FIRE, LIFE SAFETY, & SECURITY INSTITUTE, INC.

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North Miami Beach, FL 33162
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HAZARD ANALYSIS

GENUINE BIO-FUEL INC.
17250 SW RAILROAD AVE.
INDIANTOWN, FL 34956

Prepared For

GENUINE BIO-FUEL INC.

P.O. Box 50
Indiantown, FL 34956

April 14, 2014

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Introduction:

Fire, Life Safety, & Security Institute has been retained by Genuine Bio-Fuel Inc. to conduct a hazard analysis of the operations involving flammable and combustible liquids in accordance with Section 66.6.4 of NFPA 1, Fire Code, Florida, 2010 edition. Following site visits of the facility, a hazard analysis of the process building was developed.

Description:

A. Overview

Genuine Bio-Fuel Inc. manufactures biodiesel fuel, a natural, renewable, green alternative to diesel fuel, from various feedstocks such as virgin and used cooking oil, plant oils and fats. A patent is pending for the manufacturing process and the owners wish to keep details of the process proprietary. As a result no pictures inside the process building were allowed and some of the process description is purposely vague.

Production of biodiesel began at this site in June 2008. The process facility operates 2 shifts per day 5 days per week.

B. Facility

Genuine Bio-Fuel Inc. leases offices and a process building from a manufacturer of concrete parts. The main structures on the property are as follows:

1. Process building – The production facility used by Genuine Bio-Fuel Inc.

2. Office Building – Located approximately 85 feet south of the process building are the offices of Genuine Bio-Fuel Inc. in the front portion of

the building. The rear portion of the building is occupied by the concrete parts manufacturer.

3. Concrete Parts Building – Approximately 85 feet south of the process building and 50 feet west of the offices of Genuine Bio-Fuel Inc. is a small building used to store concrete parts.

4. Concrete Production Building – Approximately 200 feet south of the process building is the production building for concrete parts.

There is a water pond on the site that is located approximately 175 feet south of the process building.

C. Process Building

Construction - The main structure within the process building is a one story building of steel frame metal clad construction. The 10 feet wide addition running along the north east side of the building and the 17 feet wide addition running along the south east side of the building are wood frame metal clad construction. There is a 27 feet wide opening on the east side of the building and an 18 feet opening along the south side of the building.

Means of Egress - Exiting from the process building is provided by perimeter doors that discharge directly to the exterior of the building.

Fire Detection and Alarm - Presently, the building does not have any detectors or fire alarm system.

Fire Suppression - Presently, the building is not sprinklered. Fire extinguishers have been mounted in strategic areas throughout the plant.

Layout – The layout of the process building is located in Attachment A.

D. Process Description

The feedstock arrives at the east side of the process building by trailer (Area A) or other vehicles and pumped into blue plastic atmospheric tanks located at the south-east area of the process building (Area B).

The feedstock is allowed to settle inside the tanks and the water and food contaminants are pumped out of the building into plastic portable tanks and sold as animal feed. The concentrated feedstock is then filtered and pumped through plastic process piping along the exterior wall at the south-east corner of the process building (Stage 1 Process).

Using a continuous flow process, the concentrated feedstock is heated to below 140^{o}F and a small amount of acid and methanol is added to the concentrated feedstock. The mixture then undergoes an ultra-sonification process where sound energy is applied in order to break chemical bonds and then flows into 5 tanks on the west side of the process building (End of Stage 1 Process).

Using a continuous flow process at the west side of the building (Stage 2 Process), potassium methoxide solution (catalyst) is added to the mixture from the Stage 1 Process. This mixture undergoes an ultra-sonification process and flows into two 6,000 tanks (End of Stage 2 Process) where the mixture stored in tanks next to the End of Stage 1 tanks and pumped into tankers outside the building for removal from the site.

Using a continuous flow process at the north-west side of the building (Stage 3 Process), the biofuel is filtered using a centrifuge and neutralized (using an alkali) using an ion exchanger. The finished product is then stored in tanks on the east side of the building. Finally, the biofuel is pumped into jet aviation fuel tanker truck where it is metered and then pumped into customer's trucks.

The flammable and combustible liquids used in the process are listed in Table 1 along with their flashpoint and classification. The MSDS for the flammable and combustible liquids are located in Attachment B.

Table 1
Flammable/Combustible Liquids
Genuine Bio-Fuel Process Building

Material	Flash Point (ºF)	Flammable/Combustible Liquid Classification
Used Vegetable Oil	491	Class IIIB Combustible Liquid
Methanol	52	Class IB Flammable Liquid
Potassium Methoxide Solution	89	Class IB Flammable Liquid
Glycerin	320	Class IIIB Combustible Liquid
Biodiesel	266	Class IIIB Combustible Liquid

The Issue:

Section 66.6.4 of NFPA 1, Fire Code, Florida, 2010 edition and Section 6.4 of NFPA 30, Flammable and Combustible Liquids Code, 2008 edition requires that any operation involving flammable and combustible liquids must be reviewed to confirm that fire and explosion hazards resulting from loss of containment of liquids are afforded with corresponding fire prevention, fire control, and emergency action plans. The evaluation must include:

1. Analysis of the fire and explosion hazards of the operation.
2. Analysis of emergency relief from process vessels, taking into consideration the properties of the materials used and the fire protection and control measures taken.
3. Analysis of applicable facility design requirements in Chapters 17, 18, 19, 28, and 29 of NFPA 30.
4. Analysis of applicable requirements for liquid handling, transfer, and use, as covered in Chapters 17, 18, 19, 28, and 29 of NFPA 30.
5. Analysis of local conditions, such as exposure to and from adjacent properties and exposure to floods, earthquakes, and windstorms, and
6. Analysis of the emergency response capabilities of the local emergency services.

This report will evaluate the process building where biodiesel is produced in accordance with the criteria above. Please note that Chapters 19, 28 and 29 of NFPA 30, Flammable and Combustible Liquids Code, 2008 edition do not apply to the operations at Genuine Bio-Fuels, Inc. Chapter 19 contains

additional requirements for specific operations but none apply to the operations within the process building. Chapter 28 applies to the bulk loading and unloading facilities for tank cars and tank vehicles, which this is not. Finally, Chapter 29 applies to wharves.

Hazard Analysis:

A. Fire and Explosion Hazards

There are two primary hazards associated with flammable and combustible liquids: explosion and fire. In order to prevent these hazards, the three sides of the fire triangle must be explored: storage, ignition sources, and ventilation. In the case of the biodiesel production facility, flammable liquids used in the production process are methanol and potassium methoxide.

1. Storage of Flammable/Combustible Materials

Flammable Liquids

Methanol – Methanol arrives to the plant by tanker and pumped into stainless steel Department of Transportation (DOT) approved totes. These totes are designed with top-mounted emergency vents that is capable of limiting internal pressure under fire exposure conditions to 10 psig or 30 percent of the bursting pressure of the tank, whichever is greater. A maximum of 14 totes are stored outside the building. Methanol is used in the Stage 1 Process. A small amount of methanol and acid is automatically added to the concentrated feedstock using a continuous flow process. The online methanol tote is located outside the building.

Potassium Methoxide Solution - Potassium methoxide solution is produced as needed outside the building by mixing together potash (a noncombustible material) with methanol in one of four yellow metal caged DOT approved 300 gallon plastic mixing totes. The methanol is pumped pneumatically from the metal totes to the plastic mixing totes. These mixing totes are designed with top-mounted emergency vents that is capable of limiting internal pressure under fire exposure conditions to 10 psig or 30 percent of the bursting pressure of the tank, whichever is greater. The potassium methoxide solution is used in the Stage 2 Process. Potassium methoxide solution (catalyst) is added to the mixture from the Stage 1 Process using a continuous flow process. The online potassium methoxide solution tote is located outside the building.

Summary – All flammable liquids are stored outside the building in DOT approved containers that are provided with emergency vents. Small amounts

are added during the Stage 1 and Stage 2 continuous flow process. The continuous flow processes are always attended and if any leak should occur, the process is immediately stopped. The plant contains process tanks, which may contain mixtures of flammable and combustible liquids; however, since the amount of combustible liquids in these tanks is far greater than the amount of flammable liquids, one would expect that the flash point of these mixtures of flammable and combustible liquids within the process tanks will remain over 200^{o}F.

Combustible Liquids

Used Vegetable Oil – The feedstock used for the production of biodiesel is used vegetable oil. The used vegetable oil arrives at the plant by tanker truck or customer trucks and pumped into one of eleven plastic atmospheric tanks located at the south-east area of the process building (Area B). The contents are allowed to settle inside the tanks and the water and food contaminants are pumped out of the building into plastic portable tanks and sold as animal feed. The concentrated feedstock is then filtered and pumped through plastic process piping along the exterior wall at the south-east corner of the process building (Stage 1 Process).

Glycerin – Glycerin is a by-product produced during the Stage 2 Process when potassium methoxide (catalyst) is added to the mixture from the Stage 1 Process. The mixture from the Stage 1 Process with potassium methoxide flows into two 6,000 plastic atmospheric tanks (End of Stage 2 Process) where the mixture separates into biodiesel at the top and glycerin at the bottom. The glycerin is then pumped from the two 6,000 tanks into eight plastic atmospheric tanks next to the End of Stage 1 tanks. From there, the glycerin is pumped into tankers outside the building for removal from the site.

Biodiesel – The finished product is stored in nine plastic atmospheric tanks located at the north-east and south-east areas of the process building. When the biodiesel is ready to be shipped out, it is pumped to a jet aviation fuel tanker truck where it is metered and then pumped into customer's trucks.

