SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Methyl t-Butyl Ether

MSDS Number : 000000011395

Product Use Description : Solvent

Manufacturer or supplier's details : Honeywell International Inc.
                                115 Tabor Road
                                Morris Plains, NJ 07950-2546

For more information call : 1-800-368-0050
                          +1-231-726-3171
                          (Monday-Friday, 9:00am-5:00pm)

In case of emergency call : Medical: 1-800-498-5701 or +1-303-389-1414
                          Transportation (CHEMTREC): 1-800-424-9300 or
                          +1-703-527-3887
                          (24 hours/day, 7 days/week)

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Form : liquid, clear

Color : colourless

Odor : pungent organic

Classification of the substance or mixture

Classification of the substance or mixture : Flammable liquids, Category 2
                                          Skin irritation, Category 2

GHS Label elements, including precautionary statements
Symbol(s): 

Signal word: Danger

Hazard statements: Highly flammable liquid and vapour. Causes skin irritation.

Precautionary statements:

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

Response:
IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/shower.
If skin irritation occurs: Get medical advice/attention.
Take off contaminated clothing and wash before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Storage: 
Store in a well-ventilated place. Keep cool.

Disposal:
Dispose of contents/container to an approved waste disposal plant.

Carcinogenicity

ACGIH: Methyl t-butyl ether 1634-04-4
A3: Confirmed animal carcinogen
SAFETY DATA SHEET

242-1L METHYL t-BUTYL ETHER CS6

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula : C₅H₁₂O
Chemical nature : Substance

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl t-butyl ether</td>
<td>1634-04-4</td>
<td>100.00 %</td>
</tr>
</tbody>
</table>

SECTION 4. FIRST AID MEASURES

Inhalation : Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Use oxygen as required, provided a qualified operator is present. Call a physician.

Skin contact : Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use. Call a physician.

Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician.

Ingestion : Do not induce vomiting without medical advice. If a person vomits when lying on his back, place him in the recovery position. Call a physician immediately. Never give anything by mouth to an unconscious person.

Notes to physician

Treatment : Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Carbon dioxide (CO2)
Dry chemical
Foam
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.

Specific hazards during firefighting: Extremely flammable. Vapours may form explosive mixtures with air. Vapours are heavier than air and may spread along floors. Vapors may travel to areas away from work site before igniting/flushing back to vapor source. In case of fire hazardous decomposition products may be produced such as: Carbon monoxide Carbon dioxide (CO2)

Special protective equipment for firefighters: Wear self-contained breathing apparatus and protective suit.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Wear personal protective equipment. Immediately evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Remove all sources of ignition. Do not swallow. Avoid breathing vapours, mist or gas. Avoid contact with skin, eyes and clothing.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Discharge into the environment must be avoided. Do not flush into surface water or sanitary sewer system. Do not allow run-off from fire fighting to enter drains or water courses.

Methods for cleaning up: Ventilate the area. No sparking tools should be used. Use explosion-proof equipment. Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).
SECTION 7. HANDLING AND STORAGE

Handling

Handling: Wear personal protective equipment. Use only in well-ventilated areas. Keep container tightly closed. Do not smoke. Do not swallow. Avoid breathing vapours, mist or gas. Avoid contact with skin, eyes and clothing.

Advice on protection against fire and explosion: Keep away from fire, sparks and heated surfaces. Take precautionary measures against static discharges. Ensure all equipment is electrically grounded before beginning transfer operations. Use explosion-proof equipment. Keep product and empty container away from heat and sources of ignition. No sparking tools should be used. No smoking.

Storage

Requirements for storage areas and containers: Store in area designed for storage of flammable liquids. Protect from physical damage. Keep containers tightly closed in a dry, cool and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep away from heat and sources of ignition. Keep away from direct sunlight. Store away from incompatible substances. Container hazardous when empty. Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective measures: Ensure that eyewash stations and safety showers are close to the workstation location.
Engineering measures: Use with local exhaust ventilation. Prevent vapour buildup by providing adequate ventilation during and after use.

Eye protection: Do not wear contact lenses. Wear as appropriate: Safety glasses with side-shields If splashes are likely to occur, wear: Goggles or face shield, giving complete protection to eyes

Hand protection: Solvent-resistant gloves Gloves must be inspected prior to use. Replace when worn.

Skin and body protection: Wear as appropriate: Solvent-resistant apron Flame retardant antistatic protective clothing If splashes are likely to occur, wear: Protective suit

Respiratory protection: In case of insufficient ventilation, wear suitable respiratory equipment. For rescue and maintenance work in storage tanks use self-contained breathing apparatus. Use NIOSH approved respiratory protection.

Hygiene measures: When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product. Keep working clothes separately. Remove and wash contaminated clothing before re-use. Do not swallow. Avoid breathing vapours, mist or gas. Avoid contact with skin, eyes and clothing.

