

Creation Date 28-May-2009

Revision Date 20-Oct-2023

Revision Number 8

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

| | |
|----------------------------------|--|
| Product Description: | Methyl-tert-butyl ether |
| Cat No. : | M/4496/25SS, M/4496/27SS, M/4496/27Z, M/4496/17, M/4496/17X, M/4496/21RSS, M/4496/10RSS, M/4496/25RSS, M/4496/30RSS, M/4496/27RSS |
| Synonyms | 2-Methyl-2-methoxy propane; MTBE; Methyl tert-butyl ether |
| Index No | 603-181-00-X |
| CAS No | 1634-04-4 |
| EC No | 216-653-1 |
| Molecular Formula | C5 H12 O |
| REACH registration number | 01-2119452786-27 |

1.2. Relevant identified uses of the substance or mixture and uses advised against

| | |
|---------------------------------------|---|
| Recommended Use | Laboratory chemicals. |
| Sector of use | SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites |
| Product category | PC21 - Laboratory chemicals |
| Process categories | PROC15 - Use as a laboratory reagent |
| Environmental release category | ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates) |
| Uses advised against | No Information available |

1.3. Details of the supplier of the safety data sheet

Company

EU entity/business name

Thermo Fisher Scientific
Janssen Pharmaceuticaaan 3a
2440 Geel, Belgium

UK entity/business name

Fisher Scientific UK
Bishop Meadow Road, Loughborough,
Leicestershire LE11 5RG, United Kingdom

Swiss distributor - Fisher Scientific AG

Neuhofstrasse 11, CH 4153 Reinach
Tel: +41 (0) 56 618 41 11
e-mail - infoch@thermofisher.com

E-mail address

begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

Chemtrec US: (800) 424-9300
Chemtrec EU: 001-703-527-3887

For customers in Switzerland:

Tox Info Suisse Emergency Number: **145 (24hr)**

Tox Info Suisse: +41-44 251 51 51 (Emergency number from abroad)

Chemtrec (24h) Toll-Free: 0800 564 402

Chemtrec Local: +41-43 508 20 11 (Zurich)

Tel: 01509 231166

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SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - Regulation (EC) No 1272/2008

Physical hazards

Flammable liquids

Category 2 (H225)

Health hazards

Skin Corrosion/Irritation

Category 2 (H315)

Environmental hazards

Based on available data, the classification criteria are not met

Full text of Hazard Statements: see section 16

2.2. Label elements



Signal Word

Danger

Hazard Statements

H225 - Highly flammable liquid and vapor

H315 - Causes skin irritation

Precautionary Statements

P240 - Ground and bond container and receiving equipment

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water

2.3. Other hazards

Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB)

Contains a known or suspected endocrine disruptor

Contains a substance on the National Authorities Endocrine Disruptor Lists

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

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3.1. Substances

| Component | CAS No | EC No | Weight % | CLP Classification - Regulation (EC) No 1272/2008 |
|-------------------------|-----------|-------------------|----------|---|
| Methyl tert-butyl ether | 1634-04-4 | EEC No. 216-653-1 | >95 | Flam. Liq. 2 (H225) Skin Irrit. 2 (H315) |

| | |
|---------------------------|------------------|
| REACH registration number | 01-2119452786-27 |
|---------------------------|------------------|

Full text of Hazard Statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

| | |
|---|--|
| Eye Contact | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention. |
| Skin Contact | Wash off immediately with plenty of water for at least 15 minutes. Get medical attention. |
| Ingestion | Do NOT induce vomiting. Get medical attention. |
| Inhalation | Remove to fresh air. Get medical attention immediately if symptoms occur. If not breathing, give artificial respiration. |
| Self-Protection of the First Aider | Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. |

4.2. Most important symptoms and effects, both acute and delayed

Difficulty in breathing. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

4.3. Indication of any immediate medical attention and special treatment needed

| | |
|---------------------------|---|
| Notes to Physician | Treat symptomatically. Symptoms may be delayed. |
|---------------------------|---|

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media

Water spray, carbon dioxide (CO₂), dry chemical, alcohol-resistant foam. Water mist may be used to cool closed containers.

