

Identification of the substance or preparation:

Fatty Acid Methyl Ester (FAME / Biodiesel)

Revision date: 13.04.2018 / Date of printing: 13.04.2018

CAFT Ltd: Clean Air Biodiesels

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH)**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1. Product identifiers****Fatty Acid Methyl Ester (FAME / Biodiesel)**

Revision date: 13.04.2018

REACH registration No.: 01-2119471664-32-0108

737-3

Use of the substance/ preparation: Fuel, fuel component, solvent

1.2. Relevant identified uses of the substance or mixture and uses advised against**1.3. Details of the supplier of the safety data sheet**

Supplier
: CAFT Ltd
71 - 75 Shelton Street
London, WC2H 9JQ

Telephone: +44 7899990344

E-mail info@cleanairfueltechnologies.co.uk**1.4. Emergency telephone number**

Emergency telephone: +44 7899990344

SECTION 2: Hazards identification**2.1. Classification of the substance or mixture**

Classification according to EC regulation 1272/2008 (CLP):

No classification.

Classification according to Directive 67/548/EEC or 1999/45/EC:

No classification.

2.2. Label elements

Labelling (67/548/EEC or 1999/45/EC):

Special provisions concerning the labelling of certain mixtures:

No

2.3. Other hazards

Possible harmful effect(s) on human beings and possible symptom(s):

May cause minor eye irritation.

Vapors produced by heating the substance, or finely misted materials, may irritate the mucous membranes and cause dizziness, and nausea.

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SECTION 3: Composition/ information on ingredients**Chemical characterization (preparation):**

The substance consists mainly of saturated and unsaturated fatty acids methyl ester (typical chain length C16-C18).

The substance may contain residuals of glycerol and partial glycerides (total < 3.5%) and traces of methanol (< 0.2 %).

To improve the properties the substance may contain additives in small concentrations: Cold flow improvers consisting mainly of oligomers of vinyl acetate and other monomers and oxidation stabilizers containing mainly steric hindered phenols. The single active components do not exceed a concentration of 1000 mg/kg (0.1%) in relation to the whole substance.

Exemption: The articles 12740 and 12741 Fatty Acid Methyl Ester /-20°C DIN EN 14114 may contain up to 2000 mg/kg (0.2%) cold flow improver.

SECTION 4: First aid measures**4.1. Description of first aid measures****After inhalation:**

In case of accident by inhalation: remove casualty to fresh air and keep at rest. Seek medical attention if symptoms persist.

In case of skin contact:

After contact with skin, wash immediately with plenty of water and soap.

Change contaminated, saturated clothing.

In case of eye contact:

On contact with the eyes, rinse immediately with plenty of water for 15 minutes.

After ingestion:

Do not induce vomiting.

Rinse mouth thoroughly with water.

If conscious, give half a litre of water to drink immediately.

Never give anything by mouth to an unconscious person or a person with cramps.

4.2. Most important symptoms and effects, both acute and delayed

May cause minor eye irritation.

Vapors produced by heating the substance, or finely misted materials, may irritate the mucous membranes and cause dizziness, and nausea.

4.3. Indication of any immediate medical attention and special treatment needed**Information to physician:**

No special medical actions required.

SECTION 5: Firefighting measures**5.1. Extinguishing media****Suitable extinguishing media:**

Carbon dioxide (CO₂).

Water mist

alcohol resistant foam.

Extinguishing powder.

Extinguishing media which must not be used for safety reasons:

Strong water jet. Water stream may splash the burning liquid and spread fire.

Consider halon use may not be permissible in some countries.

5.2. Special hazards arising from the substance or mixture**Special exposure hazards arising from the substance or preparation itself, its combustion products or from resulting gases:**

In combustion emits toxic fumes of carbon dioxide / carbon monoxide.

Soaked rags or spill absorbents (i.e. oil dry, sacks, sand) can cause spontaneous combustion if stored near combustibles and not handled properly.

5.3. Advice for firefighters

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Special protective equipment for firefighters:

In case of fire: Wear self-contained breathing apparatus.

On danger by contact with substance: Oil-resistant protective clothing.

SECTION 6: Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures****Personal precautions:**

Remove all sources of ignition.

If outside do not approach from downwind. If outside keep bystanders upwind and away from danger point.

Mark out the contaminated area with signs and prevent access to unauthorised personnel.

Turn leaking containers leakside up to prevent the escape of liquid.

6.2. Environmental precautions**Environmental measures:**

Make sure spills can be contained, e.g. in sump pallets or kerbed areas.

Fire residues and contaminated firefighting water must be disposed of in accordance with the local regulations.

6.3. Methods and material for containment and cleaning up**Methods for cleaning up:**

Take up with absorbent material (e.g. oil binder).

Recover large spills for salvage or disposal. Wash hard surfaces with safety solvent or detergent to remove remaining oil film.

Greasy nature will result in a slippery surface.

6.4. Reference to other sections**Additional information:**

If appropriate Sections 8 and 13 shall be referred to.

