

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form	: Substance
Trade name	: MTBE (tert-butyl methyl ether)
EC index no	: 603-181-00-X
EC no	: 216-653-1
CAS No.	: 1634-04-4
REACH registration No.	: 01-2119452786-27-0043
Formula	: C ₅ H ₁₂ O
Synonyms	: methyl-tert-butyl ether (MTBE) / methyl 1,1-dimethylethyl ether / 1,1-dimethylethyl methyl ether / 2-methoxy-2-methylpropane / 2-methyl-2-methoxypropane

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

1.2.1. Relevant identified uses

Industrial/Professional use spec.	: Manufacture. Formulation of preparations (mixtures). intermediate Solvent. Extraction agents Distribution: Fuels
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1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Supplier (Only Representative):
Braskem Nederland BV
Weena 238-240, 9th Floor, Tower C
NL - 3012 NJ – Rotterdam

Manufacturer:
BRASKEM S/A UNIB1 -BA
Rua Eteno, 1561 - Polo Petroquímico de Camacari - Bahia/BA
Brazil - Cep 42810-000

BRASKEM S/A UNIB2-RS
BR 386-Rodovia Tabai/Canos - km 419 - Triunfo/RS
Brazil - Cep 95853-000

productsafety@braskem.com

1.4. Emergency telephone number

Emergency number : +31 10 205 2945 (business hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

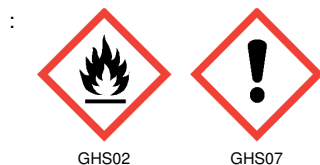
Flam. Liq. 2 H225
Skin Irrit. 2 H315

Full text of H-phrases: see section 16.

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)



GHS02

GHS07

Signal word (CLP)

: Danger

Hazard statements (CLP)

: H225 - Highly flammable liquid and vapour
H315 - Causes skin irritation

MTBE (tert-butyl methyl ether)

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Precautionary statements (CLP) : P210 - Keep away from sparks, open flames. - No smoking.
P243 - Take precautionary measures against static discharge
P280 - Wear protective gloves.
P302+P352 - IF ON SKIN: Wash with plenty of soap and water
P403+P235 - Store in a cool and well-ventilated place.

2.3. Other hazards

other hazards which do not result in classification : Vapours can travel considerable distances to a source of ignition where they can ignite, flash back, or explode. Absorbed through the skin. May cause minor eye irritation. Depression of the central nervous system. This substance does not meet the criteria for classification as PBT or vPvB.

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance type : Mono-constituent
Name : Tert-butyl methyl ether
CAS No. : 1634-04-4
EC no : 216-653-1
EC index no : 603-181-00-X

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Tert-butyl methyl ether	(CAS No.) 1634-04-4 (EC no) 216-653-1 (EC index no) 603-181-00-X	98	Flam. Liq. 2, H225 Skin Irrit. 2, H315

Full text of R-, H- and EUH-phrases: see section 16.

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Avoid : vomiting. Do not effect a mouth-to-mouth resuscitation. Do not rub the skin and eyes after direct contact with the product.

First-aid measures after inhalation : Remove victim to fresh air. Do not apply mouth-to-mouth resuscitation. Delayed fatal pulmonary oedema possible. In case of irregular breathing or respiratory arrest provide artificial respiration. Seek medical advice (show the label where possible).

First-aid measures after skin contact : Rinse immediately with plenty of water for 15 minutes. Do not rub the skin and eyes after direct contact with the product. Remove contaminated clothing and shoes. Discard contaminated clothing. If skin irritation persists, seek medical attention.

First-aid measures after eye contact : Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum). Remove contact lenses, if present and easy to do. Continue rinsing. Do not rub the skin and eyes after direct contact with the product. Seek medical advice (show the label where possible).

First-aid measures after ingestion : Do not induce vomiting. Give water to drink if victim completely conscious/alert. Never give anything by mouth to an unconscious person. Immediately get medical attention.

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

Symptoms/injuries after inhalation : May cause irritation to the respiratory tract. Excessive concentrations may cause nervous system depression, headache, and weakness leading to unconsciousness.

Symptoms/injuries after skin contact : Irritating to skin. Absorbed through the skin.

Symptoms/injuries after eye contact : May cause irritation to the eyes. redness, itching, tears.

Symptoms/injuries after ingestion : May cause gastric irritation. Depression of the central nervous system, headaches, dizziness, drowsiness, loss of co-ordination.

Chronic symptoms : Excessive concentrations may cause nervous system depression, headache, and weakness leading to unconsciousness. Prolonged/repetitive skin contact may cause skin defatting or dermatitis.

