Dimethyl Ether (Compressed)

Safety Data Sheet

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 05/29/2017 Version: 1.0

SECTION 1: Identification

1.1. Product identifier

Product form	:	Substance
Substance name	:	Dimethyl Ether (Compressed)
CAS-No.	:	115-10-6
Product code	:	CA-1001-05305
Formula	:	C_2H_6O
Synonyms	:	Methane, oxybis- / Methyl ether / Wood ether / Methoxymethane / Methane, 1,1'-oxybis- / DIMETHYL ETHER / Oxybismethane / Dimethyl oxide

1.2. Recommended use and restrictions on use

Recommended uses and restrictions	:	Various

1.3. Supplier

Air Liquide Canada Inc.
1250, René Lévesque West Blvd. Suite 1700
H3B 5E6 Montreal, QC - Canada
T 1-800-817-7697
www.airliquide.ca

1.4. Emergency telephone number

Emergency number	:	514-878-1667

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

Classification (GHS-CA)

Flammable gases, Category 1	H220
Gases under pressure : Liquefied gas	H280
Specific target organ toxicity — Single exposure, Category 3, Narcosis	H336
Hazardous to the aquatic environment — Acute Hazard, Category 2	H401

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS-CA labelling

Hazard pictograms (GHS-CA) :

GHS02 GHS04 GHS07

Signal word (GHS-CA) : Danger

Hazard statements (GHS-CA) :
H280 - Contains gas under pressure; may explode if heated
H220 - Extremely flammable gas
H336 - May cause drowsiness or dizziness
H401 - Toxic to aquatic life
OSHA-H01 - May displace oxygen and cause rapid suffocation
CGA-HG01 - May cause frostbite
CGA-HG04 - May form explosive mixtures with air

Precautionary statements (GHS-CA) :
P271+P403 - Use and store only outdoors or in a well-ventilated place
P381 - In case of leakage, eliminate all ignition sources
P377 - Leaking gas fire: Do not extinguish unless leak can be stopped safely
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations.
P403 - Store in a well-ventilated place
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P410+P403 - Protect from sunlight. Store in a well-ventilated place
P405 - Store locked up
P261 - Avoid breathing dust/fume/gas/mist/vapours/spray
P262 - Do not get in eyes, on skin, or on clothing
P202 - Do not handle until all safety precautions have been read and understood

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P312 - Call a POISON CENTER or doctor if you feel unwell
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P264 - Wash hands, forearms and face thoroughly after handling
P273 - Avoid release to the environment
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52 °C/125 °F
CGA-PG05 - Use a back flow preventive device in the piping
CGA-PG06 - Close valve after each use and when empty

2.3. Other hazards

Other hazards not contributing to the classification : Contact with liquid may cause cold burns/frostbite.

2.4. Unknown acute toxicity (GHS-CA)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Chemical name/Synonyms	Product identifier	%	Classification (GHS-CA)
Dimethyl Ether (Compressed) (Main constituent)	Methane, oxybis- / Methyl ether / Wood ether / Methoxymethane / Methane, 1,1'-oxybis- / DIMETHYL ETHER / Oxybismethane / Dimethyl oxide	(CAS-No.) 115-10-6	100	Flam. Gas 1, H220 Press. Gas (Liq.), H280 STOT SE 3, H336 Aquatic Acute 2, H401

Full text of hazard classes and H-statements : see section 16

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.

First-aid measures after skin contact : For liquid spillage - flush with water for at least 15 minutes.

First-aid measures after eye contact : Adverse effects not expected from this product.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects (acute and delayed)

Most important symptoms and effects, both acute and delayed : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination.

4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : None.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Suitable extinguishing media : Water spray or fog. Dry powder.

5.2. Unsuitable extinguishing media

Unsuitable extinguishing media : Do not use water jet to extinguish. Carbon dioxide.

5.3. Specific hazards arising from the hazardous product

Hazardous combustion products : Incomplete combustion may form carbon monoxide.

5.4. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Exposure to fire may cause containers to rupture/explode.

Specific methods	:	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. If possible, stop flow of product. Use water spray or fog to knock down fire fumes if possible. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
Special protective equipment for fire fighters	:	In confined space use self-contained breathing apparatus. Standard protective clothing and equipment (e.g, Self Contained Breathing Apparatus) for fire fighters. Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters. 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

General measures	:	Try to stop release. Evacuate area. Consider the risk of potentially explosive atmospheres. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Eliminate ignition sources. Ensure adequate air ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Personal Precautions, Protective Equipment and Emergency Procedures	:	EVACUATE ALL PERSONNEL FROM AFFECTED AREA. Use appropriate protective equipment. If leak is on user's equipment, be certain to purge piping before attempting repairs. If leak is on a container or container valve contact the closest Air Liquide Canada location.