Extinguishing media which must not be used for safety reasons

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

5.2. Special hazards arising from the substance or mixture

Flammable. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.

Hazardous Combustion Products

Carbon monoxide (CO), Carbon dioxide (CO₂).

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5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment as required. Remove all sources of ignition. Take precautionary measures against static discharges. Ensure adequate ventilation.

6.2. Environmental precautions

Should not be released into the environment. See Section 12 for additional Ecological Information.

6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges. Use only under a chemical fume hood. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

7.2. Conditions for safe storage, including any incompatibilities

Flammables area. Keep away from heat, sparks and flame. Keep container tightly closed in a dry and well-ventilated place. May form explosive peroxides on prolonged storage.

Technical Rules for Hazardous Substances (TRGS) 510
Storage Class (LGK) (Germany)

Class 3

Switzerland - Storage of hazardous substances

Storage class - SC 3
<https://www.kvu.ch/de/themen/stoffe-und-produkte>
<https://www.kvu.ch/fr/themes/substances-et-produits>
<https://www.kvu.ch/it/temi/sostanze-e-prodotti>

7.3. Specific end use(s)

Use in laboratories

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

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8.1. Control parameters

Exposure limits

List source(s): **EU** - Commission Directive (EU) 2019/1831 of 24 October 2019 establishing a fifth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC and amending Commission Directive 2000/39/EC **UK** - EH40/2005 Work Exposure Limits, Forth edition. Published 2020. **IRE** - 2010 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001. Published by the Health and Safety Authority. **CH** - The Government of Switzerland has set a directive on limit values for working materials (Grenzwerte am Arbeitsplatz) which is based on the Swiss Federal Regulation "Verordnung über die Verhütung von Unfällen und Berufskrankheiten". This directive is administered, periodically revised and enforced by SUVA (Swiss National Accident Insurance Fund).

| Component | European Union | The United Kingdom | France | Belgium | Spain |
|-------------------------|---|---|--|---|---|
| Methyl tert-butyl ether | TWA: 50 ppm (8h) TWA: 183.5 mg/m ³ (8h) STEL: 100 ppm (15min) STEL: 367 mg/m ³ (15min) | STEL: 100 ppm 15 min STEL: 367 mg/m ³ 15 min TWA: 50 ppm 8 hr TWA: 183.5 mg/m ³ 8 hr | TWA / VME: 50 ppm (8 heures). restrictive limit TWA / VME: 183.5 mg/m ³ (8 heures). restrictive limit STEL / VLCT: 367 mg/m ³ . restrictive limit STEL / VLCT: 100 ppm. restrictive limit | TWA: 40 ppm 8 uren TWA: 146 mg/m ³ 8 uren STEL: 100 ppm 15 minuten STEL: 367 mg/m ³ 15 minuten | STEL / VLA-EC: 100 ppm (15 minutos). STEL / VLA-EC: 367 mg/m ³ (15 minutos). TWA / VLA-ED: 50 ppm (8 horas) TWA / VLA-ED: 183.5 mg/m ³ (8 horas) |

| Component | Italy | Germany | Portugal | The Netherlands | Finland |
|-------------------------|---|---|---|---|---|
| Methyl tert-butyl ether | TWA: 50 ppm 8 ore. Time Weighted Average TWA: 183.5 mg/m ³ 8 ore. Time Weighted Average STEL: 100 ppm 15 minuti. Short-term STEL: 367 mg/m ³ 15 minuti. Short-term | TWA: 50 ppm (8 Stunden). AGW - exposure factor 1.5 TWA: 180 mg/m ³ (8 Stunden). AGW - exposure factor 1.5 TWA: 50 ppm (8 Stunden). MAK TWA: 180 mg/m ³ (8 Stunden). MAK Höhepunkt: 75 ppm Höhepunkt: 270 mg/m ³ | STEL: 100 ppm 15 minutos STEL: 367 mg/m ³ 15 minutos TWA: 50 ppm 8 horas TWA: 183.5 mg/m ³ 8 horas | STEL: 360 mg/m ³ 15 minuten TWA: 180 mg/m ³ 8 uren | TWA: 50 ppm 8 tunteina TWA: 180 mg/m ³ 8 tunteina STEL: 100 ppm 15 minuutteina STEL: 360 mg/m ³ 15 minuutteina |

