



MATERIAL SAFETY DATA SHEET

Product Name:
Bunker C (3630)

SECTION 1 – PRODUCT IDENTIFICATION AND USE

Product name	Bunker C	PIN #, UN #	1993
Chemical name	None	TDG, DOT class	Class 3
Common names and synonyms	Residual oil. No. 6 fuel oil.	Packing group	I, II, or III, depending on shipping method
Product use	Fuel	Shipping Name	Flammable liquid N.O.S.
WHMIS classification	Combustible liquid Class B Division 3 Toxic Class D Division 2 Subdivision B		
Hazard codes	NFPA Health 0 Flammability 2 Reactivity 0 <i>NFPA & HMIS 0=Insignificant/No Hazard. 1=Slight Hazard. 2=Moderate Hazard. 3=High/Serious Hazard. 4=Extreme/Severe Hazard.</i>	HMIS Health 1 Flammability 2 Reactivity 0	
Supplier	Irving Oil Limited, Refining Division Box 1260, Saint John New Brunswick Canada E2L 4H6	Phone (506) 202-2000 Emergency (Chemtrec) 1-800-424-9300 Refinery (506) 202-3000	

SECTION 2 – HAZARDOUS INGREDIENTS

Ingredients	CAS#	Wt (%)	ACGIH-TLVs (2004)	OSHA PELs (2004) (general industry)	NIOSH RELs (2004)	LD ₅₀ (rat, oral)	LC ₅₀ (rat, 4 hours)
Bunker C oil	68553-00-4	100	100 mg/m ³ TWA (vapour & aerosol)	Not available for this product name or CAS#		5.1-5.3 g/kg	Not available
<i>May contain:</i> Polycyclic aromatic hydrocarbons (PAHs)	Various	Not available	Various	Various	Various	Various	Various
<i>Including:</i> Benzo-a-pyrene (BAP)	50-32-8	Trace	As low as possible	0.2 mg/m ^{3A}	0.1 mg/m ^{3B}	0.1 g/kg	Not available
Sulphur	7704-34-9	Trace	Not available	Not available	Not available	>0.008 g/kg	Not available
<i>which may result in the evolution of:</i> Hydrogen sulphide (H ₂ S)	7783-04-6	Not applicabl	10 ppm TWA 15 ppm STEL	20 ppm C 50 ppm PEAK	10 ppm C	Not applicable	444 ppm
Vanadium	1314-62-1	Trace	0.05 mg/m ^{3CDE} TWA	0.5 mg/m ^{3CDG} C 0.1 mg/m ^{3CF} C	0.05 mg/m ^{3E} C	0.1 g/kg	0.15 g/m ³

^A Benzene-soluble fraction ^B Cyclohexane-extractable fraction ^C Pentoxide ^D Respirable fraction ^E Dust or fume ^F ^G Dust C means CEILING standard.

Bunker C oil is a complex mixture of hydrocarbons. Its exact composition depends on the source of the crude oil from which it was produced and the refining methods used. Bunker C oil contains hundreds of individual organic chemicals. This section identifies only some of the well-known chemical constituents.

SECTION 3 – PHYSICAL DATA

Form	Thick viscous liquid	Specific gravity	0.95 to 0.97 @ 20°C
Colour	Black	Vapour density	>1 (air = 1)
Odour	Rotten egg odour if H ₂ S present. Tar-like odour otherwise. Note: H₂S deadens the sense of smell. Absence of rotten egg smell does <u>not</u> mean absence of H₂S.	Vapour pressure	0.0001 mm Hg
		Evaporation rate	Negligible
Odour pH	<0.15 ppm for H ₂ S Not applicable	Boiling point	>260°C (>500°F)
		Freezing point	Not available
		Coefficient of water/oil distribution	Not available

SECTION 4 – FIRE AND EXPLOSION HAZARDS

Flammability	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Conditions	Ignited by heat, sparks or flames.
Flash point	>65°C (>150°F) (cc)	Auto ignition temperature	~400°C (~760°F)
Lower flammable limit	1%	Upper flammable limit	5%
Explosion data: Sensitivity		Mechanical impact	Not expected to be sensitive
		Static discharge	Vapour: Yes
Means of extinction	In general, do not extinguish fire unless flow can be stopped. Use carbon dioxide, dry chemical, or foam. Cool containers with flooding quantities of water until well after the fire is out.		
Special precautions	Vapour is heavier than air. It will spread along the ground and collect in low or confined areas (basements, sewers, tanks). Vapour may travel to a source of ignition and flash back. Containers may explode when heated.		
Hazardous combustion products	Carbon monoxide. Nitrogen oxides. PAHs and other aromatic hydrocarbons. H ₂ S and sulphur dioxide (SO ₂).		



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SECTION 5 – REACTIVITY INFORMATION

Stability	Stable
Conditions to avoid	Sources of ignition. Static discharges. High temperatures.
Incompatible substances	Oxidizers such as peroxides, nitric acid, and perchlorates.
Hazardous decomposition	Carbon monoxide. Nitrogen oxides. Numerous aromatic hydrocarbons. H ₂ S and SO ₂ .