Summary - The plastic atmospheric tanks used to throughout the plant are suitable for liquids up to 140^{o}F with specific gravity over 1. Since the plastic tanks are transparent, the level of liquid inside each plastic tanks can be clearly seen. This helps to avoid the overfilling of the tanks. Since none of the tanks within the building are under pressure, there is little risk that these tanks will explode.

2. Ignition Sources

In order to avoid a fire from starting it is important to control the sources of ignition. Within the process building, the potential sources of ignition are smoking, cutting and welding, static electricity, electrical sparks, and heating equipment.

Smoking – Smoking is not permitted inside the process building and at the outside storage area where the methanol and potassium methoxide totes are kept. "No Smoking" signs have been posted throughout the process building.

Cutting and welding – No cutting and welding is performed inside the process building. If required, cutting and welding is performed in the metal shop located outside the east wall of the process building.

Static Electricity – All tanks and process equipment used within the process building are plastic. Since there is no flammable vapor-air mixture within any tank or process equipment, there is minimal potential hazard associated with the buildup of static electricity in electric pipes. When the biofuel is pumped into tanks or when methanol is pumped from the tanker trucks to the totes, the tanks/totes are grounded to the tanker trucks via the hose.

Electrical Sparks – Electrical sparks can cause ignition if exposed to a flammable gas-air mixture. In the case of the process building, the only location where the where flammable vapor–air mixtures could exist under normal operation is the outdoor storage where the methanol and potassium methoxide totes are kept. All electric equipment in this area is explosion proof.

Heating Equipment – There are three hot water heaters that use biodiesel as fuel used in the production process to heat liquids. Two are located outside the building while the third is located along the west wall next to the centrifuge. All of these water heaters have internal flames and proper clearances are maintained to any combustible materials.

3. Ventilation

Proper ventilation is required within any production facility to avoid the building up of flammable vapors and the risk of explosions. In the case of the process building, the interior is open to the atmosphere. As a result, any release of flammable vapors or building of pressure within the building would be dissipated to the atmosphere.

B. Emergency Relief from Process Vessels

Process vessels can rupture if there is an increase of internal energy of the contents and there is insufficient emergency relief. Since all tanks within the process building are open to the atmosphere, there is no building up of pressure within the tanks.

C. Facility Design

Chapters 17 of NFPA 30, Flammable and Combustible Liquid Code," 2008 edition contains requirements for facilities where flammable and combustible liquids are used. These requirements are intended to protect occupants and exposures.

1. Separation Distances

Process Vessels - Within the process building, there are various sized tanks ranging from 200 to 6,000 gallons. Based on the capacity largest process tank, Table 17.4.3 requires that the minimum distance between the process tank and the property line is 30 feet and between the process tank and the nearest side of any public way or from the nearest important building on same property that is not an integral part of the process is 10 feet. The location of the process tanks within the process building, excess these distances.

Process Building – Table 17.6.1 contains minimum separation distances required between the process building and any public way or adjacent property line that is or can be built upon. Based on Class III Combustible Liquids, the minimum distance to any public way is 10 feet and to any property line is 20 feet. These minimum separation distances have been provided.

2. Construction Requirements

Section 17.6 requires all buildings or structures used for liquid operations be constructed of noncombustible materials. Combustible construction may be used if the buildings or structures is used

(1) solely for blending, mixing, or dispensing of Class IIIB liquids at temperatures below their flash points,

(2) for processing or handling of liquids where the quantities of liquids do not exceed 360 gal of Class I and Class II liquids and 720 gal of Class III liquids.

In the case of the process building, the building is of noncombustible construction except for the 10 feet wide addition running along the north east side of the building and the 17 feet wide addition running along the south east

side of the building, which are of wood frame metal clad construction. However, all liquids used within the building are Class III combustible liquids except for a small amount of flammable liquids used within the process.

3. Containment, Drainage, and Spill Control

Section 17.10 requires any process facility be designed and operated to prevent the discharge of liquids to public waterways, public sewers, or adjoining property. In the case of the process facility, the tanks on the west side of the building used during Stage 2 and 3 of the process are located an area separated from the remainder of the plant by a concrete wall with ramps located at the openings. In the event of a failure of any tank in this area, there is sufficient area to contain any spill. In the event that a spill does occur inside the process building, 6,000 gallon wet vacuums using 3 inch hoses at a rate of 275 gpm are used to remove the liquid.

Section 17.10 also requires emergency drainage systems be provided to direct any leaks and fire protection water to a safe location. If the emergency drainage systems are connected to public sewers or discharged into public waterways, they must be equipped with traps or separators. Presently, there are sump pumps in the parking lot that would direct any leaks and fire protection water to the pond located approximately 175 feet south of the process building.

4. Emergency Action Plan

Section 17.15.4 requires a written emergency action plan be established to respond to fires and related emergencies. This plan must include the following:

(1) Procedures to be followed in case of fire, such as sounding the alarm, notifying the fire department, evacuating personnel, and controlling and extinguishing the fire
(2) Procedures and schedules for conducting drills of these procedures
(3) Appointment and training of personnel to carry out assigned duties, which shall be reviewed at the time of initial assignment, as responsibilities or response actions change, and whenever anticipated duties change
(4) Maintenance of fire protection equipment
(5) Procedures for shutting down or isolating equipment to reduce the release of liquid, which shall include assigning personnel responsible for maintaining critical plant functions or shutdown of plant processes
(6) Alternate measures for the safety of occupants

Genuine Bio-Fuels Inc. has developed procedures in the event of a fire and the training of personnel. These procedures will be expanded to incorporate all the components required by Section 17.15.4 for an emergency action plan.

D. Liquid Handling, Transfer, and Use

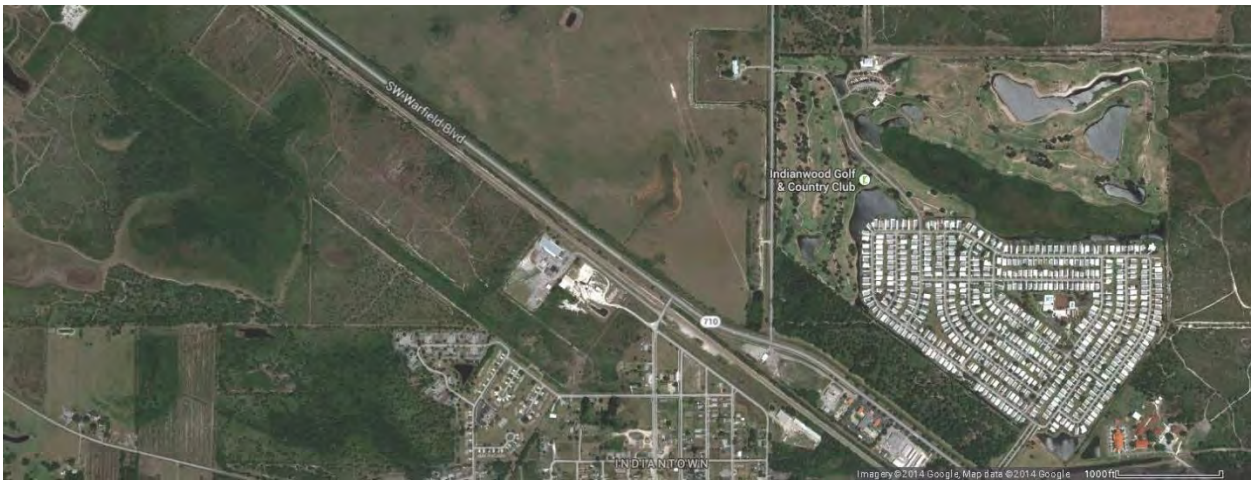
Chapters 18 of NFPA 30, Flammable and Combustible Liquid Code," 2008 edition contains requirements the dispensing, handling, transfer, and use of flammable and combustible liquids within buildings.

As required by Section 18.3, the methanol and potassium methoxide are always stored in closed containers and used in closed systems within the process building away from any sources of ignition. Since the building is open to the atmosphere, adequate ventilation has been provided to avoid the build up an ignitable vapor-oxygen mixtures.

E. Local Conditions

Local conditions must be evaluated to address any exposures to and from adjacent properties and from local climate conditions.

1. Exposures



The property where Genuine Bio-Fuel is located is in a rural part of Martin County away from any residential areas. It does share the property with a concrete parts manufacturer. The main structures on the property in addition to the process building are:

1. Office Building – Located approximately 85 feet south of the process building are the offices of Genuine Bio-Fuel Inc. in the front portion of

the building. The rear portion of the building is occupied by the concrete parts manufacturer.

2. Concrete Parts Building – Approximately 85 feet south of the process building and 50 feet west of the offices of Genuine Bio-Fuel Inc. is a small building used to store concrete parts.
3. Concrete Production Building – Approximately 200 feet south of the process building is the production building for concrete parts.

Due to nature of the operations, the concrete parts manufacturer does not pose a hazard to the process building and due to the distance between the process building and the other buildings on the property, the process building does not pose a hazard to the other buildings on the property.

2. Climate

The process building is not near any major body of water or located in an area prone to earthquakes. On the other hand, since the process building is located in South Florida, it is likely to be exposed to hurricanes. Genuine Bio-Fuel Inc. has procedures in place to prepare the building for a hurricane. Please refer to Attachment C.

