



Safety Data Sheet

Revision Date: 17-Jul-2018

Revision Number: 3

1. Identification

Product Name:

Fuel Ethanol

Product Code:

017609

Use of the Substance / Preparation:

Fuel

Contact Manufacturer:

Archer Daniels Midland Company

4666 Faries Parkway

Decatur, IL 62526, USA

Telephone Number: (+1) 217-424-5200

Emergency response telephone number:

Chemtrec 1-800-424-9300 (CCN 1635)

2. Hazard(s) identification

Emergency Overview

Danger. Highly flammable liquid and vapour. Not for human consumption. Vapors may be irritating to eyes, nose, throat, and lungs. May be fatal if swallowed and enters airways. Contains > 0.1% of a Category 1 Carcinogen and a Category 1 mutagen. May cause genetic defects and/or cancer. One or more ingredients of the product may present a reproductive toxicity hazard if misused or mishandled. Irritating to eyes.

Appearance

Clear Bright

Physical State

Liquid

Odor

Characteristic

Classification according to 29 CFR 1910 and SOR/2015-17, amended to conform to the United Nations' Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

Serious Eye Damage / Eye Irritation Category 2

Germ Cell Mutagenicity Category 1B

Carcinogenicity Category 1A

Reproductive Toxicity Category 2

Aspiration hazard Category 1

Flammable Liquids Category 2

Signal Word: Danger

GHS Hazard Pictogram(s):



Hazard Statement(s):

H225 Highly flammable liquid and vapour
 H304 May be fatal if swallowed and enters airways
 H319 Causes serious eye irritation
 H340 May cause genetic defects.
 H350 May cause cancer.
 (H361fd) Suspected of damaging fertility. Suspected of damaging the unborn child

Prevention Precautionary Statements:

Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Ground/bond container and receiving equipment. Use only non-sparking tools. Use explosion-proof electrical/ventilating/lighting/equipment. Take precautionary measures against static discharges. Keep container tightly closed. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. Do not breathe fume/gas/mist/vapours/spray. Wash hands and exposed skin thoroughly after handling.

Response Precautionary Statements:

In case of fire: Use Alcohol-resistant foam / dry chemical / carbon dioxide (CO₂) to extinguish. Do not use a solid water stream as it may scatter and spread fire. If swallowed: Immediately call a poison center or doctor/physician. Do NOT induce vomiting. If on skin (or hair): Take off immediately, all contaminated clothing. Rinse skin with water. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed: Get medical advice/attention.

Storage Precautionary Statements:

Store locked up. Store in a well-ventilated place. Keep container tightly closed. Keep cool.

Disposal Precautionary Statements:

Dispose of contents/container in accordance with all applicable national and local regulations.

3. Composition/information on ingredients

Chemical Family
Description

Alcohols
This product contains 95-98% Ethanol and 2-5% Natural Gasoline.

The following component(s) in this product are considered hazardous under applicable OSHA (USA), WHMIS (Canada), and/or NOM-002-SCT-2003 (Mexico) regulations (or require disclosure as an air contaminant)

Chemical Name	CAS-No	Weight %	North American Substance Hazard Class
Ethyl alcohol	64-17-5	95-98	Flam. Liq. 2. Eye Irrit. 2. 29 CFR 1910.1000 Air Contaminant.
Natural Gasoline	8006-61-9	2-5	OSHA / GHS: Flam. Liq. 1. Skin Irrit. 2. Asp. Tox. 1. Repr. 2. Muta. 1B. Eye Irrit. 2. Carc. 1A. Acute Tox. 2. (dermal) STOT Rep. 1. STOT SE 3. (inhalation)
Gasoline (natural gas), natural	68425-31-0	2-5	OSHA / GHS: Flam. Liq. 1. Skin Irrit. 2. Asp. Tox. 1. Repr. 2. Muta. 1B. Eye Irrit. 2. Carc. 1A. Acute Tox. 2. (dermal) STOT Rep. 1. STOT SE 3. (inhalation)
Hexane	110-54-3	< 2.25	OSHA / GHS: Flam. Liq. 2 Asp. Tox. 1. Skin Irrit. 2. STOT SE 3. Repr. 2. STOT Rep. 2. See section 8 for OELs. IDL (1.0%) 29 CFR 1910.1000 Air Contaminant.
Isopentane	78-78-4	< 1.75	OSHA / GHS: Asp. Tox. 1. STOT SE 3. (inhalation) Flam. Liq. 1. See section 8 for OELs.
2,2-Dimethylpropane	463-82-1	< 1.75	OSHA / GHS: Press.Gas. Flam. Gas 1 See section 8 for OELs.
Pentane	109-66-0	< 1.5	OSHA / GHS: Flam. Liq. 2 Asp. Tox. 1. STOT SE 3. See section 8 for OELs. 29 CFR 1910.1000 Air Contaminant.
Butane	106-97-8	< 0.40	OSHA / GHS: Flam. Gas 1 Press.Gas. See section 8 for OELs.
Cyclohexane	110-82-7	< 0.25	OSHA / GHS: Flam. Liq. 2 Asp. Tox. 1. Skin Irrit. 2. STOT SE 3. (inhalation) See section 8 for OELs. 29 CFR 1910.1000 Air Contaminant.
Benzene	71-43-2	< 0.25	Flam. Liq. 2 Asp. Tox. 1. Skin Irrit. 2. Eye Irrit. 2. Muta. 1B. Carc. 1A. STOT Rep. 1. Asp. Tox. 1. 29 CFR 1910.1000 Air Contaminant. See section 8 for OELs.
Toluene	108-88-3	< 0.15	OSHA / GHS: Flam. Liq. 2 Asp. Tox. 1. Skin Irrit. 2. STOT SE 3. Repr. 2. STOT Rep. 2. 29 CFR 1910.1000 Air Contaminant. See section 8 for OELs.
Methyl alcohol	67-56-1	TRACE (0.015)	Flam. Liq. 2 Acute Tox. 2. (oral) (dermal) (inhalation) STOT SE, Cat. 1. Affected organs: Optic nerve (nervus opticus), central nervous system. 29 CFR 1910.1000 Air Contaminant. See section 8 for OELs.
Hydrogen sulfide	7783-06-4	Trace	OSHA / GHS: Flam. Gas 1 Press.Gas. Acute Tox. 2. (inhalation) See section 8 for OELs. IDL (1.0%) 29 CFR 1910.1000 Air Contaminant.
Acetaldehyde	75-07-0	TRACE (0.002)	Flam. Liq. 1. Eye Irrit. 2. STOT SE 3. Carc. 2. 29 CFR 1910.1000 Air Contaminant. See section 8 for OELs.
Acetone	67-64-1	TRACE (0.0004)	Flam. Liq. 2 Eye Irrit. 2. STOT SE 3. 29 CFR 1910.1000 Air Contaminant. See section 8 for OELs.

