SAFETY DATA SHEET

SECTION 1: IDENTIFICATION

1.1 Product Identifier

Product Name	Marine Fuel Oil
Chemical name	Fuel Oil, residual
Trade name	Heavy Fuel Oil
Product type	Liquid
CAS No.	68476-33-5

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

Identified Use(s)	Use only as fuel Fuel for industrial, marine, and commercial boilers and furnaces; fuel for low and medium speed diesel engines

The product should not be used for purposes other than those shown above without first referring to the supplier and obtaining written handling instructions.

1.3 Details of the supplier of the safety data sheet

Company Identification	Monjasa AS Strevelinsvej 34 7000 Fredericia Denmark

1.4 Emergency telephone number: the details below are available 24/7

Country	Emergency Contact Number	Email
Angola	+244 222002243	angola@monjasa.com
Cyprus	+357 25 123 200	cyprus@monjasa.com
Denmark	+45 70 260 230	denmark@monjasa.com
Dubai	+971 4 420 8600	dubai@monjasa.com
Namibia	+264 64 201 2180	namibia@monjasa.com
Panama	+507 2 025 231	americas@monjasa.com
Singapore	+65 3163 4000	singapore@monjasa.com
Stamford	+1 203 276 6300	americas@monjasa.com
Vietnam	+84 28 6287 5952	vietnam@monjasa.com

SECTION 2: HAZARD IDENTIFICATION

2.1 Classification of the substance or mixture

Regulation (EC) No 1272/2008 (CLP)

Asp. Tox. 1; H304
Acute Tox. 4; H332
Carc. 1B; H350
Repr. 2; H361d
STOT RE 2; H373 (Thymus, Liver, blood effects)
Aquatic Acute 1; H400
Aquatic Chronic 1; H410

2.2 Label elements

Signal word(s)	Danger

Warning statement	Combustible liquid and vapor Avoid prolonged and repeated skin contact. Launder Contaminated Clothing. May be harmful if swallowed, inhaled, or absorbed through skin. Use only as fuel Heated material can cause thermal burns
Hazard Pictogram (s)	

Hazard statement

Skin	Brief contact may cause slight irritation. Repeated or prolonged contact may cause more severe irritation and discomfort, seen as local oil acne, redness, itching, inflammation, cracking and possible secondary infection. May cause allergic reactions in some individuals. Absorption from prolonged or repeated skin contact may cause systemic toxicity. Skin contact may produce a sunburn-like condition through an increased sensitivity to sunlight or other light sources. Contact with heated material may cause thermal burns.
Eye	May cause slight eye irritation, experienced as mild discomfort and seen as slight excess redness of the eye.
Inhalation	May cause respiratory tract irritation. May release toxic hydrogen sulfide vapors and cause harmful central nervous system effects. Effects may include headache, dizziness, drowsiness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death.
Ingestion	May be irritating to mouth, throat, and stomach. Symptoms may include pain, nausea, vomiting, and diarrhea.
Long Term Toxic Effects	Suspect cancer hazard. Contains a component(s) that may cause cancer. Risk of cancer depends on duration and level of exposure. Toxic gas hazard. Very toxic to aquatic life with long lasting effects. See section 11 for additional information.
Precautionary statement	Obtain special instruction before use Do not breathe dust/fume/gas/mist/vapours/spray Use personal protective equipment as required. IF SWALLOWED: Immediately call a POISON EMERGENCY CENTER or doctor/physician. Do NOT induce vomiting. Avoid release to the environment.

2.3 Other hazards

Product may release Hydrogen Sulphide: A specific assessment of inhalation risks from the presence of hydrogen sulphide in tank headspaces, confined spaces, product residue, tank waste and waste water, and unintentional releases should be made to help determine controls appropriate to local circumstances. Remove contaminated clothing and wash clothing before reuse. Vapour may create explosive

atmosphere.The vapour is heavier than air; beware of pits and confined spaces.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Substance	CAS No.	EC No.	Range in %
Fuel Oil, Residual	68476-33-5	270-675-6	100

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Self-protection for the first aider: The vapour is heavier than air; beware of pits and confined spaces. If it is suspected that fumes are still present, the responder should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Avoid all contact. Do not ingest. If swallowed, then seek immediate medical assistance.