F. Emergency response capabilities of the local emergency services

The process building for Genuine Bio-Fuels, Inc. is located in Indiantown and area that is served by Martin County Fire Rescue, a full time paid fire department. Martin County Fire Rescue's personnel are cross-trained as either Paramedics or Emergency Medical Technicians in the State of Florida.

The closest fire station to the property is Station 24 Indiantown located on 16556 SW Warfield Boulevard, which is approximately 0.6 miles away.

Results & Conclusions

Genuine Bio-Fuel Inc. manufactures biodiesel fuel from various feedstocks such as virgin and used cooking oil, plant oils and fats. Except for small amounts of methanol and potassium methoxide solution (Class IB flammable liquids), the raw materials, intermediate process fluids and finished products are Class III combustible liquids.

A hazard analysis was conducted on the process building in accordance with Section 66.6.4 of NFPA 1, Fire Code, Florida, 2010 edition and Section 6.4 of NFPA 30, Flammable and Combustible Liquids Code, 2008 edition in order to confirm that fire and explosion hazards resulting from loss of containment of liquids are afforded with corresponding fire prevention, fire control, and emergency action plans.

This analysis has determined that within the process building, flammable and combustible liquids are properly stored and used, sources of ignition are controlled, and adequate ventilation is provided to prevent a fire or explosion from occurring. Spill containment procedures are in place to address any minor or major spills within the process building. In the event that a fire should start within the facility, the process building is located at a distance that it does not expose other buildings on the property or adjacent properties.

Genuine Bio-Fuel Inc. is in the process of revising and expanding their emergency action plan to be in compliance with Section 17.15.4 of NFPA 30, Flammable and Combustible Code, 2008 edition.

Respectfully submitted,

Sarah Maman P.E.
Fire Protection Engineer

Attachment A

Floor Plan of the Process Building

FLOOR PLAN LAYOUT

SCALE: 1/8" = 1'-0"

- BIO FUEL (FINISHED PRODUCT)
- USED VEGETABLE OIL (RAW MATERIAL)
- END OF STAGE 1 PROCESS TANKS
- STAGE 2 PROCESS TANKS
- STAGE 3 PROCESS TANKS
- GLYCERIN TANKS
- EMPTY TANKS
- OTHER PROCESS TANKS
- METHANOL TOTES
- WORK AREA
- CENTRIFUGE
- POTASSIUM METHOXIDE MIXING TOTES

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EF#0001026 U.L.# S7195-1

PROJECT:

GENUINE BIO-FUEL INC.

17250 SW RAILROAD AVE.

INDIANTOWN, FL. 34956

REVISIONS:

AFSI PROJECT NUMBER: 7140093

DATE:	SCALE:
3/10/14	AS-NOTED
DRAWN BY: D.C.	CHECKED BY: --

1 OF 1

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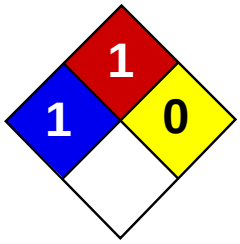
Attachment B

MSDS



Health	1
Fire	1
Reactivity	0
Personal Protection	G

Material Safety Data Sheet
Glycerin MSDS

Section 1: Chemical Product and Company Identification

Product Name: Glycerin

Catalog Codes: SLG1171, SLG1894, SLG1111, SLG1615

CAS#: 56-81-5

RTECS: MA8050000

TSCA: TSCA 8(b) inventory: Glycerin

CI#: Not available.

Synonym: 1,2,3-Propanetriol; Glycerol

Chemical Name: Glycerin

Chemical Formula: C3H5(OH)3

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Glycerin	56-81-5	100

Toxicological Data on Ingredients: Glycerin: ORAL (LD50): Acute: 12600 mg/kg [Rat]. 4090 mg/kg [Mouse]. DERMAL (LD50): Acute: 10000 mg/kg [Rabbit]. MIST(LC50): Acute: >570 mg/m 1 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention if irritation occurs.

Skin Contact:
Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops. Cold water may be used.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature:
370°C (698°F)(NFPA Fire Protection Guide to Hazardous Materials, 13th ed., 2002; NIOSH ICSC, 2001; CHRIS, 2001) 392 C (739 F) (Lewis, 1997)

Flash Points:
CLOSED CUP: 160°C (320°F). (Chemical Hazard Response Information System, 2001; Lewis, 1997). OPEN CUP: 177°C (350.6°F) (Budavari, 2000; Chemical Response Information System, 2001; NIOSH ICSC, 2001) OPEN CUP: 199 C(390 F) (National Fire Protection Association, Fire Protection Guide to Hazardous Materials, 13 ed., 2002)

Flammable Limits: LOWER: 0.9%

Products of Combustion: These products are carbon oxides (CO, CO2), irritating and toxic fumes.

Fire Hazards in Presence of Various Substances:
Slightly flammable to flammable in presence of open flames and sparks, of heat, of oxidizing materials. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Explosive in presence of oxidizing materials.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards:
Glycerin is incompatible with strong oxidizers such as chromium trioxide, potassium chlorate, or potassium permanganate and may explode on contact with these compounds. Explosive glyceryl nitrate is formed from a mixture of glycerin and nitric and sulfuric acids. Perchloric acid , lead oxide + glycerin form perchloric esters which may be explosive. Glycerin and chlorine may explode if heated and confined.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:

Stop leak if without risk. If the product is in its solid form: Use a shovel to put the material into a convenient waste disposal container. If the product is in its liquid form: Do not get water inside container. Absorb with an inert material and put the spilled material in an appropriate waste disposal. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Hygroscopic

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Safety glasses. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 10 (mg/m3) from ACGIH (TLV) [United States] [1999] Inhalation Total. TWA: 15 (mg/m3) from OSHA (PEL) [United States] Inhalation Total. TWA: 10 STEL: 20 (mg/m3) [Canada] TWA: 5 (mg/m3) from OSHA (PEL) [United States] Inhalation Respirable.Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Viscous (Syrupy) liquid.)

Odor: Mild

Taste: Sweet.

Molecular Weight: 92.09 g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 290°C (554°F)

Melting Point: 19°C (66.2°F)

Critical Temperature: Not available.

Specific Gravity: 1.2636 (Water = 1)

Vapor Pressure: 0 kPa (@ 20°C)

Vapor Density: 3.17 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: The product is more soluble in water; log(oil/water) = -1.8

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, acetone.

Solubility:
Miscible in cold water, hot water and alcohol. Partially soluble in acetone. Very slightly soluble in diethyl ether (ethyl ether). Limited solubility in ethyl acetate. Insoluble in carbon tetrachloride, benzene, chloroform, petroleum ethers, and oils

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Avoid contact with incompatible materials, excess heat and ignition, sources, moisture.

Incompatibility with various substances: Highly reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Hygroscopic. Glycerin is incompatible with strong oxidizers such as chromium trioxide, potassium chlorate, or potassium permanganate. Glycerin may react violently with acetic anhydride, aniline and nitrobenzene, chromic oxide, lead oxide and fluorine, phosphorous triiodide, ethylene oxide and heat, silver perchlorate, sodium peroxide, sodium hydride.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 4090 mg/kg [Mouse]. Acute dermal toxicity (LD50): 10000 mg/kg [Rabbit]. Acute toxicity of the mist (LC50): >570 mg/m3 1 hours [Rat].

Chronic Effects on Humans: May cause damage to the following organs: kidneys.

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals:
TDL (rat) - Route: Oral; Dose: 100 mg/kg 1 day prior to mating. TDL (human) - Route: Oral; Dose: 1428 mg/kg

Special Remarks on Chronic Effects on Humans:
Glycerin is transferred across the plancenta in small amounts. May cause adverse reproductive effects based on animal data (Paternal Effects (Rat): Spermatogenesis (including genetic material, sperm morphology, motility, and count), Testes, epididymis, sperm duct). May affect genetic material.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Low hazard for normal industrial handling or normal workplace conditions. Skin: May cause skin irritation. May be absorbed through skin Eyes: May cause eye irritation with stinging, redness, burning sensation, and tearing, but no eye injury. Ingestion: Low hazard. Low toxicity except with very large doses. When large doses are ingested, it can cause gastrointestinal tract irritation with thirst (dehydration), nausea or vomiting diarrhea. It may also affect behavior/central nervous system/nervous system (central nervous system depression, general anesthetic, headache, dizziness, confusion, insomnia, toxic psychosis, muscle weakness, paralysisconvulsions), urinary system/kidneys(renal failure,

hemoglobinuria), cardiovascular system (cardiac arrhythmias), liver. It may also cause elevated blood sugar. Inhalation: Due to low vapor pressure, inhalation of the vapors at room temperature is unlikely. Inhalation of mist may cause respiratory tract irritation. Chronic Potential Health Effects: Ingestion: Prolonged or repeated ingestion may affect the blood(hemolysis, changes in white blood cell count), endocrine system (changes in adrenal weight), respiratory system, and may cause kidney injury.

