

# Material Safety Data Sheet

## tert-Butyl methyl ether, 99%

ACC# 00978

### Section 1 - Chemical Product and Company Identification

**MSDS Name:** tert-Butyl methyl ether, 99%**Catalog Numbers:** AC177040000, AC177040010, AC177040025, AC177040051, AC177040100, AC177040250, AC177042500, AC375210000, AC375210010, AC375211000, AC375220000, AC375220010, AC375221000, AC378720000, AC378720010, AC378720025, AC389050010, AC389050025, AC390480000, AC390480010, AC390480025, 61027-1000, BP2605-100, E127-4, E127J4, E127RS200, NC9272602, NC9683363**Synonyms:** t-Butyl methyl ether; MBE; 2-Methoxy-2-methylpropane; 2-Methyl-2-methoxypropane; MTBE; Methyl t-butyl ether.**Company Identification:**Fisher Scientific  
1 Reagent Lane  
Fair Lawn, NJ 07410**For information, call:** 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887

### Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1634-04-4	tert-Butyl methyl ether	>98	216-653-1

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: -28 deg C.

**Danger!** Extremely flammable liquid and vapor. Vapor may cause flash fire. Causes eye, skin, and respiratory tract irritation. Aspiration hazard if swallowed. Can enter lungs and cause damage. May cause central nervous system depression.**Target Organs:** Kidneys, central nervous system, reproductive system.**Potential Health Effects****Eye:** Causes eye irritation. Causes redness and pain.**Skin:** Causes skin irritation. Causes symptoms similar to those of inhalation. May be harmful if absorbed through the skin.**Ingestion:** Aspiration hazard. May cause effects similar to those for inhalation exposure. Aspiration of

material into the lungs may cause chemical pneumonitis, which may be fatal. May cause unconsciousness. May cause central nervous system effects. May cause headache, nausea, fatigue, and dizziness.

**Inhalation:** May cause respiratory tract irritation. Exposure produces central nervous system depression. May cause kidney damage. May cause headache. Inhalation of vapors may cause nausea, vomiting, dizziness, and loss of consciousness.

**Chronic:** May cause cancer according to animal studies. Repeated inhalation may cause nasal and tracheal inflammation. Chronic exposure may cause liver damage. Adverse reproductive effects have been reported in animals. MTBE has been reported to induce lymphomas, leukemias, and testicular tumors in rats exposed by the oral route. It has induced liver tumors in mice by the inhalation route, while kidney tumors occurred in rats.

## Section 4 - First Aid Measures

**Eyes:** Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

**Skin:** Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

**Ingestion:** Possible aspiration hazard. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

**Inhalation:** Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

**Notes to Physician:** Treat symptomatically and supportively.

## Section 5 - Fire Fighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Combustion generates toxic fumes. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. May form explosive peroxides. Extremely flammable liquid and vapor. Vapor may cause flash fire. This liquid floats on water and may travel to a source of ignition and spread fire.

**Extinguishing Media:** Use water spray to cool fire-exposed containers. Water may be ineffective. This material is lighter than water and insoluble in water. The fire could easily be spread by the use of water in an area where the water cannot be contained. Use water spray, dry chemical, carbon dioxide, or chemical foam. Do NOT use straight streams of water.

**Flash Point:** -28 deg C ( -18.40 deg F)

**Autoignition Temperature:** 224 deg C ( 435.20 deg F)

**Explosion Limits, Lower:** 1.6%

**Upper:** 15.1%

**NFPA Rating:** (estimated) Health: 2; Flammability: 3; Instability: 1

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Remove all sources of

ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

## Section 7 - Handling and Storage

**Handling:** Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid ingestion and inhalation. If peroxide formation is suspected, do not open or move container. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame. Do not allow to evaporate to near dryness.

**Storage:** Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. In the presence of atmospheric oxygen, ethers generally form unstable peroxides, but no peroxides were detected in unstabilized MTBE after storage for 52 months. MTBE has a significantly decreased formation of peroxides compared with other ethers.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

### Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
tert-Butyl methyl ether	50 ppm TWA	none listed	none listed

**OSHA Vacated PELs:** tert-Butyl methyl ether: No OSHA Vacated PELs are listed for this chemical.

### Personal Protective Equipment

**Eyes:** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin:** Wear appropriate protective gloves to prevent skin exposure. Chemical-resistant nitrile rubber gloves should be worn during routine handling. Disposable nitrile gloves may be suggested for intermittent use. PVC, Neoprene, Viton, Butyl or natural rubber are NOT recommended.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** clear, colorless

**Odor:** turpentine - mild odor

**pH:** Not available.

**Vapor Pressure:** 268 mbar @20 deg C

**Vapor Density:** 0.2 (air=1)  
**Evaporation Rate:** Not available.  
**Viscosity:** 0.36 mPa @20 deg C  
**Boiling Point:** 54-56 deg C  
**Freezing/Melting Point:** -110 deg C  
**Decomposition Temperature:** Not available.  
**Solubility:** 51 g/l (20°C)  
**Specific Gravity/Density:** 0.74 (water=1)  
**Molecular Formula:** C<sub>5</sub>H<sub>12</sub>O  
**Molecular Weight:** 88.15

## Section 10 - Stability and Reactivity

**Chemical Stability:** Stable at room temperature in closed containers under normal storage and handling conditions.

**Conditions to Avoid:** Incompatible materials, light, ignition sources, excess heat, prolonged exposure to air.

**Incompatibilities with Other Materials:** Oxidizing agents, strong acids, amines, ammonia, chlorinated solvents, plastics, aldehydes (e.g. acetaldehyde, acrolein, chloral, formaldehyde), caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide).

