contaminated clothing and wash underlying skin as soon as reasonably practicable.

Never use gasoline, kerosene or other solvents to remove product from skin or clothing.

Inhalation

If inhaled, remove to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention immediately.

EXPOSURE TO HYDROGEN SULPHIDE:

Casualties suffering ill effects as a result of exposure to hydrogen sulphide should be immediately removed to fresh air and medical assistance obtained without delay. Unconscious casualties must be placed in the recovery position. Monitor breathing and pulse rate and if breathing has failed, or is deemed inadequate, respiration must be assisted, preferably by the mouth to mouth method. Administer external cardiac massage if necessary. Seek medical attention immediately.

Ingestion

Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Get medical attention immediately.

Protection of first-aiders

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician

Treatment should in general be symptomatic and directed to relieving any effects.

Inhalation of hydrogen sulphide may cause central respiratory depression leading to coma and death. It is irritant to the respiratory tract causing chemical pneumonitis and pulmonary oedema. The onset of pulmonary oedema may be delayed for 24 to 48 hours. Treat with oxygen and ventilate as appropriate. Administer broncho-dilators if indicated and consider administration of corticosteroids. Keep casualty under surveillance for 48 hours in case pulmonary oedema develops.

Note: High Pressure Applications

Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discoloured and extremely painful with extensive subcutaneous necrosis. Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimise tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

In case of fire, use water fog, foam, dry chemical or carbon dioxide extinguisher or spray. This substance will float and can be reignited on surface water.

Unsuitable extinguishing media

Do not use water jet.

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SECTION 5: Firefighting measures

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture

In a fire or if heated, a pressure increase will occur and the container may burst. Vapours can form explosive mixtures with air. Vapours are heavier than air and can spread along the ground or float on water surfaces to remote ignition sources. Vapours may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. Avoid spraying directly into storage containers because of the danger of boil-over. Boil-over is the rapid increase in volume caused by the presence of water in hot product and the subsequent overflow from a tank.

Hazardous combustion products

Combustion products may include the following:
 carbon oxides (CO, CO₂) (carbon monoxide, carbon dioxide)
 sulphur oxides (SO, SO₂, etc.)
 carbon oxides (CO, CO₂) (carbon monoxide, carbon dioxide)
 Hydrogen Sulphide (H₂S)
 unidentified organic and inorganic compounds

5.3 Advice for firefighters

Special precautions for fire-fighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. First move people out of line-of-sight of the scene and away from windows. No action shall be taken involving any personal risk or without suitable training. Use water spray to keep fire-exposed containers cool. This material is very toxic to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Immediately contact emergency personnel. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Floors may be slippery; use care to avoid falling. Avoid breathing vapour or mist. Provide adequate ventilation. Put on appropriate personal protective equipment.

For emergency responders

This material can contain hydrogen sulphide (H₂S), a very toxic and extremely flammable gas. Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. Wear self-contained positive pressure breathing apparatus (SCBA).

Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. Wear self-contained breathing apparatus. Wear a suitable chemical protective suit. Chemical resistant boots. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

Depending upon its temperature the product may be liquid, semi-solid or solid. Protect drains from spills and prevent entry of product, since this may result in blockage on cooling. Should blockage occur, notify the appropriate authority immediately.

Spillages in water or at sea:

Product less dense than water: In case of small spillages in closed waters (i.e. ports), contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents. If possible, large spillages in open waters should be contained with floating barriers or other mechanical means. If this is not possible, control the spreading of the spillage, and collect the product by skimming or other suitable mechanical means. The use of dispersants should be advised by an expert, and, if required, approved by local authorities. Collect recovered product and other contaminated materials in suitable tanks or containers for recycle, recovery or safe disposal. Product which is denser than water will sink to the bottom, and usually no intervention will be feasible. If possible, collect the product and contaminated materials with mechanical means, and store/dispose of according to relevant regulations. In special situations (to be assessed on case-by-case basis, according to expert judgement and local conditions), excavations of trenches on the bottom to collect the product with sand may be a feasible option.