Section 12: Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 58.5 ppm 96 hours [Trout].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Illinois toxic substances disclosure to employee act: Glycerin Rhode Island RTK hazardous substances: Glycerin Pennsylvania RTK: Glycerin Minnesota: Glycerin Massachusetts RTK: Glycerin Tennessee - Hazardous Right to Know: Glycerin TSCA 8(b) inventory: Glycerin

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):
Not available S24/25- Avoid contact with skin and eyes.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 1

Reactivity: 0

Personal Protection: g

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:38 PM

Last Updated: 05/21/2013 12:00 PM

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MATERIAL SAFETY DATA SHEET

Mitsui & Co. (USA), Inc.
1300 Post Oak Blvd, Suite 1700
Houston, TX 77056

Date of Issue: January 12, 2004
Revised Date: June 18, 2009

Telephone: 713-236-6124
Fax: 713-236-6293

Emergency Number (CHEMTREC): 1-800-424-9300

SECTION 1 – CHEMICAL INDENTIFICATION

Chemical Name: Methanol
Synonyms: Methyl Alcohol, methyl hydrate, wood spirit, methyl hydroxide
Formula: CH_3OH
Chemical Family: Alcohol

SECTION 2- COMPOSITION

Components	Percentage	PEL/TLV	CAS Number	EINECS Number
Methanol	100	200 ppm	67-56-1	200-659-6

Note: N.E. = Not Established N/A = Not Applicable

SECTION 3 – HAZARDS IDENTIFICATION

Emergency Overview: Danger! Flammable liquid. Poison. Cannot be made nonpoisonous. Harmful or fatal if swallowed. Harmful if inhaled. May cause blindness if swallowed. May cause central nervous system effects. Causes eye and skin irritation. Causes digestive and respiratory tract irritation. May cause reproductive and fetal effects. May be absorbed through intact skin. Target Organs: kidneys, liver, heart, central nervous system, eyes, lungs, brain, pancreas.

NFPA ratings
1 Health
3 Flammability
0 Reactivity
Specific Hazards: N/A

Routes of Entry: Skin: Moderate; Eye: Moderate; **Ingestion: Major; Inhalation: Major**

Inhalation: May cause irritation of mucous membranes and respiratory tract. May cause central nervous system depression with symptoms of dizziness, headache, nausea, drowsiness, lethargy, convulsions, vertigo, disorientation, visual impairment, and permanent blindness. High levels of exposure may result in collapse, unconsciousness, coma, and death due to respiratory failure.

Skin Contact: May cause moderate irritation. Prolonged and repeated contact may result in defatting and drying of the skin which may lead to dermatitis and increased chance of secondary infection.

Skin Absorption: May be absorbed through the skin in harmful amounts with symptoms paralleling those of ingestion or inhalation.

Eye Contact: Causes severe eye irritation characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury. May cause painful sensitization to light.

Ingestion: Swallowing as little as 1 to 2 ounces (25 to 50 ml) can result in metabolic acidosis leading to optic nerve damage ranging from diminished visual capacity to complete blindness and death. Death from a dose of less than 30 ml has been reported. May cause gastrointestinal irritation with symptoms of nausea, vomiting, and diarrhea. May cause systemic toxicity with acidosis. May cause central nervous system depression with symptoms of dizziness, headache, nausea, and drowsiness. High levels of exposure may result in collapse, unconsciousness, coma and death due to respiratory failure. May cause cardiopulmonary system effects.

Effects of Chronic Exposure: Chronic exposure may cause reproductive disorders, teratogenic effects, and mutagenic effects. Prolonged exposure may damage the liver, kidneys, and heart. Inhalation may worsen conditions such as emphysema or bronchitis.

SECTION 4 - FIRST AID MEASURES

Eye Contact: remove contact lenses if worn. Immediately flush eyes with clean water for at least 15 minutes. Retract eyelids often while flushing out with water. Seek medical attention immediately.

Skin Contact: Immediately remove contaminated clothing and shoes. Flush skin with water for at least15 minutes. Use mild soap if available or follow by washing with mild soap and water. Do not reuse contaminated clothing without laundering. If irritation persists, seek medical attention.

Inhalation: Remove victim to fresh air. If breathing is difficult, give oxygen. If not breathing, administer artificial respiration. Seek medical attention immediately.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. **Never give anything by mouth to an unconscious person.** Induce vomiting by giving one teaspoon of Syrup of Ipecac or sticking fingers down throat. Keep head below hips to prevent aspiration of liquid into lungs. Seek medical attention immediately. Prompt action is essential.

SECTION 5 – FIREFIGHTING MEASURES

Flash Point Temperature:	51.8°F, and 11°C
Auto Ignition Temperature:	867.2 °F, and 464 °C
Flammable Limits:	Lower: 6.0% Upper: 36.0%
Extinguishing Media:	Water, Dry Chemical, "Alcohol" Foam, Carbon Dioxide
Firefighting Procedure:	Firefighters should wear NIOSH approved self-contained breathing apparatus and appropriate protective clothing to prevent contact. Cool exposed containers with water. Fight fire from a safe distance/protected location.
Unusual Fire and Explosion Information:	Do not use direct stream of water to fight fire. Methanol will float and can be re-ignited on the surface. Containers can build up pressure if subjected to heat of the fire and may explode. Flashback hazard – vapors are heavier than air and can collect in low areas forming an explosive methanol and air mixture. Under some circumstances, may corrode certain metals, including aluminum and zinc and generate hydrogen gas. A methanol fire may not be visible to the naked eye.
Environmental Note:	Prevent product from getting into sewers or surface waters. Notify authorities immediately if liquid enters sewer/public waters.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Isolate the hazard area and deny entry to nonessential personnel. Emergency responders and/or clean-up personnel should wear appropriate protective clothing and equipment when responding. Stop flow if safe to do so. Remove all ignition sources. A vapor suppressing foam may be used to reduce vapors. Prevent from entering sewers or surface waters. Collect liquid in containers and seal shut. Absorb remaining material with a noncombustible absorbent such as earth, sand, or vermiculite and collect for disposal.

SECTION 7 – HANDLING AND STORAGE

DANGER! Flammable:

Keep away from heat, sparks, and open flames. Keep containers tightly closed. Store away from strong oxidizing agents in a cool dry place. Use adequate explosion-proof ventilation to prevent accumulation of static charge. When pouring or transferring materials, containers must be bonded and grounded. Do not store in aluminum or lead containers.

DO NOT weld, heat or drill on or near full or empty containers. Empty containers can contain explosive vapors.

Do not breathe vapors or mist. Minimize skin contact. Wash with soap and water before eating, drinking, smoking, or using toilet facilities. launder contaminated clothing before reuse. Properly dispose of contaminated leather articles, including shoes that cannot be decontaminated.

SECTION 8 – EXPOSURE CONTROLS AND PERSONAL PROTECTION

Respiratory Protection:	Utilize NIOSH approved half face or full face supplied air respirator, or self-contained breathing apparatus. Cartridge respirators have a very short service life when used for methanol. Consult with an Industrial Hygienist before determining which respirators to use. Respirators must be utilized in compliance with OSHA regulations 29CFR1910.134.
Ventilation:	Use explosion-proof ventilation equipment. Utilize local exhaust to control vapors. Do not rely on general exhaust.
Protective Gloves:	Neoprene, butyl, PVC, or viton gloves are recommended.
Eye Protection:	Chemical goggles and face shield.
Other Protective Equipment:	Wear additional protective clothing as required to prevent skin contact. This may include chemical aprons, chemical resistant boots, and chemical resistant suits. Safety shower and eyewash are necessary in work area.
Work Practices:	Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove contaminated clothing and launder before reuse. Shower after work using plenty of soap and water.
Electrical Equipment:	Class I Division 2 or higher

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	clear, colorless liquid	**Threshold Odor Conc:**	141 ppm
Odor:	alcohol	**Boiling Point:**	148.5 °F, 64.7°C
Specific Gravity (H2O = 1):	0.7910	**Freezing Point:**	-144.4°F, -98°C
Evaporation Rate (ether = 1):	5.2	**Vapor Density (Air=1):**	1.11
Soluble in:	most organic solvents	**Vapor Pressure:**	128 mm Hg @ 20°C
Solubility in Water:	Miscible	**% Volatiles by Volume:**	100
Viscosity:	0.55 cP @ 20°C	**Molecular Weight:**	32.04

SECTION 10 – STABILITY AND REACTIVITY

Chemical Stability:	Stable under normal temperatures and pressures.
Hazardous Polymerization:	Will not occur.

Conditions to Avoid: Incompatible materials, ignition sources, excess heat.

Incompatible Materials: **Explodes on contact with:** chloroform + sodium methoxide, diethyl zinc.

Violent reaction with: alkyl aluminum salts, acetyl bromide, chloroform + sodium hydroxide, chromium oxide, cyanuric chloride, iodine + ethanol + mercuric oxide, lead perchlorate, perchloric acid, phosphorus trioxide, potassium hydroxide + chloroform, nitric acid.

Strong oxidizing agents, strong acids, isocyanates, aliphatic amines, caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), beryllium dihydride, metals (e.g., potassium, magnesium), oxidants (e.g., barium perchlorate, bromine, sodium hypochlorite, chlorine, hydrogen peroxide), potassium tert-butoxide, carbon tetrachloride + metals (e.g., aluminum, magnesium, zinc), dichloromethane

Decomposition Products: Carbon monoxide, carbon dioxide, formaldehyde, irritating and toxic fumes and gases.

SECTION 11 – TOXICOLOGICAL INFORMATION

Occupational Exposure Limits

OSHA	PEL:	200 ppm	STEL:	250 ppm
ACGIH	TLV:	200 ppm	STEL:	250 ppm
NIOSH	IDLH:	25,000 ppm		

Eye:	100 mg/24H MODERATE (rabbit)		85JCAE -, 187, 86
Skin:	20 mg/24 H MODERATE (rabbit)		85JCAE -, 187, 86
Inhalation:	LCLo:	1,000 ppm (monkey)	IECHAD 23, 931, 31
	TCLo:	300 ppm (human) eye, pulmonary, CNS effects	NPIRI* 1, 74, 74
	LC50:	64,000 ppm/4 H (rat)	NPIRI* 1, 74, 74
Oral:	LDLo:	143 mg/kg (human)	34ZIAG -, 382, 69
	LDLo:	428 mg/kg (human)	NPIRI* 1, 74, 74
Skin:	LDLo:	393 mg/kg (monkey)	IECHAD 23, 931, 31

Methane is a suspected mutagen, reproductive hazard and teratogen. Methanol is eliminated from the body very slowly and should be considered a cumulative poison.