**Hazardous Decomposition Products:** Carbon monoxide, carbon dioxide, peroxides, formic acid, butyl formate, methyl radicals, acetone.

**Hazardous Polymerization:** Has not been reported.

## Section 11 - Toxicological Information

**RTECS#:**

**CAS#** 1634-04-4: KN5250000

**LD50/LC50:**

CAS# 1634-04-4:

Inhalation, mouse: LC50 = 141 gm/m<sup>3</sup>/15M;  
 Inhalation, mouse: LC50 = 28000 mg/m<sup>3</sup>/2H;  
 Inhalation, rat: LC50 = 23576 ppm/4H;  
 Inhalation, rat: LC50 = 41000 mg/m<sup>3</sup>/4H;  
 Oral, mouse: LD50 = 5960 uL/kg;  
 Oral, rat: LD50 = 4 gm/kg;

**Carcinogenicity:**

CAS# 1634-04-4:

- **ACGIH:** A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

**Epidemiology:** No information found

**Teratogenicity:** See actual entry in RTECS for complete information.

**Reproductive Effects:** TClO (Inhalation, rat) = 8000 ppm/6H; Effects on Newborn - viability index (e.g., # alive at day 4 per # born alive)TClO (Inhalation, mouse) = 4000 ppm/6H; Reproductive - Effects on Embryo or Fetus - fetotoxicity (except death, e.g., stunted fetus); Developmental Abnormalities - musculoskeletal system.

**Mutagenicity:** No information found

**Neurotoxicity:** No information found

**Other Studies:**

## Section 12 - Ecological Information

**Ecotoxicity:** Fish: Fathead Minnow: LC50 = 110 mg/L; 96 Hr.; UnspecifiedFish: Fathead Minnow: LC50 = 706 mg/L; 30 days old; Flow-through; 24-26 degreesBacteria: Phytobacterium phosphoreum: EC50 = 11.4-55 mg/L; 5,15,30 minutes; Microtox test; 15 degrees CBacteria: Pseudomonas putida: EC10 : ca. 700 mg/l; 18Hr.; Bringmann-Kühn testFish: Leuciscus idus: LC50 : > 100 mg/l; 48Hr.; Daphnia: Daphnia: EC50 : 651 mg/l; 48Hr.; log POW = 1,06

**Environmental:** Not biodegradable.

**Physical:** No information available.

**Other:** Avoid entering into waters or underground water. Do not empty into drains.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:** None listed.

## Section 14 - Transport Information

	US DOT	Canada TDG
<b>Shipping Name:</b>	METHYL TERT-BUTYL ETHER	METHYL TERT-BUTYL ETHER
<b>Hazard Class:</b>	3	3
<b>UN Number:</b>	UN2398	UN2398
<b>Packing Group:</b>	II	II
<b>Additional Info:</b>		FLASHPOINT -28 C

## Section 15 - Regulatory Information

### US FEDERAL

#### TSCA

CAS# 1634-04-4 is listed on the TSCA inventory.

### **Health & Safety Reporting List**

CAS# 1634-04-4: Effective 12/15/86, Sunset 12/15/96

### **Chemical Test Rules**

CAS# 1634-04-4: 40 CFR 799.5000

### **Section 12b**

None of the chemicals are listed under TSCA Section 12b.

### **TSCA Significant New Use Rule**

None of the chemicals in this material have a SNUR under TSCA.

### **CERCLA Hazardous Substances and corresponding RQs**

CAS# 1634-04-4: 1000 lb final RQ; 454 kg final RQ

### **SARA Section 302 Extremely Hazardous Substances**

None of the chemicals in this product have a TPQ.

### **SARA Codes**

CAS # 1634-04-4: immediate, delayed, fire.

### **Section 313**

This material contains tert-Butyl methyl ether (CAS# 1634-04-4, >98%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

### **Clean Air Act:**

CAS# 1634-04-4 is listed as a hazardous air pollutant (HAP).

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

### **Clean Water Act:**

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

### **OSHA:**

None of the chemicals in this product are considered highly hazardous by OSHA.

### **STATE**

CAS# 1634-04-4 can be found on the following state right to know lists: New Jersey, Pennsylvania, Minnesota, Massachusetts.

### **California Prop 65**

California No Significant Risk Level: None of the chemicals in this product are listed.

## **European/International Regulations**

### **European Labeling in Accordance with EC Directives**

#### **Hazard Symbols:**

XI F

#### **Risk Phrases:**

R 11 Highly flammable.

R 38 Irritating to skin.

#### **Safety Phrases:**

S 16 Keep away from sources of ignition - No smoking.

S 24 Avoid contact with skin.

S 9 Keep container in a well-ventilated place.

### **WGK (Water Danger/Protection)**

CAS# 1634-04-4: 1

### **Canada - DSL/NDSL**

CAS# 1634-04-4 is listed on Canada's DSL List.

**Canada - WHMIS**

This product has a WHMIS classification of D2B, B2.

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

**Canadian Ingredient Disclosure List**

<b>Section 16 - Additional Information</b>
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**MSDS Creation Date:** 6/24/1999

**Revision #9 Date:** 7/29/2008

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