6.3 Methods and materials for containment and cleaning up

Small spill

Eliminate all ignition sources. Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

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SECTION 6: Accidental release measures

Large spill

Eliminate all ignition sources. Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Dike spill area and do not allow product to reach sewage system and surface or ground water. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Contaminated absorbent material may pose the same hazard as the spilt product. Depending upon its temperature the product may be liquid, semi-solid or solid. Protect drains from spills and prevent entry of product, since this may result in blockage on cooling. Should blockage occur, notify the appropriate authority immediately. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections

See Section 1 for emergency contact information.
 See Section 5 for firefighting measures.
 See Section 8 for information on appropriate personal protective equipment.
 See Section 12 for environmental precautions.
 See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures

Contact with hot product may cause burns. Put on appropriate personal protective equipment. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid contact of spilt material and runoff with soil and surface waterways. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Do not reuse container. Empty containers retain product residue and can be hazardous.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Regular periodic self inspection of the skin is recommended, especially those areas subject to contamination. In the event of any localised changes in appearance or texture of the skin being noticed, medical advice should be sought without delay.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Store locked up. Keep away from heat and direct sunlight. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Store and use only in equipment/containers designed for use with this product. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

This material can contain hydrogen sulphide (H₂S), a very toxic and extremely flammable gas. Vapours containing hydrogen sulphide may accumulate during storage or transport and may also be vented during filling of tanks. Hydrogen sulphide has a typical "bad egg" smell but at high concentrations the sense of smell is rapidly lost, therefore do not rely on sense of smell for detecting hydrogen sulphide. Use specially designed measuring instruments for determining its concentration.

Light hydrocarbon vapours can build up in the headspace of tanks. These can cause flammability/explosion hazards even at temperatures below the normal flash point (note: flash point must not be regarded as a reliable indicator of the potential flammability of vapour in tank headspaces). Tank headspaces should always be regarded as potentially flammable and care should be taken to avoid static electrical discharge and all ignition sources during filling, ullaging and sampling from storage tanks. Do not enter storage tanks. If entry to vessels is necessary, follow permit to work procedures. Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. When the product is pumped (e.g. during filling, discharge or ullaging) and when sampling, there is a risk of static discharge. Ensure equipment used is properly earthed or bonded to the tank structure. Electrical equipment should not be used unless it is intrinsically safe (i.e. will not produce sparks). Explosive air/vapour mixtures may form at ambient temperature. If product comes into contact with hot surfaces, or leaks occur from pressurised fuel pipes, the vapour or mists generated will create a flammability or explosion hazard. Product contaminated rags, paper or material used to absorb spillages, represent a fire hazard, and should not be allowed to accumulate. Dispose of safely immediately after use.

7.3 Specific end use(s)

Recommendations

See section 1.2 and Exposure scenarios in annex, if applicable.

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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
Fuel oil, residual	ACGIH TLV (United States). TWA: 0.2 mg/m ³ , (Benzene-soluble)
Hydrogen Sulphide	EU OEL (Europe). TWA: 7 mg/m ³ 8 hours. Issued/Revised: 12/2009 TWA: 5 ppm 8 hours. Issued/Revised: 12/2009 STEL: 14 mg/m ³ 15 minutes. Issued/Revised: 12/2009 STEL: 10 ppm 15 minutes. Issued/Revised: 12/2009

Whilst specific OELs for certain components may be shown in this section, other components may be present in any mist, vapour or dust produced. Therefore, the specific OELs may not be applicable to the product as a whole and are provided for guidance only.

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Derived No Effect Level

Product/ingredient name	Type	Exposure	Value	Population	Effects	
Fuel oil, residual	DNEL	Short term Inhalation	15 minutes	4700 mg/m ³	Workers	Systemic
	DNEL	Long term Dermal	8 hours TWA	0.065 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	8 hours TWA	0.12 mg/m ³	Workers	Systemic
	DNEL	Long term Oral	24 hours TWA	0.015 mg/kg bw/day	Consumers	Systemic

Predicted No Effect Concentration

No PNECs available

8.2 Exposure controls

Appropriate engineering controls

Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits. All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained. Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards. The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory protection

If local exhaust ventilation or other methods of ventilation are not possible or are insufficient, wear suitable respiratory protective devices. Wear suitable respiratory protective devices if there is a risk of exposure limits being exceeded. The choice of suitable respiratory device will depend upon a risk assessment of the workplace environment and the task being carried out. If required, the respiratory device must be certified as safe in defined explosive atmospheres (EX Label). Respiratory protective devices must be checked to ensure they fit correctly each time they are worn. Please consult European standard EN 529 for further guidance on the selection, use, care and maintenance of respiratory protective devices.

