FUEL OILS

SPECIFICATION DATA SHEET

BioDiesel (100%) EN 14214

Biodiesel is defined as the mono alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, for use in compression-ignition (diesel) engines.
This specification is for pure (100%) biodiesel prior to use or blending with diesel fuel.

Property	Unit	Minimum	Maximum	Test Method
Ester Content	% (m/m)	96.5		prEN 14103
Density @ 15°C	kg/m?;	860	900	EN ISO 3675 EN ISO 12185
Viscosity @ 40°C	mm2	3.5	5.0	EN ISO 310
Flash Point	°C	Above 101		ISO / CD 3679
Sulphur Content	mg/Kg		10	
Carbon Residue (10% Bottoms)	% (m/m)		0.3	EN ISO 10370
Cetane Number		51.0		EN ISO 5165
Sulphated Ash Content	% (m/m)		0.02	ISO 3987
Water Content	mg/Kg		500	EN ISO 12937
Total Contamination	mg/Kg		24	EN 12662
Copper Strip Corrosion (3hr @ 50°C)	rating	Class 1	Class 1	EN ISO 2160
Thermal Stability Oxidation Stability, 110°C	hours	6		pr EN 14112
Acid Value	mg KOH/g		0.5	pr EN 14104
Iodine Value			120	pr EN 14111
Linolenic acid methyl ester	% (m/m)		12	pr EN 14103
Polyunsaturated (>= 4 double bonds) methyl esters	% (m/m)		1	
Methanol Content	% (m/m)		0.2	pr EN 14110
Monoglyceride Content	% (m/m)		0.8	pr EN 14105
Diglyceride Content	% (m/m)		0.2	pr EN 14105
Triglyceride Content	% (m/m)		0.2	pr EN 14105
Free Gylcerol	% (m/m)		0.02	pr EN 14105 pr EN 14106
Total Gylcerol	% (m/m)		0.25	pr EN 14105
Alkaline Metals (Na + K)	mg/Kg		5	pr EN 14108 pr EN 14109
Phosphorus Content	mg/Kg		10	pr EN 14107

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SPECIFICATION DATA SHEET

Biodiesel Safety Information

1. CHEMICAL PRODUCT and COMPANY INFORMATION (rev. Jan-2015)
Fuel Oils
Unit 3-4, Burnett Rd
Darent Industrial Park
Slade Green
Erith, Kent. DA8 2LG.

2. COMPOSITION and INFORMATION ON INGREDIENTS
A complex combination of hydrocarbons with carbon numbers in the range C9 and higher produced from the distillation of petroleum crude oil with up to 5% Fatty Methyl Ester

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION!
OSHA/NFPA COMBUSTIBLE LIQUID - SLIGHT TO MODERATE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED
Moderate fire hazard. Avoid breathing vapours or mists. May cause dizziness and drowsiness. May cause moderate eye irritation and skin irritation. Long-term, repeated exposure may cause skin cancer. If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs).

EYES
Contact with eyes may cause mild irritation.

SKIN
Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

INGESTION
The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.
Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

INHALATION
Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING:
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.

CHRONIC EFFECTS and CARCINOGENICITY
Similar products have produced skin cancer and systemic toxicity in laboratory animals following repeated applications. The significance of these results to human exposures has not been determined – see Section 11Toxicological Information.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash).

4. FIRST AID MEASURES

EYES
In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

SKIN
Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops.

INGESTION
DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

INHALATION
Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:
FLASH POINT: 100 ^{o}F (38 ^{o}C) minimum PMCC
AUTOIGNITION POINT: 494 ^{o}F (257 ^{o}C)
LOWER EXPLOSIVE LIMIT (%): 0.6
UPPER EXPLOSIVE LIMIT (%): 7.5

FIRE AND EXPLOSION HAZARDS
OSHA and NFPA Class 2 COMBUSTIBLE LIQUID
Vapours may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapours may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA
SMALL FIRES:
Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.
LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

FIRE FIGHTING INSTRUCTIONS
Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.
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 face piece and full protective clothing.
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.