* Please note that, for this product, the formula percentages are provided based on volume rather than weight. Mixture ingredients may be listed which are below a concentration limit which results in the mixture itself being classified in any health hazard class. In such cases, disclosure of the exact substance percentage is not required.

Additives / Other Ingredients:

This product contains natural gasoline from multiple suppliers.

Natural Gasoline CAS 8006-61-9 A complex combination of hydrocarbons separated from natural gas by processes such as refrigeration or absorption. It consists predominantly of saturated aliphatic hydrocarbons having carbon numbers predominantly in the range of C4 through C8 and boiling in the range of approximately minus 20°C to 120°C (-4°F to 248°F).

Natural Gasoline CAS 68425-31-0 A complex combination of hydrocarbons separated as a liquid from natural gas liquids and/or natural gas condensates from which ethane, propane, butane and possibly pentane have been extracted. It consists of hydrocarbons having carbon numbers predominantly in the range of C5 through C8. It is a liquid at atmospheric temperature and pressure.

Natural gasoline has a variable composition consisting of the following constituents: Hexane, Isopentane, 2,2-Dimethylpropane, Pentane, Butane, Cyclohexane, Benzene, Toluene. Additional non-hazardous components and hazardous components may also be present at levels less than 0.1%

4. First-aid measures

Description of first aid measures

Eye Contact Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first five minutes, then continue rinsing eye.

Skin Contact Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes.

Inhalation Move to fresh air in case of accidental inhalation of vapors. Artificial respiration and/or oxygen may be necessary.

Ingestion Clean mouth with water and afterwards drink plenty of water. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

Protection of First-aiders Use personal protective equipment. Remove all sources of ignition.

Most important symptoms and affects, both acute and delayed

Eyes Irritating to eyes.

Skin May cause slight skin irritation.

Inhalation Inhalation of vapors in high concentration may cause irritation of respiratory system. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting. In humans, ethanol is readily absorbed by the oral and inhalation routes, is distributed throughout all tissues and organs and is readily, metabolized and excreted. At exposures relevant to occupational inhalation exposure, the alcohol dehydrogenase metabolic route in the liver dominates and does not become saturated. Ethanol is not accumulated in the body.

Ingestion Ingestion may cause irritation to mucous membranes. May cause drowsiness and dizziness. Lack of coordination. Nausea. Vomiting. Abdominal pain. Unconsciousness. Very severe cases of overexposure may result in coma.

Main Symptoms Vomiting. Nausea.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. Fire-fighting measures

Flammable Properties

Flammable liquid. Vapors may form explosive mixtures with air. Vapors may cause flash fire or explosion. Material may pose fire hazard because it is dispersed (or spread) by water.

Extinguishing media

Suitable Extinguishing Media Alcohol-resistant foam. Dry chemical. Carbon dioxide (CO₂) Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Evacuate area and fight fire from a safe distance Cool closed containers exposed to fire with water spray

Unsuitable Extinguishing Media Do not use a solid water stream as it may scatter and spread fire.

Special hazards arising from the substance or mixture

Hazardous Combustion Products Thermal decomposition can lead to release of irritating gases and vapors, Carbon monoxide (CO), Carbon dioxide (CO₂).

Specific Hazards Arising from the Chemical Keep product and empty container away from heat and sources of ignition. Risk of ignition.

Sensitivity to mechanical impact No information available.
Sensitivity to static discharge Yes.

Advice for fire-fighters

Protective Equipment and Precautions for Firefighters As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health 2
Flammability 3

Stability and Reactivity 0
Physical hazard None known

6. Accidental release measures

Personal Precautions, Protective Equipment, and Emergency Procedures

Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Remove all sources of ignition. Pay attention to flashback. Take precautionary measures against static discharges. Use personal protective equipment. Avoid contact with the skin and the eyes.

