



SDS – SAFETY DATA SHEET

SDS N°: 019

FUEL OIL FOR BUNKER (MARINE FUELS) - VLSFO 0.5% (380)

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1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: FUEL OIL FOR BUNKER (MARINE FUELS) - VLSFO 0.5% (380)

Internal reference product identification: REAM 019

Company: REFINARIA DE MANAUS S.A.

Address: Rua Rio Quixito, 1 – Vila Buriti - CEP 69.072-070 – Manaus, AM - Brasil.

Telephone: 55 (92) 3042-2918.

Emergency Telephone number: 55 (92) 3042-2918.

E-mail: smsseguranca@ream.com.br

Use of
Substance/Mixture: Used as fuel.

Be handled near ignition sources.

Use not recommended:

2. HAZARDS IDENTIFICATIONS

Classification system adopted: Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Classification of the substance or mixture:

Flammable liquids: Category 3

Acute toxicity – Oral: Category 4

Skin irritation: Category 2

Carcinogenicity: Category 2

Specific target organ toxicity – Single exposure: Category 3

Specific target organ toxicity – repeated exposure, Inhalation: Category 2

Aspiration hazard: Category 1

Acute aquatic toxicity: Category 2

Chronic aquatic toxicity: Category 2

GHS Label elements, including precautionary statements

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Pictogram:		
Signal word:	Danger	

Hazard statement(s):

H226 - Flammable liquid and vapour.

H305 - May be fatal if swallowed and enters airways.

H315 - Causes skin irritation.

H332 - Harmful if inhaled.

H336 - May cause drowsiness or dizziness.

H351 - Suspected of causing cancer.

H373 - May cause damage to organs (Respiratory system, Central nervous system, Liver, Kidney) through prolonged or repeated exposure if inhaled.

H411 - Toxic to aquatic life with long lasting effects.

Precautionary statement(s):

P201 - Obtain special instructions before use.

P202 - Do not handle until all safety precautions have been read and understood.

P260 - Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.

P261 - Avoid breathing dust/fume/gas/mist/vapours/spray.

P264 - Wash skin thoroughly after handling.

P273 - Avoid release to the environment.

P280 - Wear protective gloves/ eye protection/ face protection.

P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water.

P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.

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

P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

P391 - Collect spilled product.

P403 + P233 - Store in a well-ventilated place. Keep container tightly closed.

P403 + P235 - Store in a well-ventilated place. Keep cool.

P501 - Dispose of contents/ container to an approved waste disposal plant.



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3. COMPOSITION/ INFORMATION ON INGREDIENTS

Product: Mixture

Chemical Name: Marine diesel oil - LSMGO 0.1%.

Hazardous componentes

N°.	Component	CAS	Concentration %
	Fuel Oil A	****	**
01	Fuel Oil	68476-30-2	**
02	Sulfur	7704-34-9	0.5 mg/kg

4. FIRST AID MEASURES

Description of first aid measures

If inhaled:	If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician. Show this safety data sheet to the doctor in attendance.
In case of skin contact:	Wash off with soap and plenty of water. If skin irritation: Consult a physician.
In case of eye contact:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Consult a physician.
If swallowed:	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Beware of the risk of aspiration. Get medical attention.
Most important symptoms and effects, both acute and delayed:	Causes skin irritation with redness, dryness. Causes severe eye irritation with redness, pain and tearing. May cause upper airway irritation if inhaled with coughing, headache. May cause damage to the respiratory tract and central nervous system and liver through prolonged and repeated exposure. It can be fatal if aspirated if it enters the airways, resulting in chemical pneumonia.
Information to the doctor:	Avoid contact with this product while helping the victim. If necessary, symptomatic treatment must include, specially, support measures to correct electrolyte, metabolic disorders, as well as respiratory assistance. In case of contact with the skin does not rub the affected site.

5. FIREFIGHTING MESURES

Suitable extinguishing media:	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. (CO ₂), compatible with hydrocarbon foam.
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Not appropriate extinguishing material: Jet moorhen with great flow directly over the burning liquid.