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

Use personal protective equipment as required. Refer to section 8. Excessive concentrations may cause nervous system depression, headache, and weakness leading to unconsciousness.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : carbon dioxide (CO2), dry chemical powder, foam. Water fog.

Unsuitable extinguishing media : Do not use a solid water stream as it may scatter and spread fire.

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5.2. Special hazards arising from the substance or mixture

- Fire hazard : Flammable liquid. Exposed to ignition source, vapours can burn in open / explode if confined. This material can accumulate static charge by flow or agitation and can be ignited by static discharge. The vapours are heavier than air and can accumulate in high concentrations on the ground, in cavities, channels and cellars. Vapours can travel considerable distances to a source of ignition where they can ignite, flash back, or explode. Combustion generates : Carbon monoxide. Carbon dioxide. May form explosive peroxides.
- Explosion hazard : Exposure to fire may cause containers to rupture/explode. Do not allow surface water to enter drains and sewers as this will create a potential explosive hazard. If this occurs inform local authorities immediately.
- Reactivity : May react violently with oxidants. May react violently with acids.

5.3. Advice for firefighters

- Firefighting instructions : Cool closed containers exposed to fire with water spray. Fight fire with normal precautions from a reasonable distance. Do not approach fire except upwind and only with proper skin and respiratory protection (supplied air only).
- Protective equipment for firefighters : Wear recommended personal protective equipment. In case of fire: Wear self-contained breathing apparatus. Refer to section 8.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Eliminate all ignition sources if safe to do so.
- 6.1.1. For non-emergency personnel**
- Protective equipment : Use personal protective equipment as required. Refer to section 8.
- Emergency procedures : Eliminate all ignition sources if safe to do so. Stop leak if safe to do so.
- 6.1.2. For emergency responders**
- Protective equipment : Wear suitable protective clothing. In case of fire: Wear self-contained breathing apparatus. Refer to section 8.
- Emergency procedures : Evacuate unnecessary personnel. Eliminate ignition sources. Stop leak if safe to do so.

6.2. Environmental precautions

Use water spray to minimise or disperse vapours. Prevent entry to sewers and public waters. Prevent spreading over great surfaces (e.g. by damming or installing oil booms). Take up liquid spill into inert absorbent material, e.g.: sand, earth, vermiculite or powdered limestone.

6.3. Methods and material for containment and cleaning up

- For containment : Prevent spreading over great surfaces (e.g. by damming or installing oil booms). Use a water spray jet to knock down vapours/gases/mists.
- Methods for cleaning up : Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents). zeolites. Sweep or shovel spills into appropriate container for disposal.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Avoid producing mist or vapors by heating of opened recipient. Keep container closed when not in use. Ground/bond container and receiving equipment. Use only non-sparking tools. When handling product, avoid contact with oxidation agents and combustible products. Do not re-use empty containers. Do not pressurize, cut, weld, braze solder, drill, grind, or expose containers to flames, sparks, heat, or other potential ignition sources. Handle in accordance with good industrial hygiene and safety procedures.
- Hygiene measures : Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

- Technical measures: : Keep away from sources of ignition - No smoking. Proper grounding procedures to avoid static electricity should be followed. Only use anti-static equipped (spark-free) tools. Use explosion-proof electrical equipment. Use explosion-proof lighting equipment. Use explosion-proof ventilating equipment.
- Storage condition(s) : Protect containers against damage. Keep stored the least quantity possible. Keep in original containers closed. Store in dry, cool, well-ventilated area. Keep away from ignition sources (including static discharges).
- Incompatible materials : Oxidizing agents, strong. Strong acid.
- Packaging materials : PVC (Polyvinyl chloride). carbon steel. stainless steel. This material may attack some forms of plastics, rubbers and coatings.

7.3. Specific end use(s)

No additional information available

MTBE (tert-butyl methyl ether)