Exposure Guidelines

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Update</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl t-butyl ether</td>
<td>1634-04-4</td>
<td>TWA: time weighted average</td>
<td>(50 ppm)</td>
<td>2008</td>
<td>ACGIH:US. ACGIH Threshold Limit Values</td>
</tr>
</tbody>
</table>
## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- **Physical state**: liquid, clear  
- **Color**: colourless  
- **Odor**: pungent organic  
- **pH**: Note: not applicable  
- **Melting point/freezing point**: -108.6 °C  
- **Boiling point/boiling range**: 55.2 °C  
- **Flash point**: -17 °F (-27 °C)  
  - Method: closed cup  
- **Evaporation rate**: < 1  
  - Method: Compared to Ether (anhydrous).  
- **Lower explosion limit**: 2 % (V)  
- **Upper explosion limit**: 15.1 % (V)  
- **Vapor pressure**: 320 hPa  
  - at 20 °C (68 °F)  
- **Vapor density**: 3.1 Note: (Air = 1.0)  
- **Density**: 0.74 g/cm³ at 20 °C  
- **Water solubility**: ca. 50 g/l
Ignition temperature : 193 °C
Molecular weight : 88.14 g/mol

SECTION 10. STABILITY AND REACTIVITY

Chemical stability : Stable under recommended storage conditions.
Possibility of hazardous reactions : Hazardous polymerisation does not occur.
Conditions to avoid : Heat, flames and sparks.
Keep away from direct sunlight.
Incompatible materials to avoid : Strong oxidizing agents
Strong acids
Hazardous decomposition products : In case of fire hazardous decomposition products may be produced such as:
Carbon monoxide
Carbon dioxide (CO2)

SECTION 11. TOXICOLOGICAL INFORMATION

Acute oral toxicity : LD50: 3,870 mg/kg
Species: rat
Acute inhalation toxicity : LC50: > 85 mg/l
Exposure time: 4 h
Species: rat
Acute dermal toxicity : LD50: > 10,000 mg/kg
Species: rabbit
Skin irritation: Species: rabbit  
Result: Irritating to skin.

Eye irritation: Species: rabbit  
Result: slight irritation

Further information: Note: Confirmed animal carcinogen with unknown relevance to humans.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Toxicity to fish: LC50: 672 mg/l  
Exposure time: 96 h  
Species: Pimephales promelas (fathead minnow)

Toxicity to daphnia and other aquatic invertebrates: LC50: 651 mg/l  
Exposure time: 48 h  
Species: Daphnia

Toxicity to bacteria: EC50: 8.23 mg/l  
Exposure time: 5 min  
Species: Photobacterium phosphoreum

: EC50: 9.67 mg/l  
Exposure time: 15 min  
Species: Photobacterium phosphoreum

: EC50: 11.4 mg/l  
Exposure time: 30 min  
Species: Photobacterium phosphoreum

Further information on ecology

Additional ecological information: Harmful to aquatic organisms.  
Accumulation in aquatic organisms is unlikely.
SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods: Observe all Federal, State, and Local Environmental regulations.

SECTION 14. TRANSPORT INFORMATION

DOT
- UN/ID No.: UN 2398
- Proper shipping name: METHYL tert-BUTYL ETHER
- Class: 3
- Packing group: II
- Hazard Labels: 3

IATA
- UN/ID No.: UN 2398
- Description of the goods: METHYL tert-BUTYL ETHER
- Class: 3
- Packaging group: II
- Hazard Labels: 3
- Packing instruction (cargo aircraft): 364
- Packing instruction (passenger aircraft): 353
- Packing instruction (passenger aircraft): Y341

IMDG
- UN/ID No.: UN 2398
- Description of the goods: METHYL tert-BUTYL ETHER
- Class: 3
- Packaging group: II
- Hazard Labels: 3
- EmS Number: F-E, S-D
- Marine pollutant: no

SECTION 15. REGULATORY INFORMATION

Inventories
- US. Toxic Substances: On TSCA Inventory
Control Act

Australia. Industrial Chemical (Notification and Assessment) Act: On the inventory, or in compliance with the inventory

Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL): All components of this product are on the Canadian DSL.

Japan. Kashin-Hou Law List: On the inventory, or in compliance with the inventory

Korea. Toxic Chemical Control Law (TCCL) List: On the inventory, or in compliance with the inventory

Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act: On the inventory, or in compliance with the inventory

China. Inventory of Existing Chemical Substances: On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand: On the inventory, or in compliance with the inventory

National regulatory information

US. EPA CERCLA Hazardous Substances (40 CFR 302): The following component(s) of this product is/are subject to release reporting under 40 CFR 302 when release exceeds the Reportable Quantity (RQ):

Reportable quantity: 1000 lbs
- Methyl t-butyl ether 1634-04-4

SARA 302 Components: SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components: The following components are subject to reporting levels established by SARA Title III, Section 313:
- Methyl t-butyl ether 1634-04-4
SAFETY DATA SHEET

242-1L METHYL t-BUTYL ETHER CS6

000000011395

Version 1.5 Revision Date 03/27/2014 Print Date 12/02/2016

SARA 311/312 Hazards: Fire Hazard
Acute Health Hazard
Chronic Health Hazard

CERCLA Reportable Quantity: 1000 lbs

California Prop. 65: This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Massachusetts RTK: Methyl t-butyl ether 1634-04-4
New Jersey RTK: Methyl t-butyl ether 1634-04-4
Pennsylvania RTK: Methyl t-butyl ether 1634-04-4

WHMIS Classification: B2: Flammable liquid
D2B: Toxic Material Causing Other Toxic Effects
This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

SECTION 16. OTHER INFORMATION

HMIS III NFPA
Health hazard 2* 1
Flammability 3 3
Physical Hazard 0
Instability 0

* - Chronic health hazard

Hazard rating and rating systems (e.g. HMIS® III, NFPA): This information is intended solely for the use of individuals trained in the particular system.
Further information

The information provided in this Safety Data Sheet 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 guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered 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 materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user. This information should not constitute a guarantee for any specific product properties.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.
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Prepared by Honeywell Performance Materials and Technologies  Product Stewardship Group