Carcinogenicity listed by: NTP: No IARC: No OSHA: No

SECTION 12 – ECOLOGICAL INFORMATION

Environmental Fate and Effects

Ecotoxicity: Toxic to aquatic life at high concentrations.

Fish: LC50: 13mg/l (rainbow trout fingerling)
LC50: 29,400 mg/l/96 H (fathead minnow, 28 days old)
LC50: 8000 mg/l (trout)

Mobility:	Expected to be highly mobile in soil and may leach into groundwater.
Persistence and Degradability:	Expected to biodegrade in soil or water very rapidly. Estimated half life of 17.8 days.
Bioaccumulative Potential:	Not expected to bioaccumulate

SECTION 13 – DISPOSAL INFORMATION

Place in a city, state, or federally permitted disposal facility. Handle in accordance with all applicable regulations.

SECTION 14 – TRANSPORTATION INFORMATION

DOT shipping Description: Methanol, 3, UN1230, II
Note: the EPA RQ is 5000 pounds (2270 kilograms)

SECTION 15 – REGULATORY INFORMATION

TSCA: All components are listed on the TSCA Inventory
SARA Title III

Acute:	Yes
Chronic:	Yes
Fire:	Yes
Reactivity:	No
Pressure:	No

Methanol is on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, and Massachusetts.

SECTION 16 – OTHER INFORMATION

First revision June 18, 2009.

DISCLAIMER

The information contained in this Material Safety Data Sheet is offered in good faith as accurate but does not purport to be all-inclusive. Health and safety precautions in this Material Safety Data Sheet may not be adequate for all individuals and/or situations. It is the user's responsibility to determine the suitability of any material for a specific purpose, adopt such safety precautions as may be necessary and comply with all applicable laws and regulations. Nothing herein is to be construed as recommending any practice or the use of any product in violation of any patent or of any law or regulation. Mitsui & Co. (USA) makes no representations or warranties, either express or implied, including without limitation any warranties of merchantability or of fitness for a particular purpose with respect to the information set forth in this Material Safety Data Sheet or to the product of which the information refers. Accordingly, Mitsui & Co. (USA) will assume no liabilities in connection with any use of or reliance on this information.

SAFETY DATA SHEET

OxyChem®

Responsible Care® Good Chemistry at Work

DRY CAUSTIC POTASH (ALL GRADES)

MSDS No.: M31867 **Rev. Date:** 2010-Aug-25 **Rev. Num.:**04

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Company Identification:	Occidental Chemical Corporation 5005 LBJ Freeway P.O. Box 809050 Dallas, Tx 75380-9050
24 Hour Emergency Telephone Number:	1-800-733-3665 or 1-972-404-3228 (U.S.); 32.3.575.55.55 (Europe); 1800-033-111 (Australia)
To Request an MSDS:	MSDS@oxy.com or 1-972-404-3245
Customer Service:	1-800-752-5151 or 1-972-404-3700
Trade Name:	Caustic Potash - Crystal; Caustic Potash - Flake; Caustic Potash - Flake 90%
Synonyms:	Potassium hydroxide, KOH Dry
Product Use:	Glass manufacture, Cleaner, Process chemical, Petroleum industry, Food processing

2. HAZARDS IDENTIFICATION

****

EMERGENCY OVERVIEW:

Color: White / Off-white
Physical State: Solid
Odor: Odorless
Signal Word: DANGER

MAJOR HEALTH HAZARDS: CORROSIVE. CAUSES BURNS TO THE RESPIRATORY TRACT, SKIN, EYES AND GASTROINTESTINAL TRACT. CAUSES PERMANENT EYE DAMAGE. EFFECTS OF CONTACT OR INHALATION MAY BE DELAYED.
PHYSICAL HAZARDS: Mixing with water, acid or incompatible materials may cause splattering and release of heat. Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated.
ECOLOGICAL HAZARDS: This material has exhibited moderate toxicity to aquatic organisms.

DRY CAUSTIC POTASH (ALL GRADES)

MSDS No.: M31867 **Rev. Date:** 2010-Aug-25 **Rev. Num.:**04

2. HAZARDS IDENTIFICATION

PRECAUTIONARY STATEMENTS: Do not get in eyes, on skin, or on clothing. Do not breathe dust. Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation.

****

POTENTIAL HEALTH EFFECTS:

Inhalation: May cause severe irritation of the respiratory tract with coughing, choking, pain and possibly burns of the mucous membranes.

Skin contact: Causes skin burns.

Eye contact: Causes serious eye damage.

Ingestion: Causes burns.

Chronic Effects: None known.

Medical Conditions Aggravated by Exposure: Respiratory system (including asthma and other breathing disorders)

See Section 11: TOXICOLOGICAL INFORMATION

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Component	Percentage	CAS Number
Potassium hydroxide	84.5 - 90.5	1310-58-3
Water	9.5 - 15.5	7732-18-5

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. If respiration or pulse has stopped, have a trained person administer basic life support (Cardio-Pulmonary Resuscitation and/or Automatic External Defibrillator) and CALL FOR EMERGENCY SERVICES IMMEDIATELY.

SKIN CONTACT: Immediately flush contaminated areas with water. Remove contaminated clothing, jewelry and shoes. Wash contaminated areas with soap and water. Thoroughly clean and dry contaminated clothing before reuse. Discard contaminated leather goods. GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT: Immediately flush eyes with a directed stream of water for at least 15 minutes, forcibly holding eyelids apart to ensure complete irrigation of all eye and lid tissues. Washing eyes within several seconds is essential to achieve maximum effectiveness. GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION: Never give anything by mouth to an unconscious or convulsive person. If swallowed, do not induce vomiting. Give large amounts of water. If vomiting occurs spontaneously, keep airway clear. Give more water when vomiting stops. GET MEDICAL ATTENTION IMMEDIATELY.

DRY CAUSTIC POTASH (ALL GRADES)

MSDS No.: M31867 **Rev. Date:** 2010-Aug-25 **Rev. Num.:**04

4. FIRST AID MEASURES

Notes to Physician: The absence of visible signs or symptoms of burns does NOT reliably exclude the presence of actual tissue damage. Probable mucosal damage may contraindicate the use of gastric lavage.

5. FIRE-FIGHTING MEASURES

Fire Hazard: Negligible fire hazard.

Extinguishing Media: Do not use water. Use extinguishing agents appropriate for surrounding fire.

Fire Fighting: Move container from fire area if it can be done without risk. Cool containers with water. Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode. Avoid contact with skin.

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Flash point: Not flammable

6. ACCIDENTAL RELEASE MEASURES

Occupational Release:
Wear appropriate personal protective equipment recommended in Section 8 of the SDS. Shovel dry material into suitable container. Keep out of water supplies and sewers. This material is alkaline and may raise the pH of surface waters with low buffering capacity. Releases should be reported, if required, to appropriate agencies.

7. HANDLING AND STORAGE

Storage Conditions: Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated. Keep separated from incompatible substances (see Section 10 of SDS).

Handling Procedures: Avoid breathing dust. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. When mixing, slowly add to water to minimize heat generation and spattering.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Regulatory Exposure limit(s):

DRY CAUSTIC POTASH (ALL GRADES)

MSDS No.: M31867 **Rev. Date:** 2010-Aug-25 **Rev. Num.:**04

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Component	CAS Number	OSHA Final PEL TWA	OSHA Final PEL STEL	OSHA Final PEL Ceiling
Potassium hydroxide	1310-58-3	-----	-----	-----

OEL: Occupational Exposure Level; OSHA: United States Occupational Safety and Health Administration; PEL: Permissible Exposure Level; TWA: Time Weighted Average; STEL: Short Term Exposure Level

Non-Regulatory Exposure Limit(s):

- **The Non-Regulatory United States Occupational Safety and Health Association (OSHA) limits shown in the table are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).**
- **The American Conference of Governmental Industrial Hygienists (ACGIH) is a voluntary organization of professional industrial hygiene personnel in government or educational institutions in the United States. The ACGIH develops and publishes recommended occupational exposure limits each year called Threshold Limit Values (TLVs) for hundreds of chemicals, physical agents, and biological exposure indices.**

Component	CAS Number	ACGIH TWA	ACGIH STEL	ACGIH Ceiling	OSHA TWA (Vacated)	OSHA STEL (Vacated)	OSHA Ceiling (Vacated)
Potassium hydroxide	1310-58-3	-----	-----	2 mg/m^3	-----	-----	2 mg/m^3

ENGINEERING CONTROLS: Provide local exhaust ventilation where dust or mist may be generated. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear chemical safety goggles with a faceshield to protect against eye and skin contact when appropriate. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear protective clothing to minimize skin contact. When potential for contact with wet material exists, wear Tychem® or similar chemical protective suit. When potential for contact with dry material exists, wear disposable coveralls suitable for dust exposure, such as Tyvek®. Always place pants legs over boots. Thoroughly clean and dry contaminated clothing before resue. Discard contaminated leather goods.

