



HEAVY FUEL OIL; BUNKER FUEL OIL; MARINE RESIDUAL FUEL; NO. 6 FUEL OIL, NO 5B FUEL OIL
MSDS Revision Date (dd/mm/yyyy): 01/12/2013

HEAVY FUEL OIL

SECTION 1 - IDENTIFICATION

Product name : **HEAVY FUEL OIL; BUNKER FUEL OIL; MARINE RESIDUAL FUEL; NO. 6 FUEL OIL, NO 5B FUEL OIL**

Product Code(s) : HEAVY FUEL OIL

Product Use : High BTU, high viscosity, heavy residual fuel.

Chemical Family : Mixture.

Supplier's name and address:
Kildair Service Ltd.
92, Chemin Delangis
St-Paul de Joliette, QC, Canada
J0K 3E0
Telephone # for general information : (450) 756-8091
24 Hours Emergency Tel. # for dangerous goods emergencies : (613) 996-6666 (CANUTEC)

Manufacturer's name and address:
Refer to Supplier

SECTION 2 - HAZARDS IDENTIFICATION

Classification : WHMIS classification:
Class B3 (Combustible Liquids);
Class D2A (Materials Causing Other Toxic Effects, Very Toxic Material);
Class D2B (Materials Causing Other Toxic Effects, Toxic Material).

OSHA : This material is classified as hazardous under OSHA regulations (29CFR 1910.1200).
Hazardous classification :
Combustible liquid;
Acute Health Hazard;
Chronic Health Hazard.

Emergency Overview : Viscous liquid; black. Petroleum odour.
WARNING! Combustible liquid and vapour. Vapour is heavier than air and will collect in low-lying places.
Harmful if inhaled or swallowed. May be harmful if absorbed through the skin.
May cause nausea, vomiting, headache and other central nervous system effects.
May cause respiratory irritation. May cause eye and skin irritation. May cause liver and kidney damage.
Possible cancer hazard - contains material which may cause cancer.

POTENTIAL HEALTH EFFECTS

Signs and symptoms of short-term (acute) exposure

Inhalation : May cause irritation to the nose, throat and upper respiratory tract.
Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects.
Irritating or noxious gases may be released during thermal decomposition. Releases: Hydrogen sulfide.
Severe respiratory irritation (from vapours or mists) is possible. Could also cause convulsions, coma, respiratory arrest and death.

Skin : May cause mild to moderate skin irritation. Prolonged contact, such as when trapped against the skin under clothing or jewelry, may be more irritating. Can be absorbed through skin. Exposure to hot material may cause thermal burns.

Eyes : May cause moderate eye irritation.

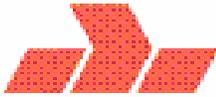
Ingestion : May cause irritation of mouth, throat, and stomach. Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects.

Effects of long-term (chronic) exposure : Prolonged skin contact may cause dermatitis (rash), characterized by red, dry, itching skin.
Prolonged overexposure may cause liver and kidney effects.

Carcinogenic status : Possible cancer hazard. See TOXICOLOGICAL INFORMATION, Section 11.

Additional health hazards : See TOXICOLOGICAL INFORMATION, Section 11.

Potential environmental effects : See ECOLOGICAL INFORMATION, Section 12.



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SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	CAS #	Wt. %
Gas oil	64741-44-2	10.00 - 30.00
Distillates, petroleum, heavy straight-run	68915-96-8	10.00 - 30.00
Fuel oil, residual	68476-33-5	40.00 - 70.00
Distillates, (petroleum), light catalytic	64741-59-9	10.00 - 30.00
Clarified oils (petroleum), catalytic cracked	64741-62-4	10.00 - 30.00

SECTION 4 - FIRST AID MEASURES

- Inhalation :** Immediately remove person to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen by qualified medical personnel only. Get medical attention.
- Skin contact :** Remove/Take off immediately all contaminated clothing. Wash exposed area thoroughly with soap and water for at least 15 minutes. If irritation persists, seek prompt medical attention. Treat all thermal burns with appropriate first aid measures for degree of burn. Flush with cool running water. Cover wound with sterile dressing. Get medical attention.
- Eye contact :** Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists, seek prompt medical attention.
- Ingestion :** Seek immediate medical attention/advise. Do not induce vomiting. Never give anything by mouth to an unconscious person.
- Note for Physician :** Treat symptomatically.