Environmental Precautions

Prevent further leakage or spillage if safe to do so. Prevent product from entering drains.

Methods and Materials for Containment and Cleaning Up

Small spills: Allow to evaporate if it is safe to do so or contain and absorb using earth, sand or other inert material then transfer into suitable containers for recovery or disposal. Ventilate contaminated area thoroughly. Use non-sparking tools. Do not use electrical equipment unless it is intrinsically safe.

Large spills: Dike or dam to contain for later disposal. Cover drains. Contact emergency authorities.

7. Handling and storage

Handling

Take precautionary measures against static discharges. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from open flames, hot surfaces and sources of ignition. Wear personal protective equipment. Do not breathe vapors or spray mist. Use only in area provided with appropriate exhaust ventilation. Use product only in closed system. Avoid contact with skin and eyes.

Storage

Keep in properly labelled containers. Keep away from heat and sources of ignition. Keep containers tightly closed in a cool, well-ventilated place.

8. Exposure controls/Personal protection

Exposure Limits

Components with workplace control parameters.

Chemical Name	ACGIH TLV	OSHA PEL	Mexico	NIOSH
Ethyl alcohol	STEL: 1000 ppm	TWA: 1000 ppm TWA: 1900 mg/m ³	TWA: 1000 ppm (LMPE-PPT) TWA: 1900 mg/m ³ (LMPE-PPT)	IDLH: 3300 ppm 10% LEL TWA: 1000 ppm TWA: 1900 mg/m ³
Hexane	TWA: 50 ppm	TWA: 500 ppm TWA: 1800 mg/m ³	TWA: 500 ppm (VLE-PPT) except n-Hexane TWA: 1760 mg/m ³ (VLE-PPT) except n-Hexane STEL: 1000 ppm (PPT-CT) except n-Hexane STEL: 3500 mg/m ³ (PPT-CT) except n-Hexane	IDLH: 1100 ppm 10% LEL TWA: 50 ppm TWA: 180 mg/m ³
Isopentane	TWA: 1000 ppm Pentane, all isomers			
2,2-Dimethylpropane	TWA: 600 ppm Pentane, all isomers			
Pentane	TWA: 600 ppm Pentane, all isomers	TWA: 1000 ppm TWA: 2950 mg/m ³	TWA: 600 ppm (LMPE-PPT) TWA: 1800 mg/m ³ (LMPE-PPT) STEL: 760 ppm (LMPE-CT) STEL: 2250 mg/m ³ (LMPE-CT)	IDLH: 1500 ppm 10% LEL TWA: 120 ppm TWA: 350 mg/m ³
Butane	STEL: 1000 ppm		TWA: 800 ppm (LMPE-PPT) TWA: 1900 mg/m ³ (LMPE-PPT)	TWA: 800 ppm TWA: 1900 mg/m ³
Cyclohexane	TWA: 100 ppm	TWA: 300 ppm TWA: 1050 mg/m ³	TWA: 300 ppm (LMPE-PPT) TWA: 1050 mg/m ³ (LMPE-PPT) STEL: 375 ppm (LMPE-CT) STEL: 1300 mg/m ³ (LMPE-CT)	IDLH: 1300 ppm 10% LEL TWA: 300 ppm TWA: 1050 mg/m ³
Benzene	STEL: 2.5 ppm TWA: 0.5 ppm	TWA: 10 ppm applies to industry segments exempt from the benzene standard at 29 CFR 1910.1028 TWA: 1 ppm STEL: 5 ppm see 29 CFR 1910.1028 Ceiling: 25 ppm	TWA: 1 ppm (LMPE-PPT) TWA: 3.2 mg/m ³ (LMPE-PPT) STEL: 5 ppm (LMPE-CT) STEL: 16 mg/m ³ (LMPE-CT)	IDLH: 500 ppm STEL: 1 ppm TWA: 0.1 ppm
Toluene	TWA: 20 ppm	TWA: 200 ppm Ceiling: 300 ppm	TWA: 50 ppm (LMPE-PPT) TWA: 188 mg/m ³ (LMPE-PPT) Skin	IDLH: 500 ppm STEL: 150 ppm STEL: 560 mg/m ³ TWA: 100 ppm TWA: 375 mg/m ³
Methyl alcohol	STEL: 250 ppm TWA: 200 ppm	TWA: 200 ppm TWA: 260 mg/m ³	TWA: 200 ppm (LMPE-PPT) TWA: 260 mg/m ³ (LMPE-PPT) STEL: 250 ppm (LMPE-CT) STEL: 310 mg/m ³ (LMPE-CT) Skin	IDLH: 6000 ppm Skin STEL: 250 ppm STEL: 325 mg/m ³ TWA: 200 ppm TWA: 260 mg/m ³
Hydrogen sulfide	STEL: 5 ppm TWA: 1 ppm	Ceiling: 20 ppm	TWA: 10 ppm (LMPE-PPT) TWA: 14 mg/m ³ (LMPE-PPT) STEL: 15 ppm (LMPE-CT) STEL: 21 mg/m ³ (LMPE-CT)	IDLH: 100 ppm
Acetaldehyde	Ceiling: 25 ppm	TWA: 200 ppm TWA: 360 mg/m ³	Ceiling: 25 ppm (LMPE-Pico) Ceiling: 45 mg/m ³ (LMPE-Pico)	IDLH: 2000 ppm

Acetone	STEL: 750 ppm TWA: 500 ppm	TWA: 1000 ppm TWA: 2400 mg/m ³	TWA: 1000 ppm (LMPE-PPT) TWA: 2400 mg/m ³ (LMPE-PPT) STEL: 1260 ppm (LMPE-CT) STEL: 3000 mg/m ³ (LMPE-CT)	IDLH: 2500 ppm 10% LEL TWA: 250 ppm TWA: 590 mg/m ³
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Biological Limit Values

BLVs provide information useful for evaluating a worker's response and measuring overall exposure and can be regarded as reference guides for assessing the results of biological monitoring data. BLVs depend on many factors, such as metabolism and pharmacokinetics of the chemical and body build, workload, and lifestyle of the worker. BEI notations are meant to aid in assessing biological monitoring results. BEIs provide an index of an individual's uptake of a chemical and generally indicate a concentration below which nearly all workers should not experience adverse health effects. When one or more BEI is recommended for a substance, biological monitoring should be instituted to evaluate total exposure from all sources, including dermal, ingestion, or non-occupational.

Component	ACGIH - Biological Exposure Indices (BEI)
Hexane 110-54-3 (< 2.25)	0.4 mg/L Medium: urine Time: end of shift at end of workweek Parameter: 2,5-Hexanedione without hydrolysis
Benzene 71-43-2 (< 0.25)	25 µg/g creatinine Medium: urine Time: end of shift Parameter: S-Phenylmercapturic acid (background); 500 µg/g creatinine Medium: urine Time: end of shift Parameter: t,t-Muconic acid (background)
Toluene 108-88-3 (< 0.15)	0.02 mg/L Medium: blood Time: prior to last shift of workweek Parameter: Toluene; 0.03 mg/L Medium: urine Time: end of shift Parameter: Toluene; 0.3 mg/g creatinine Medium: urine Time: end of shift Parameter: o-Cresol with hydrolysis (background)
Methyl alcohol 67-56-1 (TRACE (0.015))	15 mg/L Medium: urine Time: end of shift Parameter: Methanol (background, nonspecific)
Acetone 67-64-1 (TRACE (0.0004))	25 mg/L Medium: urine Time: end of shift Parameter: Acetone (nonspecific)

Appropriate Engineering Controls Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location. Apply technical measures to comply with the occupational exposure limits.

General Hygiene Considerations When using, do not eat, drink or smoke. Regular cleaning of equipment, work area and clothing. Handle in accordance with good industrial hygiene and safety practice.

Personal Protective Equipment**Eye/face Protection.**

Tightly fitting safety goggles.

Skin and Body Protection

Long sleeved clothing. Chemical resistant apron. Antistatic boots. Neoprene gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used. Appropriate body protection should be selected based on activity and possible exposure.

Respiratory Protection

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Wear a positive-pressure supplied-air respirator with full facepiece.



9. Physical and chemical properties

Appearance	Clear Bright
Physical State	Liquid
Granulometry	No information available
Odor	Characteristic
Odor Threshold	No information available
pH	No information available

Flash Point	Approx. 10-15.5 °C / 50-60 °F (ASTM D93_85 - Pensky-Martens Closed Cup)
Autoignition Temperature	> 365 °C / 689 °F
Boiling point	73.9 - 79.4 °C / 165 - 175 °F
Melting/Freezing Point	No information available
Decomposition temperature	No information available
Oxidizing Properties	No information available
Flammability Limits in Air	Upper: 19% Lower: 3.3%

Water Solubility	Miscible
Evaporation Rate	3.2 [Butyl acetate = 1.0]
Vapor Pressure	psi @ 100°F(37.8°C) = 3.5 (Reid)
Vapor Density	1.6 (Air = 1.0)
Specific Gravity / Relative Density	0.79 at 60°F (Water = 1.0)
Partition Coefficient (n-octanol/water)	No information available

10. Stability and reactivity

Reactivity May react violently with very strong oxidising agents.

Stability Stable under normal conditions.

Possibility of Hazardous Reactions Hazardous polymerization does not occur.

Conditions to Avoid Heat, flames and sparks. Incompatible products.

Incompatible Materials Strong oxidizing agents. Strong mineral acids. Aluminum at higher temperatures.

Hazardous Decomposition Products Thermal decomposition may lead to release of. Carbon oxides.

11. Toxicological information

Information on toxicological effects

Acute toxicity	Based on available data, the classification criteria are not met.
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Toxicology data for the components

Literature data source

Chemical Name	Weight %	LD50 Oral	LD50 Dermal	LC50 Inhalation
Ethyl alcohol	95-98	7060 mg/kg Rat	> 5000 mg/kg	124.7 mg/l
Natural Gasoline	2-5			300 g/m ³ Rat 5 min

Skin corrosion/irritation	Based on available data, the classification criteria are not met. All available acute 4 hour exposure studies for ethanol show not irritating in animals (OECD404 or equivalent) and humans. In humans, repeated dose studies for ethanol show no irritation with repeated application over a whole day under occlusive conditions for up to 12 days. Further exposures cause irritation to occur.
Serious eye damage/eye irritation	Cat. 2 H319: Causes serious eye irritation. For ethanol, studies according to OECD guideline 405 generally cause moderate eye irritation. All effects disappear within 8-14 days. The level of conjunctival response is sufficient to require classification as a category 2 irritant.
Respiratory or skin sensitisation	Based on available data, the classification criteria are not met. Mouse swelling study: negative (ethanol) Local Lymph Node Assay (OECD429): Negative (ethanol) Guinea Pig maximisation study: (OECD406) Negative (ethanol) Respiration sensitisation: no data available. (ethanol).

Germ cell mutagenicity	<p>Cat. 1B. (Benzene). In a Mammalian Erythrocyte Micronucleus Test (OECD474), benzene produced an increased frequency of micronuclei following inhalation exposure at 100 and 200 ppm in mice and is considered to be an in vivo clastogen.</p> <p>Ethanol:</p> <p>Bacterial reverse mutation studies (OECD471) for ethanol: all negative</p> <p>In vitro cytogenicity studies (eg OECD473) for ethanol: negative without metabolic activation. No studies available with metabolic activation.</p> <p>In vitro mammalian cell gene mutation studies (OECD476) for ethanol: negative with and without metabolic activation.</p> <p>In vivo micronucleus test (OECD474) for ethanol: no convincing evidence that ethanol causes micronuclei in the bone marrow.</p> <p>In vivo chromosome aberration test (OECD475) for ethanol: negative.</p> <p>Dominant Lethal assay (OECD478): Ethanol is unlikely to produce an effect up to the maximum tolerated dose.</p> <p>There is some evidence from in vitro studies that ethanol can cause genotoxic or clastogenic effects. However, the effects seen are weak and only occur at very high doses. The balance of evidence is that ethanol is not genotoxic.</p>				
Carcinogenicity	<p>Contains > 0.1% of a category 1 carcinogen. (Benzene). Benzene is classified as a known human carcinogen for all routes of exposure based on occupational epidemiological studies and numerous supporting animal studies. Experimental animal studies support increased risk of cancer in multiple organ systems for both oral and inhalation exposure. Human exposure to benzene is associated with increased risk of leukemia and there is also evidence that benzene causes hematologic neoplasms, blood disorders such as preleukemia and aplastic anemia, Hodgkin's lymphoma, and myelodysplastic syndrome. (Literature Source). Ethanol: In humans, the consumption of alcoholic beverages is associated with an increased incidence of certain tumours. There is no evidence that the exposure of humans to ethanol other than by repeated consumption of alcoholic beverages may result in an increase in cancer incidence. The table below indicates whether each agency has listed any ingredient as a carcinogen.</p>				
Chemical Name	Weight %	OSHA	NTP	ACGIH	IARC
Ethyl alcohol	95-98	Present	Known	A3 - Confirmed Animal Carcinogen	Group 1 - Carcinogenic to Humans
Natural Gasoline	2-5	Present			Group 2B - Possibly Carcinogenic to Humans
Benzene	< 0.25	Present	Known	A1 - Confirmed Human Carcinogen	Group 1 - Carcinogenic to Humans

Reproductive toxicity	<p>Reproductive Toxicant, Cat. 2: Suspected of damaging fertility or unborn child. Contains Hexane and Toluene.</p> <p>HEXANE: Two generation study: Rat (inhalation) showed reduced body weight in F1 and F2 generation (male and female) at 9000 ppm. The NOAEL is therefore 3000 ppm (10560 mg/m³), and the LOAEL is 9000 ppm (31680 mg/m³). Since there were no adverse effects in offspring without adverse maternal effects, the NOAEL for reproduction is 9000 ppm (31680 mg/m³).</p> <p>TOLUENE:</p> <p>Two generation study: Rat (Inhalation)</p> <p>NOAEL parental = 500ppm</p> <p>NOAEL F1 = 500ppm</p> <p>NOAEL F2 = 500 ppm</p> <p>Source IUCLID</p> <p>FERTILITY (for ethanol):</p> <p>NOAEL (oral, mouse) = 13.8g/kg (OECD416 equiv.)</p> <p>NOAEC (inhalation, rat) >16,000ppm</p> <p>DEVELOPMENTAL TOXICITY (OECD414 equiv):</p> <p>NOAEL (oral) = 5.2g/kgbw/day</p> <p>NOAEC (inhalation) = 39mg/l.</p> <p>Source IUCLID chapter 7.8 summary</p> <p>In humans excessive consumption of alcoholic beverages during pregnancy is associated with the induction of Fetal Alcohol Syndrome in the offspring causing reduced birth weight and physical and mental defect to occur. There is no evidence that such effects might be caused by exposures other than direct ingestion of alcoholic drinks. Blood ethanol concentrations resulting from ethanol exposure by any route other than deliberate and repeated oral consumption are unlikely to reach levels associated with reproductive or developmental effects. From the available data, it can be concluded that it is impossible to reach the doses of ethanol required to produce any sort of adverse reproductive response other than by repeated oral consumption of large amounts of ethanol, doses normally only associated with problem drinking, and therefore classification for reproductive or developmental toxicity in the context of a chemical substance is not appropriate or warranted.</p>
STOT - single exposure	Based on available data, the classification criteria are not met. (Classification is based on available literature data for the significant mixture components).
STOT - repeated exposure	Based on available data, the classification criteria are not met. In sub-chronic feeding or drinking water studies in rats, NOAELs for ethanol ranged from 1.73g/kg to 3.9g/kg. The most sensitive affect above these doses appeared to be to the kidney in males. Effects are only seen at doses well above the levels that would require classification. (Classification is based on available literature data for the significant mixture components).
Aspiration hazard	Aspiration hazard, Cat. 1. (Classification is based on available literature data for the significant mixture components).