H2S Warning: Hydrogen sulphide (H2S) can accumulate in the headspace of storage tanks and reach potentially hazardous concentrations.
If there is any suspicion of inhalation: A self-contained breathing apparatus should be worn. Remove to fresh air immediately.

Skin Contact Wash skin thoroughly with plenty of water, using soap if available. Remove contaminated clothing. In case of burns through contact with hot product, cool with plenty of running water. Get medical attention.

Eye Contact Rinse immediately with plenty of water until irritation subsides, or at least 15 min. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Splashes of hot product should be immediately flushed with clean water until irritation subsides. Get immediate medical attention.

Inhalation In emergency situations use proper respiratory protection to immediately remove the affected victim from exposure. If not breathing, ensure clear airway. Remove to fresh air. Administer artificial respiration if breathing has stopped. If breathing is difficult, qualified medical personnel may administer oxygen. Keep at rest. Call for prompt medical attention.

Ingestion If swallowed, DO NOT induce vomiting. Aspiration of the material can cause serious lung injury such as chemical pneumonia. Call a doctor immediately. If spontaneous vomiting occurs, keep head below hips to prevent aspiration and monitor for breathing difficulty. Never give anything by mouth to an unconscious person.

Advice to Doctor This product may present an aspiration hazard. See related comments in this MSDS. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours. The use of nitrites in H2S poisoning is recommended as part of the treatment regimen, although the efficacy has not been unequivocally demonstrated. Hyperbaric oxygen therapy (as used in cyanide poisoning with some success) may also benefit if other measures are ineffective.

4.2 Most important symptoms and effects, both acute and delayed

Inhalation: Vapour may be irritant to the respiratory tract.
Skin Contact: Repeated and/or prolonged skin contact may cause irritation.
Eye Contact: May cause eye irritation.
Ingestion: Aspiration hazard. Aspiration into the lungs may cause chemical pneumonitis, which can be fatal.

4.3 Indication of any immediate medical attention and special treatment needed

If breathing is laboured, oxygen should be administered by qualified personnel.
In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Note to a physician:

IF INHALED: If unconscious, place in recovery position and get medical attention immediately. Administer oxygen if available and artificial respiration if necessary.
IF SWALLOWED: Do not induce vomiting because of risk of aspiration into the lungs. If aspiration is suspected obtain immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration into the lungs.

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Appropriate: Use water fog, foam, dry chemical, or carbon dioxide (CO_2) to extinguish flames.
Inappropriate: Straight streams of water.

5.2 Special hazards arising from the substance or mixture

Fire and explosion hazards

Combustible material, low hazard. The product can form flash point. However, in a small percentage of residual fuels, light hydrocarbon components can generate flammable headspace gases not detectable by the flash point test. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop leak. Use water to flush spills away from sources of ignition.

5.3 Advice for firefighters

Water fog spray, to cool fire-exposed surfaces (e.g. containers) and to protect personnel, should only be used by personnel trained in firefighting. Cut off “fuel”. depending on circumstances, either allow the fire to burn out under controlled conditions or use foam or dry chemical powder to extinguish the fire.
Respiratory and eye protection required for firefighting personnel exposed to fumes or smoke.

5.4 Hazardous Combustion Products

Smoke, sulphur oxides, and carbon monoxide in the event of incomplete combustion. Possible release of hydrogen sulphide during heating or hot storage

