

HEAVEY FUEL OIL

SECTION 1: PRODUCT AND COMPANY CREDENTIALS

Product Name	Heavy Fuel Oil (HFO)
Product Use	Fuel Oil (HFO) for Burners
Standard	ASTM D396
Company Identification	Wataniya Group
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SECTION 2: PRODUCT INFORMATION/COMPOSITION

AMOUNT	CAS NUMBER	COMPONENTS
0 - 100 %weight	64742-93-4	High Density and Viscosity Fuel Oil

Section 3: HAZARDS IDENTIFICATION

Emergency Overview	- MAY CAUSE RESPIRATORY TRACT IRRITATION IF INHALED - HEATING MAY RELEASE HIGHLY TOXIC AND FLAMMABLE HYDROGEN SULFIDE GAS (H₂S) - DO NOT ATTEMPT RESCUE WITHOUT SUPPLIED-AIR RESPIRATORY PROTECTION)
Immediate Health Effects	<u>Eye:</u> Not expected to cause prolonged or significant eye irritation. If this material is heated, thermal burns may result from eye contact. <u>Skin:</u> Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin. If this material is heated, thermal burns may result from skin contact. <u>Ingestion:</u> Not expected to be harmful if swallowed. <u>Inhalation:</u> The vapor or fumes from this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing. Hydrogen sulfide has a strong rotten-egg odor. However, with continued exposure and at high levels, H₂S may deaden a person's sense of smell. If the rotten egg odor is no longer noticeable, it may not necessarily mean that exposure has stopped. At low levels, hydrogen sulfide causes irritation of the eyes, nose, and throat. Moderate levels can cause headache, dizziness, nausea, and vomiting, as well as coughing and difficulty breathing. Higher levels can cause shock, convulsions, coma, and death. After a serious exposure, symptoms usually begin immediately. The U.S. National Institute for Occupational Safety and Health (NIOSH) considers air concentrations of hydrogen sulfide gas greater than 100 ppm to be Immediately Dangerous to Life and Health (IDLH).
Delayed or Other Health Effects	<u>Cancer:</u> May cause cancer in laboratory animals, but the available information is inadequate to determine if this material can cause cancer in humans.

SECTION 4: FIRST AID MEASURES

General Information:

DO NOT DELAY. Obtain immediate medical treatment.

First Aid Instructions:

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water. If heated material should splash into eyes, flush eyes immediately with fresh water for 15 minutes while holding the eyelids open. Get immediate medical attention.

Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, apply a waterless hand cleaner, mineral oil, or petroleum jelly. Then wash with soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse. If the hot material gets on skin, quickly cool in water. See a doctor for extensive burns. Do not try to peel the solidified material from the skin or use solvents or thinners to dissolve it. The use of vegetable oil or mineral oil is recommended for removal of this material from the skin.

Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue. If exposure to hydrogen sulfide (H₂S) gas is possible during an emergency, wear an approved, positive pressure air-supplying respirator. Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get immediate medical attention.

Note to Physicians: Administration of 100% oxygen and supportive care is the preferred treatment for poisoning by hydrogen sulfide gas. For additional information on H₂S, see Chevron MSDS No. 301.

SECTION 5: FIRE FIGHTING MEASURES

Flammable Properties:

Flashpoint: 100°C - 160 °C (212 °F - 320 °F)

Auto ignition: 250 °C (482 °F)

Flammability (Explosive) Limits (% by volume in air): Lower: 0.7 Upper: 6

Suitable Extinguishing Media: Use water fog, foam, dry chemical, or carbon dioxide (CO₂) to extinguish flames.

SECTION 6: PROTECTION OF FIRE FIGHTERS

Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion. Combustion may form oxides of: Sulfur.

ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing.

Precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. If heated material is spilled, allow it to cool before proceeding with disposal methods.

Reporting: Report spills to local authorities as appropriate or required.

SECTION 7: HANDLING AND STORAGE

Precautionary Measures: This material is typically stored, transported, and used at temperatures between 275F (135C) and 325F (163C). DO NOT ADD OR ALLOW WATER TO MIX WITH HOT FUEL OIL. Steam generated eruptions may occur. Store and transport Fuel Oil only in properly vented containers. Combustion of Fuel Oil and Fuel Oil vapors may occur. DO NOT MISHANDLE FUEL OIL EQUIPMENT. Observe manufacturer's guidelines on proper equipment use.

Do not get in eyes, on skin, or on clothing. Do not breathe vapor or fumes from heated material. Smoking, eating, and drinking, etc. should be prohibited when skin contact with the product or fume condensate is possible. Workers should clean hands and face before smoking, eating, and drinking, etc. Do not use solvents to clean hands and face. Use vegetable oils or mineral oil, followed by a thorough washing with soap and water. Avoid contact of heated material with eyes, skin, and clothing. Do not breathe vapor or fumes. Wash thoroughly after handling.

Unusual Handling Hazards: An ignition source should be considered present in large tanks where Fuel Oil is stored at temperatures above 350 F (176.7C). Deposits can form in the vapor space of large Fuel Oil tanks which may ignite as low as 350 F. Pyrophoric iron sulfide, commonly present in such tanks, may cause ignition below 350 F.

