

Safety Data Sheet

Dimethyl Ether


Section 1. Identification of product and company

Material name	Dimethyl ether
Synonyms	DME, Dimethyl oxide, Methyl ether, Oxybis-methane
Product use	Aerosol propellant, refrigerant, solvent, extraction agent
SDS ID number	SDS115-10-6
Supplier's details	Aerosol Supplies Australia Pty Ltd Unit 6, 36 Curtis Road Mulgrave, NSW 2756 AUSTRALIA
General telephone enquiries	+61 2 4577 8890
Emergency telephone number (24h)	+61 412 024 612

Section 2. Hazards identification

Classification of the substance	FLAMMABLE GASES - Category 1 GASES UNDER PRESSURE – Liquefied gas
---------------------------------	--

GHS label elements:

Hazard pictograms	
Signal words	Danger
Hazard statements	Extremely flammable gas. Contains gas under pressure; may explode if heated. May cause drowsiness and dizziness.

¹Precautionary statements:

Prevention	Keep away from heat, sparks, open flame and hot surfaces – No smoking. Avoid breathing gas. Wear protective gloves. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area.
Response	Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTRE or doctor / physician if you feel unwell. IF ON SKIN: Wash with plenty of water. If skin irritation occurs, get medical advice / attention. Take off contaminated clothing and wash before re-use. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice / attention.
Storage	Store in a well-ventilated place. Protect from sunlight. Keep container tightly closed. Store locked up.
Disposal	Dispose in accordance with all applicable local regulations.
Hazards not otherwise classified	Frostbite may occur from rapid evaporation of the liquefied gas.

Section 3. Composition / information on ingredients

Chemical identity	CAS Number	Proportion (%)
Dimethyl ether	115-10-6	>99.9%

Section 4. First aid measures**Description of necessary first aid measures:**

Inhalation	Symptoms: Drowsiness or dizziness; lack of breathing. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position
------------	--

	and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as collar, tie, belt or waistband.
Skin contact	Symptoms: Skin irritation; frostbite. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Get medical attention if symptoms occur. In case of contact with liquid, do not remove clothing and warm frozen tissues slowly with lukewarm water and get medical attention. Do not rub affected area. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Eye contact	Symptoms: Eye irritation; frostbite. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least ten minutes. Get medical attention if irritation occurs.
Ingestion	Symptoms: Drowsiness or dizziness; frostbite. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if adverse health effects persist or are severe. Ingestion of liquid can cause burns similar to frostbite. If frostbite occurs, get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as collar, tie, belt or waistband. As this product rapidly becomes a gas when released, refer to the inhalation section.

Most important symptoms / effects:

Acute	Central nervous system depression, frostbite.
Delayed	No information on significant delayed adverse health effects.

Medical attention and special treatment:

Notes to physicians	For inhalation, consider oxygen. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Due to a possible increased risk of cardiac dysrhythmias, catecholamine drugs such as epinephrine should only be used with extreme caution.
---------------------	---

Section 5. Fire-fighting measures

Suitable extinguishing equipment	Suitable: Carbon dioxide, regular dry chemical. For large fires flood with fine water spray. Unsuitable: None known.
----------------------------------	---

Specific hazards arising from the chemical	<p>Specific hazards: Contains extremely flammable gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapour / gas is heavier than air and will spread along the ground. Gas may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back, causing fire or explosion. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.</p> <p>Hazardous combustion products: Formaldehyde, oxides of carbon, peroxides, carbon dioxide, carbon monoxide.</p>
Special protective equipment and precautions for fire fighters	<p>Special protective equipment for fire fighters: Fire fighters should wear full protective fire fighting gear including self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.</p> <p>Special protective precautions for fire fighters: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.</p>

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	<p>For non-emergency personnel: Accidental release poses a serious fire or explosion hazard. No action shall be taken involving any personal risk without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate air-supplied respirator when ventilation is inadequate. Wear appropriate personal protective equipment as specified in Section 8. Notify Fire Brigade, Police and Emergency Services where leakage cannot be contained, or where there is a risk of escalation to multiple cylinders coming under threat.</p> <p>For emergency personnel:</p>
---	---