Special hazards arising from the substance or mixture:

Very dangerous when exposed to excessive heat or other sources of ignition: open flames, sparks or open flames from matches and cigarettes, welding operations, pilot lamps and electric motors. Can accumulate static charge by flow or agitation. The vapors of heated liquid can be ignited by static discharge. Vapors may be heavier than air and tend to accumulate in low or confined areas, as sewers and basements. They can travel long distances causing retrogression of the flame or new fires both in open environments as confined. Containers may explode if heated. The combustion of the chemical or its packaging can form toxic and irritant gases as carbon monoxide and carbon dioxide.

Advice for firefighters:

Respiratory protection equipment independent type (SCBA) with positive pressure and full protective clothing. Containers and tanks involved in the fire should be cooled with water fog.

Additional information: Cool closed containers exposed to fire with water spray. Away containers from area if it can be done without risk. Avoid underground and surface water contamination of water with fire fighting water.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

Recommendations for people who are not part of the emergency services:

Evacuate personnel to safe areas.

Personal precautions, protective equipment and emergency procedures:

Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Evacuate the area within a radius of 50 meters. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. For personal protection see section 8.

Environmental precautions:

Contain release to prevent soil and water contamination. In case of significant spill local authorities should be advised and earth dikes, sand or similar should be fitted for retention.



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Methods and materials for containment and cleaning up:

Use water mist or vapor suppressing foam to reduce the dispersion of the vapors. Do not allow water ingress into the containers. Use natural barriers or spill containment. Collect the spilled material and place in appropriate containers. Adsorbs the remaining product with sand, vermiculite or any other inert material. Place the adsorbed material into suitable containers and remove them to a safe place. Use tools that do not cause sparks to collect absorbed material. For disposal, proceed conform Section 13 of this SDS.

Differences in the action of large and small leaks:

Large Spill: Confine the liquid into a dike away from the spill for subsequent proper disposal. water fog may be used to reduce vapors, but this will not prevent ignition in indoors.

Cleaning techniques:

Any disposal method should comply with the laws and local regulations. Dont discard in the drain, on the ground or into any body or water source. Dispose of contents/ container to an approved incineration plant. This product should not be allowed to enter drains, waterways or soil. Dispose of in accordance with local regulations.

7. HANDLING AND STORAGE

Appropriate technical measures for handling

Precautions for safe handling:

Handle in a ventilated area or general ventilation system / local exhaust ventilation. Avoid generation of vapors and mists. Avoid exposure to the chemical. Avoid contact with incompatible materials. No smoking. Use personal protective equipment as described in Section 8.

Hygiene measures:

Handle in accordance with established safety standards. Use personal protective equipment (PPE). Avoid contact with eyes, skin and respiratory tract. Keep containers always tightly closed. Wash your hands before eating, drinking, smoking and using the toilet. Contaminated clothing or PPE must not come into contact with food.

Conditions for safe storage, including any incompatibilities

Fire and explosion prevention:

Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Keep container tightly sealed. Ground the container vessel and the product receiver during transfer. Only use anti-sparking tools. Avoid the accumulation of electrostatic charges. Use electrical equipment, ventilation and explosion-proof lighting.

Appropriate Conditions:

Keep container tightly closed in a dry and well-ventilated place, away from sunlight. Keep stored at room temperature not exceeding 35 ° C. Storage class (TRGS 510): Flammable liquids.

Conditions to avoid:

Proximity flames, hot surfaces, incompatible materials and ignition sources. It is not necessary stabilizers and antioxidants added to ensure product durability.



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Packaging materials:

Similar to the original packaging.

8. EXPOSURE CONTROL/ PERSONAL PROTECTION

Components with workplace control parameters

Component	Value	Control parameters	Basis
Fuel Oil	TWA	100 mg/m ³	USA. ACGIH Threshold Limit Values (TLV)

Biological occupational exposure limits

The product does NOT contain substances with Biological occupational exposure limits

Appropriate engineering controls:

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Off direct mechanical ventilation and exhaust system to the outside environment. These measures help reduce the exposure to the chemical. Keep the atmospheric concentrations of the constituents of the product, below the limits of occupational exposure indicated.

