ECO LIGHT FUEL OIL (ELFO)

PRODUCT SPECIFICATIONS

Parameters	Unit	Specification	Method of Analysis
Appearance	-	Dark & Cloudy	Visual Inspection
Density at 15°C	kg/L	0.90 max	ASTM D 4052
Density at 30°C	kg/L	0.89 max	ASTM D 4052
Flash Point (PMCC)	°C	45 min	ASTM D 93
Kinematic Viscosity at 50°C	cSt	18 max	ASTM D 445
Water Content	% w/w	1.0 max	ASTM E 203
Acid Number	mg KOH/g	2.0 max	ASTM D 664
Sediment Content (TSE)	% w/w	2.0 max	ASTM D 4870
Ash Content	% w/w	2.0 max	ASTM D 482
Calorific Value	MJ/kg	43 min	ASTM D 240
Carbon Residue	% w/w	5.0 max	ASTM D 4530
pH	-	6 – 7	ASTM D 7946
Sulfur Content	% w/w	0.5 max	ASTM D 5185
Poly-aromatic hydrocarbons			
Benzo(a)pyrene	mg/kg	5 max	US EPA 8670D & US EPA 3630C
Dibenz(a,h)anthracene	mg/kg	5 max	US EPA 8670D & US EPA 3630C
Benz(a)anthrecene	mg/kg	20 max	US EPA 8670D & US EPA 3630C
Benzo(b)fluoranthene	mg/kg	20 max	US EPA 8670D & US EPA 3630C
Benzo(k)fluoranthene	mg/kg	20 max	US EPA 8670D & US EPA 3630C
Chrysene	mg/kg	20 max	US EPA 8670D & US EPA 3630C
Indeno(1,2,3-cd)pyrene	mg/kg	20 max	US EPA 8670D & US EPA 3630C
Elements			
Arsenic, As	mg/kg	2 max	ASTM D 5185
Cadmium, Cd	mg/kg	2 max	ASTM D 5185
Chromium, Cr	mg/kg	5 max	ASTM D 5185
Lead, Pb	mg/kg	5 max	ASTM D 5185
Total Halogen, as Cl	mg/kg	600 max	US EPA 9076

Effective Date : 01st November 2023

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SAMM 751

SAFETY DATA SHEET

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

Product Name: Pentas Flora Eco Light Fuel Oil

Product Use : Industrial Grade Fuel Oil for Burners and Boilers

Synonyms/Trade Name: Recycled Fuel Oil, Reconstituted Fuel Oil

Company Identification:

Pentas Flora Sdn. Bhd.
Lot 183, Jalan 5,
Kompleks Perabot Olak Lempit, 42700 Banting, Selangor
https://pentasflora.com/

Emergency Response:
Telephone No: 603-3149 1388

SECTION 2 - HAZARD IDENTIFICATION

CLASSIFICATIONS

Carcinogenicity – Category 2
Reproductive Toxicity – Category 2
Specific Target Organ Toxicity (Repeated Exposure) – Category 2
Acute Toxicity – Inhalation – Category 4
Chronic Aquatic Toxicity – Category 4

PICTOGRAMS

SIGNAL WORD **WARNING**

HAZARDS STATEMENT

Suspected of causing cancer
Suspected of damaging fertility or the unborn child
May cause damage to organs through prolonged or repeated exposure
Harmful if inhaled
May cause long lasting harmful effects to aquatic life

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice.

SECTION 3 - COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	SYNONYM	CAS NUMBER	AMOUNT
Lubricating oils, used	Used Oil	70514-12-4	80 – 100%
Hydrocarbon solvents. May include diesel, gasoline, jet fuels etc.	N/A	N/A	0 – 20%

SECTION 4 - FIRST AID MEASURES

Eye: 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.

Skin: 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.

Ingestion: 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.

Inhalation: Move to fresh air. Give oxygen. If breathing is irregular or stopped, administer artificial respiration. Seek medical attention immediately.

SECTION 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide (CO_2), water spray, dry chemical, or foam. Keep containers and surroundings cool with water.

SPECIFIC HAZARDS DURING FIRE FIGHTING: 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.