Suitable breathing apparatus (independent of ambient atmosphere) must be worn if any of the following situations apply.
- When the workplace atmosphere is considered to be immediately dangerous to life and health.

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- When there is a risk of the workplace atmosphere being oxygen deficient.
- When the workplace atmosphere is uncontrolled.
- When the workplace atmosphere is unknown.
- When there is a risk of loss of consciousness or asphyxiation
- When entry into a confined space is required.
- When there is a risk of gases being released that could be a fire or explosion hazard.
- When the concentration of contaminants in the atmosphere exceeds the level of protection (maximum allowed concentration) given by a filtering device
- When the contaminants have a low odour that would not be tasted or smelt by the wearer of a filtering device if the filter became exhausted or saturated.
- When there is a risk of hydrogen sulphide exposure limits being exceeded.

If there is a requirement for the use of a respiratory protective device, but the use of breathing apparatus (independent of ambient atmosphere) is not required, then a suitable filtering device must be worn.

The filter class must be suitable for the maximum contaminant concentration (gas/vapour/ aerosol/particulates) that may arise when handling the product.

Recommended: Combined filter suitable for gases, vapours and particles (dust, smoke, mist, aerosol). Filter type: AP.

Eye/face protection

Hot material: to prevent thermal burns wear a helmet, full face visor and heat resistant neck flap / apron.

Cold material: wear safety glasses with side shields.

Chemical splash goggles.

Skin protection

Hand protection

General Information:

Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. The correct choice of protective gloves depends upon the chemicals being handled, and the conditions of work and use. Most gloves provide protection for only a limited time before they must be discarded and replaced (even the best chemically resistant gloves will break down after repeated chemical exposures).

Gloves should be chosen in consultation with the supplier / manufacturer and taking account of a full assessment of the working conditions.

Wear chemical resistant gloves.

Recommended: Nitrile gloves.

Breakthrough time:

Breakthrough time data are generated by glove manufacturers under laboratory test conditions and represent how long a glove can be expected to provide effective permeation resistance. It is important when following breakthrough time recommendations that actual workplace conditions are taken into account. Always consult with your glove supplier for up-to-date technical information on breakthrough times for the recommended glove type.

Our recommendations on the selection of gloves are as follows:

Continuous contact:

Gloves with a minimum breakthrough time of 240 minutes, or >480 minutes if suitable gloves can be obtained.

If suitable gloves are not available to offer that level of protection, gloves with shorter breakthrough times may be acceptable as long as appropriate glove maintenance and replacement regimes are determined and adhered to.

Short-term / splash protection:

Recommended breakthrough times as above.

It is recognised that for short-term, transient exposures, gloves with shorter breakthrough times may commonly be used. Therefore, appropriate maintenance and replacement regimes must be determined and rigorously followed.

Glove Thickness:

For general applications, we recommend gloves with a thickness typically greater than 0.35 mm.

It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.

Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers' technical data should always be taken into account

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to ensure selection of the most appropriate glove for the task.

Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:

- Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.

- Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential.

Hot material: to prevent thermal burns wear heat resistant and impervious gauntlets/gloves.

Cold material: Wear chemical resistant gloves. Recommended: nitrile gloves.

Do not re-use gloves.

Protective gloves will deteriorate over time due to physical and chemical damage. Inspect and replace gloves on a regular basis.

Protective gloves must give suitable protection against mechanical risks (i.e. abrasion, blade cut and puncture).

The frequency of replacement will depend upon the circumstances of use.

Skin and body

Cold material:

Wear suitable protective clothing.

Footwear highly resistant to chemicals.

When there is a risk of ignition wear inherently fire resistant protective clothes and gloves.

Refer to standard: ISO 11612

When there is a risk of ignition from static electricity, wear anti-static protective clothing. For greatest effectiveness against static electricity, overalls, boots and gloves should all be anti-static.

Refer to standard: EN 1149

Cotton or polyester/cotton overalls will only provide protection against light superficial contamination.

When the risk of skin exposure is high (from experience this could apply to the following tasks: cleaning work, maintenance and service, filling and transfer, taking samples and cleaning up spillages) then a chemical protective suit and boots will be required.