Hand Protection: Wear appropriate chemical resistant gloves

Protective Material Types: Butyl rubber, Natural rubber, Nitrile, Polyvinyl chloride (PVC), Tychem®, Tyvek®

Respiratory Protection: A NIOSH approved respirator with N95 dust/mist filter (1/2 facepiece) or N100 dust/mist filter (full facepiece) cartridges may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits, or when symptoms have been observed that are indicative of overexposure. If eye irritation occurs, a full face style mask should be used. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid
Color: White / Off-white
Odor: Odorless
Molecular Weight: 56.11
Molecular Formula: KOH
Boiling Point/Range: Not applicable

DRY CAUSTIC POTASH (ALL GRADES)

MSDS No.: M31867 **Rev. Date:** 2010-Aug-25 **Rev. Num.:**04

9. PHYSICAL AND CHEMICAL PROPERTIES

Melting Point/Range:	752 F (400 C)
Vapor Pressure:	60 mmHg @ 1013 C
Vapor Density (air=1):	Not applicable
Specific Gravity (water=1):	2.044 @ 20 C
Water Solubility:	100%
pH:	Not applicable
Volatility:	0%
Flash point:	Not flammable

10. STABILITY AND REACTIVITY

Reactivity/ Stability: Stable at normal temperatures and pressures.

Conditions to Avoid: Mixing with water, acid, or incompatible materials may cause splattering and release of large amounts of heat. Will react with some metals forming flammable hydrogen gas. Carbon monoxide gas may form upon contact with reducing sugars, food and beverage products in enclosed spaces.

Incompatibilities/ Materials to Avoid: Acids, Halogenated compounds, Prolonged contact with aluminum, brass, bronze, copper, lead, tin, zinc or other alkali sensitive metals or alloys

Hazardous Decomposition Products: None known

Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

TOXICITY:
As a solid, this material interacts with moist tissue to cause damage. When in solution, this material will affect all tissues with which it comes in contact. The severity of the tissue damage is a function of concentration, the length of tissue contact time, and local tissue conditions. After exposure there may be a time delay before irritation and other effects occur. The material is a strong irritant and is corrosive to the skin, eyes, and mucous membranes. This material may cause severe burns and permanent damage to any tissue with which it comes in contact.

CARCINOGENICITY: This product is not classified as a carcinogen by NTP, IARC or OSHA.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

- **Aquatic Toxicity:**
  This material is alkaline and may raise the pH of surface waters with low buffering capacity.
  This material has exhibited moderate toxicity to aquatic organisms.

- **Freshwater Fish Toxicity:**
  LC50 (Mosquito fish): 80 mg/L/96 hr (static bioassay in fresh water at 18-19 C)
  LC50 (Fathead Minnow): 179 mg/L/96 hr (static at 22.3-24.7 C)

- **Invertebrate Toxicity:**
  EC50 (Daphnia magna): 60 mg/L/48 hr (static bioassay at 20.3-20.7 C)

- **Algae Toxicity:**
  ErC50 (Selenastrum capricornutum): 61 mg/L/96 hr (static bioassay at 23-23.9 C)

FATE AND TRANSPORT:

BIODEGRADATION: This material will disassociate into ionic form in the aquatic environment. Natural carbon dioxide will slowly neutralize this material.

BIOCONCENTRATION: This material will not bioconcentrate.

ADDITIONAL ECOLOGICAL INFORMATION:
This material has exhibited slight toxicity to terrestrial organisms.

13. DISPOSAL CONSIDERATIONS

Reuse or reprocess, if possible. Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

U.S.DOT 49 CFR 172.101:

PROPER SHIPPING NAME:	Potassium hydroxide, solid
UN NUMBER:	UN1813
HAZARD CLASS/ DIVISION:	8
PACKING GROUP:	II
LABELING REQUIREMENTS:	8
DOT RQ (lbs):	RQ 1,000 Lbs. (Potassium hydroxide)

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME:	Potassium hydroxide, solid
UN NUMBER:	UN1813
CLASS OR DIVISION:	8
PACKING/RISK GROUP:	II

15. REGULATORY INFORMATION

DRY CAUSTIC POTASH (ALL GRADES)

MSDS No.: M31867 **Rev. Date:** 2010-Aug-25 **Rev. Num.:**04

15. REGULATORY INFORMATION

U.S. REGULATIONS

- **OSHA REGULATORY STATUS:** This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200) (US)

- **CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):**
  If a release is reportable under CERCLA section 103, notify the state emergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 426-2675.

Component	CERCLA Reportable Quantities:
Potassium hydroxide	1000 lb (final RQ)

- **EPCRA EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):** Not regulated

- **EPCRA SECTIONS 311/312 HAZARD CATEGORIES (40 CFR 370.21):**
  Acute Health Hazard

- **EPCRA SECTION 313 (40 CFR 372.65):** Not regulated.

- **OSHA PROCESS SAFETY (PSM) (29 CFR 1910.119):** Not regulated

FDA: This material has Generally Recognized as Safe (GRAS) status under specific FDA regulations. Additional information is available from the Code of Federal Regulations which is accessible on the FDA's website.

NATIONAL INVENTORY STATUS

- **U.S. INVENTORY STATUS: Toxic Substance Control Act (TSCA):** All components are listed or exempt

- **TSCA 12(b):** This product is not subject to export notification

- **Canadian Chemical Inventory:** All components are listed

STATE REGULATIONS

Component	Potassium hydroxide	
	California Proposition 65 Cancer WARNING:	Not Listed
	California Proposition 65 CRT List - Male reproductive toxin:	Not Listed
	California Proposition 65 CRT List - Female reproductive toxin:	Not Listed
	Massachusetts Right to Know Hazardous Substance List	Listed
	New Jersey Right to Know Hazardous Substance List	Listed
	New Jersey Special Health Hazards Substance List	Listed - corrosive
	New Jersey - Environmental Hazardous Substance List	Not Listed
	Pennsylvania Right to Know Hazardous Substance List	Listed
	Pennsylvania Right to Know Special Hazardous Substances	Not Listed
	Pennsylvania Right to Know Environmental Hazard List	Listed
	Rhode Island Right to Know Hazardous Substance List	Listed

CANADIAN REGULATIONS

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

DRY CAUSTIC POTASH (ALL GRADES)

MSDS No.: M31867 **Rev. Date:** 2010-Aug-25 **Rev. Num.:**04

WHMIS Classification: E

16. OTHER INFORMATION

Prepared by: OxyChem Corporate HESS - Health Risk Management

HMIS: (SCALE 0-4) (Rated using National Paint & Coatings Association HMIS: Rating Instructions, 2nd Edition)

Health:	3	**Flammability:**	0	**Reactivity:**	1

NFPA 704 - Hazard Identification Ratings (SCALE 0-4)

Health:	3	**Flammability:**	0	**Reactivity:**	1

IMPORTANT:
The information presented herein, while not guaranteed, was prepared by technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, SAFETY, SUITABILITY, STABILITY OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling, storage, disposal and other factors that may involve other or additional legal, environmental, safety or performance considerations, and OxyChem assumes no liability whatsoever for the use of or reliance upon this information. While our technical personnel will be happy to respond to questions, safe handling and use of the product remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as, a recommendation to infringe any existing patents or to violate any Federal, State, local or foreign laws.

OSHA Standard 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, material safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Material Safety Data Sheet available to your employees.

SAMPLE MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT

General Product Name:	**Biodiesel (B100)**
Synonyms:	Methyl Soyate, Rapeseed Methyl Ester (RME)
Product Description:	Methyl esters from lipid sources
CAS Number:	Methyl Soyate: 67784-80-9; RME: 73891-99-3;

2. COMPOSITION/INFORMATION ON INGREDIENTS

This product contains no hazardous materials.

3. HAZARDS IDENTIFICATION

Potential Health Effects:

INHALATION:

Negligible unless heated to produce vapors. Vapors or finely misted materials may irritate the mucous membranes and cause irritation, dizziness, and nausea. Remove to fresh air.

EYE CONTACT:

May cause irritation. Irrigate eye with water for at least 15 to 20 minutes. Seek medical attention if symptoms persist.

SKIN CONTACT:

Prolonged or repeated contact is not likely to cause significant skin irritation. Material is sometimes encountered at elevated temperatures. Thermal burns are possible.

INGESTION:

No hazards anticipated from ingestion incidental to industrial exposure.

4. FIRST AID MEASURES

EYES:

Irrigate eyes with a heavy stream of water for at least 15 to 20 minutes.

SKIN:

Wash exposed areas of the body with soap and water.

INHALATION:

Remove from area of exposure; seek medical attention if symptoms persist.

INGESTION:

Give one or two glasses of water to drink. If gastro-intestinal symptoms develop, consult medical personnel. (Never give anything by mouth to an unconscious person.)

5. FIRE FIGHTING MEASURES

Flash Point (Method Used): 130.0 C or 266.0 F min (ASTM 93)

Flammability Limits: None known

EXTINGUISHING MEDIA:

Dry chemical, foam, halon (may not be permissible in some countries), CO_2, water spray (fog). Water stream may splash the burning liquid and spread fire.

SPECIAL FIRE FIGHTING PROCEDURES:

Use water spray to cool drums exposed to fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Biodiesel soaked rags or spill absorbents (i.e. oil dry, polypropylene socks, sand, etc.) can cause spontaneous combustion if stored near combustibles and not handled properly. Store biodiesel soaked rags or spill absorbents in approved safety containers and dispose of properly. Oil soaked rags may be washed with soap and water and allowed to dry in

well ventilated area. Firefighters should use self-contained breathing apparatus to avoid exposure to smoke and vapor.

