



MATERIAL SAFETY DATA SHEET

Residual Fuel Oil

MSDS: 940

REVISION: 12/18/2008

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **Residual Fuel Oil**

SYNONYMS: Residual Fuel Oil, Fuel Oil #6, Bunker C Fuel Oil, IFO-30, IFO-100, IFO-120, IFO-180, IFO-240, IFO-280, IFO-320, IFO-380, IFO-500, IFO-600, IFO-700, ISO Marine Fuels

PRODUCT CODE:	Bunker C Fuel Oil (422010)	IFO-30 (422030)	IFO-100 (422100)	IFO-120 (422120)
	IFO-180 (422180)	IFO-240 (422240)	IFO-280 (422280)	IFO-320 (422320)
	IFO-380 (422380)	IFO-500 (422500)	IFO-600 (422600)	IFO-700 (422700)
	Generic Marine Fuels (429999)			

This Material Safety Data Sheet applies to the listed products and synonym descriptions for Hazard Communication purposes only. Technical specifications vary greatly depending on the product and are not reflected in this document. Consult specification sheets for technical information. This product contains ingredients that are considered to be hazardous as defined by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

IMPORTANT: Read this MSDS before handling or disposing of this product. Pass this information on to employees, customers and product users.

MANUFACTURER: U. S. OIL & REFINING CO.
ADDRESS: 3001 Marshall Ave., Tacoma, WA 98421

EMERGENCY PHONE: (253)-383-1651
FAX PHONE: (253)-272-2495
CHEMTREC PHONE: (800) 424-9300
NATIONAL RESPONSE: (800) 424-8802

CHEMICAL NAME: Residual Fuel Oil
CHEMICAL FAMILY: Hydrocarbon

PRODUCT USE: Residual Fuel Oil is a complex blend of hydrocarbons derived from various refinery streams, usually residue, and can contain hydrogen sulfide and polycyclic aromatic hydrocarbons. Typical streams include atmospheric tower bottoms and vacuum tower bottoms. The composition is complex and varies with the source of crude oil. This product is intended for use as a refinery feedstock, fuel or for use in an engineered process. Use in other applications may result in higher exposures and require additional controls, such as local exhaust ventilation and personal protective equipment.

PREPARED BY: U.S. OIL & REFINING CO.

CAS #: Mixture

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

RESIDUAL FUEL OIL CONSISTS OF DISTILLATES AND RESIDUAL FRACTIONS BLENDED TO PRESCRIBED VISCOSITY RANGES. THIS PRODUCT IS LIKELY TO CONTAIN TRACE AMOUNTS OF HYDROGEN SULFIDE.

Name	CAS NUMBER	CONCENTRATION %
Fuel Oil, Residual	68476-33-5	100% (Approx)

SECTION 3: HAZARDS IDENTIFICATION

Danger! This product may contain or release Hydrogen Sulfide a highly toxic, highly flammable gas which can be fatal if inhaled at certain concentrations. This product may also contain polycyclic aromatic oils which may be carcinogenic to humans. This product may cause irritation to eyes, skin and respiratory system. Avoid liquid, mist and vapor contact. Harmful or fatal if swallowed. Aspiration hazard, can enter lungs and cause damage. May cause irritation or be harmful if inhaled or absorbed through the skin. Avoid prolonged or repeated skin contact. Contains polycyclic aromatic compounds which have been shown to cause anemia, disorders of the liver, bone marrow and lymphoid tissues in rats following dermal application. Combustible Liquid. Vapors may explode. May cause irritation to eyes, skin and respiratory system. Avoid liquid, mist and vapor contact. Harmful or fatal if swallowed. Aspiration hazard, can enter lungs and cause damage. May cause irritation or be harmful if inhaled or absorbed through the skin. CAUTION: This product is normally shipped hot and may cause burns to skin or eyes.

PHYSICAL STATE: Liquid (Thick, Oily Liquid)

ROUTES OF ENTRY: Dermal Contact. Eye Contact. Inhalation. Ingestion.