SECTION 5 - FIRE FIGHTING MEASURES

Fire hazards/conditions of flammability :

Combustible liquid and vapour. Will ignite when exposed to heat, flame and other sources of ignition. Vapours are heavier than air and collect in confined and low-lying areas. Vapour can travel to ignition source and flash back. Product may float, and be re-ignited at the water's surface. Closed containers may rupture if exposed to excess heat or flame due to a build-up of internal pressure.

Flammability classification (OSHA 29 CFR 1910.1200) :

Combustible Liquid Class III A.

Oxidizing properties : Not known

Explosion data: Sensitivity to mechanical impact / static discharge

: May be sensitive to static discharge. Not expected to be sensitive to mechanical impact.

Suitable extinguishing media

: Dry chemical, foam, carbon dioxide and water fog. Do not use water jet, as this may spread burning material.

Special fire-fighting procedures/equipment

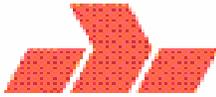
: Firefighters should wear proper protective equipment and self contained breathing apparatus with full face piece operated in positive pressure mode. Move containers from fire area if safe to do so. Water spray may be useful in cooling equipment exposed to heat and flame.

Hazardous combustion products

: Carbon oxides; Sulphur oxides; Phosphorus compounds; Nitrogen oxides (NOx); Hydrogen sulfide; Hydrocarbons; Other unidentified organic compounds.

NFPA Rating

0-Minimal	1-Slight	2-Moderate	3-Serious	4-Severe
Health : 2	Flammability :2	Instability :0	Special Hazards :None	



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SECTION 6 - ACCIDENTAL RELEASE MEASURES

- Personal precautions** : All persons dealing with clean-up should wear the appropriate protective equipment including self-contained breathing apparatus. Keep all other personnel upwind and away from the spill/release. Restrict access to area until completion of clean-up.
- Environmental precautions** : Ensure spilled product does not enter drains, sewers, waterways, or confined spaces. For large spills, dike the area to prevent spreading.
- Spill response/cleanup** : Ventilate area of release. Remove all sources of ignition. Use only non-sparking tools and equipment in the clean-up process. Contain and absorb spilled liquid with non-combustible, inert absorbent material (e.g. sand), then place absorbent material into a container for later disposal (see Section 13). Notify the appropriate authorities as required. For a water spill: Remove from the water surface by skimming or with suitable absorbents. Notify the appropriate authorities as required.
- Prohibited materials** : Do not use combustible absorbents, such as sawdust.
- Special spill response procedures** : If a spill/release in excess of the EPA reportable quantity is made into the environment, immediately notify the national response center in the United States (phone : 1-800-424-8002). US CERCLA Reportable quantity (RQ): None reported.

SECTION 7 - HANDLING AND STORAGE

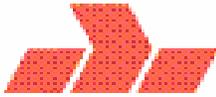
- Safe Handling procedures** : Use in a well ventilated area. Wear suitable protective equipment during handling. Avoid breathing vapours. Avoid contact with skin, eyes and clothing. Keep away from heat, sparks, and open flames. No sparking tools should be used. Avoid contact with incompatible materials. Ground all equipment during handling. Wash thoroughly after handling.
- Storage requirements** : Store in a cool, dry, well-ventilated area. Keep away from direct sunlight. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. No smoking in the area.
- Incompatible materials** : Acids; Bases; Strong oxidizers (e.g. Chlorine, Peroxides, etc.)
- Special packaging materials** : Always keep in containers made of the same materials as the supply container.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

