3 : Flammable liquids

Danger

SECTION 1. Identification of the hazardous chemical and of the supplier

1.1. Product identifier

Trade name : Tert-Buthyl-Methylether

1.2. Other means of identification

SDS Nr : ALM/SDS/58

1.3. Recommended use of the chemical and restrictions on use

Relevant identified uses : Industrial and professional. Perform risk assessment prior to use.
Test gas/Calibration gas. Laboratory use. Contact supplier for more information on uses.

1.4. Details of Principal Supplier

Company identification : AIR LIQUIDE MALAYSIA SDN. BHD.
Lot P.T. 2317, No 21, Jalan PTB 1,
Tangga Batu Industrial Estate,
76400 Melaka MALAYSIA

1.5. Emergency phone number

Emergency phone number : 06-3513512

SECTION 2. Hazard identification

2.1. Classification of the substance or mixture and any nation or regional information

Hazard Class and Category Code Regulation EC 1272/2008 (CLP)

- **Health hazards** : Skin irritation - Category 2 - Warning - (CLP : Skin Irrit. 2) - H315
- **Physical hazards** : Flammable liquids - Category 2 - Danger - (CLP : Flam. Liq. 2) - H225

Classification EC 67/548 or EC 1999/45

: F; R11
Xi; R38

2.2. Label elements

Labelling Regulation EC 1272/2008 (CLP)

- **Hazard pictograms**

- **Hazard pictograms code** : GHS02 - GHS07
- **Signal word** : Danger
- **Hazard statements** : H225 - Highly flammable liquid and vapour.
H315 - Causes skin irritation.

SECTION 2. Hazard identification (continued)

• Precautionary statements

2.3. Other hazards

: None.

SECTION 3. Composition and Information of the ingredients of the hazardous chemical

3.1. Substance / 3.2. Mixture

Substance.

Substance name		Contents	CAS No EC No Index No Registration No	Classification(DSD)	Classification(CLP)
tert.-Butyl-Methylether	:		1634-04-4 216-653-1 603-181-00-X ----		Flam. Liq. 2 (H225) Skin Irrit. 2 (H315)

Contains no other components or impurities which will influence the classification of the product.
* 1: Listed in Annex IV / V REACH, exempted from registration.
* 2: Registration deadline not expired.
* 3: Registration not required: Substance manufactured or imported < 1t/y.
Full text of R-phrases see section 16. Full text of H-statements see section 16.

SECTION 4. First-aid measures

4.1. Description of first aid measures

- **Inhalation** : Adverse effects not expected from this product.
- **Skin contact** : Remove contaminated clothing. Drench affected area with water for at least 15 minutes.
- **Eye contact** : Adverse effects not expected from this product.
- **Ingestion** : Ingestion is not considered a potential route of exposure.

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

: May cause irritation to skin.
Refer to section 11.

4.3. Indication of immediate medical attention and special treatment needed

: None.

SECTION 5. Fire-fighting measures

5.1. Extinguishing media

- **Suitable extinguishing media** : Water spray or fog.
- **Unsuitable extinguishing media** : Do not use water jet to extinguish.

5.2. Special hazards arising from the chemical

Specific hazards : Exposure to fire may cause containers to rupture/explode.

Hazardous combustion products : None

5.3. Special protective equipment and precautions for fire-fighters

Specific methods : If possible, stop flow of product.
Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
Use water spray or fog to knock down fire fumes if possible.

SECTION 5. Fire-fighting measures (continued)

Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus.
EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

: Try to stop release.
Use chemically protective clothing.

6.2. Environmental precautions

: Try to stop release.

6.3. Methods and material for containment and cleaning

: None.

6.4. Reference to other sections

: See also sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Safe use of the product : Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Only experienced and properly instructed persons should handle gases under pressure.
The substance must be handled in accordance with good industrial hygiene and safety procedures.
Do not smoke while handling product.
Ensure the complete gas system was (or is regularily) checked for leaks before use.
Consider pressure relief device(s) in gas installations.

