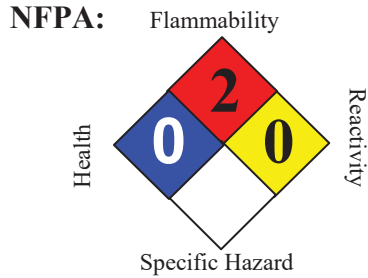


# Material Safety Data Sheet

## Fuel Oil



### SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

<b>Product name</b>	: Fuel Oil
<b>Synonyms</b>	: Bunkers, Black Fuel Oil, MFO, Industrial Fuel Oil, 6 Oil, Slurry Fuel Oil, RFO, Refinery Fuel Oil, High Sulfur Fuel Oil, HSFO, IFO-30, IFO-180, IFO-380, IFO-510, IFO-700, Bunker C, Bunker Fuel Oil, Marine Fuel Oil, Decant Oil, Utility Fuel Oil, LSFO, Six Oil, 888100008793
<b>SDS Number</b>	: 888100008793 <b>Version</b> : 1.20
<b>Product Use Description</b>	: Fuel, Intermediate Stream
<b>Company</b>	: For: Tesoro Refining & Marketing Co. 19100 Ridgewood Parkway, San Antonio, TX 78259
<b>Tesoro Call Center</b>	: (877) 783-7676 <b>Chemtrec (Emergency Contact)</b> : (800) 424-9300

### SECTION 2. HAZARDS IDENTIFICATION

<b>Classifications</b>	Flammable Liquid – Category 4 Carcinogenicity – Category 1B Toxic to Reproduction – Category 1B Specific Target Organ Toxicity (Repeated Exposure) – Category 2 Acute Toxicity – Inhalation – Category 4 Acute Aquatic Toxicity– Category 3
<b>Pictograms</b>	
<b>Signal Word</b>	<b>DANGER</b>
<b>Hazard Statements</b>	Combustible liquid. May cause cancer from prolonged and repeated skin contact. May damage fertility or the unborn child. May cause damage to liver, kidney and nervous system through prolonged or repeated exposure. Harmful if inhaled. Harmful to aquatic life Skin and eye irritant. May contain and release toxic hydrogen sulfide (H2S) gas.

**Precautionary Statements****Prevention**

Obtain special instructions before use.  
 Do not handle until all safety precautions have been read and understood.  
 Keep away from flames and hot surfaces. No smoking.  
 Wear gloves, eye protection and face protection as needed to prevent skin and eye contact with liquid.  
 Wash hands or liquid-contacted skin thoroughly after handling.  
 Do not eat, drink or smoke when using this product.  
 Do not breathe vapors or mists.  
 Use only outdoors or in a well-ventilated area

**Response**

In case of fire: Use dry chemical, CO<sub>2</sub>, water spray or fire fighting foam to extinguish.  
 Get medical advice or attention if you feel unwell, are exposed, or become concerned.  
 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.  
 If in eye: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 If skin or eye irritation persists, get medical attention.  
 If inhaled: Remove person to fresh air and keep comfortable for breathing.  
 Immediately call or doctor or emergency medical provider

**Storage**

Store in a well ventilated place. Keep cool. Store locked up. Keep container tightly closed . Use only approved containers.

**Disposal**

Dispose of contents/containers to approved disposal site in accordance with local, regional, national, and/or international regulations.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Component	CAS-No.	Weight %
Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4	100%
Polycyclic aromatic compounds (PACs or PNAs)		Typically 1.5%
Benzo[a]pyrene; Benzo[def]chrysene	50-32-8	Trace to 0.2%
Hydrogen Sulfide	7783-06-4	Trace to 0.2%
Sulfur (for waters within 25 miles of California shores)	17704-34-9	Trace to 0.1%
Sulfur (for waters within 200 miles of American shores)	17704-34-9	Trace to 1.0%
Sulfur (for International waters)	17704-34-9	Trace to 3.5%

**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.
<b>Eye contact</b>	: 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.
<b>Ingestion</b>	: 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.
<b>Notes to physician</b>	: Symptoms: Dizziness, Discomfort, Headache, Nausea, Disorder, Vomiting, Liver disorders, Kidney disorders, Aspiration may cause pulmonary edema and pneumonitis.