6.2. Methods and materials for containment and cleaning up

Methods and material for containment and cleaning up	:	Ventilate area.

6.3. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection"

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Safe use of the product	:	The product must be handled in accordance with good industrial hygiene and safety procedures. Only experienced and properly instructed persons should handle gases under pressure. Consider pressure relief device(s) in gas installations. Ensure the complete gas system was (or is regularily) checked for leaks before use. Do not smoke while handling product. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Avoid suck back of water, acid and alkalis. Assess the risk of potentially explosive atmospheres and the need for explosion-proof equipment. Purge air from system before introducing gas. Take precautionary measures against static discharge. Keep away from ignition sources (including static discharges). Consider the use of only non-sparking tools.
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.

7.2. Conditions for safe storage, including any incompatibilities

Conditions for safe storage, including any incompatibilities	:	Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion. Container valve guards or caps should be in place. Containers should be stored in the vertical position and properly secured to prevent them from falling over. Stored containers should be periodically checked for general condition and leakage. Keep container below 50°C in a well ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials. Segregate from oxidant gases and other oxidants in store. All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Dimethyl Ether (Compressed) (115-10-6)		
British Columbia	OEL TWA (ppm)	1000 ppm

8.2. Appropriate engineering controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Ensure exposure is below occupational exposure limits (where available). Gas detectors should be used when flammable gases/vapours may be released. Consider the use of a work permit system e.g. for maintenance activities.

Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Gloves. Safety glasses. Protective clothing. Safety shoes.

Hand protection:

Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risk.

Eye protection:

Wear safety glasses with side shields. Wear goggles when transfilling or breaking transfer connections. Standard EN 166 - Personal eye-protection - specifications

Respiratory protection:

Gas filters do not protect against oxygen deficiency. Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known. Recommended: Filter AX (brown). Consult respiratory device supplier´s product information for the selection of the appropriate device. Standard EN 14387 - Gas filter(s), combined filter(s) and full face mask - EN 136.

Thermal hazard protection:

None necessary.

Other information:

Consider the use of flame resistant anti-static safety clothing. Standard EN ISO 14116 - Limited flame spread materials. Standard EN ISO 1149-5 - Protective clothing: Electrostatic properties. Wear safety shoes while handling containers. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Gas
Appearance	:	No data available
Colour	:	Colourless.
Odour	:	Poor warning properties at low concentrations. Ethereal.
Odour threshold	:	No data available
pH	:	Not applicable.
Relative evaporation rate (butylacetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable for gases and gas mixtures.
Molecular mass	:	46.07 g/mol
Melting point	:	-141.5 °C
Freezing point	:	-141.5 °C
Boiling point	:	-23.85 °C
Flash point	:	Not applicable for gases and gas mixtures.
Critical temperature	:	127.85 °C
Auto-ignition temperature	:	240 °C
Decomposition temperature	:	No data available

Flammability (solid, gas)	:	No data available
Vapour pressure	:	2641.0850432355 mbar
Vapour pressure at 50 °C	:	No data available
Critical pressure	:	5370 kPa
Relative vapour density at 20 °C	:	1.6
Relative density	:	0.73
Density	:	668.3 kg/m³ (at 20 °C)
Relative gas density	:	1.6
Solubility	:	Water: No reliable data available.
Log Pow	:	0.1
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidising properties	:	None.
Explosive limits	:	2.7 - 32 vol %

9.2. Other information

Gas group	:	Press. Gas (Liq.)
Additional information	:	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	:	No reactivity hazard other than the effects described in sub-sections below.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	May react violently with oxidants. Can form explosive mixture with air.
Conditions to avoid	:	Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
Incompatible materials	:	Air, Oxidisers. For additional information on compatibility refer to ISO 11114.
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 (oral)	:	Not classified
Acute toxicity (dermal)	:	Not classified
Acute toxicity (inhalation)	:	Inhalation:gas: Not classified.

Dimethyl Ether (Compressed) (\f)115-10-6	
LC50 inhalation rat (mg/l)	308.5 mg/l/4h
LC50 inhalation rat (ppm)	164000 ppm/4h
ATE CA (gases)	164000.00000000 ppmv/4h
ATE CA (vapours)	308.50000000 mg/l/4h
ATE CA (dust,mist)	308.50000000 mg/l/4h

Skin corrosion/irritation	:	Not classified pH: Not applicable.
Serious eye damage/irritation	:	Not classified pH: Not applicable.
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
STOT-single exposure	:	May cause drowsiness or dizziness.
STOT-repeated exposure	:	Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Dimethyl Ether (Compressed) (115-10-6)	
LC50-96 h - fish [mg/l]	4.1 mg/l
EC50 48h - Daphnia magna [mg/l]	4.4 mg/l
EC50 72h Algae [mg/l]	No data available
EC50 96h Algae [mg/l]	155 mg/l

12.2. Persistence and degradability

Dimethyl Ether (Compressed) (115-10-6)	
Persistence and degradability	Not readily biodegradable.