Ingredients	ACGIH TLV		OSHA PEL	
	TWA	STEL	PEL	STEL
Gas oil	5 mg/m ³ (As 'Oil mist, mineral')	10 mg/m ³ (As 'Oil mist, mineral')	5 mg/m ³ (As 'Oil mist, mineral')	N/Av
Distillates, petroleum, heavy straight-run	N/Av	N/Av	N/Av	N/Av
Fuel oil, residual	5 mg/m ³ (As 'Oil mist, mineral')	10 mg/m ³ (As 'Oil mist, mineral')	5 mg/m ³ (As 'Oil mist, mineral')	N/Av
Distillates, (petroleum), light catalytic	N/Av	N/Av	N/Av	N/Av
Clarified oils (petroleum), catalytic cracked	N/Av	N/Av	N/Av	N/Av

Note: Irritating or noxious gases may be released during thermal decomposition. Releases: Hydrogen sulfide. ACGIH TLV: 10 ppm (Hydrogen sulfide).

- Ventilation and engineering measures** : Use in a well ventilated area. General mechanical ventilation and local exhaust is recommended for use with this product.
- Respiratory protection** : Respiratory protection is required if the concentrations exceed the TLV. NIOSH-approved respirators are recommended. Advice should be sought from respiratory protection specialists.



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- Skin protection** : Impervious gloves must be worn when using this product. Advice should be sought from glove suppliers.
- Eye / face protection** : Safety glasses with side shields should be used with this product.
Chemical goggles are recommended when there is a potential for splashing.
- Other protective equipment** : Wear a chemically resistant apron and long sleeves when dispensing, to prevent skin contact. An eyewash station and safety shower should be made available in the immediate working area.
- General hygiene considerations** : Avoid breathing vapour or mist. Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Upon completion of work, wash hands before eating, drinking, smoking or use of toilet facilities. Remove soiled clothing and wash it thoroughly before reuse.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Physical state	: Viscous liquid	Appearance	: black
Odour	: Petroleum odour.	Odour threshold	: N/Av
pH	: N/Av	Specific gravity	: 0.940 - 1.100 @ 15.5°C (60°F)
Boiling point	: Typical result : 250 to 550°C	Coefficient of water/oil distribution	: N/Av
Melting/Freezing point	: N/Av	Solubility in water	: Insoluble.
Vapour pressure (mmHg @ 20° C / 68° F)	: < 1.0 kPa	Evaporation rate (n-Butyl acetate = 1)	: < 1
Vapour density (Air = 1)	: > 1	Volatiles (% by weight)	: N/Av
Volatile organic Compounds (VOC's)	: N/Av	Auto-ignition temperature	: >300 (572°F) (estimated)
Flash point	: ≥ 61°C (142°F)	Upper flammable limit (% by vol.)	: N/Av
Flash point Method	: ASTM D 93	Flashback observed	: N/Av
Lower flammable limit (% by vol.)	: N/Av		
Flame Projection Length	: N/Av		

SECTION 10 - STABILITY AND REACTIVITY

- Stability and reactivity** : Stable under the recommended storage and handling conditions prescribed.
- Hazardous polymerization** : Will not occur.
- Conditions to avoid** : Avoid heat and open flame. Keep away from direct sunlight.
- Materials To Avoid And Incompatibility** : See Section 7 (Handling and Storage) section for further details.
- Hazardous decomposition products** : None known, refer to hazardous combustion products in Section 5.

SECTION 11 - TOXICOLOGICAL INFORMATION

- Target organs** : Eyes, skin, respiratory system, digestive system, central nervous system.
- Routes of exposure** : *Inhalation* : YES *Skin Absorption* : YES *Skin & Eyes* : Yes *Ingestion* : YES
- Toxicological data** : Product (based on similar blends):
LD50 (Rat, oral): >5000mg/kg (supplier)
LD50 (Rabbit, dermal): >2000mg/kg (supplier)
LC50 (Rat, inhalation): > 2500 mg/m³ (supplier)
See below for individual ingredient acute toxicity data.



