



MATERIAL SAFETY DATA SHEET

HEALTH, SAFETY AND ENVIRONMENTAL DATA

Material	Residual Fuel Oil; Bunker Fuel Oils
Reference	ISO 8217 Grades RMA to RML
Synonyms	Bunker C, Fuel Oil No.s 4, 5 or 6 in USA
Application	Fuel for low and medium speed diesel engines or heating/boiler plant
Typical Physical Characteristics	<p>Appearance: Black, medium to high viscosity liquids having characteristic petroleum odour</p> <p>Density (liquid at 15°C) kg/l: varies with grade - typically 0.95 to 1.01</p> <p>Viscosity at 100°C CST: varies with grade - typically 10 to 55</p> <p>Vapour pressure at 20°C: negligible</p> <p>Vapour density: heavier than air</p> <p>Flash point, (PMC) °C: 80 (60 min)</p> <p>Auto Ignition Temp. (in air) °C: 350</p> <p>Solubility in water: negligible</p>
Chemical Composition	<p>A blend of mainly residual and middle distillate components of paraffinic, naphthenic, or aromatic hydrocarbons originating from straight run, catalytic and thermal cracking refining processes. Flow improver additives may be included (generally ethylene vinyl acetate co-polymers).</p> <p>CAS No. *68476 -33-5</p>
Hazardous Components	<p>Cracked components containing polycyclic aromatic hydrocarbon compounds may be present some of which have been shown to induce skin cancer in laboratory animals.</p> <p>Hydrogen sulphide (H₂S, an extremely toxic and highly flammable gas) and other flammable light hydrocarbon gases may collect in vapour spaces where fuel oils are stored.</p>
Reactivity Data	<p>Thermal Stability</p> <p>Stable at ambient temperatures.</p> <p>Incompatibility</p> <p>Avoid strong oxidizing agents.</p>

<p>Hazardous Decomposition Products</p>	<p>Thermal decomposition products may include oxides of carbon, nitrogen and sulphur.</p> <p>Incomplete combustion will generate smoke and hazardous gases, including carbon monoxide.</p> <p>Overheating in storage may cause partial decomposition with the production of toxic hydrogen sulphide gas (H₂S).</p> <p>Ash from combustion will contain vanadium and other heavy metal oxides.</p>
<p>Potential Hazards</p>	<p>Health:</p> <p>Assessment of available data, including information on the biological activity of the material and/or its components, indicates that this material:</p> <ul style="list-style-type: none"> • will be unlikely to cause harm to the skin on brief or occasional contact. • may cause dermatitis and serious irreversible skin disorders on repeated or prolonged contact. • will cause thermal burns if hot material contacts skin. • is unlikely to cause sensitization by skin contact. • will cause thermal burns if hot material contacts eyes. • may cause irritation to eyes, nose and throat due to exposure to vapour, mist or fumes generated during normal use. • may be toxic by inhalation when hydrogen sulphide is present in the vapour. • will be unlikely to be swallowed in view of the high handling temperatures. <p>If fuel oil under high pressure is injected under the skin, prompt medical attention is necessary.</p> <p>Safety:</p> <p>Light hydrocarbon vapours can build up in the headspace of tanks. These can cause flammability/explosion hazards even at temperatures below the normal flash point of the fuel; (note: flash point must not be regarded as a reliable indicator of the potential flammability of vapour in fuel oil tank headspaces). Tank headspaces should always be regarded as potentially flammable and care should be taken to avoid static electrical discharge and all ignition sources during filling, ullaging and sampling from storage tanks.</p> <p>Fuel oil will present a flammability hazard if heated above flash point but bulk liquids at normal storage temperatures will present virtually no fire hazard. If fuel contacts hot surfaces, or leaks from high pressure fuel pipes, the vapour and/or mists generated will create a flammability or explosion hazard.</p>

