

## SAFETY DATA SHEET

**REVISION DATE:** 06/14/2017

### SECTION 1 - PRODUCT & COMPANY IDENTIFICATION

**COMMON NAME:** Bio-oil, wood oil

**PRODUCT NAME:** *Agrefine* Low-Ash Pyrolysis Bio-Oil

**USE:** Liquid fuel for industrial, commercial, residential, or laboratory applications

**DESCRIPTION:** Wood-derived fast pyrolysis bio-oil

**MANUFACTURER:** *Mainstream BioEnergy*

A Division of Mainstream Engineering  
 200 Yellow Place  
 Rockledge, Florida 32955

**INFORMATION TELEPHONE:** 321-631-3550

**EMERGENCY TELEPHONE:** 800-424-9300

### SECTION 2 - HAZARDS IDENTIFICATION

#### GHS CLASSIFICATION IN ACCORDANCE WITH 29 CFR 1910

**(OSHA HCS):**

Skin corrosion/irritation (Category 2)

Sensitization - skin (Category 1)

Eye damage/irritation (Category 2A)

#### HAZARD STATEMENT(S):

H315 Causes skin irritation

H317 May cause an allergic skin reaction

H319 Causes serious eye irritation

#### PICTOGRAM(S):



**SIGNAL WORD:** Warning (Irritant)

#### PRECAUTIONARY STATEMENT(S):

P102 Keep out of reach of children.

P103 Read label before use.

P234 Keep only in original container.

P261 Avoid breathing fume/mist/vapors/spray.

P262 Do not get in eyes, on skin, or on clothing.

P264 Wash hands thoroughly after handling.

P272 Contaminated work clothing should not be allowed out of the workplace

P280 Wear protective gloves/eye protection/face protection.

P302 + P352

IF ON SKIN: Wash with plenty of soap and water.

P305 + P351 + P338

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P333 + P313

If skin irritation or a rash occurs: Get medical advice/attention.

P337 + P313

If eye irritation persists: Get medical advice/attention.

P362 + P364

Take off contaminated clothing and wash before reuse.

P501 Dispose of contents/container in accordance with local and federal regulations.

**HAZARDS NOT OTHERWISE CLASSIFIED BY GHS:** none

### SECTION 3 - PRODUCT COMPOSITION INFORMATION

COMPONENT	CAS #	AMOUNT
Fast Pyrolysis Bio-Oil	1207435-39-9	100%

### SECTION 4 - EMERGENCY & FIRST-AID PROCEDURES

**EYE:** Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes, occasionally lifting the upper and lower lids. Get medical aid immediately, preferably from an ophthalmologist.

**SKIN:** Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Wash clothing before reuse.

**INGESTION:** Immediately rinse mouth several times with water. If any of the product is swallowed, do not induce vomiting, but drink 2 – 3 glasses of water for dilution. Seek medical attention from a physician, medical facility, or poison control center. If individual is drowsy or unconscious, do not give anything by mouth.

**INHALATION:** If overcome by vapor move victim to fresh air. If person is not breathing, call 911 or an ambulance;



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provide artificial respiration, if possible. Call a physician for further treatment advice.

**NOTICE TO PHYSICIANS:** The product is acidic (pH approx. 2.5) and is partly soluble in water. No specific antidote exists, so treat exposures symptomatically.

### SECTION 5 – FIRE-FIGHTING MEASURES

**EXTINGUISHING MEDIA:** Use CO<sub>2</sub> (Carbon Dioxide), dry chemical, or extinguishing foams. Use of water should be only to cool fire-exposed containers and personnel. However, the direct use of a water jet may serve to spread the fire.

**HAZARDOUS DECOMPOSITION PRODUCTS:** This material will burn to produce thick smoke and possibly toxic vapors in addition to carbon dioxide and monoxide.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:** Containers exposed to high heat represent explosion risks due to increased pressures.

**SPECIAL FIRE FIGHTING PROCEDURES:** Firefighters should wear full protective gear, including self-contained breathing apparatus.

### SECTION 6 – ACCIDENTAL RELEASE MEASURES

**PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES:** Avoid inhalation of vapors/mist and make sure area is well ventilated. Avoid getting material in eyes or mouth, or prolonged exposure to skin. Thus, protective eyewear and gloves are recommended. Remove contaminated clothing and wash before reuse.

