



Lanka IOC

LANKA IOC PLC

MATERIAL SAFETY DATA SHEET

[Marine Fuel Oil]



SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Marine Fuel Oil
Synonyms : Black Fuel Oil, MFO, Industrial Fuel Oil, 6 Oil, Slurry Fuel Oil, IFO-380, RFO, Refinery Fuel Oil, High Sulfur Fuel Oil, HSFO, IFO 180, IFO 380, Bunker C, Bunker Fuel Oil, Decant Oil, Utility Fuel Oil,
Product Use Description : Fuel, Intermediate Stream
Company : Lanka IOC PLC
Level 20, west tower, world trade center,
Echelon square, Colombo-1, Sri Lanka.
E-mail : bunker@lankaio.com, web : www.lankaio.com

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Regulatory status : This material is considered hazardous by the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200).
Signal Word : WARNING
Hazard Summary : Combustible Liquid Slight to moderate irritant. Affects central nervous system. Skin cancer hazard. Hot liquid may cause thermal burns.

Potential Health Effects

Eyes : May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.
Skin : May cause skin irritation with prolonged or repeated contact. Practically nontoxic if absorbed following acute (single) exposure. Exposure may cause a phototoxicity reaction: liquid or mist on the skin may produce a painful sunburn reaction when exposed to sunlight. Product may be hot which could cause 1st, 2nd, or 3rd degree thermal burns.
Ingestion : This material has a low order of acute toxicity. If large quantities are ingested, nausea, vomiting and diarrhea may result. Ingestion may also cause effects similar to inhalation of the product. Aspiration hazard if liquid is inhaled into lungs, particularly from vomiting after ingestion. Aspiration may result in chemical pneumonia, severe lung damage, respiratory failure and even death.
Inhalation : Because of its low vapor pressure, this product presents a minimal inhalation hazard at ambient temperature. Upon heating, fumes may be evolved. Inhalation of fumes or mist may result in respiratory tract irritation and central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death. The burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death. Irritating and toxic hydrogen sulfide gas may be present. Greater than 15 - 20 ppm continuous exposure can cause mucous membrane and respiratory tract irritation. 50 - 500 ppm can cause headache, nausea, and dizziness. Continued exposure at these levels can lead to loss of reasoning and balance, difficulty in breathing, fluid in the lungs, and possible loss of consciousness. Greater than 500 ppm can cause rapid unconsciousness due to respiratory paralysis and death by suffocation unless the victim is removed from exposure and successfully resuscitated. Greater than 1000 ppm can cause immediate unconsciousness and death if not promptly revived. After-effects from overexposure are not anticipated except what would be expected if the victim was without oxygen for more than 3 to 5 minutes (asphyxiation). The "rotten egg" odor of hydrogen sulfide is not a reliable indicator for warning of exposure, since olfactory fatigue (loss of smell) readily occurs, especially at concentrations above 50 ppm. At high concentrations, the victim may not even recognize the odor before becoming unconscious.
Chronic Exposure : Similar products produced skin cancer and skin tumors in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined - see Section 11, Toxicological Information. Petroleum industry experience indicates that a program providing for good personal hygiene, proper use of personal protective equipment, and minimizing

the repeated and prolonged exposure to liquids and fumes, as outlined in this MSDS, is effective in reducing or eliminating the carcinogenic risk of high boiling aromatic oils (polynuclear aromatic hydrocarbons) to humans.

Target Organs

: Skin, Eyes, Central nervous system

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Complex mixtures of distillate hydrocarbons mainly paraffinic, naphthenic and aromatics. Catalytically and thermally cracked hydrocarbons may be present. Included may be small concentrations of cetane number improvers (organic nitrates), flow improvers (ethylene vinyl acetate copolymers), a lubricity additive (long-chain ester), silicone anti-foam additives. These additives do not contribute any additional hazard.

CAS NO

: 68476 - 33 - 5

SECTION 4. FIRST AID MEASURES

Inhalation	: Move to fresh air. Give oxygen. If breathing is irregular or stopped, administer artificial respiration. Seek medical attention immediately.
Skin contact	: Take off all contaminated clothing immediately. Wash off immediately with soap and plenty of water. Wash contaminated clothing before re-use. If skin irritation persists, call a physician.
Eye contact	: Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists, consult a specialist.
Ingestion	: Do NOT induce vomiting. Do not give liquids. Seek medical attention immediately. If vomiting does occur naturally, keep head below the hips to reduce the risks of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.
Notes to physician	: Symptoms: Dizziness, Discomfort, Headache, Nausea, Disorder, Vomiting, Liver disorders, Kidney disorders, Aspiration may cause pulmonary edema and pneumonitis.