	If specialised clothing is required to deal with the spillage, take note of information in Section 8 on suitable and unsuitable materials. See also the information above for “non-emergency personnel”.
Environmental precautions	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Although small liquid spills will rapidly evaporate to the air, inform the relevant authorities if the product has caused environmental pollution by entering sewers, waterways, soil or air.
Methods and materials for containment and cleaning up	<p>Small spills: Stop leak if possible without personal risk, using spark-proof tools and explosion-proof equipment. Small liquid spills will evaporate rapidly to the air, so adequate ventilation of the affected area should be ensured prior to re-entry of personnel.</p> <p>Large spills: Immediately contact emergency services. Stop leak if possible without personal risk, using spark-proof tools and explosion-proof equipment. Reduce vapours with water spray, and ventilate any closed spaces before re-entering. Note Section 1 for emergency contact information, and Section 13 for waste disposal.</p>

Section 7. Handling and storage

Precautions for safe handling	<p>Protective measures: Put on appropriate personal protective equipment (see Section 8). Do not get in eyes, or on skin or clothing. Avoid breathing gas. Use only with adequate ventilation, or use an appropriate supplied-air respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical equipment (ventilating, lighting and material handling). Use only non-sparking tools. Empty containers contain product residue under pressure and can be hazardous. Do not puncture or incinerate containers. Use equipment properly rated for cylinder pressures. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide or drop cylinders. Use a suitable hand truck, or appropriate materials handling equipment for container movement.</p> <p>Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is stored, handled and processed. Workers should wash hands and face before eating, drinking and smoking. Remove any contaminated clothing or PPE before entering eating areas. See also Section 8 for additional hygiene measures.</p>
Conditions for safe storage, including any incompatibilities	Store in accordance with local regulations. Store in an approved segregated and secured area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials such as combustible materials, halogens, oxidising materials and strong

	acids (see Section 10). Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright and firmly secured to prevent falling or being knocked over.
--	---

Section 8. Exposure controls and personal protection

Exposure standards:

(Safe Work Australia, *Workplace Exposure Standards for Airborne Contaminants*, 2013)

Chemical name	CAS number	TWA (ppm)	TWA (mg/m3)	STEL (ppm)	STEL (mg/m3)
Dimethyl ether	115-10-6	400	760	500	950

Exposure control measures	Emissions from work process equipment and ventilation should be checked to ensure legislative compliance on emissions, as well as the listed exposure standards. In some cases, it may be necessary to implement engineering controls to minimise exposure.
Biological monitoring	There are no known biological limit values for the product.
Control banding	There are no known control banding recommendations for the product, beyond the exposure controls and PPE recommendations described in the SDS.
Engineering controls	Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below the recommended or statutory limits. The engineering controls also need to keep gas concentrations below the lower explosive limits. Use explosion-proof ventilation equipment.
Individual protection measures	<p>Eye and face protection: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or gases. If contact is possible, safety glasses with side-shields should be worn as a minimum, unless the assessment indicates a higher degree of protection requiring goggles and/or a faceshield (refer AS/NZS 1337). Provide an emergency eye-wash fountain and quick drench shower in the immediate work area.</p> <p>Skin protection (hands): Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling, where a risk assessment indicates this is necessary. If contact with the liquid is possible, insulated gloves suitable for low temperature should be worn (refer AS/NZS 2161.1.2016).</p> <p>Skin protection (body):</p>

	<p>Where there is a risk of liquid contact with the skin, operators should wear appropriate protective, cold-insulating clothing. Where there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves. When handling cylinders, fully enclosed safety boots should be worn.</p> <p>Respiratory protection: None required if engineering, storage and handling controls are adequate. Where a risk assessment indicates it is necessary, or where STEL exposure standards may be exceeded, use a properly fitted half- or full-faced respirator suitable for organic vapours. For high concentrations or when operating in enclosed areas where there is a risk of asphyxiation, self-contained air-supplied breathing apparatus must be worn (refer AS/NZS 1715 and 1716).</p> <p>Thermal Hazards: Principal thermal hazards arise from contact with liquid product having the potential to freeze body tissues. Refer to the above eye/face and skin/body protective equipment recommendations to minimise exposure.</p>
--	---