Safe handling of the gas receptacle : Refer to supplier's container handling instructions.
Do not allow backfeed into the container.
Protect cylinders from physical damage; do not drag, roll, slide or drop.
When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.
If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.
Never attempt to repair or modify container valves or safety relief devices.
Damaged valves should be reported immediately to the supplier.
Keep container valve outlets clean and free from contaminants particularly oil and water.
Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
Close container valve after each use and when empty, even if still connected to equipment.
Never attempt to transfer gases from one cylinder/container to another.
Never use direct flame or electrical heating devices to raise the pressure of a container.
Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.
Containers should be stored in the vertical position and properly secured to prevent toppling.

7.2. Conditions for safe storage, including any incompatibilities

: Keep container below 50°C in a well ventilated place.
Observe all regulations and local requirements regarding storage of containers.
Containers should not be stored in conditions likely to encourage corrosion.
Containers should be stored in the vertical position and properly secured to prevent toppling.
Stored containers should be periodically checked for general condition and leakage.
Container valve guards or caps should be in place.
Store containers in location free from fire risk and away from sources of heat and ignition.

SECTION 7. Handling and storage (continued)

Keep away from combustible materials.

7.3. Specific end use(s)

: None.

SECTION 8. Exposure controls and personal protection

8.1. Control parameters

Permissible exposure limit : Data is not available.

Biological limit values : Data is not available.

DMEL: Derived mimimum effect level (Workers)

: No data available.

8.2. Appropriate engineering controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation.
Consider work permit system e.g. for maintenance activities.
Gas detectors should be used when oxidising gases may be released.
Avoid oxygen rich (>23,5%) atmospheres.
Systems under pressure shoud be regularily checked for leakages.

8.3. Individual protection measures

• Eye/face protection : Wear safety glasses with side shields.
Standard EN 166 - Personal eye-protection.

• Skin protection

- Hand protection : Standard EN 374 - Protective gloves against chemicals.
Wear chemically resistant protective gloves.
Consult glove manufacturer´s product information on material suitability and material thickness.
The breakthrough time of the selected gloves must be greater than the intended use period.
Wear working gloves when handling gas containers.
Standard EN 388 - Protective gloves against mechanical risk.

- Other : Wear safety shoes while handling containers.
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
Keep suitable chemically resistant protective clothing readily available for emergency use.
Standard EN943-1 - Full protective suits against liquid, solid and gaseous chemicals.

• Respiratory protection : Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

• Thermal hazards : None necessary.

Individual protection measures : A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk.
The following recommendations should be considered:
PPE compliant to the recommended EN/ISO standards should be selected.
Protect eyes, face and skin from liquid splashes.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

Physical state at 20°C / 101.3kPa : Gas.

Colour : Colourless.

Odour : Odourless. No odour warning properties.

Odour threshold : Odour threshold is subjective and inadequate to warn for overexposure.

SECTION 9. Physical and chemical properties (continued)

pH value	:	Not applicable for gas-mixtures.
Molar mass [g/mol]	:	Not applicable for gas-mixtures.
Melting point [°C]	:	Not applicable for gas-mixtures.
Boiling point [°C]	:	Not applicable for gas-mixtures.
Flash point [°C]	:	Not applicable for gas-mixtures.
Evaporation rate (ether=1)	:	Not applicable for gas-mixtures.
Flammability range [vol% in air]	:	Not applicable for gas-mixtures.
Vapour pressure [20°C]	:	Not applicable.
Solubility in water [mg/l]	:	No reliable data available.
Partition coefficient n-octanol/water [log Kow]	:	Not applicable for gas-mixtures.
Decomposition Temperature [°C]	:	Data is not available.
Viscosity at 20°C [mPa.s]	:	Not applicable.
Explosive Properties	:	Not applicable.
Oxidising Properties	:	None.

9.2. Other information

Other data	:	None.

SECTION 10. Stability and reactivity

10.1. Reactivity

: No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

: Stable under normal conditions.

10.3. Possibility of hazardous reactions

: None

10.4. Conditions to avoid

: None

10.5. Incompatible materials

: None

10.6. Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity	:	No known toxicological effects from this product.
Rat inhalation LC50 [ppm/4h]	:	No data available.
Skin corrosion/irritation	:	Irritation to skin.
Serious eye damage/irritation	:	No known effects from this product.
Respiratory or skin sensitisation	:	No known effects from this product.
Carcinogenicity	:	No known effects from this product.
Germ cell mutagenicity	:	No known effects from this product.
Toxic for reproduction : Fertility	:	No known effects from this product.
Toxic for reproduction : unborn child	:	No known effects from this product.