SECTION 5. FIRE-FIGHTING MEASURES

Form	: Liquid
Flash point	: 60°C (140°F) Minimum
Suitable extinguishing media	: Carbon dioxide (CO2), Water spray, Dry chemical, Foam, Keep containers and surroundings cool with water spray.
Specific hazards during fire Fighting	: Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.
Special protective equipment for fire-fighters	: Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.
Further information	: Flammable vapor production at ambient temperature in the open is expected to be minimal, as the material is generally wet. However, depending on oil content and conditions, it is possible flammable vapors could accumulate in the headspace of storage containers, presenting a flammability and explosion hazard. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions	: Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to contain spill areas.
Environmental precautions	: Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material.
Methods for cleaning up	: Take up with sand or oil absorbing materials. Carefully vacuum, shovel, scoop or sweep up into a waste container for reclamation or disposal.

SECTION 7. HANDLING AND STORAGE

Handling	: Keep away from fire, sparks and heated surfaces. No smoking near areas where material is stored or handled. The product should only be stored and handled in areas with intrinsically safe electrical classification.
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Advice on protection against fire and explosion

: Hydrocarbon liquids including this product can act as a non-conductive flammable liquid (or static accumulators), and may form ignitable vapor-air mixtures in storage tanks or other containers. Precautions to prevent static-initiated fire or explosion during transfer, storage or handling, include but are not limited to these examples:

- (1) Ground and bond containers during product transfers. Grounding and bonding may not be adequate protection to prevent ignition or explosion of hydrocarbon liquids and vapors that are static accumulators.
- (2) Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such as gasoline or naphtha).
- (3) Storage tank level floats must be effectively bonded.

For more information on precautions to prevent static-initiated fire or explosion, see NFPA 77, Recommended Practice on Static Electricity (2007), and API Recommended Practice 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents (2008).

**Dust explosion class
Requirements for storage areas and containers**

- : Not applicable
- : Keep away from flame, sparks, excessive temperatures and open flame. Use approved containers. Keep containers closed and clearly labeled. Empty or partially full product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose containers to sources of ignition. Store in a well-ventilated area. The storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

Advice on common storage

Hydrogen sulfide may accumulate in tanks and bulk transport compartments. Consider appropriate respiratory protection (see Section 8). Stand upwind. Avoid vapors when opening hatches and dome covers. Confined spaces should be ventilated and gas tested prior to entry.

- : Keep away from food, drink and animal feed. Incompatible with oxidizing agents. Incompatible with acids.

Other data

- : No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

List	Components	CAS-No.	Type:	Value
OSHA	Polycyclic aromatic compounds (or coal tar pitch volatiles – benzene soluble)		PEL	0.2 mg/m3
	Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4	PEL	5 mg/m3 (as mineral oil mist)
	Hydrogen Sulfide	6/4/7783	STEL	20 ppm
ACGIH	Hydrogen Sulfide	6/4/7783	TWA	1 ppm
		6/4/7783	STEL	5 ppm
	Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4	TWA	0.2 mg/m3 (as mineral oil) Sum of 15 NTP-listed polynuclear aromatic hydrocarbons 0.005 mg/m3
	Polycyclic aromatic compounds (or coal tar pitch volatiles – benzene soluble)		TWA	0.2 mg/m3

Engineering measures

- : Use adequate ventilation to keep gas and vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Eye protection

- : Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Hand protection

- : Gloves constructed of nitrile, neoprene, or PVC are recommended.

Skin and body protection

- : Chemical protective clothing such as DuPont Tyvek QC, TyChem® or equivalent, recommended based on degree of exposure. The resistance of specific material may vary from product to product as well as with degree of exposure.

Respiratory protection

- : If hydrogen sulfide concentration may exceed permissible exposure limit, a positive-pressure SCBA or Type C supplied air respirator with escape bottle is required as respiratory protection. If hydrogen sulfide concentration is below H2S permissible exposure limit a NIOSH/ MSHA-approved air-purifying respirator with acid gas cartridges may be acceptable for odor control, but continuous air monitoring for H2S is recommended. Protection provided by air-purifying respirators is limited. Use a NIOSH/ MSHA-approved positive-pressure supplied- air respirator if there is a potential for uncontrolled release, exposure levels are not

Work / Hygiene practices

known, in oxygen-deficient atmospheres, or any other circumstance where an air purifying respirator may not provide adequate protection. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

- : Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form	: Liquid
Appearance	: Dark brown to black
Odor	: Petroleum asphalt odor
Flash point (PMC) °C	: 60°C (140°F) Minimum
Thermal decomposition	: No decomposition if stored and applied as directed.
pH	: Not applicable
Boiling point °C	: 343 - 538 °C (649 - 1,000 °F)
Vapor Pressure	: 1.33 hPa at 37.78 °C (100.00 °F)
Density (liquid at 15 °C)	: Typically 0.900 to 0.990 kg / m3
Water solubility	: Insoluble
Percent Volatiles	: 100%
Conductivity (conductivity can be reduced by environmental factors such as a decrease in temperature)	: Hydrocarbon-liquids without static dissipater additive may have conductivity below 1 picoSiemens per meter (pS/m). The highest electro-static ignition risks are associated with "ultra-low conductivities" below 5 pS/m. See Section 7 for sources of information on defining safe loading and handling procedures for low conductivity products.