Section 9. Physical and chemical properties

Appearance	Colourless, liquefied gas	Structural formula	CH ₃ -O-CH ₃
Odour	Mild, chloroform-like, slightly ethereal odour	Molecular weight	46.07
Odour threshold	None specified	Specific gravity	0.66 at 20°C (liquid) 1.617 at 20°C (gas, Air = 1)
pH	None specified for gas	Solubility in water	45.6 g/l (at 25°C and 1 atm.)
Melting point / freezing point	-141.5°C	Partition coefficient	POW 0.07 at 25°C (n-octanol/water)
Boiling point	-24.8°C		
Flash point	-41.1°C closed cup		
Evaporation rate	None specified		
Flammability	Flammable gas DOT 2.1		
Upper/lower flammability limits	3.4% LEL (v% in air) 18.2% UEL (v% in air)		
Vapour pressure	63.03 psig at 21.1°C (70°F)		
Vapour density	1.6 (Air = 1)		
Auto-ignition temperature	350°C		
Critical temperature	126.9°C		
Critical density	0.242 g/ml		
Critical pressure	777.5 psig (5.361 MPa)		

Section 10. Stability and reactivity

Reactivity	Extremely flammable gas.
Chemical stability	The product is chemically stable under normal ambient conditions of storage and use.
Possibility of hazardous reactions	Vapours may form explosive mixtures with air. Will not polymerise.
Conditions to avoid	Avoid excess heat and all possible ignition sources (spark or flame). For containers, do not cut, weld, braze, solder, drill, grind or expose to heat or sources of ignition. Do not allow gas to accumulate in low or confined spaces.
Incompatible materials	Combustible materials, halogens, oxidising materials and oxidising metals, acid anhydrides, strong acids, carbon monoxide, acetic anhydride, powdered metals.
Hazardous decomposition products	Hazardous thermal decomposition products may include formaldehyde, carbon dioxide, carbon monoxide, methanol, peroxides.

Section 11. Toxicological information

Acute toxicity	<p>Acute oral toxicity: Ingestion of liquid highly unlikely, as vaporises rapidly. Acute oral effects likely to be frostbite to exposed tissues.</p> <p>Acute inhalation toxicity: LC50 Inhalation Gas – Rat – 164,000ppm – 4 hours exposure LC50 Inhalation Vapour – Rat – 309g/m³ – 4 hours exposure</p> <p>Acute dermal toxicity: No information is available. Acute dermal effects likely to be from contact with liquid dimethyl ether causing frostbite to exposed tissues.</p>
Skin corrosion / irritation	<p>Classification: Not classified as a skin irritant. Not expected to cause skin irritation based on expert review of the properties of the substance. Contact of liquid dimethyl ether with the skin may cause frostbite to exposed tissues.</p>
Serious eye damage / irritation	<p>Classification: Not classified as an eye irritant. Not expected to cause eye irritation based on expert review of the properties of the substance. Contact of liquid dimethyl ether with the eyes may cause frostbite to exposed tissues.</p>

Respiratory or skin sensitisation	Classification: Not classified as a skin sensitiser. Not expected to cause sensitisation based on expert review of the properties of the substance. There are no reports of human skin or respiratory sensitisation.
Germ cell mutagenicity	Not classified as a mutagen. Tests on bacterial or mammalian cell cultures did not show mutagenic effects (Dupont).
Carcinogenicity	Not classified as a carcinogen.
Reproductive toxicity	No toxicity to reproduction. Evidence suggests the substance is not a reproductive toxin in animals (Dupont).
Specific Target Organ Toxicity (STOT) - single exposure	Asphyxiant gas. Symptoms of exposure are directly related to displacement of oxygen from air. Low vapour concentrations may cause nausea, dizziness, headaches and drowsiness. High vapour concentrations may produce symptoms of oxygen deficiency which, coupled with central nervous system depression, may lead to rapid loss of consciousness, asphyxiation and fatal arrhythmia. May have a narcotic effect if high concentrations of vapours are inhaled.
Specific Target Organ Toxicity (STOT) - repeated exposure	Not classified as causing organ effects from repeated exposure.
Aspiration hazard	Not classified as an aspiration hazard.
Further information	Routes of entry anticipated: inhalation. May cause cardiac arrhythmia. Cardiac sensitisation threshold limit: 376,850 mg/m ³ (Dupont). Rapid evaporation of the liquid may cause frostbite.

