# **SAFETY DATA SHEET**

**Dimethyl Ether** 

# Section 1. Identification

GHS product identifier	: Dimethyl Ether
Chemical name	: dimethyl ether
Other means of identification	<ul> <li>Methane, 1,1'-oxybis-; Methane, oxybis-; Methyl ether; oxybismethane; DME; Methoxymethane; Wood ether; Ether, Dimethyl; Dimethyl oxide; N,N-dimethyl ether; DIMETHYL ETHER PROPELLANT</li> </ul>
Product type	: Gas.
Product use	: Synthetic/Analytical chemistry.
Synonym	: Methane, 1,1'-oxybis-; Methane, oxybis-; Methyl ether; oxybismethane; DME; Methoxymethane; Wood ether; Ether, Dimethyl; Dimethyl oxide; N,N-dimethyl ether; DIMETHYL ETHER PROPELLANT
SDS #	: 001021
Supplier's details	: Chengdu Hongjin Chemical Co.,Ltd Room 402, Xixi Central International, Chenghua District, Chengdu City

**24-hour telephone** : 028-84791130

# Section 2. Hazards identification

OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	: FLAMMABLE GASES - Category 1 GASES UNDER PRESSURE - Liquefied gas SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3
GHS label elements	
Hazard pictograms	
Signal word	: Danger
Hazard statements	: Extremely flammable gas. May form explosive mixtures with air. Contains gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation. May cause drowsiness or dizziness.
Precautionary statements	
General	: Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position. Approach suspected leak area with caution.
Prevention	: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only outdoors or in a well-ventilated area. Avoid breathing gas.
Response	: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.
Storage	: Store locked up. Protect from sunlight. Store in a well-ventilated place.
Date of issue/Date of revision	: 6/11/2019 Date of previous issue : No previous validation Version : 1 1/11

### Section 2. Hazards identification

Disposal	: Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazards not otherwise classified	: In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.

### Section 3. Composition/information on ingredients

Substance/mixture	: Substance
Chemical name	: dimethyl ether
Other means of identification	<ul> <li>Methane, 1,1'-oxybis-; Methane, oxybis-; Methyl ether; oxybismethane; DME; Methoxymethane; Wood ether; Ether, Dimethyl; Dimethyl oxide; N,N-dimethyl ether; DIMETHYL ETHER PROPELLANT</li> </ul>
Product code	: 001021

#### **CAS number/other identifiers**

CAS number	: 115-10-6		
Ingredient name		%	CAS number
dimethyl ether		100	115-10-6

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

### Section 4. First aid measures

#### **Description of necessary first aid measures**

Eye contact	mmediately 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 10 minutes. Get medical attention if irritation occurs.	
Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If is s suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.	< It
Skin contact	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. Wash clothing before reuse. Clean shoes thoroughly before reuse.	
Ingestion	As this product is a gas, refer to the inhalation section.	
Most important symptoms/ef	s, acute and delayed	
Potential acute health effec		
Eye contact	No known significant effects or critical hazards.	
Inhalation	Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness.	
Skin contact	No known significant effects or critical hazards.	
Frostbite	Fry to warm up the frozen tissues and seek medical attention.	
Ingestion	Can cause central nervous system (CNS) depression. As this product is a gas, refer t he inhalation section.	0
Over-exposure signs/sympt		
Eye contact	No specific data.	

 Date of issue/Date of revision
 : 6/11/2019
 Date of previous issue
 : No previous validation
 Version
 : 1

2/11

Inhalation	: Adverse symptoms may include the following:, nausea or vomiting, headache, drowsiness/fatigue, dizziness/vertigo, unconsciousness
Skin contact	: No specific data.
Ingestion	: No specific data.
Notes to physician	: Treat symptomatically. Contact poison treatment specialist immediately if large
	quantities have been ingested or inhaled.
Specific treatments	<ul><li>quantities have been ingested or inhaled.</li><li>No specific treatment.</li><li>No action shall be taken involving any personal risk or without suitable training. If it is</li></ul>