POTENTIAL HEALTH EFFECTS

EYES: Hot material can cause burns to the eyes. Eye irritation, tearing blurred vision may result from contact with liquid, mists and/or vapors.

SKIN: Hot material can cause burns to the skin. Contact may cause moderate irritation, de-fatting (cracking), redness, itching, inflammation, dermatitis and possible secondary infection. Repeated contact with components in this product may cause harmful effects in other parts of the body.

INGESTION: May cause burns to mouth, throat and stomach. This product may cause nausea, vomiting, diarrhea and restlessness. DO NOT INDUCE VOMITING. May cause harmful central nervous system effects, similar to those listed under "inhalation".

INHALATION: Nasal and respiratory tract irritation, central nervous system effects including dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of reflexes or loss of consciousness may occur. Hydrogen sulfide can evolve from this product, which can cause dizziness, nausea, headache or death.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray or mist may produce respiratory tract irritation. This product may contain compounds that are possibly carcinogenic to humans.

OVER-EXPOSURE SIGNS/SYMPTOMS:

Nasal and respiratory tract irritation, central nervous system effects including dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of consciousness, respiratory arrest or sudden death could occur as a result of long term

and/or high concentration exposure to vapors.
See toxicological information (section 11)

SECTION 4: FIRST AID MEASURES

- EYES:** This product is normally stored and shipped hot (110°F to 200 °F) and thermal burns are a risk. Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Seek medical advice if pain or redness continues.
- SKIN:** This product is normally stored and shipped hot (110°F to 200 °F) and thermal burns are a risk. In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention. Wash exposed area thoroughly with soap and water. Remove contaminated clothing promptly and launder before reuse. Contaminated leather goods should be discarded. If irritation persists or symptoms described in the MSDS develop, seek medical attention.
- INGESTION:** This product may cause nausea, vomiting, diarrhea and restlessness. **DO NOT INDUCE VOMITING.** Seek prompt medical attention.
- INHALATION:** If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Seek prompt medical attention if breathing is difficult or if not breathing.

SECTION 5: FIRE-FIGHTING MEASURES

FLAMMABILITY OF THE PRODUCT: **Combustible**

**FLAMMABLE LIMITS IN AIR,
(% BY VOLUME):** LOWER: Not Determined
UPPER: Not Determined

FLASH POINT: Closed Cup >60° C, (140° F)

AUTOIGNITION TEMPERATURE: Approx 500 F

PRODUCTS OF COMBUSTION: These products are carbon oxides (CO, CO₂), nitrogen and sulfur oxides (NO_x, SO_x), particulate matter, VOC's.

**FIRE HAZARDS IN THE
PRESENCE OF VARIOUS
SUBSTANCES:**

When heated above the flash point, this material will release vapors that can ignite when exposed to open flames, sparks and static discharge. Mists or sprays may be flammable at temperatures below the normal flash point. Keep away from heat and open flame.

**FIRE-FIGHTING MEDIA AND
INSTRUCTIONS:**

Combustible Liquid. Use dry chemical, foam or carbon dioxide to extinguish the fire. Consult foam manufacturer for appropriate media, application rates and water/foam ratio. If a leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak. Use water to flush spills away from sources of ignition.

**SPECIAL FIRE FIGHTING
EQUIPMENT:**

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Cool tanks and containers exposed to fire with water. Improper use of water and extinguishing media containing water may cause frothing which can spread the fire over a larger area.

UNUSUAL FIRE AND EXPLOSION

HAZARDS:

Moderately combustible. When heated above the flash point, this material will release flammable vapors which if exposed to a source of ignition can burn or be explosive in confined spaces. Mists or sprays may be flammable at temperatures below the normal flash point. Keep away from heat and open flame.

SECTION 6: ACCIDENTAL RELEASE MEASURES

**PERSONAL
PRECAUTIONS:**

Immediately contact emergency personnel. Eliminate all ignition sources and stop spill/release if it can be done without risk. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Do not touch or walk through spilled material. Tanks, vessels or other confined spaces which have contained product should be freed of vapors before entering. The container should be checked to ensure a safe atmosphere before entry. Empty containers may contain toxic, combustible or explosive residues or vapors. Do not cut, grind, drill, weld or reuse empty containers that contained this product. Do not transfer this product to another container unless the container receiving the product is labeled with proper DOT shipping name, hazard class and other information that describes the product and its hazards.