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1	**Personal precautions**	Caution - spillages may be slippery. Ensure operatives are trained to minimize exposures. Ensure suitable personal protection during removal of spillages. Eliminate sources of ignition. Shut off leaks if without risk. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid all contact with substance. Ensure adequate ventilation. Do not breathe vapour. Do not ingest. If swallowed, then seek immediate medical assistance. Do not use sparking tools. See Section 8.
	H2S Warning	Product may release Hydrogen Sulphide. Exposure controls – These controls may include: Segregation of areas, Access only to authorized persons, Permit to work systems, Confined space working procedures, Area H2S alarms, Personal H2S alarms, Personal escape sets, H2S awareness training. Please see section 8 for appropriate personal protection equipment
	Small spills:	Wear flame-resistant antistatic protective clothing.
	Large spills:	Evacuate the area and keep personnel upwind. Drench contaminated clothing with water before removing to avoid risk of sparks from static electricity. Avoid all contact. Wear chemical protection suit and breathing apparatus. See Section 8.
6.2	**Environmental precautions**	Avoid release to the environment. Do not allow to enter drains, sewers or watercourses. In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. If necessary: Dike area to contain the spill and prevent releases to sewers, drains, or other waterways.
6.3	**Methods and material for containment and clean up**	Provided it is safe to do so, isolate the source of the leak. The vapour is heavier than air; beware of pits and confined spaces. Ensure that the equipment is adequately grounded. Allow small spillages to evaporate provided there is adequate ventilation.
	Land Spill	Shut off source taking under normal safety precautions. Prevent liquid from entering sewers, water courses or low-lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation. Take measures to minimize the effects on ground water. Recover by skimming or pumping using explosion-proof equipment, or contain spilled liquid with booms, sand, or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.
	Water Spill	Confine the spill immediately with booms. Warn other shipping. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. Disperse the residue in unconfined waters, if permitted by local authorities and environmental agencies.
6.4	**Reference to other sections**	For guidance on selection of personal protective equipment see Section 8

of this Safety Data Sheet notify authorities if any exposure to the general public or the environment occurs or is likely to occur. For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet.
Local authorities should be advised if significant spillages cannot be contained.
Maritime spillages should be dealt with using a Shipboard Oil Pollution Emergency Plan (SOPEP), as required by MARPOL Annex 1 Regulation 26.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin. Use proper bonding and/or grounding procedures. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source).

7.2 Storage

Keep container closed. Handle containers with care. Open slowly to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be grounded and bonded. Drums must be grounded and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters.
Keep only in original packaging. Containers must be properly labelled. Keep containers properly sealed when not in use. Protect from sunlight. Containers of this material may be hazardous when empty since they retain product residue. Empty container may contain product residue which may result in flammable or explosive vapours inside the container.

Storage temperature	Stable at ambient temperature
Incompatible materials	Keep away from oxidizing agents

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Engineering controls

Ventilation and other forms of engineering controls are often the preferred means for controlling chemical exposure.

8.2 Personal Protection

In open systems where contact is likely, wear safety goggles, chemical-resistant overalls, and chemically impervious gloves. Where only incidental contact is likely, wear safety glasses with side shields. No other special precautions are necessary provided skin/eye contact is avoided.

Eye/ face protection

Avoid eye contact. The wearing of chemicals safety goggles, or face shield is recommended.

Skin protection

Avoid contact with skin or clothing. Skin contact can be minimized by wearing impervious protective clothing including gloves. Protective clothing made from neoprene, nitrile, or n-butyl rubber is suitable in these applications.
Exposed employees should exercise reasonable personal cleanliness; this includes cleansing exposed skin several times daily with soap and

water and laundering or dry-cleaning soiled work clothing at least weekly.

Respiratory protection

If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:
No special requirements under ordinary conditions of use and with adequate ventilation.
For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Inhalation

If operating conditions create airborne concentrations that are excessive and may exceed the exposure standard(s), the use of an approved respirator is recommended.

8.3 Environmental exposure controls Avoid release to the environment.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Basic physical and chemical properties

Boiling Point	> 204.4 C
Flash Point	> 60 deg. C
Flammability	Not determinate
Vapour Pressure	Negligible
Vapour Density at 1 Bar (Air=1)	Heavier than air
Density	g/ml: at 15 deg. C range 0.94 - 1.01 (varies with grade)
Auto-ignition	Not determinate
Viscosity	mm2/S: 30-700 at 50 deg. C
Pour Point	< 10 C
Benzene	Not determinate
Hydrogen Sulfide	Not determinate
Sulphur	< 4.5%
Appearance	Black viscous liquid, may be coloured
Odour	Petroleum Oil like

SECTION 10: STABILITY AND REACTIVITY

10.1 Stability Material is stable under normal conditions.
Hazardous polymerisation will not occur. Product may release Hydrogen Sulphide.