#### See toxicological information (Section 11)

Section 5. Fire-fighting measures

#### Extinguishing media Suitable extinguishing : Use an extinguishing agent suitable for the surrounding fire. media **Unsuitable extinguishing** : None known. media Specific hazards arising : Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a from the chemical pressure increase will occur and the container may burst, with the risk of a subsequent explosion. **Hazardous thermal** : Decomposition products may include the following materials: carbon dioxide decomposition products carbon monoxide **Special protective actions** : Promptly isolate the scene by removing all persons from the vicinity of the incident if for fire-fighters 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. : Fire-fighters should wear appropriate protective equipment and self-contained breathing **Special protective** apparatus (SCBA) with a full face-piece operated in positive pressure mode. equipment for fire-fighters

### Section 6. Accidental release measures

Personal precautions, protec	tiv	e equipment and emergency procedures
For non-emergency personnel	:	Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	:	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	:	Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Date of issue/Date of revision

### Section 6. Accidental release measures

#### Methods and materials for containment and cleaning up

Small spill	: Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.
Large spill	: Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

# Section 7. Handling and storage

Precautions for safe handling	1	
Protective measures	:	Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement. Use only non-sparking tools. Avoid contact with eyes, skin and clothing. Empty containers retain product residue and can be hazardous. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.
Advice on general occupational hygiene	:	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	:	Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F). Store locked up. Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use.

### Section 8. Exposure controls/personal protection

#### **Control parameters**

#### **Occupational exposure limits**

Ingredient name		Exposure limits	
dimethyl ether		AIHA WEEL (United States, 10/2011). TWA: 1000 ppm 8 hours.	
Appropriate engineering controls	other engineering controls to keep recommended or statutory limits.	Use process enclosures, local exhaust ventilation or worker exposure to airborne contaminants below any The engineering controls also need to keep gas, any lower explosive limits. Use explosion-proof	
Environmental exposure controls	they comply with the requirements cases, fume scrubbers, filters or er	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.	
Individual protection meas	<u>ures</u>		
Hygiene measures	eating, smoking and using the lava Appropriate techniques should be u	oroughly after handling chemical products, before tory and at the end of the working period. used to remove potentially contaminated clothing. e reusing. Ensure that eyewash stations and safety	

4/11

showers are close to the workstation location.

# Section 8. Exposure controls/personal protection

-	
Eye/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, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.
Skin protection	
Hand protection	: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
Body protection	: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear antistatic protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.
Other skin protection	: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	: Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

# Section 9. Physical and chemical properties

<u>Appearance</u>		
Physical state	Gas.	
Color	Colorless.	
Odor	Characteristic.	
Odor threshold	Not available.	
рН	Not available.	
Melting point	-141.5°C (-222.7°F)	
Boiling point	-24.82°C (-12.7°F)	
Critical temperature	126.95°C (260.5°F)	
Flash point	Closed cup: -41.11°C (-42°F)	
Evaporation rate	Not available.	
Flammability (solid, gas)	Not available.	
Lower and upper explosive	Lower: 3.3%	
(flammable) limits	Upper: 26.2%	
Vapor pressure	62.3 (psig)	
Vapor density	1.6 (Air = 1)	
Specific Volume (ft <sup>3</sup> /lb)	8.1833	
Gas Density (lb/ft <sup>3</sup> )	0.1222	
Relative density	Not applicable.	
Solubility	Not available.	
Solubility in water	45.6 g/l	
Partition coefficient: n- octanol/water	0.07	
Auto-ignition temperature	350°C (662°F)	
Decomposition temperature	Not available.	
Viscosity	Not applicable.	
Data of issue/Data of revision	(11/2010 Date of provious issue	5/11

Date o	f issue	/Date of	revision

### Section 9. Physical and chemical properties

Flow time (ISO 2431)	: Not available.
Molecular weight	: 46.08 g/mole
Aerosol product	
Heat of combustion	: -31284700 J/kg

# Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
Incompatible materials	: Oxidizers
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

### Section 11. Toxicological information

#### Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
dimethyl ether	LC50 Inhalation Gas. LC50 Inhalation Gas. LC50 Inhalation Vapor	Rat		1 hours 4 hours 4 hours

#### Irritation/Corrosion

Not available.

#### **Sensitization**

Not available.

#### **Mutagenicity**

Not available.

#### **Carcinogenicity**

Not available.