Work clothing / overalls should be laundered on a regular basis. Laundering of contaminated work clothing should only be done by professional cleaners who have been told about the hazards of the contamination. Always keep contaminated work clothing away from uncontaminated work clothing and uncontaminated personal clothes.

Thermal hazards

Hot material: Wear suitable protective clothing to protect against heat and brief contact with flame. Protection should be provided for exposed areas of the neck and head.

Personal protective equipment (Pictograms)



Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	Liquid.
Colour	Dark Brown. / Black.
Odour	Oily.
Odour threshold	Not available.
pH	Not applicable. Endpoint waived according to REACH Annex VII, IX or XI
Melting point/freezing point	<30°C (<86°F)
Initial boiling point and boiling range	164 to 750°C (327.2 to 1382°F)
Pour point	30 °C
Flash point	Closed cup: ≥60°C (≥140°F) [Pensky-Martens.]

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Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable. Endpoint waived according to REACH Annex VII, IX or XI
Upper/lower flammability or explosive limits	Lower: 0.5% Upper: 5%
Vapour pressure	<0.013 kPa (<0.1 mm Hg) at 20°C
Vapour density	>0.9 [Air = 1]
Relative density	Not available.
Density	1010 kg/m ³ (1.01 g/cm ³) at 15°C
Solubility(ies)	Not applicable. Endpoint waived according to REACH Annex VII, IX or XI
Partition coefficient: n-octanol/ water	Not applicable. Endpoint waived according to REACH Annex VII, IX or XI
Auto-ignition temperature	250 to 537°C (482 to 998.6°F)
Decomposition temperature	Not applicable. Endpoint waived according to REACH Annex VII, IX or XI
Viscosity	Kinematic: 663.2 mm ² /s (663.2 cSt) at 40°C Kinematic: 180 to 700 mm ² /s (180 to 700 cSt) at 50°C
Explosive properties	Not applicable. Endpoint waived according to REACH Annex VII, IX or XI
Oxidising properties	Not applicable. Endpoint waived according to REACH Annex VII, IX or XI

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.
10.2 Chemical stability	The product is stable.
10.3 Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerisation will not occur.
10.4 Conditions to avoid	Avoid all possible sources of ignition (spark or flame). Avoid excessive heat.
10.5 Incompatible materials	Reactive or incompatible with the following materials: oxidising materials.
10.6 Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information**11.1 Information on toxicological effects****Acute toxicity**

Product/ingredient name	Result / Route	Test authority / Number	Species	Dose	Exposure	Remarks
Fuel oil, residual	LC50 Inhalation Dusts and mists	EPA 798.115	Rat	4500 mg/m ³	4 hours	Based on Carbon black oil
	LC50 Inhalation Dusts and mists	EPA 798.115	Rat	4100 mg/m ³	4 hours	Based on Carbon black oil
	LD50 Dermal	EU B.3	Rabbit	>2000 mg/kg	-	Based on Catalytic cracked clarified oil (CCCO)
	LD50 Dermal	OECD 434	Rabbit	>2000 mg/kg	-	Based on Heavy fuel oil
	LD50 Oral	OECD 401	Rat	5270 mg/kg	-	Based on Catalytic cracked

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LD50 Oral	OECD	401	Rat	4320 mg/kg	-	clarified oil (CCCO) Based on Catalytic cracked clarified oil (CCCO)
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Irritation/Corrosion

Product/ingredient name	Test authority / Test number	Species	Route / Result	Test concentration	Remarks	
Fuel oil, residual	EU	B.4	Rabbit	Skin - Non-irritant to skin.	-	Based on Heavy fuel oil
	EU	B.5	Rabbit	Eyes - Non-irritating to the eyes.	-	Based on Heavy fuel oil

Sensitiser

Product/ingredient name	Route	Test authority / Test number	Species	Result	Remarks	
Fuel oil, residual	skin	EU	B.6	Guinea pig	Not sensitising	Based on Heavy fuel oil

GERM CELL MUTAGENICITY

Product/ingredient name	Test authority / Test number	Cell	Type	Result	Remarks	
Fuel oil, residual	Equivalent to OECD 476	-	Experiment: In vitro	Subject: Mammal - species unspecified	Positive	Based on Catalytic cracked clarified oil (CCCO)
	Equivalent to OECD 471	-	Experiment: In vitro	Subject: Non-mammalian species	Positive	Based on Catalytic cracked clarified oil (CCCO)
	Equivalent to OECD 475	Cell: Germ	Experiment: In vivo	Subject: Unspecified	Negative	Based on Catalytic cracked clarified oil (CCCO)
	Equivalent to OECD 474	Cell: Germ	Experiment: In vivo	Subject: Unspecified	Negative	Based on Catalytic cracked clarified oil (CCCO)

Conclusion/Summary

Not classified. Based on available data, the classification criteria are not met.