## SECTION 5. FIRE-FIGHTING MEASURES

<b>Suitable extinguishing media</b>	: Carbon dioxide (CO <sub>2</sub> ), Water spray, Dry chemical, Foam, Keep containers and surroundings cool with water spray.
<b>Specific hazards during fire fighting</b>	: 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.
<b>Special protective equipment for fire-fighters</b>	: 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.
<b>Further information</b>	: 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

<b>Personal precautions</b>	: 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.
<b>Environmental precautions</b>	: 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.
<b>Methods for cleaning up</b>	: 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

<b>Precautions for safe handling</b>	: Keep away from fire, sparks and heated surfaces. No smoking near areas where
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material is stored or handled. The product should only be stored and handled in areas with intrinsically safe electrical classification.

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).

**Conditions for storage, including any incompatibilities**

- : 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".

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.

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/m <sup>3</sup>
	Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4	PEL	5 mg/m <sup>3</sup> (as mineral oil mist)
	Hydrogen Sulfide	7783-06-4	STEL	20 ppm
ACGIH	Hydrogen Sulfide	7783-06-4	TWA	1 ppm
		7783-06-4	STEL	5 ppm

	Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil	64741-62-4	TWA	0.2 mg/m <sup>3</sup> (as mineral oil) Sum of 15 NTP-listed polynuclear aromatic hydrocarbons 0.005 mg/m <sup>3</sup>
	Polycyclic aromatic compounds (or coal tar pitch volatiles – benzene soluble)		TWA	0.2 mg/m <sup>3</sup>

- 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 H<sub>2</sub>S 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 H<sub>2</sub>S 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 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.
- Work / Hygiene practices** : 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

<b>Appearance</b>	Dark green to brown or black liquid
<b>Odor</b>	Petroleum asphalt odor

<b>Odor threshold</b>	No data available
<b>pH</b>	Not applicable
<b>Melting point/freezing point</b>	32° - 80°C (89.6° - 176°F)
<b>Initial boiling point &amp; range</b>	154 - 372 °C (310° - 702 °F)
<b>Flash point</b>	60°C (140°F) minimum
<b>Evaporation rate</b>	Higher initially and declining as lighter components evaporate
<b>Flammability (solid, gas)</b>	Flammable vapor released by heated liquid
<b>Upper explosive limit</b>	No data available
<b>Lower explosive limit</b>	No data available
<b>Vapor pressure</b>	210 Pa at 25°C
<b>Vapor density (air = 1)</b>	>5
<b>Relative density (water = 1)</b>	>0.9 to 1.2 g/mL
<b>Solubility (in water)</b>	6 to 1400 mg/L at 25°C
<b>Partition coefficient (n-octanol/water)</b>	3.4 to 5 as log Pow at 25°C
<b>Auto-ignition temperature</b>	>176°C (>350 °F)
<b>Decomposition temperature</b>	Will evaporate or boil and possibly ignite before decomposition occurs.
<b>Kinematic viscosity</b>	>300 cST typical at 40°C

## SECTION 10. STABILITY AND REACTIVITY

<b>Reactivity</b>	: Vapors may form explosive mixtures with air. Hazardous polymerization does not occur.
<b>Chemical Stability</b>	Stable under normal conditions.
<b>Possibility of hazardous reactions</b>	Can react with strong oxidizing agents and peroxides. Keep away from strong acids and bases.
<b>Conditions to avoid</b>	Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers.
<b>Hazardous decomposition products</b>	Carbon monoxide, carbon dioxide and noncombusted hydrocarbons (smoke).

## SECTION 11. TOXICOLOGICAL INFORMATION

<b>Inhalation</b>	: 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
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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.

**Skin irritation**

May cause skin irritation with prolonged or repeated contact. Practically non-toxic 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.

**Eye irritation**

May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.

**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. Could present an 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.

**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.) 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, is effective in reducing or eliminating the carcinogenic risk of high boiling aromatic oils (polynuclear aromatic hydrocarbons) to humans.

Liver and kidney injuries may occur.

Components of the product may affect the nervous system.

**Component:**

Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil

64741-62-4 Acute oral toxicity: LD50 rat  
Dose: 4,320 mg/kg

Acute dermal toxicity: LD50 rabbit  
Dose: 2,001 mg/kg

Skin irritation: Classification: Irritating to skin.  
Result: Mild skin irritation

Eye irritation: Classification: Irritating to eyes.  
Result: Mild eye irritation

Carcinogenicity: Animal experiments showed a statistically significant number of tumors.

