MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
150 Allen Road Suite 302
Basking Ridge, New Jersey 07920
Information: 1-800-416-2505

Emergency Contact:
CHEMTREC 1-800-424-9300
Calls Originating Outside the US:
703-527-3887 (Collect Calls Accepted)

SUBSTANCE: ETHYL ETHER

TRADE NAMES/SYNONYMS:
MTG MSDS 112; DIETHYL ETHER; ETHOXYETHANE; ETHER; ETHYL OXIDE; DIETHYL OXIDE;
SURFURIC ETHER; RCRA U117; UN 1155; STCC 4908157; C4H10O; MAT08980; RTECS KI5775000

CHEMICAL FAMILY: ethers, aliphatic

CREATION DATE: Jan 24 1989
REVISION DATE: Dec 11 2008

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: ETHYL ETHER
CAS NUMBER: 60-29-7
PERCENTAGE: 100.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2  FIRE=4  REACTIVITY=1

EMERGENCY OVERVIEW:
COLOR: colorless
PHYSICAL FORM: volatile liquid
ODOR: sweet odor
MAJOR HEALTH HAZARDS: respiratory tract irritation, skin irritation, eye irritation, central nervous system depression
PHYSICAL HAZARDS: Flammable liquid and vapor. Vapor may cause flash fire. May form peroxides during prolonged storage.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: irritation, nausea, vomiting, headache, drowsiness, symptoms of drunkenness
LONG TERM EXPOSURE: same as effects reported in short term exposure

SKIN CONTACT:
SHORT TERM EXPOSURE: irritation
LONG TERM EXPOSURE: same as effects reported in short term exposure

EYE CONTACT:
SHORT TERM EXPOSURE: irritation
LONG TERM EXPOSURE: same as effects reported in short term exposure

INGESTION:
SHORT TERM EXPOSURE: nausea, vomiting, drowsiness, symptoms of drunkenness
LONG TERM EXPOSURE: no information on significant adverse effects

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: Contact local poison control center or physician immediately.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Severe fire hazard. Severe explosion hazard. Electrostatic charges may be generated by flow, agitation, etc. Vapor/air mixtures are explosive. May form explosive peroxides. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back.

EXTINGUISHING MEDIA: alcohol-resistant foam, carbon dioxide, regular dry chemical, water, alcohol-resistant foam

Large fires: Use alcohol-resistant foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile).
Water may be ineffective.

**FLASH POINT:** -49 F (-45 C) (CC)
**LOWER FLAMMABLE LIMIT:** 1.9%
**UPPER FLAMMABLE LIMIT:** 48%
**AUTOIGNITION:** 356 F (180 C)
**FLAMMABILITY CLASS (OSHA):** IA

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### 6. ACCIDENTAL RELEASE MEASURES

**OCCUPATIONAL RELEASE:**
Avoid heat, flames, sparks and other sources of ignition. Remove sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

### 7. HANDLING AND STORAGE

**STORAGE:** Store and handle in accordance with all current regulations and standards. Protect from physical damage. Store outside or in a detached building. Store with flammable liquids. Keep separated from incompatible substances. Avoid contact with light. Grounding and bonding required. Provide fire protection and spill control systems suitable for the hazards of the material. May form peroxides during prolonged storage. Keep separated from incompatible substances.

### 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

**EXPOSURE LIMITS:**
**ETHYL ETHER:**
400 ppm (1200 mg/m3) OSHA TWA
500 ppm (1520 mg/m3) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)
400 ppm ACGIH TWA
500 ppm ACGIH STEL

**VENTILATION:** Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

**EYE PROTECTION:** Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
1900 ppm
Any air-purifying half-mask respirator equipped with organic vapor cartridge(s).
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.
Any powered, air-purifying respirator with organic vapor cartridge(s).
Any supplied-air respirator.
Any self-contained breathing apparatus with a full facepiece.
Emergency or planned entry into unknown concentrations or IDLH conditions -
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.
Escape -
Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted organic vapor canister.
Any appropriate escape-type, self-contained breathing apparatus.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid
COLOR: colorless
PHYSICAL FORM: volatile liquid
ODOR: sweet odor
TASTE: burning taste, sweet taste
MOLECULAR WEIGHT: 74.12
MOLECULAR FORMULA: C4-H10-O
BOILING POINT: 95 F (35 C)
FREEZING POINT: -189 F (-123 C)
VAPOR PRESSURE: 442 mmHg @ 20 C
VAPOR DENSITY (air=1): 2.6
SPECIFIC GRAVITY (water=1): 0.7
WATER SOLUBILITY: 6.9%
PH: Not available
VOLATILITY: Not available
ODOR THRESHOLD: 0.33 ppm
EVAPORATION RATE: 37.5 (butyl acetate=1)
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available
SOLVENT SOLUBILITY:
Soluble: alcohol, acetone, benzene, chloroform, naphtha
10. STABILITY AND REACTIVITY

**REACTIVITY:** May form explosive peroxides. Avoid prolonged storage or contact with air, light or storage and use above room temperature.

**CONDITIONS TO AVOID:** Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat.

**INCOMPATIBILITIES:** peroxides, combustible materials, halogens, oxidizing materials, metal salts, acids, bases

**HAZARDOUS DECOMPOSITION:**
Thermal decomposition products: oxides of carbon

**POLYMERIZATION:** Will not polymerize.

11. TOXICOLOGICAL INFORMATION

**ETHYL ETHER:**
**IRRITATION DATA:** 100 ppm eyes-human; 360 mg open skin-rabbit mild; 100 mg eyes-rabbit moderate; 50 mg/24 hour(s) skin-guinea pig severe
**TOXICITY DATA:** 31000 ppm/30 minute(s) inhalation-mouse LC50; >20 ml/kg skin-rabbit LD50; 1215 mg/kg oral-rat LD50
**CARCINOGEN STATUS:** IARC: Human Inadequate Evidence, Group 3
**LOCAL EFFECTS:** Irritant: inhalation, skin, eye
**ACUTE TOXICITY LEVEL:** Moderately Toxic: ingestion  Slightly Toxic: inhalation
**TARGET ORGANS:** central nervous system
**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** respiratory disorders, skin disorders and allergies
**MUTAGENIC DATA:** Available.
**ADDITIONAL DATA:** Alcohol may enhance the toxic effects.

12. ECOLOGICAL INFORMATION

**ECOTOXICITY DATA:**
**FISH TOXICITY:** >10000000 ug/L 96 hour(s) LC50 (Mortality) Bluegill (Lepomis macrochirus)

**FATE AND TRANSPORT:**
**BIOCONCENTRATION:** 61 ug/L 6 hour(s) BCF (Residue) Water flea (Daphnia magna) 0.8 ug/L
13. DISPOSAL CONSIDERATIONS

Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): U117. Dispose in accordance with all applicable regulations.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Diethyl ether
ID NUMBER: UN1155
HAZARD CLASS OR DIVISION: 3
PACKING GROUP: 1
LABELING REQUIREMENTS: 3

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:
SHIPPING NAME: Ethyl ether
UN NUMBER: UN1155
CLASS: 3
PACKING GROUP/CATEGORY: 1

15. REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
ETHYL ETHER: 100 LBS RQ


SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):
ACUTE: Yes
CHRONIC: No
FIRE: Yes
REACTIVE: Yes
SUDDEN RELEASE: No


STATE REGULATIONS:
California Proposition 65: Not regulated.

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: B

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

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