6. ACCIDENTAL RELEASE MEASURES SPILL CLEAN-UP PROCEDURES

Remove sources of ignition, contain spill to smallest area possible. Stop leak if possible. Pick up small spills with absorbent materials and dispose of properly to avoid spontaneous combustion (see unusual fire and explosion hazards above).

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.

7. HANDLING AND STORAGE

Store in closed containers between 50°F and 120°F.
Keep away from oxidizing agents, excessive heat, and ignition sources.
Store and use in well ventilated areas.
Do not store or use near heat, spark, or flame, store out of sun.
Do not puncture, drag, or slide this container.
Drum is not a pressure vessel; never use pressure to empty.

8. EXPOSURE CONTROL /PERSONAL PROTECTION

RESPIRATORY PROTECTION:

If vapors or mists are generated, wear a NIOSH approved organic vapor/mist respirator.

PROTECTIVE CLOTHING:

Safety glasses, goggles, or face shield recommended to protect eyes from mists or splashing. PVC coated gloves recommended to prevent skin contact.

OTHER PROTECTIVE MEASURES:

Employees must practice good personal hygiene, washing exposed areas of skin several times daily and laundering contaminated clothing before re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point, 760 mm Hg:>200°C
Volatiles, % by Volume: <2
Specific Gravity (H_2O=1): 0.88
Solubility in H_2O, % by Volume: insoluble
Vapor Pressure, mm Hg: <2
Evaporation Rate, Butyl Acetate=1: <1
Vapor Density, Air=1:>1
Appearance and Odor: pale yellow liquid, mild odor

10. STABILITY AND REACTIVITY

GENERAL:

This product is stable and hazardous polymerization will not occur.

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS:

Combustion produces carbon monoxide, carbon dioxide along with thick smoke.

11. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:

Waste may be disposed of by a licensed waste disposal company. Contaminated absorbent material may be disposed of in an approved landfill. Follow local, state and federal disposal regulations.

12. TRANSPORT INFORMATION

UN HAZARD CLASS: N/A

NMFC (National Motor Freight Classification):

PROPER SHIPPING NAME: Fatty acid ester
IDENTIFICATION NUMBER: 144920
SHIPPING CLASSIFICATION: 65

13. REGULATORY INFORMATION:

OSHA STATUS:

This product is not hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200. However, thermal processing and decomposition fumes from this product may be hazardous as noted in Sections 2 and 3.

TSCA STATUS:

This product is listed on TSCA.

CERCLA (Comprehensive Response Compensation and Liability Act):

NOT reportable.

SARA TITLE III (Superfund Amendments and Reauthorization Act):

Section 312 Extremely Hazardous Substances:

None

Section 311/312 Hazard Categories:

Non-hazardous under Section 311/312

Section 313 Toxic Chemicals:

None

RCRA STATUS:

If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste,
(40 CFR 261.20-24)

CALIFORNIA PROPOSITION 65:

The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act of 1986. This product contains no chemicals known to the state of California to cause cancer.

14. OTHER INFORMATION:

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any other process. Such information is to the best of the company's knowledge and believed accurate and reliable as of the date indicated. However, no representation, warranty or guarantee of any kind, express or implied, is made as to its accuracy, reliability or completeness and we assume no responsibility for any loss, damage or expense, direct or consequential, arising out of use. It is the user's responsibility to satisfy himself as to the suitableness and completeness of such information for his own particular use.

Material Safety Data Sheet

Original Date: 03/17/2000
Revision Date: 02/04/2003

BASF CORPORATION
3000 CONTINENTAL DRIVE NORTH

MOUNT OLIVE, NJ 07828
(973) 426-4671

EMERGENCY TELEPHONE: (800) 424-9300 CHEMTREC
(800) 832-HELP (BASF Hotline)
BOTH NUMBERS ARE AVAILABLE DAYS, NIGHTS, WEEKENDS, & HOLIDAYS.

SECTION 1 - PRODUCT INFORMATION

POTASSIUM METHYLATE 32% SOLUTION
Product ID: NCI 836841
Common Chemical Name:
POTASSIUM METHYLATE SOLUTION IN 32% METHANOL
Synonyms:
POTASSIUM METHOXIDE SOLUTION
Molecular Formula:
NA
Chemical Family: Alkoxides
Molecular Wt.: NOT APPLICABLE

SECTION 2 - INGREDIENTS

Chemical Name:	CAS	Amount
METHANOL, POTASSIUM SALT	865-33-8	32.0 %
PEL/TLV NOT ESTABLISHED		
METHYL ALCOHOL	67-56-1	68.0 %
ACGIH TLV	SKIN	
	STEL 250 PPM	
	TWA 200 PPM	
OSHA PEL	TWA 200 PPM	

SECTION 3 - PHYSICAL PROPERTIES

Color: Colorless to yellow
Form/Appearance: Liquid
Odor: Alcohol

	Typical	Low/High	U.O.M.			
Specific Gravity:	0.973			@	20	DEG C
Viscosity:	18		MPAS	@	20	DEG.
pH:	11		SU			

	Typical	Low/High	Deg.	@	Pressure
Boiling Pt:	92		C	760	MM HG
Freezing Pt:	NOT AVAILABLE				
Decomp. Tmp:	NOT AVAILABLE				

Solubility in Water Description: Hydrolysis

Vapor Pressure:	36	MILLIBARS	X	20	DEG. C	XX

SECTION 3 - PHYSICAL PROPERTIES (cont)

Other Solvents:

SOLUBLE IN ALCOHOL.

pH: Alkaline

Solubility in other solvents: Soluble in alcohols

SECTION 4 - FIRE AND EXPLOSION DATA

	Typical	Low/High	Deg.	Method
Flash Point:	31.5		C	DIN 51755
Autoignition:	NOT AVAILABLE			

Extinguishing Media:

Use water, dry extinguishing media, carbon dioxide (CO2) or foam.

Fire Fighting Procedures:

Firefighters should be equipped with self-contained breathing apparatus and turn out gear.

Unusual Hazards:

Not applicable.

Information on Methanol:

Lower explosion limit:5.5% (V) Upper explosion limit 36.5% (V)

Ignition Temperature: 455 deg. C.

SECTION 5 - HEALTH EFFECTS

Routes of entry for solids and liquids include eye and skin contact, ingestion and inhalation. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquified gases.

Acute Overexposure Effects:

Contact with the eyes, skin and respiratory tract results in severe irritation. Burns and permanent eye injury may result.

This material is corrosive to the body tissues. Skin contact with the liquid or vapors/mists may result in dermatitis and deep burns.

Eye contact may result in burns and permanent injury.

Ingestion of potassium methylate may result in severe abdominal pain, nausea and vomiting. Acute renal failure and hematuria have also been reported. Inhalation may result in respiratory irritation, dyspnea and dizziness. Direct contact with the liquid may be highly corrosive to the skin and eyes.

Ingestion of large amounts of methanol results in incoordination, weakness, acidosis, convulsions, and respiratory failure. Kidney damage and blindness may result. Inhalation of the vapors may cause narcosis, dizziness, headache, and nausea.

Chronic Overexposure Effects:

Chronic overexposure to methanol vapors may cause conjunctivitis, headache, insomnia, gastric disturbances, and permanent or temporary loss of sight. Rats gavaged with methanol on day 10 of gestation showed dose-related increases in total anomalies of the testes and eye. Maternal toxicity was not observed at any dose level. Methanol was administered by inhalation to pregnant rats on days 1-19 of

SECTION 5 - HEALTH EFFECTS (cont)

gestation for 7 hr/day. Dose levels were 20,000 ppm, 10,000 ppm, 5,000 ppm and 0 ppm. Methanol was teratogenic at the high doses of 10,000 ppm and 20,000 ppm.

First Aid Procedures - Skin:

Wash affected areas with water while removing contaminated clothing. Get immediate medical attention. Launder contaminated clothing before reuse.

First Aid Procedures - Eyes:

Immediately rinse eyes with running water for 15 minutes. Get immediate medical attention.

First Aid Procedures - Ingestion:

If swallowed, dilute with water. DO NOT INDUCE VOMITING. Never give fluids or induce vomiting if the victim is unconscious or having convulsions. Get immediate medical attention.

First Aid Procedures - Inhalation:

Move to fresh air. Aid in breathing, if necessary, and get immediate medical attention.

First Aid Procedures - Notes to Physicians:

Not applicable.

First Aid Procedures - Aggravated Medical Conditions:

No data is available which addresses medical conditions that are generally recognized as being aggravated by exposure to this product. Please refer to the effects of overexposure section for effects (if any) observed in animals.

First Aid Procedures - Special Precautions:

Not applicable.

SECTION 6 - REACTIVITY DATA

Stability Data:

Stable.

Incompatability:

Water and acids.

Conditions/Hazards to Avoid:

React violently with water

Hazardous Decomposition/Polymerization:

Polymerization: Does not occur.

Decomposes to caustic and methanol.

Corrosive Properties:

Not corrosive.

Oxidizer Properties:

Not an oxidizer

SECTION 7 - PERSONAL PROTECTION

Clothing:

Gloves, coveralls, apron, and boots as necessary to prevent contact.

Eyes:

Chemical goggles; also wear a face shield if splashing hazard exists.

Respiration:

If vapors or mists are generated, wear a NIOSH/MSHA approved organic vapor/mist respirator or an air-supplied respirator as appropriate.

SECTION 7 - PERSONAL PROTECTION (cont)

Ventilation:
Use local exhaust to control vapors/mists.
Explosion Proofing:
See Section 4 - Fire and Explosion Data.
Other Personal Protection Data:
None under normal conditions.