Section 12. Ecological information

Ecotoxicity	<p>96 h LC50 <i>Poecilia reticulata</i> (guppy) > 4,000 mg/l</p> <p>96 h EC50 <i>Pseudokirchneriella subcapitata</i> (green algae) 157.9 mg/l</p> <p>48 h LC50 Daphnia (water flea) > 4,000 mg/l</p> <p>48 h EC50 Daphnia (water flea) 755.5 mg/l</p>
Persistence and degradability	The substance will vapourise rapidly when released to the atmosphere. This substance is not considered to be persistent, bio-accumulating nor toxic (PBT).
Bioaccumulative potential	This substance is not considered to be persistent, bio-accumulating nor toxic (PBT).

Mobility in soil	The substance is a gas at room temperatures. Spillages of liquid to soils will rapidly evaporate to the atmosphere. Soil/water partition coefficient (K_{oc}) = 7,759.
Other adverse effects	The substance does not harm the ozone layer (zero ozone depletion potential or ODP).

Section 13. Disposal considerations

Disposal containers and methods	Cylinders are re-usable, and should be returned to the manufacturer or supplier for disposal. Do not attempt to clean out containers.
Physical/chemical properties affecting disposal options	Empty cylinders or vessels may contain some remaining product, which is highly flammable. Do not pressurise, cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks and other sources of ignition, as they may explode and cause injury or death.
Effects of sewage disposal	Liquid spills of the substance will rapidly evaporate to the atmosphere, and it is not capable of being disposed of through sewerage lines.
Special precautions for incineration or landfill	DME cylinders or vessels should never be inadvertently disposed of in any landfill facility without being rendered visually and physically unusable before disposal.

Section 14. Transport information

UN number	1033
Proper shipping name	Dimethyl Ether
Transport hazard class	2.1 No subsidiary risks allocated.
Packing group	None allocated.
Environmental hazards for transport purposes	The substance is not a known marine pollutant according to the IMDG Code.
Special precautions for user	Refer to ADG Code for detailed and specific restrictions.
Additional information	Transport of the substance is controlled in accordance with the requirements of the ADG Code and the National Transport Commission Load Restraint Guide.
Hazchem or Emergency Action code	2YE

Section 15. Regulatory information

Poisons schedule	None allocated to this substance using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).
AICS	All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

Section 16. Other information**SDS Issue Date: 13th April 2021.**

Revised for compliance to GHS and the Safe Work Australia “Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice, February 2016”

The SDS is issued in accordance with Safe Work Australia codes of practice, and the information must not be altered or deleted in any way.

Abbreviations and acronyms:

ADG Code = Australian Code for the Transport of Dangerous Goods by Road and Rail

CAS Number = Chemical Abstracts Service Registry Number

GHS = Globally Harmonised System of Classifying and Labelling of Chemicals (published by the United Nations)

ppm = parts per million

SDS = Safety Data Sheet

TLV = Threshold Limit Value

TWA = Time weighted average

STEL = Short-term Exposure Limit

UN Number = United Nations number, a four digit number assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods

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.

Safety Data Sheet receipt acknowledgement:

I hereby acknowledge that I have been provided with a copy of the Aerosol Supplies Australia Safety Data Sheet for Dimethyl ether, Version 12, dated 13th April 2021.

Name:

Title:

Company:

Signature:

Date:
