



Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Ethyl-tert-Butyl Ether

Product Use: Chemical Intermediate

Product Number(s): 0001078111, 0001017413, 0001047052, 0001017414, 0001036330, 0001036686, 0001017411, 0001017412

Synonyms: ETBE; Ethyl Tertiary Butyl Ether

Product CAS No.: 637-92-3

Company Identification:

Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, TX 77380

Product Information:

MSDS Requests: 1 - (800) 852-5530
Technical Information: 1 - (800) 852-5531
Responsible Party: Product Safety Group
Email:msds@cpchem.com

Chevron Phillips Chemicals International N.V.
Brusselsesteenweg 355
B-3090 Overijse
Belgium

24-Hour Emergency Telephone NumbersHEALTH:Chevron Phillips Emergency Information Center 866.442.9628 (North America) and 1.832.813.4984 (International)

TRANSPORTATION: North America: CHEMTREC 800.424.9300 or 703.527.3887
ASIA: +1.703.527.3887
EUROPE: BIG .32.14.584545 (phone) or .32.14.583516 (telefax)
SOUTH AMERICA SOS-Cotec Inside Brazil: 0800.111.767
Outside Brazil: 55.19.3467.1600

SECTION 2 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Clear liquid. Mild odor.

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0

GHS Classification and Labeling:

Flammable liquid: Category 2.
Acute aquatic toxicant: Category 3.
Aspiration toxicant: Category 1.

Eye irritation: Category 2A.
Skin irritation: Category 2.
Target organ toxicant (central nervous system): Category 3.
Target organ toxicant (respiratory irritant): Category 3.

Signal Word: Danger



GHS Symbol:

Physical Hazards: Highly flammable liquid and vapor.

Environmental Hazards: Harmful to aquatic life.

Health Hazards: May be fatal if swallowed and enters airways. Causes serious eye irritation. Causes skin irritation. May cause drowsiness or dizziness. May cause respiratory irritation.

Precautionary Hazard - Prevention: Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use explosion-proof electrical/ventilating/lighting/equipment. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. Avoid release to the environment.

Precautionary Hazard - Response: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Take off contaminated clothing and wash before reuse. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician Wash with plenty of soap and water. Do NOT induce vomiting. Get medical advice/attention. Specific treatment (see Notes to Physician on this label). In case of fire: Use manufacturer/supplier or the competent authority to specify appropriate media for extinction. Collect spillage.

Precautionary Hazard - Storage: Store in a well-ventilated place. Keep cool. Store locked up.

Precautionary Hazard - Disposal: Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

EU Classification:

Risk Phrases:

R38: Irritating to skin.

R65: Harmful: may cause lung damage if swallowed.

R11: Highly flammable.

R36: Irritating to eyes.

R52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S51: Use only in well-ventilated areas.

S2: Keep out of the reach of children.

S16: Keep away from sources of ignition - No smoking.

S36/37: Wear suitable protective clothing and gloves.

S62: If swallowed do not induce vomiting; seek medical advice immediately and show this container or label.

S24: Avoid contact with skin.

S9: Keep container in a well-ventilated place.

S25: Avoid contact with eyes.

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

IMMEDIATE HEALTH EFFECTS:

Eye: Contact with the eyes causes irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision. Not expected to cause prolonged or significant eye irritation.

Skin: Contact with the skin causes irritation. Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: This material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death.

Inhalation: Not expected to be harmful if inhaled.

SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENT	CAS NUMBER	AMOUNT	EINECS / ELINCS	SYM	R-PHRASE S
Ethyl-tert-Butyl Ether	637-92-3	> 95 % weight	2113-09-7	NA	NA
Related Materials		< 5.0 % weight	NA	NA	NA

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Ethyl-tert-Butyl Ether	ACGIH	5 ppm	NA	NA	NA
Ethyl-tert-Butyl Ether	CPCHEM	5 ppm	NA	NA	NA

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with running water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

Skin: To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse. Get medical attention if any symptoms develop.

Ingestion: If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get immediate medical attention. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Flammable liquid.

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: -19°C (-2.2°F) Estimated

Autoignition: NDA

Flammability (Explosive) Limits (% by volume in air): Lower: NDA Upper: NDA

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator. Wear appropriate personal protective equipment when cleaning up spills. Refer to Section 8.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible sorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: U.S.A. regulations may require reporting spills of this material that could reach any surface waters. Report spills to local authorities and/or the National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL . REFER TO PRODUCT LABEL OR MANUFACTURERS TECHNICAL BULLETINS FOR THE PROPER USE AND HANDLING OF THIS MATERIAL .

Precautionary Measures: This material presents a fire hazard. Liquid quickly evaporates and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 15°F. Do not get in eyes. Do not taste or swallow.