| Component | Austria | Denmark | Switzerland | Poland | Norway |
|-------------------------|---|---|--|---|---|
| Methyl tert-butyl ether | MAK-KZGW: 100 ppm 15 Minuten MAK-KZGW: 360 mg/m ³ 15 Minuten MAK-TMW: 50 ppm 8 Stunden MAK-TMW: 180 mg/m ³ 8 Stunden | TWA: 40 ppm 8 timer TWA: 144 mg/m ³ 8 timer STEL: 376 mg/m ³ 15 minutter STEL: 100 ppm 15 minutter | STEL: 75 ppm 15 Minuten STEL: 270 mg/m ³ 15 Minuten TWA: 50 ppm 8 Stunden TWA: 180 mg/m ³ 8 Stunden | STEL: 270 mg/m ³ 15 minutach TWA: 180 mg/m ³ 8 godzinach | TWA: 50 ppm 8 timer TWA: 183.5 mg/m ³ 8 timer STEL: 100 ppm 15 minutter. value from the regulation STEL: 367 mg/m ³ 15 minutter. value from the regulation |

| Component | Bulgaria | Croatia | Ireland | Cyprus | Czech Republic |
|-------------------------|---|---|---|---|--|
| Methyl tert-butyl ether | TWA: 50 ppm TWA: 183.5 mg/m ³ STEL : 100 ppm STEL : 367 mg/m ³ | kože TWA-GVI: 50 ppm 8 satima. TWA-GVI: 183.5 mg/m ³ 8 satima. STEL-KGVI: 100 ppm 15 minutama. STEL-KGVI: 367 mg/m ³ 15 minutama. | TWA: 50 ppm 8 hr. TWA: 183.5 mg/m ³ 8 hr. STEL: 100 ppm 15 min STEL: 367 mg/m ³ 15 min | STEL: 367 mg/m ³ STEL: 100 ppm TWA: 183.5 mg/m ³ TWA: 50 ppm | TWA: 100 mg/m ³ 8 hodinách. Ceiling: 200 mg/m ³ |

| Component | Estonia | Gibraltar | Greece | Hungary | Iceland |
|-------------------------|--|---|---|---|--|
| Methyl tert-butyl ether | TWA: 50 ppm 8 tundides. TWA: 183.5 mg/m ³ 8 tundides. STEL: 100 ppm 15 minutites. STEL: 367 mg/m ³ 15 | TWA: 183.5 mg/m ³ 8 hr TWA: 50 ppm 8 hr STEL: 367 mg/m ³ 15 min STEL: 100 ppm 15 min | STEL: 100 ppm STEL: 367 mg/m ³ TWA: 50 ppm TWA: 183.5 mg/m ³ | STEL: 367 mg/m ³ 15 percekben. CK TWA: 183.5 mg/m ³ 8 óraban. AK | STEL: 100 ppm branched in three STEL: 367 mg/m ³ branched in three TWA: 50 ppm 8 klukkustundum. branched in three |

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| | | | | | |
|--|------------|--|--|--|---|
| | minutites. | | | | TWA: 183.5 mg/m ³ 8 klukkustundum. branched in three |
|--|------------|--|--|--|---|

| Component | Latvia | Lithuania | Luxembourg | Malta | Romania |
|-------------------------|---|---|---|---|---|
| Methyl tert-butyl ether | STEL: 100 ppm STEL: 367 mg/m ³ TWA: 50 ppm TWA: 183.5 mg/m ³ | TWA: 50 ppm IPRD TWA: 183.5 mg/m ³ IPRD STEL: 100 ppm STEL: 367 mg/m ³ | TWA: 183.5 mg/m ³ 8 Stunden TWA: 50 ppm 8 Stunden STEL: 367 mg/m ³ 15 Minuten STEL: 100 ppm 15 Minuten | TWA: 183.5 mg/m ³ TWA: 50 ppm STEL: 367 mg/m ³ 15 minuti STEL: 100 ppm 15 minuti | TWA: 50 ppm 8 ore TWA: 183.5 mg/m ³ 8 ore STEL: 100 ppm 15 minute STEL: 367 mg/m ³ 15 minute |