SECTION 7: Handling and storage**7.1. Precautions for safe handling****Advices on safe handling:**

Note: Fatty Acid Methyl Esters with longer chain length are not classified as dangerous according to the criteria of the Dangerous Substances Directive (67/548/EEC) and CLP (Regulation CE 1272/2007). Specific Risk Management Measures are therefore not required. Nevertheless, the exposure of workers during and after normal operations should be minimised by the use of good industrial hygiene practice.

Avoid direct contact with the substance.

When using do not eat, drink or smoke.

Used working clothes should not be worn outside the work area.

Wash hands before breaks and after work.

7.2. Conditions for safe storage, including any incompatibilities**Requirements for storerooms and containers:**

Keep container tightly closed in a cool, well-ventilated place.

Keep away from sources of ignition

Do not store together with oxidizing agents.

Further information on storage conditions:

Recommended storage temperature: 15 °C - 25 °C

Below normal ambient temperatures material can start to solidify.

7.3. Specific end use(s)

No sector specific guidance is available.

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SECTION 8: Exposure controls/personal protection**8.1. Control parameters**

Components with occupational exposure limits resp. biological occupational exposure limits requiring monitoring:

Remarks:

DNEL and PNECs: See annex

8.2. Exposure controls

Respiratory protection: Breathing apparatus in the event of aerosol or mist formation.

Hand protection: Gloves (oil-resistant)

Suitable material: NBR (Nitrile rubber). FKM (fluoro rubber).

Eye protection: Wear eye/face protection.

General protection and hygiene measures:

Wash hands and face before breaks and on finishing work and take a shower if necessary.

Wash contaminated clothing before reuse.

SECTION 9: Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Physical state: liquid
Colour: yellowish
Odour: mild

Important health, safety and environmental information:

		Unit		Method
pH:	-			
Boiling temperature / boiling range:	302.5 - 570	°C	1013	ASTM D 7169
Melting point / melting range:	-17 - +16	°C		DIN ISO 3016
Flash point (°C):	120 - 180	°C		EN ISO 2719
Flammability:	The product is not combustible. (67/548/EU)			
Spontaneously flammable:	Self ignition temperature in °C: 261°C +/- 5°C The ignition delay observed at this temperature was 60 seconds and a Temperature increase at middle of the flask was 14°C.			Closed Flask
Oxidizing characteristics:	Not oxidizing.			
Explosivity:	Not explosive.			
Vapour pressure:	2 - 6	mbar	at °C 25	EN 13016-1
Density:	878 - 895	kg/m ³	at °C 15	EN ISO 3675
Water solubility (g/l):	< 0.023	mg/l		
Partition coefficient n-octanol /water (log P O/W):	6.2			OECD 107
Viscosity:	5.5 - 8	mPa s	at °C 25	EN ISO 3104

9.2. Other information**SECTION 10: Stability and reactivity****10.1. Reactivity**

Stable at ambient temperature.
 No hazardous reactions known.

10.2. Chemical stability

Substance is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure

10.3. Possibility of hazardous reactions

The substance reacts with strong bases to produce methanol.

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10.4. Conditions to avoid

See incompatible materials.

10.5. Incompatible materials

Oxidising agent, strong.

Alkalis (alkalis), concentrated.

10.6. Hazardous decomposition products

In combustion emits toxic fumes of carbon dioxide / carbon monoxide.

SECTION 11: Toxicological information**11.1. Information on toxicological effects****Acute toxicity:**

Acute toxicity, oral: LD50: > 5000 mg/kg (Study is closely comparable to OECD 401; GLP)

Acute toxicity, dermal: Has been tested in a fixed dose test at 2000 mg/kg (C6-C12 ME, Rabbit.): No sign of toxicity, Method: EPA OPPTS 870.1200

Irritant and corrosive effects:

Skin corrosion/irritation: In general, esters of long-chain fatty acid methyl esters are always negative with relation to irritation (from C18 onward), while esters of short-chain fatty acids are always (slightly) positive (up to C10). Method: OECD 404

Serious eye damage/irritation: Conjunctivae effects were observed 1 hour after exposure. Slight chemosis and slight conjunctivae were observed in two animals and four animals, respectively. Two animals presented conjunctivae with diffuse, crimson colour and individual vessels not easily discernible. These effects were fully reversible within 1 day. Method: OECD 405

Sensitisation:

Respiratory sensitisation: No information but no respiratory sensitisation is expected.

Skin sensitisation: Esterol C in corn oil was tested using the Guinea pig maximisation test.

No clinical signs and no deaths were noted during the study. No cutaneous reactions were observed after the challenge application. Under the experimental conditions of the study, it is concluded that Esterol C does not induce delayed contact hypersensitivity in guinea pig. Method: OECD 406 (GLP)

Repeated dose toxicity:

Reproductive toxicity: Developmental effects: Fertility effects: The tested substance revealed no effect in Screening for reproduction for a dose of until 1000 mg/kg. Method: OECD 422

STOT-single exposure: No information.