SECTION 8 - SPILL-LEAK/ENVIRONMENTAL

General:
Spills should be contained, solidified and placed in suitable containers for disposal in a RCRA licensed facility. This material is RCRA hazardous due to its properties.
Waste Disposal:
Incinerate or bury in a RCRA licensed facility. Do not discharge into waterways or sewer systems without proper authority.
Container Disposal:
Empty containers with less than 1 inch of residue may be landfilled at a licensed facility. Recommend crushing or other means to prevent unauthorized reuse. Other containers must be disposed of in a RCRA licensed facility.

SECTION 9 - STORAGE AND HANDLING

General:
Keep away from ignition sources. Containers should be opened carefully in well-ventilated areas to avoid static discharge.
Keep in tightly closed container in a cool place.
Other Storage and Handling Data:
Protect against heat and moisture.
Prevent electrostatic charges.
Segregate from acids and acid forming substances.
Protect from temperature below -10 deg. C.
The product crystallizes below the limit temperature.
Protect from acid and acid froming substances
Protect against heat and moisture.
Prevent electrostatic charges.
Segregate from acids and acid forming substances.
Protect from temperature below -15 deg. C.

SECTION 10 - REGULATORY INFORMATION

TSCA Inventory Status
Listed on Inventory: YES
SARA - 313 Listed Chemicals:
CAS: 67-56-1 AMOUNT: 68.0 %
NAME: METHYL ALCOHOL

RCRA Haz. Waste No .: D001
CERCLA: YES Reportable Qty.: (If YES)
XXXXXXX XXXXXXXXXXXXX 5000 LBS
The RCRA hazardous waste number D001 refers to this material's RCRA hazardous waste characteristic of ignitibility.
CERCLA reporting requirements are for CAS# 67-56-1= 5000lb.

SECTION 10 - REGULATORY INFORMATION (cont)

State Regulatory Information: (By Component) NJ/PA/MA RTK

CAS:	67-56-1	YES
NAME:	METHYL ALCOHOL	
CAS:	865-33-8	NO
NAME:	METHANOL, POTASSIUM SALT	

Hazard Ratings:

	Health:	Fire:	Reactivity:	Special:
HMIS	3	3	2	NA

SECTION 11 - TRANSPORTATION INFORMATION

DOT Proper Shipping Name:
SEE BELOW
DOT Technical Name:
SEE BELOW
DOT Primary Hazard Class:
SEE BELOW
DOT Secondary Hazard Class:
SEE BELOW
DOT Label Required:
SEE BELOW
DOT Placard Required:
SEE BELOW
DOT Poison Constituent:
SEE BELOW
BASF Commodity Codes: NA NA UN/NA Code: E/R Guide:
Bill of Lading Description:
CORROSIVE LIQUID, FLAMMABLE, N.O.S., (METHANOL AND POTASSIUM METHYLATE), 8, UN 2920, PG I

CLASS:	P. G.	SHIPPING NAME:
IATA:		SEE PREVIOUS SECTION
IMO:		SEE PREVIOUS SECTION
TDG:		SEE PREVIOUS SECTION

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SECTION 11 - TRANSPORTATION INFORMATION (cont)

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END OF DATA SHEET

Vegetable Oil

MSDS # 786.00

Section 1: Product and Company Identification

Vegetable Oil

Synonyms/General Names: Soybean Oil
Product Use: For educational use only
Manufacturer: Columbus Chemical Industries, Inc., Columbus, WI 53925.

24 Hour Emergency Information Telephone Numbers

CHEMTREC (USA): 800-424-9300 **CANUTEC (Canada): 613-424-6666**

ScholAR Chemistry; 5100 W. Henrietta Rd, Rochester, NY 14586; (866) 260-0501; www.Scholarchemistry.com

Section 2: Hazards Identification

Clear, light yellow, oily liquid; faint odor.

HMIS (0 to 4)

Health	0
Fire Hazard	1
Reactivity	0

CAUTION! Combustible liquid.
Target organs: None known.

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Section 3: Composition / Information on Ingredients

Vegetable Oil (8001-22-7), 100%

Section 4: First Aid Measures

Always seek professional medical attention after first aid measures are provided.

Eyes: Immediately flush eyes with excess water for 15 minutes, lifting lower and upper eyelids occasionally.
Skin: Immediately flush skin with excess water for 15 minutes while removing contaminated clothing.
Ingestion: Call Poison Control immediately. Rinse mouth with cold water. Give victim 1-2 cups of water or milk to drink. Induce vomiting immediately.
Inhalation: Remove to fresh air. If not breathing, give artificial respiration.

Section 5: Fire Fighting Measures

When heated to decomposition, emits acrid fumes.
Protective equipment and precautions for firefighters: Use foam or dry chemical to extinguish fire. Firefighters should wear full fire fighting turn-out gear and respiratory protection (SCBA). Cool container with water spray. Material is not sensitive to mechanical impact or static discharge.

Section 6: Accidental Release Measures

Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Contain spill with sand or absorbent material and place in sealed bag or container for disposal. Ventilate and wash spill area after pickup is complete. See Section 13 for disposal information.

Section 7: Handling and Storage Green

Handling: Use with adequate ventilation and do not breathe dust or vapor. Avoid contact with skin, eyes, or clothing. Wash hands thoroughly after handling.
Storage: Store in General Storage Area [Green Storage] with other items with no specific storage hazards. Store in a cool, dry, well-ventilated, locked store room away from incompatible materials.

Section 8: Exposure Controls / Personal Protection

Use ventilation to keep airborne concentrations below exposure limits. Have approved eyewash facility, safety shower, and fire extinguishers readily available. Wear chemical splash goggles and chemical resistant clothing such as gloves and aprons. Wash hands thoroughly after handling material and before eating or drinking. Exposure guidelines: Vegetable Oil : OSHA PEL: N/A, ACGIH: TLV: N/A, STEL: N/A.

Section 9: Physical and Chemical Properties

Molecular formula	Natural Product.	**Appearance**	Clear, light yellow, oily liquid.
Molecular weight	N/A.	**Odor**	Faint odor.
Specific Gravity	~0.9 g/mL @ 60°C.	**Odor Threshold**	N/A.
Vapor Density (air=1)	N/A.	**Solubility**	Insoluble.
Melting Point	22-31°C.	**Evaporation rate**	N/A. *(Butyl acetate = 1).*
Boiling Point/Range	N/A.	**Partition Coefficient**	N/A. *(log P_{OW}).*
Vapor Pressure (20°C)	N/A.	**pH**	N/A.
Flash Point:	255°C (491°F).	**LEL**	N/A.
Autoignition Temp.:	N/A.	**UEL**	N/A.

N/A = Not available or applicable

Section 10: Stability and Reactivity

Avoid heat and moisture.
Stability: Stable under normal conditions of use and storage.
Incompatibility: Oxidizing materials.
Shelf life: Indefinite if stored properly.

Section 11: Toxicology Information

Acute Symptoms/Signs of exposure: ***Eyes***: Redness, tearing, itching, burning, conjunctivitis. ***Skin***: Redness, itching. ***Ingestion***: Irritation and burning sensations of mouth and throat, nausea, vomiting and abdominal pain. ***Inhalation***: Irritation of mucous membranes, coughing, wheezing, shortness of breath,
Chronic Effects: No information found.
Sensitization: none expected
Vegetable Oil: LD50 [oral, rat]; N/A; LC50 [rat]; N/A; LD50 Dermal [rabbit]; N/A
Material has not been found to be a carcinogen nor produce genetic, reproductive, or developmental effects.

Section 12: Ecological Information

Ecotoxicity (aquatic and terrestrial): Not considered an environmental hazard.

Section 13: Disposal Considerations

Check with all applicable local, regional, and national laws and regulations. Local regulations may be more stringent than regional or national regulations. Small amounts of this material may be suitable for sanitary sewer or trash disposal.

Section 14: Transport Information

DOT Shipping Name:	Not regulated by DOT.	**Canada TDG:**	Not regulated by TDG.
DOT Hazard Class:		**Hazard Class:**	
Identification Number:		**UN Number:**	

Section 15: Regulatory Information

EINECS: Listed (232-274-4).
TSCA: All components are listed or are exempt.
WHMIS Canada: Not WHMIS Controlled.
California Proposition 65: Not listed.

The product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Section 16: Other Information

Current Issue Date: January 23, 2009

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Attachment C

Hurricane Safety List

HURRICANE SAFETY LIST

1/17/2014

BRACE ALL OVERHEAD PIPING. – NOW.

Unplug all electrical cords, devices and appliances.

Turn off main breakers to building.

Break down ultra-sonics and put in container (dry storage). Wrap in plastic wrap, and put in dry box.

Put all paperwork, records and process sheets in dry storage.

Store all portable pumps in containers.

Strap, tie down or put in container all: ladders, buckets, chairs, gas cans, tool carts or any flying debris.

Secure all empty totes.

Put away all fans.

Shut down and secure all boilers, and water proof boiler fuel tanks.

Secure, wrap, water proof all centrifuges,

Fuel up generators, portable water pumps, chainsaws, etc.

Secure all valves to OFF position to all tanks.

Check all fluids on pump truck, and ready for emergency transport of fuel if any.

Secure all supply and parts cabinets.

Strap & band all loose lumber and wood pallets.

Secure all recycling bins, garbage cans and empty barrels.

Store fork lift charger in dry place.

Remove & store all hanging lights.

Store gasoline for general use. 50 gallons