12.3. Bioaccumulative potential

Dimethyl Ether (Compressed) (115-10-6)	
Log Pow	0.1
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

12.4. Mobility in soil

Dimethyl Ether (Compressed) (115-10-6)	
Log Pow	0.1
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Effect on global warming : No known effects from this product.

GWP 100 years : 1

Effect on ozone layer : None.

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste treatment methods : Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded. 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.

Additional information : None.

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

SECTION 14: Transport information

14.1. Basic shipping description

In accordance with TDG

Transportation of Dangerous Goods

UN-No. (TDG) : UN1033

TDG Primary Hazard Classes : 2.1 - Class 2.1 - Flammable Gas.

Transport Document Description : UN1033 DIMETHYL ETHER, 2.1

Proper Shipping Name : DIMETHYL ETHER

Hazard labels (TDG) : 2.1 - Flammable gases

ERAP Index : 3 000

Explosive Limit and Limited Quantity Index : 0.125 L

Excepted quantities (TDG)	:	E0
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index	:	Forbidden

14.2. Transport information/DOT - USA

Department of Transport

DOT NA no.	:	UN1033
UN-No.(DOT)	:	1033
Transport Document Description	:	UN1033 Dimethyl ether, 2.1
Proper Shipping Name (DOT)	:	Dimethyl ether Dimethylether
Contains Statement Field Selection (DOT)	:	
Class (DOT)	:	2.1 - Class 2.1 - Flammable gas 49 CFR 173.115
Division (DOT)	:	2.1
Hazard labels (DOT)	:	2.1 - Flammable gas

Dangerous for the environment	:	No
DOT Special Provisions (49 CFR 172.102)	:	T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter.
DOT Packaging Exceptions (49 CFR 173.xxx)	:	306
DOT Packaging Non Bulk (49 CFR 173.xxx)	:	304
DOT Packaging Bulk (49 CFR 173.xxx)	:	314;315
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	:	Forbidden
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	:	150 kg
DOT Vessel Stowage Location	:	B - (i) The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) ‘‘On deck only’’ on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.
DOT Vessel Stowage Other	:	40 - Stow ‘‘clear of living quarters’’
Emergency Response Guide (ERG) Number	:	115
Special transport precautions	:	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.
Other information	:	No supplementary information available.

14.3. Air and sea transport

IMDG

UN-No. (IMDG)	:	1033
Proper Shipping Name (IMDG)	:	DIMETHYL ETHER
Transport Document Description (IMDG)	:	UN 1033 DIMETHYL ETHER, 2.1
Class (IMDG)	:	2 - Gases

MFAG-No	:	115
Ship Safety Act	:	Gases under pressure/Gases flammable under pressure(Dangerous Goods Notification Schedule first second and third Article Dangerous Goods Regulations)
Port Regulation Law	:	Hazardous materials/High pressure gas (Article 21, Paragraph 2 of Law, Article 12 rule, notice attached table that defines the type of dangerous goods)

IATA

UN-No. (IATA)	:	1033
Proper Shipping Name (IATA)	:	Dimethyl ether
Transport Document Description (IATA)	:	UN 1033 Dimethyl ether, 2.1
Class (IATA)	:	2
Civil Aeronautics Law	:	Gases under pressure/Gases flammable under pressure(Hazardous materials notice Appended Table 1 Article 194 of the Enforcement Regulations)

SECTION 15: Regulatory information

15.1. National regulations

Dimethyl Ether (Compressed) (115-10-6)
Listed on the Canadian DSL (Domestic Substances List)

15.2. International regulations

Dimethyl Ether (Compressed) (115-10-6)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on Turkish inventory of chemical

SECTION 16: Other information

Date of issue	:	05/29/2017
Training advice	:	The hazard of asphyxiation is often overlooked and must be stressed during operator training.
Other information	:	This Safety Data Sheet has been established in accordance with the applicable European Union legislation.

Full text of H-statements:

H220	Extremely flammable gas
H280	Contains gas under pressure; may explode if heated
H336	May cause drowsiness or dizziness
H401	Toxic to aquatic life

SDS Canada (GHS)