| Component | Russia | Slovak Republic | Slovenia | Sweden | Turkey |
|-------------------------|---|---|---|---|---|
| Methyl tert-butyl ether | TWA: 100 mg/m ³ 1333 MAC: 300 mg/m ³ | Ceiling: 367 mg/m ³ TWA: 50 ppm TWA: 183.5 mg/m ³ | TWA: 50 ppm 8 urah TWA: 183.5 mg/m ³ 8 urah STEL: 100 ppm 15 minutah STEL: 367 mg/m ³ 15 minutah | Binding STEL: 100 ppm 15 minuter Binding STEL: 367 mg/m ³ 15 minuter TLV: 30 ppm 8 timmar. NGV TLV: 110 mg/m ³ 8 timmar. NGV | TWA: 50 ppm 8 saat TWA: 183.5 mg/m ³ 8 saat STEL: 100 ppm 15 dakika STEL: 367 mg/m ³ 15 dakika |

Biological limit values

This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies

Monitoring methods

BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.

MDHS70 General methods for sampling airborne gases and vapours

MDHS 88 Volatile organic compounds in air. Laboratory method using diffusive samplers, solvent desorption and gas chromatography

MDHS 96 Volatile organic compounds in air - Laboratory method using pumped solid sorbent tubes, solvent desorption and gas chromatography

Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)

See table for values

| Component | Acute effects local (Dermal) | Acute effects systemic (Dermal) | Chronic effects local (Dermal) | Chronic effects systemic (Dermal) |
|--|------------------------------|---------------------------------|--------------------------------|-----------------------------------|
| Methyl tert-butyl ether 1634-04-4 (>95) | | | | DNEL = 5100mg/kg bw/day |

| Component | Acute effects local (Inhalation) | Acute effects systemic (Inhalation) | Chronic effects local (Inhalation) | Chronic effects systemic (Inhalation) |
|--|----------------------------------|-------------------------------------|------------------------------------|---------------------------------------|
| Methyl tert-butyl ether 1634-04-4 (>95) | DNEL = 357mg/m ³ | | | DNEL = 178.5mg/m ³ |

Predicted No Effect Concentration (PNEC)

See values below.

| Component | Fresh water | Fresh water sediment | Water Intermittent | Microorganisms in sewage treatment | Soil (Agriculture) |
|-------------------------|----------------|----------------------|--------------------|------------------------------------|--------------------|
| Methyl tert-butyl ether | PNEC = 5.1mg/L | PNEC = 23mg/kg | PNEC = 47.2mg/L | PNEC = 71mg/L | PNEC = 1.56mg/kg |

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| | | | | | |
|------------------|--|-------------|--|--|---------|
| 1634-04-4 (>95) | | sediment dw | | | soil dw |
|------------------|--|-------------|--|--|---------|

| Component | Marine water | Marine water sediment | Marine water Intermittent | Food chain | Air |
|---|-----------------|---------------------------------|---------------------------|------------|-----|
| Methyl tert-butyl ether 1634-04-4 (>95) | PNEC = 0.26mg/L | PNEC = 1.17mg/kg sediment dw | | | |

8.2. Exposure controls

Engineering Measures

Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting/equipment.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

Eye Protection

Wear safety glasses with side shields (or goggles) (European standard - EN 166)

Hand Protection

Protective gloves

| Glove material | Breakthrough time | Glove thickness | EU standard | Glove comments |
|----------------|-------------------|-----------------|-------------|--|
| Nitrile rubber | < 211 minutes | 0.38 mm | Level 4 | Permeation rate 1 µg/cm ² /min |
| Viton (R) | < 152 minutes | 0.7 mm | Level 4 | Permeation rate 17 µg/cm ² /min |
| Neoprene | | | EN 374 | As tested under EN374-3 Determination of |
| Natural rubber | | | | Resistance to Permeation by Chemicals |
| PVC | | | | |

Skin and body protection

Wear appropriate protective gloves and clothing to prevent skin exposure.