Carcinogenicity

Product/ingredient name	Test authority / Test number	Species	Route	Exposure	Result	Remarks	
Fuel oil, residual	Equivalent to OECD	451	Mouse	Dermal	Lifetime	Positive	Based on Catalytic cracked clarified oil (CCCO)

Conclusion/Summary

May cause cancer

Reproductive toxicity

Product/ingredient name	Test authority / Test number	Species	Route	Exposure	Developmental	Maternal toxicity	Fertility	Remarks	
Fuel oil, residual	EPA	OTS 798. 4700	Rat	Dermal	70 days	-	-	Negative	Based on Catalytic cracked clarified oil (CCCO)
	EPA	OTS 798. 4900	Rat	Dermal	20 days	Positive	-	-	Based on atmospheric residue

Conclusion/Summary

Development: Suspected of damaging the unborn child.
Fertility: Based on available data, the classification criteria are not met.
Effects on or via lactation: Based on available data, the classification criteria are not met.

Aspiration hazard

Conclusion/Summary

Not classified. Based on available data, the classification criteria are not met.

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SECTION 11: Toxicological information

Specific target organ toxicity

Product / Ingredient Name	Hazard	Test authority / Test number	Species	Route	Type	Dose	Exposure	Target organs	Remarks	
Fuel oil, residual	STOT - RE	Equivalent to EPA	OPPTS 870.3250	Rat	Dermal	LOAEL	20 to 200 mg/kg	90 days	liver blood	Based on Catalytic cracked clarified oil (CCCO)
	STOT - SE	Equivalent to OECD	401	Rat	Oral	LOAEL	>2000 mg/kg	-	-	Based on Catalytic cracked clarified oil (CCCO)
	STOT - SE	EPA	OTS 798.1150	Rat	Inhalation	LOAEL	10 to 20 mg/l	4 hours	-	Based on Catalytic cracked clarified oil (CCCO)
	STOT - SE	OECD	434	Rabbit	Dermal	LOAEL	>2000 mg/kg	-	-	Based on Catalytic cracked clarified oil (CCCO)

Conclusion/Summary

STOT - SE: Not classified. Based on available data, the classification criteria are not met. Assessment was by using a weight of evidence approach.
 STOT - RE: May cause damage to organs through prolonged or repeated exposure. Liver, blood
 Routes of entry anticipated: Dermal, Inhalation.

Information on the likely routes of exposure

Potential acute health effects

- Inhalation** Harmful if inhaled.
- Ingestion** No known significant effects or critical hazards.
- Skin contact** Will cause burns if hot material contacts skin.
- Eye contact** Will cause burns if hot material contacts eyes.

Symptoms related to the physical, chemical and toxicological characteristics

- Inhalation** Adverse symptoms may include the following:
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness
- Ingestion** No specific data.
- Skin contact** Adverse symptoms may include the following:
irritation
dryness
cracking
- Eye contact** No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

- Inhalation** Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer. May be harmful by inhalation if exposure to vapour, mists or fumes resulting from thermal decomposition products occurs. Vapour, mist or fume may irritate the nose, mouth and respiratory tract.
- Ingestion** If swallowed, may irritate the mouth, throat and digestive system. If swallowed, may cause abdominal pain, stomach cramps, nausea, vomiting, diarrhoea, dizziness and drowsiness.
- Skin contact** As with all such products containing potentially harmful levels of PCAs, prolonged or repeated skin contact may eventually result in dermatitis or more serious irreversible skin disorders including cancer.
- Eye contact** Vapour, mist or fume may cause eye irritation. Exposure to vapour, mist or fume may cause stinging, redness and watering of the eyes.

Potential chronic health effects

- General** May cause damage to organs through prolonged or repeated exposure. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis. Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer.