**ENVIRONMENTAL PRECAUTIONS:** Prevent release of unused product to the environment if possible. Avoid discharge to natural waters or sewers.

**MATERIALS FOR CONTAINMENT AND CLEAN-UP:** Spills should be contained immediately; when necessary, use an inert adsorbent material (e.g., vermiculite or sand). Place collected materials in a tightly closed container. Transfer liquid and contaminated solid waste to containers suitable for recovery or disposal in accordance with federal and local regulations.

**REFERENCE TO OTHER SECTIONS:** For additional disposal directions and reporting requirements, please refer to Section 13.

### SECTION 7 – HANDLING AND STORAGE

**PRECAUTIONS FOR SAFE HANDLING:** Use good industrial hygiene practices when handling this material. Use with

safety glasses and suitable protective gloves as specified in Section 8. Wash hands immediately and thoroughly after handling. Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation. Keep away from children.

**STORAGE:** Store only in the original container. Store in a cool, dry location (do not exceed 55 °C). Keep container tightly closed. Maintain adequate ventilation.

**SPECIAL STORAGE CONSIDERATIONS:** None.

### SECTION 8 – EXPOSURE CONTROLS AND PERSONAL PROTECTION MEASURES

**EXPOSURE LIMITS:**

None have been specified for this material.

**ENGINEERING CONTROLS:** Handle product in accordance with good industrial hygiene and safety practice. Use with adequate general and local exhaust ventilation in order to maintain low airborne levels of volatile components.

**PERSONAL PROTECTIVE EQUIPMENT:** Please wear appropriate personal protective equipment for handling of this product as indicated below.

**EYE PROTECTION:** Chemical splash goggles are advised.

**SKIN PROTECTION:** Use gloves and appropriate clothing to minimize dermal exposure. Clothing worn by personnel should be laundered regularly. If direct contact with the product has occurred, wash the areas thoroughly with soap and water.

**RESPIRATORY PROTECTION:** Avoid breathing mists or vapors. If there is inadequate ventilation, a suitable NIOSH/MSHA approved respirator is advised, or a positive pressure self-contained breathing apparatus (SCBA).

### SECTION 9 - PHYSICAL AND CHEMICAL DATA

<b>APPEARANCE:</b>	Dark brown liquid
<b>ODOR:</b>	Strong acrid, smoky
<b>ODOR THRESHHOLD:</b>	No data available
<b>pH:</b>	approx. 2.5
<b>FLASH POINT:</b>	> 65 °C (149 °F)
<b>AUTOIGNITION TEMPERATURE:</b>	> 500 °C (932 °F)
<b>FLAMMABILITY:</b>	No data available
<b>EXPLOSION LIMITS:</b>	No data available
<b>POUR POINT:</b>	< -16 °C (3.2 °F)
<b>BOILING POINT (760 mm Hg):</b>	< 100 °C (232 °F), Start of degradation
<b>VAPOR PRESSURE:</b>	5 kPa at 38 °C (100 °F)
<b>VAPOR DENSITY (AIR = 1):</b>	No data available
<b>SPECIFIC GRAVITY (WATER = 1):</b>	1.2



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**SOLUBILITY:** Soluble with water to a concentration of 30%; soluble in acetone, methanol, ethanol  
**PARTITION COEFFICIENT (N-OCTANOL/WATER):** No data available  
**DECOMPOSITION TEMPERATURE:** > 150 °C (302 °F)  
**VISCOSITY (40 °C, 104 °F):** 56 centiStokes  
**VOC CONTENT:** No data available  
**EVAPORATION RATE (N-BUTYL ACETATE = 1):** No data available

**MUTAGENICITY:** Not mutagenic in *In Vivo* MAS test but showed slight mutagenic effect in *In Vitro* MNV test  
**TERATOGENICITY:** No known teratogenic effect (birth defect).  
**SENSITIZATION:** Moderate sensitizer  
**REPRODUCTIVE:** No information available  
**CHRONIC SYMPTOMS:** Prolonged exposures to the concentrate or diluted product can worsen the severity of the response.  
**CARCINOGENICITY:** The product contains traces of substances classified as carcinogenic (e.g. formaldehyde, acetaldehyde, and furfural).