Inspect gloves before use. observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information) gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion. gloves with care avoiding skin contamination.

Respiratory Protection

No protective equipment is needed under normal use conditions.

Large scale/emergency use

Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced

Small scale/Laboratory use

Maintain adequate ventilation

Environmental exposure controls

No information available.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

| | | |
|--------------------------|-------------------------------|-----------------------|
| Physical State | Liquid | |
| Appearance | Colorless | |
| Odor | Petroleum distillates | |
| Odor Threshold | No data available | |
| Melting Point/Range | -110 °C / -166 °F | |
| Softening Point | No data available | |
| Boiling Point/Range | 54 - 56 °C / 129.2 - 132.8 °F | |
| Flammability (liquid) | Highly flammable | On basis of test data |
| Flammability (solid,gas) | Not applicable | Liquid |

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| | | |
|--|--|--|
| Explosion Limits | Lower 1.6 vol% Upper 8.4 vol% | |
| Flash Point | -28 °C / -18.4 °F | Method - No information available |
| Autoignition Temperature | 224 °C / 435.2 °F | |
| Decomposition Temperature | No data available | |
| pH | No information available | |
| Viscosity | 0.36 mPa.s at 20 °C | |
| Water Solubility | 51 g/L (20°C) | |
| Solubility in other solvents | No information available | |
| Partition Coefficient (n-octanol/water) | | |
| Component | log Pow | |
| Methyl tert-butyl ether | 1.06 | |
| Vapor Pressure | 268 mbar @ 20 °C | |
| Density / Specific Gravity | 0.740 | |
| Bulk Density | Not applicable | Liquid |
| Vapor Density | 0.2 | (Air = 1.0) |
| Particle characteristics | Not applicable (liquid) | |

9.2. Other information

| | |
|-----------------------------|---|
| Molecular Formula | C5 H12 O |
| Molecular Weight | 88.15 |
| Explosive Properties | Vapors may form explosive mixtures with air |

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

None known, based on information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

| | |
|---------------------------------|--|
| Hazardous Polymerization | Hazardous polymerization does not occur. |
| Hazardous Reactions | None under normal processing. |

10.4. Conditions to avoid

Incompatible products. Excess heat. Keep away from open flames, hot surfaces and sources of ignition.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Carbon monoxide (CO). Carbon dioxide (CO₂).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Product Information

(a) acute toxicity;

Oral

Based on available data, the classification criteria are not met

Dermal

Based on available data, the classification criteria are not met

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Inhalation

Based on available data, the classification criteria are not met

| Component | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|-------------------------|---------------------------|-------------------------------|----------------------------|
| Methyl tert-butyl ether | LD50 = 2963 mg/kg (Rat) | LD50 = 10000 mg/kg (Rabbit) | LC50 = 85 mg/L (Rat) 4 h |

(b) skin corrosion/irritation;

Category 2

(c) serious eye damage/irritation;

Based on available data, the classification criteria are not met

(d) respiratory or skin sensitization;

Respiratory
Skin

Based on available data, the classification criteria are not met

Based on available data, the classification criteria are not met

(e) germ cell mutagenicity;

Based on available data, the classification criteria are not met

Mutagenic effects have occurred in experimental animals

(f) carcinogenicity;

Based on available data, the classification criteria are not met

The table below indicates whether each agency has listed any ingredient as a carcinogen
Limited evidence of a carcinogenic effect

(g) reproductive toxicity;

Based on available data, the classification criteria are not met

(h) STOT-single exposure;

Based on available data, the classification criteria are not met

(i) STOT-repeated exposure;

Based on available data, the classification criteria are not met

Target Organs

None known.

(j) aspiration hazard;

Based on available data, the classification criteria are not met

Other Adverse Effects

Tumorigenic effects have been reported in experimental animals.