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Ingredients	LC₅₀(4hr) inh. Rat	LD₅₀	
		(Oral, rat)	(Rabbit, dermal)
Gas oil	1.72 mg/L/4H	> 5000 mg/kg	> 2000 mg/kg
Distillates, petroleum, heavy straight-run	N/Av	N/Av	N/Av
Fuel oil, residual	N/Av	N/Av	N/Av
Distillates, (petroleum), light catalytic	3400 mg/m ³	3200 mg/kg	> 2000 mg/kg
Clarified oils (petroleum), catalytic cracked	N/Av	4300 mg/kg	> 2000 mg/kg

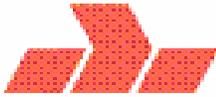
- Carcinogenic status** : This product contains Residual fuel oils. Residual fuel oils are classified as possibly carcinogenic to humans by IARC (Group 2B). Residual fuel oils contain polycyclic aromatic compounds (PAC's). Prolonged and/or repeated inhalation of PAC's, or skin contact with certain PAC's, has been shown to cause skin and lung cancer.
- Reproductive effects** : Not expected to have other reproductive effects.
- Teratogenicity** : Not expected to be a teratogen.
- Mutagenicity** : Not expected to be mutagenic in humans.
- Epidemiology** : Not available.
- Sensitization to material** : Not expected to be a skin or respiratory sensitizer.
- Synergistic materials** : None known or reported by the manufacturer.
- Irritancy** : Mild to moderate skin irritant. Moderate eye irritant.
- Other important hazards** : CNS depression may result from extreme exposures.
- Conditions aggravated by overexposure** : Pre-existing skin, eye and respiratory disorders.

SECTION 12 - ECOLOGICAL INFORMATION

- Ecotoxicity** : No data is available on the product itself. The product should not be allowed to enter drains or water courses, or be deposited where it can affect ground or surface waters.
- Mobility** : No data is available on the product itself.
- Persistence** : No data is available on the product itself.
- Bioaccumulation potential** : No data is available on the product itself.
- Other Adverse Environmental effects:** No data is available on the product itself.

SECTION 13 - DISPOSAL CONSIDERATIONS

- Handling for Disposal** : Handle waste according to recommendations in Section 7. Empty containers retain residue (liquid and/or vapour) and can be dangerous. Do not cut, weld, drill or grind on or near this container.
- Methods of Disposal** : Dispose of in accordance with federal, provincial and local hazardous waste laws.
- RCRA** : If this product, as supplied, becomes a waste in the United States, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state and federal environmental agencies.



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SECTION 14 - TRANSPORT INFORMATION

Regulatory Information	UN Number	Shipping Name	Class	Packing Group	Label
United States 49CFR/DOT	NA1993	Combustible liquid, n.o.s. [Contains : Distillates (petroleum), light catalytic]	Combustible.	III	
United States 49CFR/DOT Additional information	The above shipping description and additional information applies to U.S. Domestic ground shipments only. Not regulated for road or rail shipment if packaged in non-bulk containers (450 Litres or less each). The "label" appearing here is the placard to be used for bulk shipments.				
Canada (TDG)	None	Not regulated	Not regulated	None	
Canada (TDG) Additional information	None.				

SECTION 15 - REGULATORY INFORMATION

US Federal Information:

TSCA : All listed ingredients appear on the Toxic Substances Control Act (TSCA) inventory.

CERCLA Reportable Quantity (RQ) (40 CFR 117.302): None reported.

SARA TITLE III : Sec. 302, Extremely Hazardous Substances, 40 CFR 355: No Extremely Hazardous Substances are present in this material.

SARA TITLE III : Sec. 311 and 312, MSDS Requirements, 40 CFR 370 Hazard Classes : Immediate (Acute) health hazard; Chronic Health Hazard; Fire Hazard. Under SARA Sections 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are 500 pounds for the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SARA TITLE III : Sec. 313, Toxic Chemicals Notification, 40 CFR 372: This material is not subject to SARA notification requirements, since it does not contain any Toxic Chemical constituents above de minimus concentrations.