10.2 Reactivity Stable under normal conditions. Reacts with - Strong oxidising agents

10.3 Possibility of hazardous reactions Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. Product may release Hydrogen Sulphide.

10.4 Conditions to avoid Elevated temperature: > 50 °C
Keep away from heat, sources of ignition and direct sunlight.

10.5	**Incompatible materials**	Avoid contact with strong oxidants such as liquid chlorine and concentrated oxygen.
10.6	**Hazardous decomposition products**	Material does not decompose at ambient temperatures.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Skin Contact	Prolonged or repeated contact may dry and defeat the skin, leading to irritation and possibly dermatitis. Prolonged or repeated contact may also lead to more serious skin disorders, including skin cancer. Exposure to hot material may cause thermal burns.
Eye Contact	Hot splashes may cause eye burns and permanent tissue damage.
Inhalation	Negligible hazard at ambient/normal handling temperatures. In high concentrations and/or at elevated temperatures, vapour or mist is irritating to mucous membranes, may cause headaches and dizziness, may be anaesthetic and may cause other central nervous system effects. Contains small amount of hydrogen sulphide which can accumulate to dangerous levels in the air space above the material.
Ingestion	Minute amounts aspirated into the lungs during ingestion or vomiting may cause severe pulmonary injury and death.
Chronic	Lifetime skin painting tests indicate that materials of similar composition have produced skin cancer in experimental animals. The relationship of these results to humans has not been fully established. Contains polynuclear aromatic hydrocarbons (PNAS). Prolonged and/or repeated skin contact with certain PNAs has been shown to cause skin cancer. Prolonged and/or repeated exposures by inhalation of certain PNAs may also cause cancer of the lung and of other sites of the body.

11.2 Toxicity Data

Acute	The exact composition of this product may vary, and the potential health hazards described were based upon the possible components.
Chronic	Based on what is known of this product and of materials of similar composition and refining history, this product would be expected to have carcinogenic potential.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

In the absence of specific environmental data for this product, this assessment is based on information for general hydrocarbon components found in residual fuels. Residual fuels, immediately following a release into the environment, will remain largely on the soil surface, and in water, will distribute largely between the water and sediment surfaces. Based on chemical/physical information from the literature for selected components in this product, harmful effects to terrestrial and aquatic habitats could occur. This product is expected to be resistant to biodegradation and to persist in the environment. Very toxic to aquatic life with long lasting effects

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste Disposal

This product contains hazardous ingredients listed in Section 2. Collect and dispose of it at an authorized disposal facility, in conformance with national and local regulations, and in accordance with directives on hazardous waste.
Do not empty into drains,

SECTION 14: TRANSPORT INFORMATION

14.1 UN Number 3082

14.2 Proper Shipping Name Environmentally Hazardous Substance, Liquid, Fuel Oil Residual

SECTION 15: REGULATORY INFORMATION

For current health and safety information on marine fuels, contact any Sales Representative in the country where the bunker purchase took place.

SECTION 16: OTHER INFORMATION

PRODUCT TYPE / USES:
Heavy fuel oil for large slow speed marine diesel engines, steamships, and as blending stock for intermediate marine diesel fuels.

SOURCE OF KEY DATA:
The recommendations presented in this Safety Data Sheet were compiled from actual test data (when available), comparison with similar products, component information from suppliers and from recognized codes of good practice.

----------NOTE----------

The information and recommendations contained herein are, to the best of knowledge and belief, accurate and reliable as of the date issued, but are offered without guarantee or warranty, express or implied. They relate to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Conditions of use of the material are under the control of the user; therefore, it is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use.

Health and safety precautions and environmental advice noted in this safety data sheet may not be accurate for all individuals and/or situations.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations.

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