Symptoms / effects, both acute and delayed

Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

11.2. Information on other hazards

Endocrine Disrupting Properties Assess endocrine disrupting properties for human health

Contains a substance on the National Authorities Endocrine Disruptor Lists

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecotoxicity effects

Do not empty into drains. .

| Component | Freshwater Fish | Water Flea | Freshwater Algae |
|-------------------------|--|--|--|
| Methyl tert-butyl ether | 887 mg/L LC50 96 h 100 mg/L LC50 96 h 929 mg/L LC50 96 h | EC50: = 542 mg/L, 48h (Daphnia magna) | 800 mg/L EC50 > 72 h 184 mg/L EC50 = 96 h |

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| | | | |
|--|--------------------|--|--|
| | 672 mg/L LC50 96 h | | |
|--|--------------------|--|--|

| Component | Microtox | M-Factor |
|-------------------------|--|----------|
| Methyl tert-butyl ether | EC50 = 11.4 mg/L 30 min EC50 = 8.23 mg/L 5 min EC50 = 9.67 mg/L 15 min | |

12.2. Persistence and degradability

Persistence

Persistence is unlikely, based on information available.

12.3. Bioaccumulative potential

Bioaccumulation is unlikely

| Component | log Pow | Bioconcentration factor (BCF) |
|-------------------------|---------|-------------------------------|
| Methyl tert-butyl ether | 1.06 | No data available |

12.4. Mobility in soil

The product contains volatile organic compounds (VOC) which will evaporate easily from all surfaces. Will likely be mobile in the environment due to its volatility. Disperses rapidly in air.

12.5. Results of PBT and vPvB assessment

Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB).

12.6. Endocrine disrupting properties

Endocrine Disruptor Information Assess endocrine disrupting properties for the environment

Contains a substance on the National Authorities Endocrine Disruptor Lists.

| Component | EU - Endocrine Disruptors Candidate List | EU - Endocrine Disruptors - Evaluated Substances |
|-------------------------|--|--|
| Methyl tert-butyl ether | Group III Chemical | |

12.7. Other adverse effects

Persistent Organic Pollutant Ozone Depletion Potential

This product does not contain any known or suspected substance.
This product does not contain any known or suspected substance.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from Residues/Unused Products

Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Contaminated Packaging

Dispose of this container to hazardous or special waste collection point. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and empty container away from heat and sources of ignition.

European Waste Catalogue (EWC)

According to the European Waste Catalog, Waste Codes are not product specific, but application specific.

Other Information

Waste codes should be assigned by the user based on the application for which the product was used. Do not flush to sewer. Can be landfilled or incinerated, when in compliance with local regulations.

Switzerland - Waste Ordinance

Disposal should be in accordance with applicable regional, national and local laws and regulations. Ordinance on the Avoidance and the Disposal of Waste (Waste Ordinance, ADWO) SR 814.600

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<https://www.fedlex.admin.ch/eli/cc/2015/891/en>

SECTION 14: TRANSPORT INFORMATION

IMDG/IMO

14.1. UN number UN2398
14.2. UN proper shipping name METHYL tert-BUTYL ETHER
14.3. Transport hazard class(es) 3
14.4. Packing group II

ADR

14.1. UN number UN2398
14.2. UN proper shipping name METHYL tert-BUTYL ETHER
14.3. Transport hazard class(es) 3
14.4. Packing group II

IATA

14.1. UN number UN2398
14.2. UN proper shipping name METHYL tert-BUTYL ETHER
14.3. Transport hazard class(es) 3
14.4. Packing group II

14.5. Environmental hazards No hazards identified
14.6. Special precautions for user No special precautions required.
14.7. Maritime transport in bulk according to IMO instruments Not applicable, packaged goods

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories

Europe (EINECS/ELINCS/NLP), China (IECSC), Taiwan (TCSI), Korea (KECL), Japan (ENCS), Japan (ISHL), Canada (DSL/NDSL), Australia (AICS), New Zealand (NZIoC), Philippines (PICCS). US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

| Component | CAS No | EINECS | ELINCS | NLP | IECSC | TCSI | KECL | ENCS | ISHL |
|-------------------------|-----------|-----------|--------|-----|-------|------|----------|------|------|
| Methyl tert-butyl ether | 1634-04-4 | 216-653-1 | - | - | X | X | KE-23648 | X | X |

| Component | CAS No | TSCA | TSCA Inventory notification - Active-Inactive | DSL | NDSL | AICS | NZIoC | PICCS |
|-------------------------|-----------|------|---|-----|------|------|-------|-------|
| Methyl tert-butyl ether | 1634-04-4 | X | ACTIVE | X | - | X | X | X |