SECTION 11: Toxicological information

Other chronic toxicity data	As with all such products containing potentially harmful levels of PCAs, prolonged or repeated skin contact may eventually result in dermatitis or more serious irreversible skin disorders including cancer. Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer.
Carcinogenicity	May cause cancer. Risk of cancer depends on duration and level of exposure.
Mutagenicity	No known significant effects or critical hazards.
Developmental effects	Suspected of damaging the unborn child.
Fertility effects	No known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Test authority / Test number	Species	Type / Result	Exposure	Effects	Remarks
Fuel oil, residual	OECD 202	Daphnia	Acute EL50 2 mg/l Nominal Fresh water	48 hours	Mobility	Based on Heavy fuel oil
	OECD 203	Fish	Acute LL50 79 mg/l Nominal Fresh water	96 hours	-	Based on residual fuel oil
	Modelled data	Daphnia	Chronic NOEL 0.27 mg/l Nominal Fresh water	21 days	Reproduction	-
	Modelled data	Fish	Chronic NOEL 0.1 mg/l Nominal Fresh water	28 days	Mortality	-

Environmental hazards Very toxic to aquatic life with long lasting effects.

12.2 Persistence and degradability

IOPC Persistent / not persistent. oil: Persistent

12.3 Bioaccumulative potential

This material may accumulate in sediments.

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}) Not available.

Mobility Spillages may penetrate the soil causing ground water contamination.

12.5 Results of PBT and vPvB assessment

PBT Not available.

vPvB Not available.

12.6 Other adverse effects

Other ecological information This product has a density close to that of water. Spills are unlikely to form a distinct film on the water surface, and may become dispersed as globules if mixed or agitated. If released to water the product may sink.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal Where possible, arrange for product to be recycled. Dispose of via an authorised person/ licensed waste disposal contractor in accordance with local regulations.

Hazardous waste Yes.

European waste catalogue (EWC)

Waste code	Waste designation
13 07 01*	fuel oil and diesel

However, deviation from the intended use and/or the presence of any potential contaminants may require an alternative waste disposal code to be assigned by the end user.

Packaging

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SECTION 13: Disposal considerations

Methods of disposal

Where possible, arrange for product to be recycled. Dispose of via an authorised person/ licensed waste disposal contractor in accordance with local regulations.

Special precautions

This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Empty containers represent a fire hazard as they may contain flammable product residues and vapour. Never weld, solder or braze empty containers. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Other information

Empty packages may contain some remaining product. Hazard warning labels are a guide to the safe handling of empty packaging and should not be removed.

Empty containers represent a fire hazard as they may contain flammable product residues and vapour. Never weld, solder or braze containers unless they are cleaned and do not contain flammable vapours and residues.

At sea, used or unwanted product should be stored for eventual discharge into port approved waste oil disposal facilities.

Dusts generated during the removal of ash deposits from engine/boiler combustion surfaces or exhaust spaces, will be harmful if inhaled and may cause nausea and eye, nose and throat irritation. Repeated contact may result in serious irreversible disorders.

Before working in combustion/exhaust spaces or handling fuel oil ash/dust the area should be thoroughly damped down with water. If this is not possible, wear full breathing apparatus or positive pressure filter sets. Protective clothing must always be worn. When inspecting combustion/exhaust spaces, wear full face dust respirator and protective clothing.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	UN 3082	UN 9003	UN 3082	UN 3082
14.2 UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Heavy fuel oil)	SUBSTANCES WITH A FLASH-POINT ABOVE 60°C AND NOT MORE THAN 100°C. (Heavy fuel oil)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Heavy fuel oil).	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Heavy fuel oil)
14.3 Transport hazard class(es)	9 	9 	9 	9
14.4 Packing group	III	III	III	III
14.5 Environmental hazards	Yes.	Yes.	Yes.	No.
Additional information	<u>Hazard identification number</u> 90 <u>Tunnel code</u> E	<u>Remarks</u> Table:C.Danger: 9+ (N2,CMR, F or S).	<u>Emergency schedules (EmS)</u> F-A, S-F	-

14.6 Special precautions for user

Not available.

ADR/RID Classification code:

M6

ADN Classification code:

M6

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Proper shipping name
Ship type

fuel and residual oils, including ship's bunkers
3

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

For non-fuel uses - "Restricted to Professional Users. Attention - avoid exposure - obtain special instructions before use". Must be marked on packaging.