Personal protective equipment

Eye/ face protection:

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin/ body Protection:

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. Impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Use Closed shoes.

Respiratory Protection:

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

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Thermal hazards: Does not present thermal hazards.

Control of environmental exposure: Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES *

a) Appearance: **Form:** Viscous liquid.
Colour: Dark.

b) Odour: No data available

c) Odour Threshold: No data available

d) pH: No data available

e) Melting point/ Freezing Point: No data available

f) Initial boiling point and boiling range: No data available

g) Flash point: 60,0 °C (140 °F)

h) Evaporation rate: No data available

i) Flammability (sólid, gas): No data available

j) Upper/ lower flammability or explosive limits: No data available

k) Vapour pressure: No data available

l) Vapour density: No data available

m) Relative density: 0.9818 g/cm³ at 20°C (68.0 °F)

n) Water solubility: Insoluble

o) Partition coefficient: n-octanol/ water: No data available

p) Auto-ignition temperature: No data available

q) Decomposition temperature: No data available

r) Viscosity: No data available

s) Explosive properties: No data available

t) Oxidizing properties: No data available

Based on the pure solvent values according SDS.

10. STABILITY AND REACTIVITY

Stability: Stable under recommended storage conditions.

Possibility of hazardous reactions: None under recommended conditions of use.

Conditions to avoid: Heat, flames, sparks and contact with incompatible materials.

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Incompatible Materials: Oxidizing agents.

Hazardous decomposition products: Burning the material can generate toxic gases containing carbon oxides and hydrogen sulfide.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:	LD ₅₀ (oral, rat): >5000 mg/kg LC ₅₀ (Dermal, rabbit): >3000 mg/l. LC ₅₀ (Inhalation, rat): No data available.
Skin corrosion/ irritation:	Causes mild skin irritation, redness and dryness.
Serious eye damage/ eye irritation:	Causes severe eye irritation with redness and lacrimation.
Respiratory or skin sensitisation:	May cause sensitisation by skin contact. Not expected to cause respiratory sensitization.
Germ cell mutagenicity:	Not expected.
Carcinogenicity:	Suspected of causing cancer.
Reproductive Toxicity:	Not expected.
Specific target organ toxicity - single exposure:	May cause drowsiness, dizziness.
Specific target organ toxicity - repeated exposure:	May cause damage to organs through prolonged or repeated exposure
Aspiration hazard:	Not expected.

12. ECOLOGICAL INFORMATION

Toxicity:	- Reference: <i>Fuel Oil A</i>. Toxicity to fish LC₅₀ - <i>Fish</i> - >1 - ≤10 mg/l - 96 h. Toxicity to daphnia and other aquatic invertebrates LC₅₀ - <i>Daphnia magna</i> (Water flea) - >1 - ≤10 mg/l - 48 h Toxicity to algae LC₅₀ - <i>Algae</i> - >1 - ≤10 mg/l - 48 h - Reference: <i>Fuel Oil</i>. Toxicity to fish LC₅₀ - <i>Oncorhynchus mykiss</i> (rainbow trout) - 21 mg/l - 96 h. Toxicity to daphnia and other aquatic invertebrates LC₅₀ - <i>Daphnia magna</i> (Water flea) - 68 mg/l - 48 h Toxicity to algae LC₅₀ - <i>Algae</i> (<i>Pseudokirchnerella subcapitata</i>) - 22 mg/l - 72 h
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Persistence and degradability: The product is expected to be persistent and not rapidly degraded.



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Bioaccumulative potential: Fuel Oil - Log K_{OW}: 3.3 - 7.06.

Mobility in soil: No data available.

Other adverse effects: There are not known other environmental effects for this product.

13. DISPOSAL CONSIDERATIONS

Product: Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting, as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Product residues : Keep the product remains in its original packaging and properly closed. Disposal should be carried out as established for the product.

Contaminated packaging: Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

DOT (US) – U.S. Department of Transportation

UN Number: 1268

Proper shipping name: PETROLEUM DISTILLATES, N.O.S.