### **Carcinogenicity**

<b>NTP</b>	Benzo[a]pyrene; Benzo[def]chrysene (CAS-No.: 50-32-8)
<b>IARC</b>	Benzo[a]pyrene; Benzo[def]chrysene (CAS-No.: 50-32-8)
<b>OSHA</b>	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
<b>CA Prop 65</b>	WARNING! This product contains a chemical known to the State of California to cause cancer. Benzo[a]pyrene; Benzo[def]chrysene (CAS-No.: 50-32-8)

## **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.

## **SECTION 13. DISPOSAL CONSIDERATIONS**

**Disposal** : Consult federal, state and local waste regulations to determine appropriate waste characterization of material and allowable disposal methods.

## **SECTION 14. TRANSPORT INFORMATION**

<b>CFR</b>	
Proper shipping name	: Not regulated if shipped below 140°F (60°C) Elevated temperature liquid, flammable (if shipped above 140°F (60°C)).
UN-No.	: Not regulated if shipped below 140°F (60°C) 3256 if shipped above 140°F (60°C)
Class	: 9
Packing group	: III
Hazard inducer	: (Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil)
<b>TDG</b>	
Proper shipping name	: Not regulated if shipped below 140°F (60°C) Elevated temperature liquid, flammable (if shipped above 140°F (60°C)).
UN-No.	: Not regulated if shipped below 140°F (60°C) 3256 if shipped above 140°F (60°C)
Class	: 9
Packing group	: III
Hazard inducer	: (Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil)
<b>IATA Cargo Transport</b>	
UN-No.	: Not regulated if shipped below 140°F (60°C) 3256 if shipped above 140°F (60°C)
Class	: Not regulated if shipped below 140°F (60°C) Not permitted for transport (at 140°F (60°C) or higher temperature) 9



**IATA Passenger Transport**

UN-No. : Not regulated if shipped below 140°F (60°C)  
3256 if shipped above 140°F (60°C)

Class : Not regulated if shipped below 140°F (60°C)  
Not permitted for transport (at 140°F (60°C) or higher temperature)  
9

**IMDG-Code**

UN-No. : Not regulated if shipped below 140°F (60°C)  
3256 if shipped above 140°F (60°C)

Description of the goods : Elevated temperature liquid, n.o.s.  
(Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil)

Class :  
Not regulated if shipped below 140°F (60°C)  
Not permitted for transport (at 140°F (60°C) or higher temperature)  
9

Packaging group : III

IMDG-Labels : 9

EmS Number : F-A S-P

Marine pollutant : No

**SECTION 15. REGULATORY INFORMATION****CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIROMENT)**

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil. Fractions of crude oil, and products (both finished and intermediate) from the crude oil refining process and any indigenous components of such from the CERCLA Section 103 reporting requirements. However, other federal reporting requirements, including SARA Section 304, as well as the Clean Water Act may still apply.

TSCA Status : On TSCA Inventory

DSL Status : All components of this product are on the Canadian DSL list.

SARA 311/312 Hazards : Fire Hazard  
Acute Health Hazard  
Chronic Health Hazard

SARA III US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

**Components** CAS-No.

**Benzo[a]pyrene; Benzo[def]chrysene** 50-32-8

SARA III US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR355, Appendix A)

**Components** CAS-No.

PENN RTK US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

**Components** CAS-No.

**Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil** 64741-62-4

**Benzo[a]pyrene; Benzo[def]chrysene** 50-32-8

MASS RTK US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

**Components**CAS-No.**Benzo[a]pyrene; Benzo[def]chrysene**

50-32-8

NJ RTK

US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

**Components**CAS-No.**Clarified oils (petroleum), catalytic cracked; Heavy Fuel oil**

64741-62-4

**Benzo[a]pyrene; Benzo[def]chrysene**

50-32-8

California Prop. 65

: WARNING! This product contains a chemical known in the State of California to cause cancer.

Benzo[a]pyrene;  
Benzo[def]chrysene

50-32-8

**SECTION 16. OTHER INFORMATION**Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**Revision Date** : 07/26/2012

65, 66, 121, 295, 296, 347, 1003, 1006, 1007, 1009, 1010, 1022, 1054, 1083, 1084, 1085, 1089, 1586, 1886