Potential health effects**Eyes**

Irritating to eyes.

Skin

May cause slight skin irritation.

Inhalation

Inhalation of vapors in high concentration may cause irritation of respiratory system. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting. In humans, ethanol is readily absorbed by the oral and inhalation routes, is distributed throughout all tissues and organs and is readily metabolized and excreted. At exposures relevant to occupational inhalation exposure, the alcohol dehydrogenase metabolic route in the liver dominates and does not become saturated. Ethanol is not accumulated in the body.

Ingestion

Ingestion may cause irritation to mucous membranes. May cause drowsiness and dizziness. Lack of coordination. Nausea. Vomiting. Abdominal pain. Unconsciousness. Very severe cases of overexposure may result in coma.

Main Symptoms

Vomiting, Nausea.

12. Ecological information

Ecotoxicity

We have no quantitative data concerning the ecological effects of this product. Component-level values are listed below.

Chemical Name	Fresh Water Algae	Acute Fish Toxicity	Daphnia (Water flea)	Effects on micro-organisms	Other
Ethyl alcohol	Chlorella vulgaris, 72hr: EC50 275mg/l, EC10 11.5mg/l; Selenastrum capricornutum, 72hr, EC50: 12.9g/l, EC10=0.44g/l; Chlamydomonas eugametos, 48hr, EC50: 18g/l, NOEC=7.9g/l	LC50 (96hr) Salmo gairdneri: 13g/l; Pimephales promelas: 13.5, 14.2 and 15.3g/l.	(48hr) Daphnia Magna: 12.34g/l; NOEC (reproduction, 21 days): >10mg/l. Ceriodaphnia dubia: EC50 (48hrs): 5.012g/l; NOEC (reproduction, 10 days): 9.6mg/l. Palaemonetes pugio NOEC (developmental, 10 days): 79mg/l.	Toxicity: LC 50 (48h) Eisenia Fetida > 0.1 <1mg/cm ²	
Natural Gasoline	EC50: 72h 4700 mg/L (Pseudokirchneriella subcapitata)	LC50: 96h 56mg/L (Oncorhynchus mykiss)			

BCF No information available.

Chemical Name	log Kow	BCF
Ethyl alcohol	-0.32	
Natural Gasoline	6	

Persistence/Degradability

No information available Biodegradability unknown.

Ethanol is readily biodegradable. BOD₂₀=84%. Ethanol is expected to degrade readily in sewage treatment plants. Natural Gasoline is considered inherently biodegradable, achieving 74% biodegradation in 28 days.

Mobility

If released to air or water ethanol will disperse rapidly. If released to soil it will evaporate at a rapid rate. Ethanol is volatile and water soluble. If released to the environment it will partition to air and water. Ethanol is poorly absorbed on to soil or sediments.

PBT and vPvB assessment

The components of this product are not considered to be persistent, bioaccumulating nor toxic (PBT).

Other adverse effects

Nothing specific known.

13. Disposal considerations

Whenever possible, as rules and regulations allow, please recycle or manage materials to minimize waste.

Waste Disposal Methods

Dispose of in compliance with the laws and regulations pertaining to this product in your jurisdiction. Can be incinerated, when in compliance with local regulations. The classification and disposal method of waste material resulting from this product should be determined by the user at the time of disposal. Seek guidance from a qualified person or service within your local jurisdiction. Hazardous as supplied. The classification and disposal method of waste material resulting from this product should be determined by the user at the time of disposal.

Contaminated Packaging

Empty containers may contain hazardous residues. Do not cut, puncture or weld on or near to the container. Labels should not be removed from containers until they have been cleaned. Contaminated containers must not be treated as household waste. Containers should be cleaned by appropriate methods and then re-used or disposed of by landfill or incineration as appropriate. Do not incinerate closed containers.

14. Transport information

Domestic transport regulations (USA)

DOT

DOT Shipping Description UN1987, Alcohols, n.o.s. (Ethanol, Natural Gasoline), 3, II

UN-No UN1987
 Proper Shipping Name Alcohols, flammable, n.o.s.
 Hazard Class 3
 Packing Group II
 Transport Symbol(s)



Chemical Name	CAS-No	Weight %	Reportable Quantity (RQ)
Hexane	110-54-3	< 2.25	5000 lbs 2270 kg
Benzene	71-43-2	< 0.25	10 lb / 4.54 kg

Domestic transport regulations (Canada)

TDG

UN-No UN3475
 Proper Shipping Name Ethanol and Gasoline Mixture, with more than 10% ethanol
 Hazard Class 3
 Packing Group II

Domestic transport regulations (Mexico)

MEX

UN-No UN1987
 Proper Shipping Name Alcohols, n.o.s.
 Hazard Class 3
 Packing Group II

International transport regulations

ICAO

UN-No UN1987
 Proper Shipping Name Alcohols, n.o.s.
 Hazard Class 3
 Packing Group II