6. ACCIDENTAL RELEASE MEASURES
ACTIVATE FACILITY'S SPILL CONTINGENCY OR EMERGENCY RESPONSE PLAN.

Evacuate non essential 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 confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.
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. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.
Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

7. HANDLING and STORAGE HANDLING PRECAUTIONS
Handle as a combustible liquid. Keep away from heat, sparks, excessive temperatures and open flame!
No smoking or open flame in storage, use or handling areas. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.
Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when this product is loaded into tanks previously containing low flash point products

STORAGE PRECAUTIONS
Keep containers closed and clearly labeled. Use approved vented storage containers. Empty product containers or vessels may contain explosive vapours. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.
Store in a well-ventilated area.
Avoid storage near incompatible materials. The cleaning of tanks previously
containing this product should follow recommended practice "Cleaning Mobile Tanks In
Flammable and Combustible Liquid Service" and "Cleaning Petroleum Storage Tanks."

WORK/HYGIENIC 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 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.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION
ENGINEERING CONTROLS
Use adequate ventilation to keep vapour concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

EYE/FACE PROTECTION
Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION
Gloves constructed of nitrile, neoprene, or PVC are recommended. Chemical protective clothing based on degree of exposure.
Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

RESPIRATORY PROTECTION
An approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.
Seek additional guidance from manufacturers on respiratory protection selection.
Use a positive pressure, air-supplied 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.

9. PHYSICAL and CHEMICAL PROPERTIES
APPEARANCE
Clear liquid

ODOUR
Mild, petroleum distillate odour

BASIC PHYSICAL PROPERTIES
BOILING RANGE: 340 to 700 ^{o}F (171 to 371 ^{o}C)
VAPOUR PRESSURE: 0.009 psia @ 70 ^{o}F (21 ^{o}C)
VAPOUR DENSITY (air = 1): > 1.0
SPECIFIC GRAVITY (H_2O = 1): AP 0.87
PERCENT VOLATILES: 100 %
EVAPORATION RATE: Slow; varies with conditions
SOLUBILITY (H_2O): Negligible

10. STABILITY and REACTIVITY
STABILITY
Stable. Hazardous polymerization will not occur

CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS
Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers; Viton ®; Fluorel ®

HAZARDOUS DECOMPOSITION PRODUCTS
Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

11. TOXICOLOGICAL PROPERTIES
ACUTE TOXICITY
Acute Oral LD50 (rat): 14.5 ml/kg
Acute Dermal LD50 (rabbit): > 5 ml/kg
Guinea Pig Sensitization: negative
Primary dermal irritation: moderately irritating (Draize mean irritation score - 3.98 rabbits)
Draize eye irritation: mildly irritating (Draize score, 48 hours, unwashed - 2.0 rabbits)

CHRONIC EFFECTS AND CARCINOGENICITY
Carcinogenic: IARC: NO NTP: NO OSHA: NO ACGIH: 1997 NOIC: A3
Dermal carcinogenicity: positive - mice
Studies have shown that similar products produce 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.
This product is similar to Diesel Fuel. I ARC classifies whole diesel fuel exhaust particulates as probably carcinogenic to humans (Group 2A) and NIOSH regards it as a potential cause of occupational lung cancer based on animal studies and limited evidence in humans.

MUTAGENICITY (genetic effects)
Material of similar composition has been positive in a mutagenicity study.

12. ECOLOGICAL INFORMATION
Keep out of sewers, drainage areas and waterways. Report spills and releases to appropriate authorities.

13. DISPOSAL CONSIDERATIONS
Use approved or registered fuel suppliers or waste disposal organizations

14. TRANSPORTATION INFORMATION
PROPER SHIPPING NAME: BIODIESEL (B100)
HAZARD CLASS & PACKING GROUP: 3, PG III
DOT IDENTIFICATION NUMBER: NA 1993
DOT SHIPPING LABEL: FLAMMABLE LIQUID
May be reclassified for transportation as a COMBUSTIBLE LIQUID under conditions of DOT 49 CFR 173.120(b)(2).
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CLEAN WATER ACT (OIL SPILLS)
Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported to the proper authorities immediately.