SECTION 6 – HEALTH HAZARD INFORMATION

Route of Entry	<input checked="" type="checkbox"/> Inhalation <input checked="" type="checkbox"/> Ingestion <input type="checkbox"/> Eyes	Hazardous Contact	<input checked="" type="checkbox"/> Eye <input checked="" type="checkbox"/> Skin contact
Acute exposure	Coughing, headache, and giddiness following inhalation. Aspiration into the lungs can cause severe pneumonitis (serious lung irritation), with coughing, gagging, shortness of breath, chest pain, and/or pulmonary edema (fluid in the lungs). Ingestion may produce nausea, vomiting, and cramping. Kidney effects and systemic edema have been reported after severe exposure. H ₂ S is very toxic. At concentrations as low as 1 to 5 ppm, nausea and severe eye irritation may occur. Sense of smell may be impaired at about 20 ppm, with headache and respiratory tract irritation. At 250 to 500 ppm, potentially fatal pulmonary edema may occur. Dizziness, sudden (often fatal) collapse, unconsciousness, and death occur at higher concentrations. Note: Pulmonary edema may be delayed as long as 48 hours after exposure.		
Chronic exposure	Kidney, gastrointestinal, blood, and skin disorders.		
Carcinogenicity	Not classified by ACGIH, NIOSH, or OSHA. EPA recognizes “residual oils” as carcinogenic, and either recognizes or suspects “mineral oils” to be carcinogenic. IARC considers “residual fuel oils” to be “possibly carcinogenic to humans”, and exposure to fuel oils during refining, to be “probably carcinogenic to humans”. NTP considers untreated and mildly treated mineral oils as carcinogenic. BAP is considered by ACGIH to be a suspect carcinogen; by EPA, a recognized carcinogen; by IARC, probably carcinogenic to humans; and by NTP, reasonably anticipated to be a human carcinogen. BAP has not been classified by NIOSH or OSHA.	Sensitization	Contact sensitization. Photosensitization (extreme sensitivity to sunlight)
Mutagenicity	BAP is mutagenic.	Irritancy	Skin Respiratory tract
Toxicologically synergistic products	Other petroleum hydrocarbons and other chemicals that cause central nervous system (CNS) depression can be expected to produce additive or synergistic effects.	Teratogenicity	BAP is considered to be teratogenic.
		Reproductive toxicity	Not available

SECTION 7 – FIRST AID

Inhalation	Move victim to fresh air. Give artificial respiration if breathing has stopped and if a qualified AR administrator is available. Apply CPR if both pulse and breathing have stopped. Obtain medical attention immediately.
Ingestion	Never give anything by mouth if the person is unconscious, rapidly losing consciousness, or convulsing. If the person is conscious, have them drink 8 to 10 ounces of water or milk to dilute the material in the stomach. Do not induce vomiting. If vomiting occurs spontaneously, have the person lean forward to avoid aspiration. Obtain medical attention immediately.
Eye	If irritation occurs, flush eye with lukewarm, gently flowing fresh water for at least 10 minutes.
Skin	Quickly and gently blot away excess chemical. Gently remove contaminated clothing and shoes under running water. Wash gently and thoroughly with water and non-abrasive soap. Obtain medical assistance.

SECTION 8 – PRECAUTIONARY MEASURES

Do not attempt rescue of an H₂S knockdown victim without the use of proper respiratory protective equipment.

Personal protective equipment	Gloves	Tychem®SL preferred.
	Eye	Chemical safety goggles or face shield, as a good general safety practice.
	Respiratory	NIOSH-approved SCBA or air line respirator with escape cylinder for confined spaces or work with potential for exposure to H ₂ S. If an air-purifying respirator is appropriate, use a “P series” filter & organic vapour cartridges. A qualified occupational health and safety professional should advise on respirator selection.
Engineering controls	Clothing & footwear	Coveralls to prevent skin contact with product. If clothing or footwear becomes contaminated with product, completely decontaminate it before re-use, or discard it.
		Enclose processes. Use local exhaust ventilation to remove vapour at its site of generation. Handle laboratory samples in a fume hood. Use mechanical ventilation in confined spaces.

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Handling procedures & equipment Avoid heating open containers of product so as to minimize vapour production and accumulation. Use non-sparking equipment, explosion-proof ventilation, and intrinsically safe electrical equipment. Ground handling equipment. Have clean emergency eyewash and shower readily available in the work area.

Leak & spill Procedure Keep unauthorized persons away. Eliminate all sources of ignition. Ventilate area. Stop leak if it can be done safely. Prevent entry into sewers, waterways, or confined spaces. Absorb or cover with dry earth, sand or other non-combustible material and use clean, non-sparking tools to transfer to container.

Waste disposal Consult local authorities for advice.

Storage May be stored at ambient temperatures. Containers should be vented and equipped with a flame arrester.

Shipping Stable during transport. May be transported hot.

SECTION 9 – PREPARATION OF MSDS

Prepared by Irving Oil Limited, Refining Division

Phone (506) 202-3000

Revision date June 13, 2006

To re-order MSDS, phone (506) 202-2000