US State Right to Know Laws:

New Jersey Labeling Requirements : This product contains the following substances required to be disclosed on product labeling: Gas oil (CAS # 64741-44-2, 0-40%); Distillates, petroleum, heavy straight run (CAS # 68915-96-8, 0-50%); Fuel oil, residual (CAS # 68476-33-5, 0-70%); Distillates, (petroleum), light catalytic (CAS # 64741-59-9), 0-40%); Clarified oils (petroleum), catalytic cracked (CAS # 64741-62-4, 0-100%).

California Proposition 65 : This product contains a chemical known to the State of California to cause cancer. This product contains : Fuel oil, residual. This product may contain trace levels of the following ingredients : Naphthalene.

Other U.S. State "Right to Know" Lists : The following chemicals are specifically listed by individual States : Fuel oil, residual (PA, RI).

International Information :

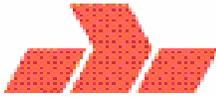
Canadian Environmental Protection Act (CEPA) information : All ingredients listed appear on the Domestic Substances List (DSL).

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and this MSDS contains all the information required by the CPR.

SECTION 16 - OTHER INFORMATION

HMIS Rating

*-Chronic hazard 0-Minimal 1-Slight 2-Moderate 3-Serious 4-Severe
 Health : *2 Flammability :2 Reactivity :0



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- Legend**
- : ACGIH: American Conference of Governmental Industrial Hygienists
 - CAS: Chemical Abstract Services
 - CERCLA : Comprehensive Environmental Response, Compensation, and Liability Act of 1980.
 - CFR : Code of Federal Regulations
 - DOT : Department of Transportation
 - EPA : Environmental Protection Agency
 - EST : Eastern Standard Time
 - HMIS : Hazardous Materials Identification System
 - HSDB: Hazardous Substances Data Bank
 - IARC: International Agency for Research on Cancer
 - Inh: Inhalation
 - LC: Lethal Concentration
 - LD: Lethal Dose
 - N/Ap: Not Applicable
 - N/Av: Not Available
 - NIOSH: National Institute of Occupational Safety and Health
 - OSHA: Occupational Safety and Health Administration
 - PA : Pennsylvania
 - PEL: Permissible exposure limit
 - RCRA : Resource Conservation and Recovery Act
 - RI : Rhode Island
 - RTECS: Registry of Toxic Effects of Chemical Substances
 - SARA : Superfund Amendments and Reauthorization Act
 - STEL: Short Term Exposure Limit
 - TLV: Threshold Limit Values
 - TWA: Time Weighted Average
 - TSCA: Toxic Substance Control Act
 - WHMIS: Workplace Hazardous Materials Identification System

- References**
- : 1. ACGIH, Threshold Limit Values and Biological Exposure Indices for 2009.
 - 2. International Agency for Research on Cancer Monographs, searched 2009.
 - 3. Canadian Centre for Occupational Health and Safety, CCHInfoWeb databases, 2009 (CHEMpendium, HSDB and RTECS).
 - 4. Material Safety Data Sheet from manufacturer.
 - 5. California Proposition 65 List - September 11, 2009 version.
 - 6. US EPA Title III List of Lists - October, 2006 version.

Prepared by:

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Please direct all enquiries to Kildair Service.



Disclaimer of liability

The information in the Material Safety Data Sheet is offered for your consideration and guidance when exposed to this product. Kildair Service Ltd. expressly disclaims all expressed or implied warranties and assumes no responsibilities for the accuracy of completeness of the data contained herein. The data in this MSDS does not apply to use with any other product or in any other process.

This Material Safety Data Sheet may not be changed, or altered in any way without the expressed knowledge and permission of Kildair Service Ltd.

Preparation Date (dd/mm/yyyy) 28/11/2007

Reviewed Date (dd/mm/yyyy) 01/12/2013

Revision No. 3

Revision Information

MSDS section updated:
9. PHYSICAL AND CHEMICAL PROPERTIES;

END OF DOCUMENT