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According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Tert-butyl methyl ether (1634-04-4)		
Austria	MAK (mg/m³)	180 mg/m³
Austria	MAK (ppm)	50 ppm
Austria	MAK Short time value (mg/m³)	360 mg/m³
Austria	MAK Short time value (ppm)	100 ppm
Belgium	Limit value (mg/m³)	146 mg/m³
Belgium	Limit value (ppm)	40 ppm
Germany	TRGS 900 Occupational exposure limit value (mg/m³)	180 mg/m³
Germany	TRGS 900 Occupational exposure limit value (ppm)	50 ppm
Italy - Portugal - USA ACGIH	ACGIH TWA (ppm)	50 ppm
Spain	VLA-ED (mg/m³)	147 mg/m³
Spain	VLA-ED (ppm)	40 ppm
Switzerland	VLE (mg/m³)	270 mg/m³
Switzerland	VLE (ppm)	75 ppm
Switzerland	VME (mg/m³)	180 mg/m³
Switzerland	VME (ppm)	50 ppm
Switzerland	Remark (CH)	max. 4x15 min/8h
United Kingdom	WEL TWA (mg/m³)	92 mg/m³
United Kingdom	WEL TWA (ppm)	25 ppm
United Kingdom	WEL STEL (mg/m³)	275 mg/m³
United Kingdom	WEL STEL (ppm)	75 ppm
Denmark	Grænseværdie (langvarig) (mg/m³)	144 mg/m³
Denmark	Grænseværdie (langvarig) (ppm)	40 ppm
Denmark	Grænseværdie (kortvarig) (mg/m³)	288 mg/m³
Denmark	Grænseværdie (kortvarig) (ppm)	80 ppm
Finland	HTP-arvo (8h) (mg/m³)	180 mg/m³
Finland	HTP-arvo (8h) (ppm)	50 ppm
Lithuania	IPRV (ppm)	50 ppm
Lithuania	TPRV (mg/m³)	250 mg/m³
Lithuania	TPRV (ppm)	75 ppm
Canada (Quebec)	VEMP (mg/m³)	144 mg/m³
Canada (Quebec)	VEMP (ppm)	40 ppm

MTBE (tert-butyl methyl ether) (1634-04-4)	
DNEL/DMEL (Workers)	
Acute - local effects, inhalation	357 mg/m³
Long-term - systemic effects, dermal	5100 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	178.5 mg/m³/day
DNEL/DMEL (General population)	
Acute - local effects, inhalation	214 mg/m³
Long-term - systemic effects, oral	7.1 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	53.6 mg/m³/day
Long-term - systemic effects, dermal	3570 mg/kg bodyweight/day
PNEC (Water)	
PNEC aqua (freshwater)	5.1 mg/l
PNEC aqua (marine water)	0.26 mg/l
PNEC aqua (intermittent, freshwater)	4.72 mg/l
PNEC (Sediment)	
PNEC sediment (freshwater)	23 mg/kg dwt
PNEC sediment (marine water)	1.17 mg/kg dwt
PNEC (Soil)	
PNEC soil	1.43 mg/kg dwt
PNEC (Oral)	
PNEC oral (secondary poisoning)	Not applicable kg/kg food
PNEC (STP)	
PNEC sewage treatment plant	71 mg/l

MTBE (tert-butyl methyl ether)

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DNEL	: 178.8 mg/m ³ Worker/Long-Term - systemic effects (Inhalation)
PNEC	: 5.1 mg/l PNEC aqua - freshwater

8.2. Exposure controls

Appropriate engineering controls	: Mechanical ventilation is recommended. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.
Personal protective equipment	: An approved organic vapour respirator/supplied air or self-contained breathing apparatus must be used when vapour concentration exceeds applicable exposure limits. Gloves. Protective goggles. Protective clothing.



Materials for protective clothing	: PVC (Polyvinyl chloride). PVA (Polyvinyl alcohol). Avoid : NR (Natural rubber (caoutchouc), Natural latex). Butyl rubber.
Hand protection	: Protective gloves made of PVC. PVA (Polyvinyl alcohol). Nitrile-rubber protective gloves.
Eye protection	: if necessary: tightly fitting safety goggles.
Skin and body protection	: Wear suitable protective clothing. Boots made of PVC. PVA (Polyvinyl alcohol).
Respiratory protection	: An approved organic vapour respirator/supplied air or self-contained breathing apparatus must be used when vapour concentration exceeds applicable exposure limits.
Environmental exposure controls	: Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Colour	: colourless.
odour	: Terpene-like.
Odour threshold	: No data available
pH	: not applicable
Melting point	: -109 °C
Solidification point	: No data available
Boiling point	: 55,2 °C
Flash point	: -28 °C
Relative evaporation rate (butylacetate=1)	: 8,5 (n-butylacetate = 1)
Relative evaporation rate (ether=1)	: 1,6 (diethylether = 1)
Flammability (solid, gas)	: Inflammable
Explosive limits	: 1,6 – 8,4 %
Vapour pressure	: 201 mmHg @ 20°C
Relative vapour density at 20 °C	: No data available
Relative density	: 0,741 g/ml @ 20°C
Solubility	: Insoluble in: Ethanol Water: moderately soluble
Log Pow	: 1,06
Log Kow	: No data available
Self ignition temperature	: 224 °C
Decomposition temperature	: No data available
Viscosity, kinematic	: 0,47 mPa.s @ 20°C
Viscosity, dynamic	: 0,35 mPa.s @ 20°C
Explosive properties	: No data available
Oxidising properties	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

May react violently with oxidants. May react violently with acids.

10.2. Chemical stability

Stable under normal conditions.