General Handling Information: Avoid work practices that may release volatile components in the atmosphere. Local air pollution regulations should be consulted to determine if the release of volatile components is regulated or restricted in the area in which this material is used. Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations, which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids, National Fire Protection Association (NFPA 77), Recommended Practice on Static Electricity' (liquids, powders and dusts), and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents' (liquids).

General Storage Information: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner, or disposed of properly. **DO NOT USE OR STORE** near heat, sparks or open flames. **USE AND STORE ONLY IN WELL VENTILATED AREA.** Keep container closed when not in use.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal

protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT:

Eye/Face Protection: Wear eye protection such as safety glasses, chemical goggles, or faceshields if engineering controls or work practices are not adequate to prevent eye contact.

Skin Protection: Wear impervious protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Users should determine acceptable performance characteristics of protective clothing. Consider physical requirements and other substances present when selecting protective clothing. Suggested materials for protective gloves include: Nitrile

Respiratory Protection: If exposure is anticipated to be greater than applicable exposure limits, wear a NIOSH approved respirator that provides adequate protection from measured concentrations of this material. Use the following elements for air-purifying respirators: Air-Purifying Respirator for Organic Vapors Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Ethyl-tert-Butyl Ether	ACGIH	5 ppm	NA	NA	NA
Ethyl-tert-Butyl Ether	CPCHEM	5 ppm	NA	NA	NA

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Clear liquid. Mild odor.

Autoignition: NDA

Boiling Point: 73°C (163.4°F)

Evaporation Rate: NDA

Flammability (Explosive) Limits (% by volume in air): Lower: NDA Upper: NDA

Flashpoint: -19°C (-2.2°F) Estimated

Molecular Formula: C6H14O

Molecular Weight: NDA

Melting Point: NDA

Octanol / Water Partition Coefficient: log-Kow: NDA

pH: NA

Pour Point: NDA

Solubility (in water): Moderate

Specific Gravity: 0.74 @ 16 °C (60.8°F)

Vapor Pressure: NDA

Vapor Density (AIR=1): NDA

Viscosity: NDA

Percent Volatile: 100 % volume

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to Avoid: heat, sparks, fire, and oxidizing agents.

Incompatibility With Other Materials: May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous Decomposition Products: Carbon Oxides.

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS:

Acute Oral Toxicity: / rat / > 5000 mg/kg

Acute Dermal Toxicity: / rabbit / > 2000 mg/kg

Acute Inhalation Toxicity: LC50 / rat / > 1450 ppm / 4 hour(s)

Eye Irritation: This material is irritating to the eyes.

Skin Irritation: This material is irritating to the skin.

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains Ethyl Tertiary Butyl Ether (ETBE):

Repeated Dose Toxicity: 90day / Inhalation / rat / 500, 1750, 5000 ppm (7hrs / day / 5days / week) / alpha 2u-globulin-induced kidney damage

Reproductive and Developmental Toxicity: rat / 1750, 5000 ppm / degenerative changes in seminiferous tubules of the testes; 13week / Inhalation / Oral / rat / 500, 1750, 5000 ppm (6hrs / day / 5 days / week) / 1000 mg/kg / NOAEL > 1000 mg/kg / no adverse effects on reproductive function or developmental effects, LOAEL = 1750 ppm

Genetic Toxicity: AMES test = Negative / In vivo micronucleus assay = Negative

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY:

This material is expected to be harmful to aquatic organisms.

Ethyl-tert-Butyl Ether - 96 hour(s) / EC50 / mysid shrimp (*Mysidopsis bahia*) / 37 mg/l

Ethyl-tert-Butyl Ether - 96 hour(s) / LC50 / sheepshead minnow (*Cyprinodon variegatus*) / > 2500 mg/l

Ethyl-tert-Butyl Ether - 72 hour(s) / EC50 / green algae (*Selenastrum capricornutum*) / 1100 mg/l

Ethyl-tert-Butyl Ether - 48 hour(s) / EC50 / water flea (*Daphnia magna*) / 110 mg/l

ENVIRONMENTAL FATE:

This material is expected to be readily biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition). Consult the appropriate domestic or international mode- specific and quantity- specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the MSDS and the bill of lading.

Shipping Descriptions per regulatory authority.