PROTECTION OF FIRE FIGHTERS

Fire Fighting Instructions: This material will burn although it is not easily ignited. See Section 7 for proper handling and storage. For fires involving this material, evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, smoke, incomplete combustion products and gases including sulfur oxides and assorted oxides of carbon.

FLAMMABILITY PROPERTIES

Flash Point [Method]: 50°C min (122°F) [ASTM D93]
Flammable Limits (Approximate volume % in air): Not applicable
Autoignition Temperature: >250°C (482°F)

SECTION 6 ACCIDENTAL RELEASES MEASURES

Notification Procedures: In the event of a spill or accidental release, notify authorities in accordance with all applicable regulations.

Protective Measures: Avoid contact with spilled material. Eliminate all sources of ignition in vicinity of spilled material. Keep unnecessary personnel away from spilled material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 - HANDLING AND STORAGE

Precautionary Measures: Keep away from fire, sparks and heated surfaces. No smoking near areas where material is stored or handled. This product should be only stored and handled areas with intrinsically safe electrical classification.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum re-conditioner or disposed of properly.

Storage: Store in a cool dry location. Keep away from incompatible materials (Section 10). Do not store in open or unlabeled containers.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product:

List	Components	CAS No.	Type	Value
OSHA	Polycyclic Aromatic Compounds (or coal tar pitch volatiles – benzene soluble)	-	PEL	0.2 mg/m^3
	Used Lubricating Oil	70514-12-4	PEL	5 mg/m^3 (as mineral oil mist)
ACGIH	Used Lubricating Oil	70514-12-4	TWA	0.2 mg/m^3 (as mineral oil) Sum of 15 NTP-listed polynuclear aromatic hydrocarbons 0.005 mg/m^3
	Polycyclic Aromatic Compounds (or coal tar pitch volatiles – benzene soluble)		TWA	0.2 mg/m^3

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the workplace when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS: Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: If contact is likely, safety glasses with side shields are recommended. **Skin Protection:** No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.

Respiratory Protection: No respiratory protection is normally required. If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge. Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health, and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

Attention: The data below are typical values and do not constitute a specification.

General Information

Colour	Dark brown/black
Physical State	Liquid
Odour	Characteristic
pH value	Data not available
Vapour Pressure	<0.1 kPa at 40°C
Initial Boiling Point	circa.150°C
Final Boiling Point	Cannot be determined (>600°C)
Solubility in Water	Negligible
Density	0.80 to 0.96 kg/L
Flash Point	45°C minimum
Flammable Limits – Upper	5%(V/V) maximum
Flammable Limits – Lower	0.5%(V/V) minimum
Auto-Ignition Temperature	>250°C
Kinematic Viscosity	Maximum 18 cST at 50°C

SECTION 10 - STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable and non-reactive under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility with Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide and noncombusted hydrocarbons (smoke).
Hazardous Polymerization: Hazardous polymerization will not occur under normal temperatures and pressures.

SECTION 11 - TOXICOLOGICAL INFORMATION

Inhalation: Because of its low vapor pressure, this product presents 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 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.

Skin irritation: May cause skin irritation with prolonged or repeated contact. Practically non-toxic 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. Produce may be hot which could cause 1st, 2nd, or 3rd degree thermal burn.

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

Ingestion: This material has 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: There may be Polyaromatic Hydrocarbons (PAHs) present in this product, some of which are animal carcinogens.

Acute Toxicity – Oral: LD50 rat > 5000 mg/kg

Acute Toxicity – Dermal: LD50 rabbit > 2000 mg/kg

Acute Toxicity – Inhalation: Data not available

Eye Irritation: Slightly irritating

Skin Irritation: Slightly irritating

Respiratory Irritation: Expected to be slightly irritating

Skin Sensitization: Not a skin sensitizer

Carcinogenicity: Dermal application to mice causes skin tumors.

Mutagenicity: In-vitro mutagenicity studies show that mutagenic activity is related to 4-6 ring polycyclic aromatic control.

Reproductive Toxicity: Causes slight fetotoxicity in rats doses which are maternally toxic.