Toxic quantities of hydrogen sulfide (H₂S) may be present in storage tanks and bulk transport vessels which contain or have contained this material. Persons opening or entering these compartments should first determine if H₂S is present. See Exposure Controls/Personal Protection -Section 8. Do not attempt rescue of a person over exposed to H₂S without wearing approved supplied-air or self-contained breathing equipment. If there is a potential for exceeding one-half the occupational exposure standard, monitoring of hydrogen sulfide levels is required. Since the sense of smell cannot be relied upon to detect the presence of H₂S, the concentration should be measured by the use of fixed or portable devices.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioned or disposed of properly.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

General Considerations:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the workplace when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

Personal Protective Equipment

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice. If this material is heated, wear chemical goggles or safety glasses or a face shield.

Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include Viton, Chlorinated Polyethylene (or Chlorosulfonated Polyethylene). If this material is heated, wear insulated clothing to prevent skin contact if engineering controls or work practices are not adequate to prevent skin contact.

Respiratory Protection: Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors, Dusts and Mists. If material is heated and emits hydrogen sulfide, determine if airborne concentrations are below the occupational exposure limit for hydrogen sulfide. If not, wear an approved, positive pressure air-supplying respirator. For more information on hydrogen sulfide, see Chevron MSDS No. 301.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Notation	Ceiling	STEL	TWA	Country/Agency	Component
--	--	--	.5 mg/m3	ACGIH	Fuel Oil

The ACGIH TLV is 0.5 mg/m3 as the benzene extractable portion of the inhalable fraction of Fuel Oil fume. The TLV may also be determined by unspecified 'equivalent' methods.

Consult local authorities for appropriate values.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color:	Black	Boiling Point:	350°C (662°F) - 470°C (878°F)
Physical State:	Semi-solid (Viscoelastic Material)	Solubility:	Insoluble in water
Odor:	Petroleum odor	Melting Point	No Data Available
PH:	Not Applicable	Specific Gravity:	0.99 - 1.05 @ 15.6°C (60.1°F) / 15.6°C (60.1°F)
Vapor Pressure:	No data available	Viscosity:	from 500 c _p up to 1000 c _p @ 135 °C (60.1°F)
Vapor Density (Air = 1):	No data available		

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Incompatibility with Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous Decomposition Products: None known (any expected)

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

Immediate Health Effects:

Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.

Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.

Skin Sensitization: The skin sensitization hazard is based on evaluation of data for similar materials or product components.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

Additional Toxicology Information:

There is concern about the carcinogenicity of chemical compounds found in Fuel Oils. The International Agency for Research on Cancer (IARC) reviewed the carcinogenic potential of Fuel Oils in 1985 and again in 1987. At that time, they concluded there was inadequate evidence to decide that Fuel Oils were carcinogenic to humans. Overall, findings from health monitoring studies of Fuel Oil workers are not conclusive. However, Fuel Oil fume condensates and certain chemical components of Fuel Oil fume have been shown to cause cancer in mice when repeatedly applied to the skin and allowed to remain on the skin for a prolonged period. In addition, Fuel Oil fume condensates have been shown to be weakly positive in Ames mutagenicity tests. Skin contact and breathing of fumes, mists and vapors should be reduced to a minimum.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity:

This material is not expected to be harmful to aquatic organisms. The ecotoxicity hazard is based on an evaluation of data for the components or a similar material.

Environmental Fate

Ready Biodegradability: This material is not expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.

SECTION 13: DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by international, country, or local laws and regulations.

SECTION 14: TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: UN3257, ELEVATED TEMPERATURE LIQUID, N.O.S.(FUEL OIL), 9, III

IMO/IMDG Shipping Description: UN3257, ELEVATED TEMPERATURE LIQUID, N.O.S.(FUEL OIL), 9, III

ICAO/IATA Shipping Description: FORBIDDEN IF OFFERED AT TEMPERATURES EQUAL TO OR EXCEEDING 100

SECTION 15: REGULATORY INFORMATION

Regulatory Lists Searched:

01-1=IARC Group 1
01-2A=IARC Group 2A
01-2B=IARC Group 2B

Chemical Inventories:

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

EU RISK AND SAFETY PHRASES: S61: Avoid release to the environment. Refer to special instructions/Safety data sheets.

WHMIS Classification:

This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

SECTION 16: OTHER INFORMATION

Revision Statement: This is a new Material Safety Data Sheet.

Revision Date: Jan 2021

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TWA - Time Weighted Average	TLV - Threshold Limit Value
PEL - Permissible Exposure Limit	STEL - Short-term Exposure Limit
CAS - Chemical Abstract Service Number	
IMO/IMDG - International Maritime Dangerous Goods Code	ACGIH - American Conference of Government Industrial Hygienists
MSDS - Material Safety Data Sheet	API - American Petroleum Institute
NFPA - National Fire Protection Association (USA)	CVX - Chevron
NTP - National Toxicology Program (USA)	DOT - Department of Transportation (USA)
OSHA - Occupational Safety and Health Administration	IARC - International Agency for Research on Cancer

Prepared according to the International Standard (**ISO 11014-1**) by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

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.