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10.3. Possibility of hazardous reactions

No polymerization .

10.4. Conditions to avoid

Direct sunlight. heat. Open flame. Sparks. Incompatible materials.

10.5. Incompatible materials

Oxidizing agents. Strong acid.

10.6. Hazardous decomposition products

Decomposition may form toxic and explosive gases. Carbon oxides (CO, CO₂).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

MTBE (tert-butyl methyl ether) (1634-04-4)	
LD50 oral rat	4000 mg/kg Approximately.
LD50 dermal rat	> 2000 mg/kg
LD50 dermal rabbit	> 10000 mg/kg
LC50 inhalation rat (ppm)	85 ppm/4h Approximately.
ATE (oral)	4000 mg/kg

Skin corrosion/irritation : Causes skin irritation.

pH: not applicable

Serious eye damage/irritation : Not classified

pH: not applicable

Respiratory or skin sensitisation : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Potential Adverse human health effects and symptoms : Causes skin irritation. May cause respiratory irritation. May cause minor eye irritation. Depression of the central nervous system. Prolonged/repetitive skin contact may cause skin defatting or dermatitis.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - air : Contributes to the formation of photochemical smog by degradation in the atmosphere through photochemical reactions to form photochemical oxidants and interfering with the photochemical cycle of nitrogen oxides.

MTBE (tert-butyl methyl ether) (1634-04-4)	
LC50 fishes 1	672 mg/l 96h Pimephales promelas
EC50 Daphnia 1	472 mg/l 48h Daphnia magna
EC50 other aquatic organisms 1	44 mg/l 96h Americamysis bahia
LC50 fishes 2	574 mg/l 96h Menidia beryllina
ErC50 (algae)	491 mg/l 96h Psuedokirchneriella subcapitata

12.2. Persistence and degradability

MTBE (tert-butyl methyl ether) (1634-04-4)	
Persistence and degradability	Inherently biodegradable.

12.3. Bioaccumulative potential

MTBE (tert-butyl methyl ether) (1634-04-4)	
BCF fishes 1	1.5
Log Pow	1.06
Bioaccumulative potential	Low bioaccumulation potential.

12.4. Mobility in soil

MTBE (tert-butyl methyl ether) (1634-04-4)	
Log Koc	0.96
Ecology - soil	Very mobile.

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12.5. Results of PBT and vPvB assessment

MTBE (tert-butyl methyl ether) (1634-04-4)

Results of PBT assessment	This substance does not meet the criteria for classification as PBT or vPvB.
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12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Disposal through controlled incineration or authorised waste dump.

SECTION 14: Transport information

Classification for ROAD and RAIL transport: ADR / RID

14.1 UN Number	: UN2398
14.2 Proper shipping name	: METHYL TERT-BUTYL ETHER
14.3 Class	: 3
14.4 Packing group	: II
14.5 Environmental hazards	: Not considered environmentally hazardous based on available data
14.6 Special precautions for user	: Hazard identification number: 33

Classification for SEA transport: IMO - IMDG

14.1 UN Number	: UN2398
14.2 Proper shipping name	: METHYL TERT-BUTYL ETHER
14.3 Class	: 3
14.4 Packing group	: II
14.5 Environmental hazards	: Not considered marine pollutant based on available data
14.6 Special precautions for user	: No supplementary information available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code:

Product name	: Methyl tert-butyl ether
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Classification for AIR transport: IATA - ICAO

14.1 UN Number	: UN2398
14.2 Proper shipping name	: Methyl tert-butyl ether
14.3 Class	: 3
14.4 Packing group	: II
14.5 Environmental hazards	: Not considered environmentally hazardous based on available data
14.6 Special precautions for user	: No supplementary information available

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product therefore it cannot be considered exhaustive. See guidelines of ADR, RID, IMDG and IATA regulations before transporting the product. The transportation organization is responsible for compliance with laws, regulations and rules for the transport of the material.

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

No Annex XVII restrictions

Contains no REACH candidate substance

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

No additional information available

SECTION 16: Other information

Sources of Key data : CSR - Chemical Safety Report. MSDS.

Abbreviations and acronyms : CAS (Chemical Abstracts Service) number. CLP - Classification, Labelling and Packaging. CSR - Chemical Safety Report. EC - European Community. EEC - European Economic Community. REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals. SDS - Safety Data Sheet.

Full text of R-, H- and EUH-phrases:

Flam. Liq. 2	flammable liquids Category 2
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MTBE (tert-butyl methyl ether)

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According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Skin Irrit. 2	skin corrosion/irritation Category 2
H225	Highly flammable liquid and vapour
H315	Causes skin irritation
R11	Highly flammable.
R38	Irritating to skin.

SDS EU (REACH Annex II)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.