**ENVIRONMENTAL
PRECAUTIONS:**

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. If facility or operation has an "oil or hazardous substance contingency plan", activate its procedures. Stay upwind and away from spill. Wear appropriate protective equipment including respiratory protection as conditions warrant. Do not enter or stay in area unless monitoring indicates that it is safe to do so. Isolate hazard area and restrict entry to emergency crew. Review Fire Fighting Measures section before proceeding with clean up.

Keep all sources of ignition (flames, smoking, flares, etc.) and hot surfaces away from release. Contain spill in smallest possible area.

Recover as much product as possible. Stop leak if it can be done without risk. Use water spray to disperse vapors. Spilled material may be absorbed by an appropriate absorbent, and then handled in accordance with environmental regulations. Prevent spilled material from entering sewers, storm drains, unauthorized treatment or drainage systems and natural waterways. Contact fire authorities and appropriate federal, state and local agencies. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, contact the National Response Center at 800-424-8802. For highway or railway spills, contact Chemtrec at 800-424-9300.

**METHODS FOR
CLEANING UP:**

If emergency personnel are unavailable, contain spilled material. For small spills, use absorbent pads or add absorbent (soil may be used in the absence of other suitable materials) and use a nonsparking or explosion-proof means to transfer material to a sealable, appropriate container for disposal. For large spills, dike spilled material or otherwise contain it to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal.

SECTION 7: HANDLING AND STORAGE

HANDLING: Do not ingest. Do not get in eyes, on skin or on clothing. Keep container closed. Use only with adequate ventilation. Avoid breathing vapor or mist. Keep away from heat, sparks and flame. Wash thoroughly after handling. In case of fire, use water spray, foam, dry chemical or carbon dioxide as described in the Fire Fighting Measures section of the MSDS. Do not pressurize, cut, weld, braze, solder, drill on or near this container. "Empty" container contains residue (liquid and/or vapor) and may explode in heat of a fire. Use good personal hygiene practices. After handling this product, wash hands before eating, drinking, or using toilet facilities. Keep out of reach of children. Failure to use caution may cause serious injury or illness.

STORAGE: Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Avoid all possible sources of ignition (spark or flame).

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide ventilation to keep the airborne concentrations of vapors below their respective occupational exposure limits.

PERSONAL PROTECTION

SKIN: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Flame Retardant Clothing is recommended.

RESPIRATORY: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

HANDS: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Heat-resistant gloves should be used when handling this product at elevated temperatures.

EYE: Eye protection (chemical-type goggles and/or face shield), should be worn whenever there is a likelihood of splashing or spraying liquid. Contact lenses should not be worn. Eye wash water should be provided.

OTHER: Use good personal hygiene practices. In case of skin contact, wash with mild soap and water or a waterless hand cleaner. Immediately remove soiled clothing and wash thoroughly before reuse. Discard oil-soaked leather goods.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION Continued

PROTECTIVE CLOTHING

OR EQUIPMENT: Gloves, hardhat, face shield, boots, safety glasses, respirator, FR clothing.

PERSONAL PROTECTIVE EQUIPMENT IN CASE

OF A LARGE SPILL: Splash goggles. Full suit. Vapor respirator. Boots. Gloves. Suggested protective clothing might not be adequate. Consult a specialist before handling this product.

Established Occupational Exposure Limits

<u>Substance</u>	<u>Value</u>	<u>Time/Type</u>	<u>Source</u>
OIL MIST, MINERAL	5 MG/M3	8 hr PEL	OSHA
	10 MG/M3	15 min STEL	ACGIH
HYDROGEN SULFIDE	10 PPM	8 hr PEL	OSHA
	15 PPM	15 min STEL	OSHA

Consult local authorities for acceptable exposure limits.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Liquid. (Thick, oily liquid.)