Class: 3

Packing group: III

Reportable Quantity (RQ): No

Poison Inhalation Hazard: No

IMDG

IMDG – International Maritime Dangerous Goods Code

UN Number: 1268

EMS-No: F-E, S-D

Class: 3

Packing group: III



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Proper shipping name: DIESEL or DIESEL OIL or HEATING OIL, LIGHT

IATA

IATA – “International Air Transport Association”

UN Number: 1268

Class: 3

Packing group: III

Proper shipping name: PETROLEUM DISTILLATES, N.O.S.

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

Specific regulations: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 313:

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

16. OTHER INFORMATION

Important information, but not specifically described in the previous sections.

HMIS Rating

Health hazard: 3

Flammability: 2

Reactivity Hazard: 0

NFPA Rating

Health hazard: 3

Flammability: 2

Reactivity Hazard: 0

ACGIH – American Conference of Governmental Industrial Hygienists

AIHA – American Industrial Hygiene Association

BCF – Bioconcentration Factor

BEI – Biological Exposure Index

CAS – Chemical Abstracts Service

DL₅₀ – Dose letal 50%

IARC – International Agency for Research on Cancer

IBMP – Índice Biológico Máximo Permitido

IDLH – Immediately Dangerous to Life or Health

ERPG – Emergency Response Planning Guidelines

LEI – Limite de Explosividade Inferior

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LES – Limite de Explosividade Superior
LT – Limite de Tolerância
NIOSH – *National Institute for Occupational Safety and Health*
NR – Norma Regulamentadora
OSHA – *Occupational Safety & Health Administration*
PEL – *Permissible Exposure Limit*
REL – *Recommended Exposure Limit*
STEL – *Short Term Exposure Limit*
TLV – *Threshold Limit Value*
TWA – *Time Weighted Average*

Further information

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Refinaria de Manaus S.A shall not be held liable for any damage resulting from handling or from contact with the above product.

Preparation Information

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIALS HYGIENISTS. TLVs® and BEIs®: Based on the Documentation of the Threshold Limit Values (TLVs®) for Chemical Substances and Physical Agents & Biological Exposure Indices (BEIs®). Cincinnati-USA, 2014.

EPA dos EUA. 2011. EPI Suite™ for Microsoft® Windows, v 4.10. United States of America: Environmental protection agency, Washington. 2011. Available in: <<http://www.epa.gov/oppt/exposure/pubs/episuite.htm>>. Access: 2017, Sep.

Globally Harmonized System of Classification and Labelling of Chemicals (GHS). 6. rev. ed. New York: United Nations, 2015.

HSDB – HAZARDOUS SUBSTANCES DATA BANK. Available in: <<http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>>. Access: 2017, Sep.

IARC – INTERNATIONAL AGENCY FOR RESEARCH ON CANCER. Available in: <<http://monographs.iarc.fr/ENG/Classification/index.php>>. Access: 2017, Sep.

IPCS – INTERNATIONAL PROGRAMME ON CHEMICAL SAFETY – INCHEM. Available in: <<http://www.inchem.org/>>. Access: 2017, Sep.

IUCLID – INTERNATIONAL UNIFORM CHEMICAL INFORMATION DATABASE. [S.I.]: European chemical Bureau. Available in: <<http://ecb.jrc.ec.europa.eu>>. Access: 2017, Sep.

NIOSH – NATIONAL INSTITUTE OF OCCUPATIONAL AND SAFETY. International Chemical Safety Cards. Available in: <<http://www.cdc.gov/niosh/>>. Acesso em: Access: 2017, Sep.

NITE-GHS JAPAN – NATIONAL INSTITUTE OF TECHNOLOGY AND EVALUATION. Available in: <http://www.safe.nite.go.jp/english/ghs_index.html>. Access: 2017, Sep.

TOXNET – TOXICOLOGY DATA NETWORKING. ChemIDplus Lite. Available in: <<http://chem.sis.nlm.nih.gov/>>. Access: 2017, Sep.



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U.S. ENVIRONMENTAL PROTECTION AGENCY. ECOSAR – Ecological Structure-Activity Relationships. Versão 1.11. Available in: <<http://www.epa.gov/oppt/newchems/tools/21ecosar.htm>>. Access: 2017, Sep.