SECTION 11. Toxicological information (continued)

STOT-single exposure : No known effects from this product.
STOT-repeated exposure : No known effects from this product.
Aspiration hazard : Not applicable for gases and gas-mixtures.

11.2. Information on possible routes of exposure

Information on possible routes of exposure : Data is not available.

11.3. Early onset symptoms related to exposure

Early onset symptoms related to exposure : Data is not available.

11.4. Delayed and immediate effects from exposure

Delayed and immediate effects from exposure : Data is not available.

11.5. Numerical measures of toxicity

Numerical measures of toxicity : Data is not available.

SECTION 12. Ecological information

12.1. Ecotoxicity

: Classification criteria are not met.
EC50 48h - Daphnia magna [mg/l] : No data available.
EC50 72h Algae [mg/l] : No data available.
LC50-96 h - fish [mg/l] : No data available.

12.2. Persistence and degradability

: No data available.

12.3. Bioaccumulative potential

: No data available.

12.4. Mobility in soil

: No data available.

12.5. Results of PBT and vPvB assessment

: No data available.

12.6. Other adverse effects

SECTION 13. Disposal information

13.1 Waste treatment methods

: May be vented to atmosphere in a well ventilated place.
Do not discharge into any place where its accumulation could be dangerous.
Refer to the EIGA code of practice Doc.30 “Disposal of Gases"", downloadable at http://www.eiga.org for more guidance on suitable disposal methods.
Contact supplier if guidance is required.

List of hazardous wastes : 16 05 04: Gases in pressure containers (including halons) containing dangerous substances.

Additional information

: None.

SECTION 14. Transportation information

UN number : 2398

Labelling ADR, IMDG, IATA

: 3 : Flammable liquids

Land transport (ADR/RID)

H.I. nr : 33
UN proper shipping name : METHYL TERT-BUTYL ETHER
Transport hazard class(es) : 3
Classification code : F1 II
Packing Instruction(s) : P001 R001
Tunnel Restriction : D/E Bulk or tank carriage: Passage forbidden through tunnels of category Dand E;Other carriage: Passage forbidden through tunnels of category E
Environmental hazards : None.

Sea transport (IMDG)

Proper shipping name : METHYL TERT-BUTYL ETHER
Class : 3
Emergency Schedule (EmS) - Fire : F-E
Emergency Schedule (EmS) - Spillage : S-D
Packing instruction : P001
IMDG-Marine pollutant : No

Air transport (ICAO-TI / IATA-DGR)

Proper shipping name (IATA) : METHYL TERT-BUTYL ETHER
Class : 3
Passenger and Cargo Aircraft : Allowed.
Packing instruction - Passenger and Cargo Aircraft : Y305
305
Cargo Aircraft only : Allowed.
Packing instruction - Cargo Aircraft only : 307

Special precautions for user

: Avoid transport on vehicles where the load space is not separated from the driver's compartment.
Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.
Before transporting product containers:
- Ensure there is adequate ventilation.
- Ensure that containers are firmly secured.
- Ensure cylinder valve is closed and not leaking.
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
- Ensure valve protection device (where provided) is correctly fitted.

SECTION 15. Regulatory information

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

EU legislation

Seveso directive 96/82/EC : Not covered.

National legislation

National legislation : Ensure all national/local regulations are observed.

15.2. Chemical safety assessment

: A CSA does not need to be carried out for this product.

SECTION 16. Other information

Indication of changes	: Revised safety data sheet in accordance with commisssion OSHR 2013 (CLASS)
Training advice	: Receptacle under pressure.
List of full text of R-phrases in section 3.	: R11 : Highly flammable. R38 : Irritating to skin.
List of full text of H-statements in section 3.	: H225 - Highly flammable liquid and vapour. H315 - Causes skin irritation.
Key literature references and sources for data used to compile the SDS	: Classification in accordance with calculation methods of regulation (EC) 1272/2008 CLP / (EC) 1999/45 DPD. This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national law.
Date of revision of the SDS	: Please refer to Header.
DISCLAIMER OF LIABILITY	: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.
Key or legend to the abbreviations and acronyms used in the SDS	: STOT - specific target organ toxicity
Date of preparation of the SDS	: Please refer to Header

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