IATA

UN-No UN1987
 Proper Shipping Name alcohols, n.o.s.
 Hazard Class 3
 Packing Group II
 ERG Code 3L

IMDG/IMO

UN-No UN1987
 Proper Shipping Name Alcohols, n.o.s.
 Hazard Class 3
 Packing Group II
 EmS No. F-E, S-D

15. Regulatory information

International Inventories

The components of this product are reported in the following inventories:

Chemical Name	TSCA	DSL	NDSL	ICL	EINECS	ELINCS	AICS
Ethyl alcohol	Yes	Yes	Yes	No	Yes 200-578-6	No	Yes
Gasoline (natural gas), natural	Yes	Yes	No	No	Yes 270-346-7	No	Yes
Natural Gasoline	Yes	Yes	No	No	Yes 232-349-1	No	Yes

Chemical Name	ENCS ISHL	CHINA	PICCS	KECL	Taiwan	Turkey	NZIoC
Ethyl alcohol	Yes 2-202	Yes	Yes	Yes KE-13217	Yes	Yes 200-578-6	Yes
Gasoline (natural gas), natural	No	Yes	Yes	Yes Annex 1 (KE-17567)	Yes	No	No
Natural Gasoline	No	Yes	Yes	Yes KE-21971	Yes	No	Yes

USA

Federal Regulations

Ozone Depleting Substances:

No Class I or Class II material is known to be used in the manufacture of, or contained in, this product.

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 CFR 372.

Chemical Name	CAS-No	Weight %	SARA 313 - Disclosure Trigger
Hexane	110-54-3	< 2.25	1.0
Benzene	71-43-2	< 0.25	0.1

CERCLA/SARA 103-302

Sections 103-302 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 CFR 103-302. In order to comply with EPCRA 304, Hazardous Substances and their Reportable Quantities, spills or discharges into the environment of a hazardous substance in a quantity equal to or exceeding the RQ within any 24-hour period, must immediately be reported to the National Response Center (Phone: 800-424-8802).

Chemical Name	CAS-No	Weight %	RQ	TPQ
Hexane	110-54-3	< 2.25	5000lb 2270kg	
Cyclohexane	110-82-7	< 0.25	1000lb 454kg	
Benzene	71-43-2	< 0.25	10lb 4.54kg	
Toluene	108-88-3	< 0.15	1lb 0.454kg	
Hydrogen sulfide	7783-06-4	Trace	100lb 45.4kg	500 lb TPQ

SARA 311/312 Hazardous Categorization

Refer to the OSHA hazard classification(s) provided in section 2 of this SDS.

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 63)

This product is known to contain the following HAPs:

Chemical Name	CAS-No	Weight %	HAPS
Hexane	110-54-3	< 2.25	Present
Toluene	108-88-3	< 0.15	Present
Methyl alcohol	67-56-1	TRACE (0.015)	Present
Acetaldehyde	75-07-0	TRACE (0.002)	Present

State Regulations

California Proposition 65

This product is known to contain the following Proposition 65 chemicals:

Chemical Name	CAS-No	Weight %	Category
Ethyl alcohol	64-17-5	95-98	Developmental
Hexane	110-54-3	< 2.25	Male Reproductive

Benzene	71-43-2	< 0.25	Carcinogen Male Reproductive Developmental
Toluene	108-88-3	< 0.15	Developmental
Methyl alcohol	67-56-1	TRACE	Developmental
Acetaldehyde	75-07-0	TRACE	Carcinogen

• Ethanol is only considered a Prop 65 chemical as "ethyl alcohol IN alcoholic beverages" and not as used in fuel or industrial applications

State Right-to-Know Component Information.

Chemical Name	Weight %	Massachusetts	Minnesota	New Jersey	Pennsylvania
Ethyl alcohol	95-98	Yes	Yes	Yes 0844	Yes
Gasoline (natural gas), natural	2-5	No	No	No	Yes
Natural Gasoline	2-5	Yes	No	Yes 0957	No
Hexane	< 2.25	Yes	Yes	Yes 1340	Yes
2,2-Dimethylpropane	< 1.75	Yes	No	Yes 0766	Yes
Isopentane	< 1.75	Yes	No	Yes 1064	Yes
Pentane	< 1.5	No	Yes	No	Yes
Butane	< 0.40	Yes	Yes	Yes 0273	Yes
Cyclohexane	< 0.25	Yes	Yes	Yes 0565	Yes Environmental hazard
Benzene	< 0.25	Yes	Yes	No	Yes Environmental hazard Special hazardous substance
Toluene	< 0.15	Yes	Yes	Yes 1866	Yes Environmental hazard
Methyl alcohol	TRACE	Yes	Yes	Yes 1222	Yes Environmental hazard
Hydrogen sulfide	Trace	Yes	Yes	Yes 1017	Yes Environmental hazard
Acetaldehyde	TRACE	Yes	Yes	Yes 0001	Yes
Acetone	TRACE	Yes	Yes	Yes 0006	Yes Environmental hazard

Canada

(NPRI) Canadian National Pollutant Release Inventory

Component Information

Chemical Name	Weight %	NPRI
Ethyl alcohol	95-98	Part 5, Individual Substances Part 4 Substance
Natural Gasoline	2-5	Part 4 Substance as set out in Section 65 of the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act, 1999
Hexane	< 2.25	Part 4 Substance as set out in Section 65 of the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act, 1999