### SECTION 10 – STABILITY AND REACTIVITY

**REACTIVITY:** Temperatures above 100 °C can induce degradation, resulting in the formation of hazardous vapors.  
**CHEMICAL STABILITY:** Stable when handled or stored under the recommended conditions.  
**POSSIBILITY OF HAZARDOUS REACTIONS:** Temperatures above 100 °C can result in the formation of hazardous vapors and oxides of carbon.  
**HAZARDOUS POLYMERIZATION:** Polymerization to hazardous materials can occur if the product is exposed to high temperatures.  
**CHEMICAL INCOMPATIBILITY:** This product is not classified as corrosive, but it may have the ability to corrode certain metals, such as copper, aluminum and carbon steel. Only tools and implements made of stainless steel are recommended for use with this product.  
**HAZARDOUS DECOMPOSITION PRODUCTS:** Thermal decomposition may generate harmful or toxic fumes (e.g., carbon monoxide, carbon dioxide, formic acid, formaldehyde, methanol, acetaldehyde).

### SECTION 11 - TOXICOLOGICAL INFORMATION

**PRIMARY ROUTES OF ENTRY:** Skin contact, eye contact, ingestion. (There is not expected to be significant exposure due to inhalation of this product.)  
**INFORMATION ON TOXICOLOGICAL EFFECTS**  
**ACUTE SYMPTOMS:** Mild irritation of the eyes, skin, and intestinal tract.  
**Eye:** Exposure to vapors or mist can cause irritation and burns.  
**Skin:** Exposure to mist or liquid can cause irritation. In some cases, there can be an allergic skin reaction and prolonged exposure can cause burns.  
**Ingestion:** Exposure can lead to irritation of the digestive tract and burns. LD50 (oral, rat) is >2000 mg/kg of body weight.

### SECTION 12 - ECOLOGICAL INFORMATION

**TOXICITY:** Negligible toxicity to *Daphnia Magna* at highest loadings tested and reported (EC50 > 100 mg/l).  
  
In high concentrations, the reduction in pH may contribute to toxicity.  
**PERSISTENCE AND DEGRADABILITY:** The product biodegrades rapidly at percentages between 32 and 50%. A low rate of biodegradation has been observed under anaerobic conditions.  
**BIOACCUMULATION:** The product is not expected to accumulate because it biodegrades rapidly under normal conditions.  
**SOIL TO GROUNDWATER MOBILITY:** No data available  
**OTHER ADVERSE EFFECTS:** No data available

### SECTION 13 – DISPOSAL CONSIDERATIONS

**DISPOSAL METHODS:** Dispose in accordance with all applicable Federal, State and Local regulations. Always contact a permitted waste disposer to assure compliance.  
**SPECIAL CONSIDERATIONS FOR DISPOSAL:** Emptied containers may still retain product residue and therefore should also be disposed in a manner consistent with all applicable Federal, State and Local regulations.

### SECTION 14 – TRANSPORT INFORMATION

**DOT (US):**  
**UN NUMBER:** UN2924  
**PROPER SHIPPING NAME:** FLAMMABLE LIQUID, CORROSIVE, N.O.S.  
**CLASS:** 3  
**PACKING GROUP:** III



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## SECTION 15 – REGULATORY INFORMATION

No data available.

## SECTION 16 – OTHER INFORMATION

### **NFPA RATING:**

Health hazard: 2

Flammability: 2

Instability: 0

The information contained herein is believed to be accurate and is offered in good faith. The above information is, in part, based on published toxicological information. The information in this safety data sheet must be regarded as a description of the safety requirements relating to the mixture and not as a guarantee of the properties of the product thereof. Because product use is beyond our control, no warranty is given, expressed, or implied. Mainstream Engineering Corporation cannot assume any liability for the use of information contained herein or from damage resulting from handling or contact with the above product. To determine applicability or effect of any law or regulation with respect to the product, users should consult a legal advisor or appropriate governmental agency.

Toxicological information based on report of the BIOTOX program titled "An assessment of bio-oil toxicity for safe handling and transport" available from [www.pyne.co.uk](http://www.pyne.co.uk).

### **PREPARATION INFORMATION**

#### ***Mainstream BioEnergy***

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