US DOT

UN1179, Ethyl Butyl Ether, 3, II

ICAO / IATA

UN1179, Ethyl Butyl Ether, 3, II

IMO / IMDG

UN1179, Ethyl Butyl Ether, 3, II, (-19°C)

RID / ADR

UN1179, Ethyl Butyl Ether, 3, II, ADR

SECTION 15 REGULATORY INFORMATION**SARA 311/312 CATEGORIES:**

- | | |
|---------------------------------------|-----|
| 1. Immediate (Acute) Health Effects: | YES |
| 2. Delayed (Chronic) Health Effects: | NO |
| 3. Fire Hazard: | YES |
| 4. Sudden Release of Pressure Hazard: | NO |
| 5. Reactivity Hazard: | NO |

REGULATORY LISTS SEARCHED:

01 = CA Prop 65	17 = FDA 178	33 = RCRA Waste Appendix VIII
02 = LA RTK	18 = FDA 179	34 = RCRA Waste D-List
03 = MA RTK	19 = FDA 180	35 = RCRA Waste P-List
04 = MN Hazardous Substance	20 = FDA 181	36 = RCRA Waste U-List
05 = NJ RTK	21 = FDA 182	37 = SARA Section 302
06 = PA RTK	22 = FDA 184	38 = SARA Section 313
07 = CAA Section 112 HAPs	23 = FDA 186	39 = TSCA 12 (b)
08 = CWA Section 307	24 = FDA 189	40 = TSCA Section 4
09 = CWA Section 311	25 = IARC Group 1	41 = TSCA Section 5(a)
10 = DOT Marine Pollutant	26 = IARC Group 2A	42 = TSCA Section 8(a) CAIR
11 = FDA 172	27 = IARC Group 2B	43 = TSCA Section 8(a) PAIR
12 = FDA 173	28 = IARC Group 3	44 = TSCA Section 8(d)
13 = FDA 174	29 = IARC Group 4	45 = WHIMS - IDL
14 = FDA 175	30 = NTP Carcinogen	46 = Germany D TAL
15 = FDA 176	31 = OSHA Carcinogen	47 = Germany WKG
16 = FDA 177	32 = OSHA Highly Hazardous	48 = DEA List 1
		49 = DEA List 2

No components of this material were found on the regulatory lists above.

WHMIS CLASSIFICATION:

Class B, Division 2: Flammable Liquids
 Class D, Division 2, Subdivision B: Toxic Material
 Skin or Eye Irritation

CHEMICAL INVENTORY LISTINGS:

AUSTRALIA	NO (AUS)
CANADA	YES (NDSL)
CHINA	NO (IECSC)
EUROPEAN UNION	YES (EINECS)
JAPAN	YES (ENCS)
KOREA	YES (ECL)
PHILIPPINES	NO (PICCS)
UNITED STATES	YES (TSCA)

EU LABELING:**Symbols:**

Xn - Harmful F - Flammable

Risk and Safety Phrases:

R38: Irritating to skin.

R65: Harmful: may cause lung damage if swallowed.

R11: Highly flammable.

R36: Irritating to eyes.

R52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S51: Use only in well-ventilated areas.

S2: Keep out of the reach of children.

S16: Keep away from sources of ignition - No smoking.

S36/37: Wear suitable protective clothing and gloves.

S62: If swallowed do not induce vomiting: seek medical advice immediately and show this container or label.

S24: Avoid contact with skin.

S9: Keep container in a well-ventilated place.

S25: Avoid contact with eyes.

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0 Special: NA

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *-Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA).

REVISION STATEMENT: This MSDS was updated to include a GHS review.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	- Threshold Limit Value	TWA	- Time Weighted Average
STEL	- Short-term Exposure Limit	PEL	- Permissible Exposure Limit
ACGIH	- American Conference of Government Industrial Hygienists	OSHA	- Occupational Safety & Health Administration
NIOSH	- National Institute for Occupational Safety & Health	NFPA	- National Fire Protection Agency
WHMIS	- Workplace Hazardous Materials Information System	IARC	- Intl. Agency for Research on Cancer
EINECS	- European Inventory of existing Commercial Chemical Substances	RCRA	- Resource Conservation Recovery Act
SARA	- Superfund Amendments and Reauthorization Act.	TSCA	- Toxic Substance Control Act

EC50	- Effective Concentration	LC50	- Lethal Concentration
LD50	- Lethal Dose	CAS	- Chemical Abstract Service
NDA	- No Data Available	NA	- Not Applicable
<=	- Less Than or Equal To	>=	- Greater Than or Equal To
CNS	- Central Nervous System	MAK	- Germany Maximum Concentration Values

This data sheet is prepared according to the latest adaptation of the EEC Guideline 67/548.
This data sheet is prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200).
This data sheet is prepared according to the ANSI MSDS Standard (Z400.1).
This data sheet was prepared by EHS Product Stewardship Group, Chevron Phillips Chemical Company LP, 10001 Six Pines Drive, The Woodlands, TX 77380.
This data sheet is prepared according to the Globally Harmonized System (GHS).

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.