Other regulations

REACH Status

For the REACH status of this product please consult your company contact, as identified in Section 1.

United States inventory (TSCA 8b)

All components are listed or exempted.

Australia inventory (AICS)

All components are listed or exempted.

Canada inventory

All components are listed or exempted.

China inventory (IECSC)

All components are listed or exempted.

Japan inventory (ENCS)

All components are listed or exempted.

Korea inventory (KECI)

Not determined.

Philippines inventory (PICCS)

Not determined.

15.2 Chemical Safety Assessment

Complete.

SECTION 16: Other information

Abbreviations and acronyms

ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
 ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
 ATE = Acute Toxicity Estimate
 BCF = Bioconcentration Factor
 CAS = Chemical Abstracts Service
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 CSA = Chemical Safety Assessment
 CSR = Chemical Safety Report
 DMEL = Derived Minimal Effect Level
 DNEL = Derived No Effect Level
 DPD = Dangerous Preparations Directive [1999/45/EC]
 DSD = Dangerous Substances Directive [67/548/EEC]
 EINECS = European Inventory of Existing Commercial chemical Substances
 ES = Exposure Scenario
 EUH statement = CLP-specific Hazard statement
 EWC = European Waste Catalogue
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals
 IATA = International Air Transport Association
 IBC = Intermediate Bulk Container
 IMDG = International Maritime Dangerous Goods
 LogPow = logarithm of the octanol/water partition coefficient
 MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
 OECD = Organisation for Economic Co-operation and Development
 PBT = Persistent, Bioaccumulative and Toxic
 PNEC = Predicted No Effect Concentration
 RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
 RRN = REACH Registration Number
 SADT = Self-Accelerating Decomposition Temperature
 SVHC = Substances of Very High Concern
 STOT-RE = Specific Target Organ Toxicity - Repeated Exposure
 STOT-SE = Specific Target Organ Toxicity - Single Exposure
 TWA = Time weighted average
 UN = United Nations

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SECTION 16: Other information

UVCB = Complex hydrocarbon substance
 VOC = Volatile Organic Compound
 vPvB = Very Persistent and Very Bioaccumulative

Full text of abbreviated H statements

H220 Extremely flammable gas.
 H280 Contains gas under pressure; may explode if heated.
 H315 Causes skin irritation.
 H330 Fatal if inhaled.
 H332 Harmful if inhaled.
 H350 May cause cancer.
 H361d Suspected of damaging the unborn child.
 H373 May cause damage to organs through prolonged or repeated exposure.
 H400 Very toxic to aquatic life.
 H410 Very toxic to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS]

Acute Tox. 2, H330 ACUTE TOXICITY: INHALATION - Category 2
 Acute Tox. 4, H332 ACUTE TOXICITY: INHALATION - Category 4
 Aquatic Acute 1, H400 ACUTE AQUATIC HAZARD - Category 1
 Aquatic Chronic 1, H410 LONG-TERM AQUATIC HAZARD - Category 1
 Carc. 1B, H350 CARCINOGENICITY - Category 1B
 Flam. Gas 1, H220 FLAMMABLE GASES - Category 1
 Press. Gas Comp. Gas, H280 GASES UNDER PRESSURE - Compressed gas
 Repr. 2, H361d TOXIC TO REPRODUCTION [Unborn child] - Category 2
 Skin Irrit. 2, H315 SKIN CORROSION/IRRITATION - Category 2
 STOT RE 2, H373 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2

Full text of abbreviated R phrases

R12- Extremely flammable.
 R45- May cause cancer.
 R63- Possible risk of harm to the unborn child.
 R26- Also very toxic by inhalation.
 R20- Also harmful by inhalation.
 R48/21- Also harmful: danger of serious damage to health by prolonged exposure in contact with skin.
 R38- Irritating to skin.
 R66- Repeated exposure may cause skin dryness or cracking.
 R50- Very toxic to aquatic organisms.
 R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Full text of classifications [DSD/DPD]

F+ - Extremely flammable
 Carc. Cat. 2 - Carcinogen category 2
 Repr. Cat. 3 - Toxic to reproduction category 3
 T+ - Very toxic
 Xn - Harmful
 Xi - Irritant
 N - Dangerous for the environment

History

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Prepared by Product Stewardship

 **Indicates information that has changed from previously issued version.**

Notice to reader

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