Precautions contd...	<p>Environmental:</p> <p>Take all necessary precautions against accidental spillage into soil or water.</p>
Protective Clothing	<p>Protective clothing, including impervious gloves, should be worn to prevent skin contact.</p> <p>Wear face visor or goggles if eye contact can accidentally occur. Wear full breathing apparatus or positive pressure filter sets and protective clothing, including gloves, for work in combustion/exhaust spaces and when handling fuel oil ash/dust. When inspecting combustion/exhaust spaces, wear full face dust respirator and protective clothing.</p> <p>Approved breathing apparatus must be used when entering storage tanks if hydrogen sulphide is present at above 10 ppm volume concentration.</p>
First Aid/Action on Contact	<p>Skin:</p> <p>Wash skin thoroughly with soap and water after contact. Change contaminated clothing and dry-clean or launder before re-use. Medical advice must be obtained urgently if product under high pressure has been injected through the skin.</p> <p>Eyes:</p> <p>Wash eye thoroughly with copious quantities of water, ensuring eyelids are held open. Obtain medical advice if any pain or redness develops and persists.</p> <p>Ingestion:</p> <p>If contamination of the mouth occurs, wash it out thoroughly with water. Obtain medical advice if large amounts are swallowed - do not induce vomiting.</p> <p>Inhalation:</p> <p>If inhalation of mists, fumes or vapour causes irritation to the nose or throat, or coughing, remove to fresh air. Obtain medical advice if any symptoms persist. If loss of consciousness occurs remove to fresh air, place in the recovery position and obtain prompt medical attention. Monitor breathing and pulse, and administer artificial respiration or external cardiac massage if necessary.</p>

<p>Exposure to Hydrogen Sulphide</p>	<p>Removal from exposure will be adequate treatment for airborne concentrations less than 50 -70 ppm.</p> <p>At higher concentrations:</p> <p>Skin:</p> <p>If exposed skin becomes inflamed or blistered, wash affected areas with soap and water and obtain medical attention.</p> <p>Eyes:</p> <p>Wash eye thoroughly with copious quantities of water, ensuring eyelids are held open. Obtain medical advice if any pain or redness develops or persists.</p> <p>Inhalation:</p> <p>If loss of consciousness occurs remove to fresh air, place in the recovery position and obtain prompt medical attention. Monitor breathing and pulse, and administer artificial respiration or external cardiac massage if necessary.</p>
<p>Medical Advice</p>	<p>If ingested, do not induce vomiting. Milk or liquid paraffin may be beneficial.</p> <p>Oil can be aspirated following regurgitation of stomach contents and can cause severe and potentially fatal chemical pneumonitis, which may require treatment with antibiotic and corticosteroid therapy. Because of the risk of aspiration, gastric lavage should be avoided - if deemed necessary undertake only after endotracheal intubation.</p> <p>Injections through the skin from contact with high pressure/velocity fuel sprays are serious medical emergencies. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discoloured and extremely painful with extensive subcutaneous necrosis. Emergency surgical exploration and thorough cleansing of the wound and underlying tissues is necessary to minimise necrosis and tissue loss. Note: high pressure may force material considerable distances along tissue planes.</p> <p>Inhalation of hydrogen sulphide may cause central respiratory depression leading to coma and death. It is irritant to the respiratory tract causing chemical pneumonitis and pulmonary oedema. The onset of pulmonary oedema may be delayed for 24 to 48 hours. Treat with oxygen and ventilation as appropriate. Administer bronchio-dilators if indicated and consider administration of corticosteroids. Keep casualty under surveillance for 48 hours in case pulmonary oedema develops.</p>
<p>Emergency Action</p>	<p>Fire:</p> <p>Extinguish using dry powder, foam, water fog, or (for small fires) carbon dioxide or BCF. (Note: Use of BCF/halon extinguishers is considered environmentally unacceptable). Fires in confined spaces should be dealt with by trained personnel wearing breathing apparatus.</p>

Emergency Action contd...	Spillage: Isolate spillage from all ignition sources. Contain and recover using sand, sawdust or other suitable absorbent material. Do not wash into drainage system.
Disposal	At sea, used product should be stored for eventual discharge into port approved waste oil disposal facilities. Dispose of by incineration or other suitable means under conditions approved by the local authority.
Labelling Classification	EEC Labelling Indication of danger - Harmful (Xn) Symbol - St Andrew's Cross (black on orange) Risk (R) Phrases: R40 - Possible risk of irreversible effects Safety (S) phrases: S43 - In case of fire use foam/dry powder/CO ₂ /halon. Never use water. S42 - Avoid contact with skin. S46* - If swallowed, seek medical advice immediately and show this container or label. Do not induce vomiting.
Transport Classification	IMO: If flash point above 61°C not classified as dangerous United Nations No: 1202 Class 3 ADR/RID: Class 3 IATA: Class 3
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