SECTION 12 - ECOLOGICAL INFORMATION

Basis for Assessment: Fuels are typically made from blending several refinery streams. Toxicological studies have been carried out on a variety of hydrocarbon blends and streams but not those containing additives. Information given is based on knowledge of available data on the hydrocarbon blends and on knowledge of the constituents.

Mobility: Float on water. Contain volatile components. Partly evaporates from water or soil surfaces, but a significant proportion will remain after one day. If it enters soil, it will adsorb particles and will not be mobile. Large volumes may penetrate soil and could contaminate groundwater.

Persistence / Degradability: Major components are inherently biodegradable. Persists under anaerobic conditions. The volatile components oxidize rapidly by photochemical reactions in air.

Bioaccumulation: Contain components which may have the potential to bio accumulate. May caused fish and shellfish tainting.

Eco toxicity: Poorly soluble mixture. Product is classified as harmful to aquatic organisms, LL/EL50 10-100 mg/L. (LL/El50 expressed as the nominal amount of product required to prepare aqueous test extract). Films formed on water may affect oxygen transfer and damage organisms.

SECTION 13 - DISPOSAL CONSIDERATION

Waste Disposal

Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor to deal satisfactorily with type of product should be established beforehand. Do not dispose into the environment, in drains or in water courses.

Product Disposal

Dispose in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed in a safe manner (see Disposal instruction).

Container Disposal

Recycle or dispose in accordance with the legislation on force with a recognized collector or contractor.

SECTION 14 - TRANSPORT INFORMATION

CFR

Proper shipping name	: Not regulated if shipped below 60°C (140°F) Elevated temperature liquid, flammable (if shipped above 60°C (140°F)
UN-No	: Not regulated if shipped below 60°C (140°F) 3256 if shipped above 60°C (140°F)
Class	9
Packing Group	III
Hazard Inducer	: Recycled Fuel Oil

TGD

Proper shipping name	: Not regulated if shipped below 60°C (140°F) Elevated temperature liquid, flammable (if shipped above 60°C (140°F)
UN-No	: Not regulated if shipped below 60°C (140°F) 3256 if shipped above 60°C (140°F)
Class	9
Packing Group	III
Hazard Inducer	: Recycled Fuel Oil

IATA

UN-No	: Not regulated if shipped below 60°C (140°F) 3256 if shipped above 60°C (140°F)
Class	: Not regulated if shipped below 60°C (140°F) Not permitted for transport at 60°C (140°F) or higher temperature

IATA Passenger Transport

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

Not permitted for transport at 60°C (140°F) or higher temperature

IMDG-Code

UN-No	: Not regulated if shipped below 60°C (140°F) 3256 if shipped above 60°C (140°F)
Description of the goods	: Elevated temperature liquid, n.o.s (Recycled Fuel Oil)
Class	: Not regulated if shipped below 60°C (140°F) Not permitted for transport at 60°C (140°F) or higher temperature.
Packing Group	III
IMDG-Labels	9
EmS Number	: F-A S-P
Marine Pollutant	: No

SECTION 15 - REGULATORY INFORMATION

EC Symbol	T
EC Risk Phrase	R45 May cause cancer. R52/53 harmful to aquatic organisms, may cause long term adverse effects in the aquatic environment. R66 Repeated exposure may cause skin dryness and cracking.
EC Safety Phrase	S45 In case of accident on if you feel unwell seek medical advice immediately. S53 Avoid exposure – obtain special instruction before use. S61 Avoid release to the environment. Refer to special instructions/safety data sheet.

AICS (Australia): All components listed.

National Legislation:
National Code of Practice for the Preparation of Material Safety Data Sheets [OHSC:2011].
List of Designated Hazardous Substances [NOHSC:10005].
Approved Criteria for Classifying Hazardous Substances [NOHSC:1008].
Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003].
Australian Dangerous Goods Code.

SECTION 16 - OTHER INFORMATION

REVISION STATEMENT: -

Revision Date: -

The information and recommendations contained herein are to the best of Pentas Flora's knowledge and belief, accurate and reliable as of the date issued. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to ensure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users.