COLOR: Brown to Black Viscous Liquid

ODOR: Strong Petroleum Odor, Asphalt like

BOILING POINT: 175 to 650°C (350 to 1200°F)

SPECIFIC GRAVITY: 0.93 to 1.0 (Water = 1) (@ 60° F)

VISCOSITY: 90 to 700 mm²/s @ 50°C (cSt @ 122°F)

VAPOR PRESSURE: Not Determined

VAPOR DENSITY: >1 (Air = 1)

VOLATILITY: Negligible

EVAPORATION RATE: Negligible

MATERIALS TO AVOID: Strong acids, alkalis, and strong oxidizers.

HAZARDOUS**DECOMPOSITION**

PRODUCTS: Burning or excessive heating may produce carbon monoxide and other harmful gases and vapors including oxides and/or other compounds of sulfur and nitrogen.

SECTION 10: STABILITY AND REACTIVITY

STABILITY AND REACTIVITY:	The product is stable.
INCOMPATIBILITY WITH VARIOUS SUBSTANCES:	Reactive with oxidizing agents, acids, alkalis.
HAZARDOUS DECOMPOSITION PRODUCTS:	These products are carbon oxides (CO, CO ₂), nitrogen and sulfur oxides (NO _x , SO _x), particulate matter, VOC's.
HAZARDOUS POLYMERIZATION:	Will not occur.
CONDITIONS TO AVOID (STABILITY):	Heat and open flame

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICITY DATA

Fuel Oil No. 6 (CAS 68553-00-4)

May contain compounds reported to cause skin cancer and have toxic effects towards liver, kidneys and central nervous system. Risk of cancer depends on duration and level of exposure.

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:	Not evaluated at this time.
PRODUCTS OF DEGRADATION:	These products are carbon oxides (CO, CO ₂) and water.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:	The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with all applicable federal, state and local environmental regulations.
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Consult your state or local authorities.

SECTION 14: TRANSPORT INFORMATION

REGULATORY INFORMATION	UN NUMBER	EMERGENCY RESPONSE GUIDEBOOK	PROPER SHIPPING NAME	CLASS	PACKING GROUP
DOT Classification	NA1993	Guide 128	Fuel Oil	3	III

SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

Extremely Hazardous Substances for Emergency Response and Planning 40 CFR 355 & 40 CFR 370:

NONE

Toxic Release Chemicals for Emission Reporting (SARA 313):

NONE

EPA SARA 311/312 Title III Hazard Categories

Acute Health Hazard: No
Chronic Health Hazard: Yes
Fire Hazard: Yes
Pressure Hazard: No
Reactive Hazard: No

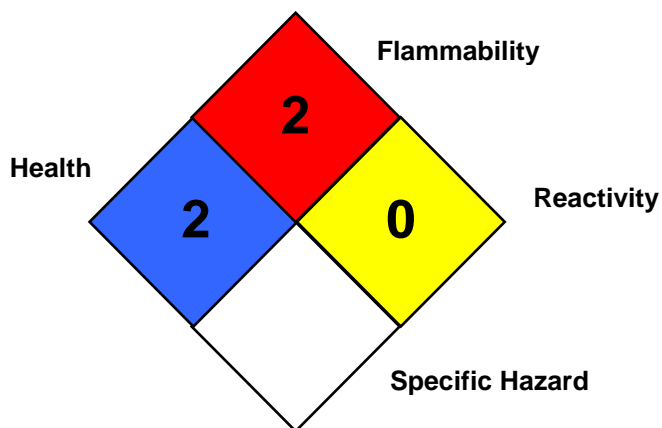
SECTION 16: OTHER INFORMATION

HAZARDOUS MATERIAL INFORMATION SYSTEM (U.S.A.)

HMIS III	
HEALTH	* 2
FLAMMABILITY	2
PHYSICAL HAZARD	0
PERSONAL PROTECTION	

* Chronic Health Hazard

NATIONAL FIRE PROTECTION
ASSOCIATION (U.S.A.)



DATE OF PRINTING: Last printed 08/20/2009 2:19:00 PM

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