STOT- repeated exposure: The tested substance revealed no effect in Screening for reproduction for a dose of until 1000 mg/kg. Method: OECD 422

CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction):

Germ cell mutagenicity, Esterol C: Ames test negative. Method: OECD 471

In vitro cytogenicity test, Esterol C: Investigation in lymphocytes. negative. Method: OECD 473

In mammalian mutation test: Methyl myristate alone had no mitogenic activity. In combination with phytohemagglutinin, however, a comitogenic activity was found. Method: EU Method B.17

Carcinogenicity: Methyl oleate and methyl 12-oxo-trans-10-octadecenoate have been tested for carcinogenicity by oral and subcutaneous administration. A positive effect of methyl oleate could not be assessed, while the results pointed to a promoter effect of methyl oxo-octadecenoate. Method: EU Method B.32

Overall Assessment on CMR properties: No CMR properties are expected.

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SECTION 12: Ecological information**12.1. Toxicity****Aquatic toxicity:**

EC50: (48 h): 2504 mg/l Method: OECD 202

EC50: (72 h): 73729 mg/l Method: OECD 201

Terrestrial toxicity:

LC50: (freshwater fisch) 100000 mg/l

12.2. Persistence and degradability**Method:**

All methyl esters of fatty acids are readily biodegradable in water, soil and sediments. They pass the 10 days windows with 62% of degradation. Half life in the three compartment is less than 2 -3 days. In some case even less than 1 day. Method: ISO 10712

12.3. Bioaccumulative potential

All methyl esters of fatty acids are readily biodegradable in water, soil and sediments. They pass the 10 days windows with 62% of degradation. Half life in the three compartment is less than 2 -3 days. In some case even less than 1 day. Method: ISO 10712

12.4. Mobility in soil

The substance is very poorly soluble in water and readily biodegradable. The equilibrium partitioning method, following a fugacity model III indicate a partition of the substance on sediments of 85.5%, based on log Koc > 5.63 at 22°C.

According to equilibrium partitioning Fugacity model III, the soil % is 1.61%, FAME have a soil primary biodegradation of less than 2 days.

12.5. Results of PBT and vPvB assessment

Fatty acids, C16-18 and C18-unsatd., Me esters is not regarded as PBT or vPvB based on physicochemical, environmental and toxicological properties. Fatty acids, C16-18 and C18-unsatd., Me esters is not regarded as P or vP based on readily biodegradability. Fatty acids, C16-18 and C18-unsatd., Me esters is not regarded as bioaccumulative based on the measured BCF of 3. The long-term no-observed effect concentration (Noec) for marine or freshwater organisms is not available because of the high biodegradation rate in environmental conditions.

The substance is not classified as carcinogenic (category 1A or 1B), mutagenic (category 1A or 1B), or toxic for reproduction (category 1A, 1B or 2).

12.6. Other adverse effects**General information:**

The substance is considered as stable in the environmental range of pH. Hydrolysis happens with the presence of strong acids or basis, with release of methanol and the fatty acid molecule.

SECTION 13: Disposal considerations**13.1. Waste treatment methods****Recommendation:**

Incineration is recommended.

SECTION 14: Transport information**14.1. Land transport (ADR/RID)**

Proper Shipping Name: FAME (Biodiesel)

Remark: Not classified for this transport carrier.

14.2. Inland waterway craft (ADN/ADNR)

Proper Shipping Name: FAME (Biodiesel)

Remark: Not classified for this transport carrier.

14.3. Sea transport (IMDG)

Marine pollutant: nein

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Remark: Not classified for this transport carrier.

14.4. Air transport (ICAO-TI / IATA-DGR)

Remark: Not classified for this transport carrier.

14.5. Additional information:

No

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Betriebssicherheitsverordnung (BetrSichV): - (Germany only)

Water Hazard Class: 1 **Source:** VwVwS, Anh. 2, Nr. 834

Other regulations (EU):

Mainly local/national tax legislation and quality requirements (EN 14214 + additional regulations).

SECTION 16: Other information

Data sources:

See annex

Further remarks:

CSA: Chemical Safety Assessment

PBT: Substance with persistent, bioaccumulative and toxic properties.

vPvB: Substance with very persistent and very bioaccumulative properties.

Annex

8.1 DNEL and PNECs

<i>DNELs and PNECs for the substance</i>			
Fatty acids, C16-18 and C18-unsaturated, Methyl esters			
<i>DNELs</i>			
<i>Population/route</i>		<i>Exposure pattern</i>	<i>Value</i>
Workers	Inhalation	Long-term systemic effects	6.96 mg/m ³
	Dermal	Long-term systemic effects	10 mg/kg bw/day
Consumers	Inhalation	Long-term systemic effects	23 mg/m ³
	Dermal	Long-term - systemic effects	5 mg/kg bw/day
	Oral	Long-term - systemic effects	5 mg/kg bw/day
<i>PNECs</i>			
<i>Compartment</i>			<i>Value</i>
Water	Freshwater		2.504 mg/l
	Marine water		0.2504 mg/l
	Intermittent releases		25.04 mg/l
Sediment			Not relevant
Soil			Not relevant
Sewage treatment			520 mg/l
Secondary poisoning			Not relevant

16. Literature

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