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	: Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers.
Materials to avoid	: Strong oxidizing agents. Peroxides.
Hazardous decomposition Products	: Carbon monoxide, carbon dioxide and noncombusted hydrocarbons (smoke).
Thermal decomposition	: No decomposition if stored and applied as directed.
Hazardous reactions	: Keep away from oxidizing agents, and acidic or alkaline products.

SECTION 11. TOXICOLOGICAL INFORMATION

Skin irritation	: Irritating to skin.
Eye irritation	: Irritating to eyes.
Further information	: This material contains polynuclear aromatic hydrocarbons (PNAs), some of which are animal carcinogens. Studies have shown that similar products produce skin cancer or skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation. The presence of carcinogenic PNAs indicates that precautions should be taken to minimize repeated and prolonged inhalation of fumes or mists. Dermal application of gas oil to rats resulted in limited evidence of liver damage (i.e., increased liver weight and changes in hepatic serum enzyme activity) and bone marrow toxicity (hypoplasia and decreased hemoglobin.) Liver and kidney injuries may occur. Components of the product may affect the nervous system.

SECTION 12. ECOLOGICAL INFORMATION

Additional ecological Information	: Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.
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SECTION 13. DISPOSAL CONSIDERATIONS

Disposal	: Consult federal, state and local waste regulations to determine appropriate waste characterization of material and allowable disposal methods.
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At sea : Used product should be stored for eventual discharge in to port approved waste oil disposal facilities. Dispose of by incineration or other suitable means under conditions approved by the local authority. Marine fuels should be disposed of in accordance with **MARPOL regulations.**

SECTION 14. TRANSPORT INFORMATION

Transport classification

Hazchem code : 3 / Z
 Symbol : Flammable liquid
 UN : Flammable liquid, Class 3 (III)
 UN Number (substance identification number) : 1202
 UN Packing group : III
 IMO Hazard class : 33
 ICAO Hazard class : 3.3
 IATA Hazard class : 3
 ADR/RID Hazard class : 3 - 32 ©

SECTION 15. REGULATORY INFORMATION

Labelling information :
Indication of danger : Xn HARMFUL
Risk phrases : Xn R 40 possible risk of irreversible effects
 Xn R 65 harmful: may cause lung damage if swallowed
Safety phases : S 2 keep out of reach of children
 S 24 avoid contact with skin
 S 36 / 37 wear suitable protective clothing and glover
 S 43 in case of fire, use CO2, dry chemical or foam. Naver use water
 S 61 avoid release to the environment. Refer to special instructions
 S 62 if swallowed, do not induce vomiting: seek medical attention advice immediately and show containec or label.
Hazardous ingredients : Fuels, Diesel
 Xn R 40 possible risk of irreversible effects
 Xn R 65 harmful: may cause lung damage if swallowed
 N R 51 toxic to aquatic organisms
 N R 53 may cause long term adverse effects in the aquatic environment
Additional information : Refer to any national measures that may be relevant

SECTION 16. OTHER INFORMATION

Hazardous concentrations of hydrogen sulphide (H₂S) gas can accumulate in storage and rundown tanks, marine vessel compartments, sump pits or other confined spaces. When opening valves, hatches and dome covers, stand upwind, keep face as far from the opening as possible and avoid breathing any gases or vapours. When exposure concentrations are unknown and respiratory protection is not used, personal H₂S warning devices should be worn. These devices should not be relied on to warn of life threatening concentrations. H₂S fatigues the sense of smell rapidly. The rotten egg odour of H₂S disappears quickly, even though high concentrations are still present. The ACGIH TLV/TWA for H₂S is 10 ppm, the STEL 15 ppm. The company recommends that all exposures to this product be minimized by strictly adhering to recommended occupational control procedures to avoid any potential adverse health effects. The ash from combusting products will contain nickel, vanadium and other potential toxic heavy metal oxides. Take appropriate precautions to avoid contact with and inhalation of ash and ash dust from combustion and exhausted spaces. All information contained in this Material Safety Data Sheet and, in particular, the health and safety and environmental information is accurate to the best of our knowledge and belief as at the date of issue specified. However, the company makes no warranty or representation, express or implied, as to the accuracy or completeness of such information. The provision of this Material Safety Data Sheet is not intended, of itself, to obviate the need for all users to satisfy themselves that the product described is suitable for their individual purposes and that the safety precautions and environmental advice are adequate for their individual purposes and situation. Further, it is user's obligation to use this product safely and to comply with all applicable laws and regulations concerning the use of the product. The company accepts no responsibility for any injury, loss or damage, consequent upon any failure to follow the safety and other recommendations contained in this Material Safety Data Sheet, nor from any hazards inherent in the nature of the material, nor from any abnormal use of the material.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.