Legend: X - Listed '-' - Not Listed

KECL - NIER number or KE number (<http://ncis.nier.go.kr/en/main.do>)

Authorisation/Restrictions according to EU REACH

| Component | CAS No | REACH (1907/2006) - Annex XIV - Substances Subject to Authorization | REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances | REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC) |
|-----------|--------|---|---|---|
| | | | | |

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Methyl-tert-butyl ether

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| | | | | |
|-------------------------|-----------|---|--|---|
| Methyl tert-butyl ether | 1634-04-4 | - | Use restricted. See item 75. (see link for restriction details) | - |
|-------------------------|-----------|---|--|---|

REACH links

<https://echa.europa.eu/substances-restricted-under-reach>

Seveso III Directive (2012/18/EC)

| Component | CAS No | Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification | Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements |
|-------------------------|-----------|---|--|
| Methyl tert-butyl ether | 1634-04-4 | Not applicable | Not applicable |

Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals

Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?

Not applicable

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work .

Take note of Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values

National Regulations

UK - Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment

WGK Classification

See table for values

| Component | Germany - Water Classification (AwSV) | Germany - TA-Luft Class |
|-------------------------|---------------------------------------|-------------------------|
| Methyl tert-butyl ether | WGK1 | |

| Component | France - INRS (Tables of occupational diseases) |
|-------------------------|--|
| Methyl tert-butyl ether | Tableaux des maladies professionnelles (TMP) - RG 84 |

Swiss Regulations

Article 4 para. 4 of the Ordinance on the protection of young people in the workplace (SR 822.115) and Article 1 lit. f of the EAER regulation on hazardous work and young people (SR 822.115.2).

Take note on Article 13 Maternity Ordinance (SR 822.111.52) with regards expectant and nursing mothers.

15.2. Chemical safety assessment

A Chemical Safety Assessment/Report (CSA/CSR) has not been conducted

SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3

H225 - Highly flammable liquid and vapor

H315 - Causes skin irritation

Legend

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Methyl-tert-butyl ether

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CAS - Chemical Abstracts Service

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

IECSC - Chinese Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List

ENCS - Japanese Existing and New Chemical Substances

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit

ACGIH - American Conference of Governmental Industrial Hygienists

DNEL - Derived No Effect Level

RPE - Respiratory Protective Equipment

LC50 - Lethal Concentration 50%

NOEC - No Observed Effect Concentration

PBT - Persistent, Bioaccumulative, Toxic

TWA - Time Weighted Average

IARC - International Agency for Research on Cancer Predicted No Effect Concentration (PNEC)

LD50 - Lethal Dose 50%

EC50 - Effective Concentration 50%

POW - Partition coefficient Octanol:Water

vPvB - very Persistent, very Bioaccumulative

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road

IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code

OECD - Organisation for Economic Co-operation and Development

BCF - Bioconcentration factor

ICAO/IATA - International Civil Aviation Organization/International Air Transport Association

MARPOL - International Convention for the Prevention of Pollution from Ships

ATE - Acute Toxicity Estimate

VOC - (volatile organic compound)

Key literature references and sources for data

<https://echa.europa.eu/information-on-chemicals>

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Fire prevention and fighting, identifying hazards and risks, static electricity, explosive atmospheres posed by vapours and dusts.

Chemical incident response training.

Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.

First aid for chemical exposure, including the use of eye wash and safety showers.

Creation Date 28-May-2009

Revision Date 20-Oct-2023

Revision Summary Not applicable.

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006. COMMISSION REGULATION (EU) 2020/878 amending Annex II to Regulation (EC) No 1907/2006 .

For Switzerland - Compiled in accordance with the technical provisions referred to in Annex 2, Number 3, ChemO (SR 813.11 - Ordinance on Protection against Dangerous Substances and Preparations).

Disclaimer

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

End of Safety Data Sheet