2,2-Dimethylpropane	< 1.75	Part 5, Isomer Groups Part 4 Substance as set out in Section 65 of the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act, 1999
Isopentane	< 1.75	Part 5, Isomer Groups Part 4 Substance as set out in Section 65 of the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act, 1999
Pentane	< 1.5	Part 5, Isomer Groups Part 4 Substance as set out in Section 65 of the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act, 1999
Butane	< 0.40	Part 5, Isomer Groups Part 4 Substance as set out in Section 65 of the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act, 1999
Cyclohexane	< 0.25	Part 4 Substance as set out in Section 65 of the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act, 1999
Benzene	< 0.25	Part 4 Substance as set out in Section 65 of the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act, 1999
Toluene	< 0.15	Part 4 Substance as set out in Section 65 of the List of Toxic Substances in Schedule 1 of the Canadian Environmental Protection Act, 1999
Methyl alcohol	TRACE	Part 1, Group A Substance; Part 5, Individual Substances; Part 4 Substance
Hydrogen sulfide	Trace	Part 1, Group A Substance also listed as part of Total reduced sulphur
Acetaldehyde	TRACE	Part 1, Group A Substance Part 4 Substance
Acetone	TRACE	Part 4 Substance

This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all the information required by the HPR.

16. Other information

Prepared By: ADM - Product Regulatory Affairs
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Abbreviations and acronyms

A1 - Known Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Animal Carcinogen
A4 - Not classifiable as a human carcinogen
ACGIH TLV - American Conference of Governmental Industrial Hygienists Threshold Limit Values
CAS - Chemical Abstract Service
Ceiling - Ceiling Limit Value: Concentrations that should never be exceeded at any given time (instantaneous)
CHINA - Chinese Inventory of Existing Chemical Substances (China)
CLP - Classification, Labelling and Packaging, Regulation (EC)1272/2008
CSA - Chemical Safety Assessment
CSR - Chemical Safety Report
Delisted - Substances Delisted from Report on Carcinogens
DNEL - Derived No Effect Level
DOT - U.S. Department of Transportation
DSL - Domestic Substance List (Canada)
EC - European Commission
EC No. - European Community number
EC50 - Half maximal effective concentration
EINECS - European Inventory of Existing Commercial Chemical Substances (EU)
ELINCS - European List of Notified Chemical Substances (EU)
ENCS - Existing and New Chemical Substances (Japan) / ISHL - Industrial Health and Safety Law (Japan)
EPCRA - Emergency Planning and Community Right-to-Know Act of 1986 (USA)
FOSFA - The Federation of Oils, Seeds and Fats Associations
GHS - Globally Harmonized System of Classification and Labelling of Chemicals
Group 1 - Carcinogenic to Humans
Group 2A - Probably Carcinogenic to Humans
Group 2B - Possibly Carcinogenic to Humans
Group 3 - Not Classifiable
IARC - International Agency for Research on Cancer
IATA - International Air Transport Association Dangerous Goods Regulations
IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
ICAO - International Civil Aviation Organisation
ICL - In Commerce List (Canada)
IDLH - Immediately Dangerous to Life or Health
IMDG - International Maritime Dangerous Goods Code
IMO - International Maritime Organization
IUB - International Union of Biochemistry and Molecular Biology
KECL - Korean Existing and Evaluated Chemical Substances (Korea)
Known - Known Carcinogen
LC50 - Lethal concentration that produces fatalities in 50% of a given test population
LD50 - Median lethal dose of a given test population
Marpol - International Convention for the Prevention of Pollution From Ships
MEPC - Marine Environment Protection Committee
MEX - NOM-002-SCT/2003 List of Hazardous Substances and Materials Most Commonly Transported
MEXICO - Mexico Occupational Exposure Limits
NDSL - Non Domestic Substances List (Canada)
NFPA - National Fire Protection Association
NIOSH - National Institute of Occupational Safety and Health
NOAEL - No Observed Adverse Effect Level
NTP - National Toxicology Program
NZIoC - New Zealand Inventory of Chemicals (New Zealand)
OECD - Organisation for Economic Co-operation and Development
OSHA - Occupational Safety & Health Administration
OSHA PEL - Occupational Safety and Health Administration Permissible Exposure Limits

PICCS - Inventory of Chemicals and Chemical Substances (Philippines)

PNEC - Predicted No-Effect Concentration

Present - Carcinogen or potential carcinogen to be identified under OSHA's Hazard Communication Standard

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

SEN - Sensitizer notation. May reflect risk of dermal and/or inhalation sensitization (consult ACGIH documentation).

Skin notation - Potential for cutaneous absorption

STEL - Short Term Exposure Limit: Concentrations that should not be exceeded except for short periods of time (usually 15-minutes)

STOT - Specific Target Organ Toxicity

STV - Short Term Value (same as STEL)

TDG - Transportation of Dangerous Goods (Transport Canada)

TSCA - Toxic Substances Control Act, Section 8(b) Inventory (USA)

TWA - Time Weighted Average: Average concentration that should not be exceeded during a work day (usually 8-hours)

Under Consideration - Under Consideration by the National Toxicology Program

vPvB - Very Persistent and Very Bioaccumulative

WHMIS - Workplace Hazardous Materials Information System

The information provided on this SDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

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