#### **Reproductive toxicity**

Not available.

#### **Teratogenicity**

Not available.

#### Specific target organ toxicity (single exposure)

Name		Route of exposure	Target organs
dimethyl ether	Category 3	Not applicable.	Narcotic effects

# Section 11. Toxicological information

Specific target organ toxicity (repeated exposure)

Not available.

#### **Aspiration hazard**

Not available.

Information on the likely	: Routes of entry anticipated: Inhalation.
routes of exposure	
Potential acute health effects	<u>&gt;</u>
Eye contact	: No known significant effects or critical hazards.
Inhalation	: Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness.
Skin contact	: No known significant effects or critical hazards.
Ingestion	: Can cause central nervous system (CNS) depression. As this product is a gas, refer to the inhalation section.
Symptoms related to the phy	vsical, chemical and toxicological characteristics
Eye contact	: No specific data.
Inhalation	: Adverse symptoms may include the following:, nausea or vomiting, headache, drowsiness/fatigue, dizziness/vertigo, unconsciousness
Skin contact	: No specific data.
Ingestion	: No specific data.
Delayed and immediate effect Short term exposure	ts and also chronic effects from short and long term exposure
Potential immediate effects	: Not available.
Potential delayed effects	: Not available.
Long term exposure	
Potential immediate effects	: Not available.
Potential delayed effects	: Not available.
Potential chronic health eff	<u>ects</u>
Not available.	
General	: No known significant effects or critical hazards.
Carcinogenicity	: No known significant effects or critical hazards.
Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: No known significant effects or critical hazards.
<b>Developmental effects</b>	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.

#### Numerical measures of toxicity

Acute toxicity estimates Not available.

## Section 12. Ecological information

#### **Toxicity**

Not available.

#### Persistence and degradability

Not available.

#### **Bioaccumulative potential**

Product/ingredient name	LogPow	BCF	Potential
dimethyl ether	0.07	-	low

#### **Mobility in soil**

Soil/water partition	: Not available.
coefficient (Koc)	

Other adverse effects : No known significant effects or critical hazards.

### Section 13. Disposal considerations

Disposal methods	The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.
------------------	---

# Section 14. Transport information

	DOT	TDG	Mexico	IMDG	ΙΑΤΑ
UN number	UN1033	UN1033	UN1033	UN1033	UN1033
UN proper shipping name	DIMETHYL ETHER	DIMETHYL ETHER	DIMETHYLETHERS	DIMETHYL ETHER	DIMETHYL ETHER
Transport hazard class(es)	2.1	2.1	2.1	2.1	2.1
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

#### Additional information

**DOT Classification** 

: Limited quantity Yes.

Quantity limitation Passenger aircraft/rail: Forbidden. Cargo aircraft: 150 kg. Special provisions T50

Date of issue/Date of revision	: 6/11/2019	Date of previous issue	: No previous validation	Version : 1	8/11
--------------------------------	-------------	------------------------	--------------------------	-------------	------

# Section 14. Transport information

•		
TDG Classification	:	Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2). Explosive Limit and Limited Quantity Index 0.125 ERAP Index 3000 Passenger Carrying Ship Index Forbidden Passenger Carrying Road or Rail Index Forbidden
ΙΑΤΑ	:	Quantity limitation Passenger and Cargo Aircraft: Forbidden. Cargo Aircraft Only: 150 kg.
Special precautions for user	:	<b>Transport within user's premises:</b> always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.
Transport in bulk according to Annex II of MARPOL and the IBC Code	:	Not available.

# Section 15. Regulatory information

U.S. Federal regulations	TSCA 8(a) CDR Exempt/Partial exemption: Not determined				
	Clean Air Act (CAA) 112 regulated flammable substances: dimethyl ether				
Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)	Not listed				
Clean Air Act Section 602 Class I Substances	: Not listed				
Clean Air Act Section 602 Class II Substances	: Not listed				
DEA List I Chemicals (Precursor Chemicals)	: Not listed				
DEA List II Chemicals (Essential Chemicals)	: Not listed				
SARA 302/304					
Composition/information	on ingredients				
No products were found.					
SARA 304 RQ <u>SARA 311/312</u>	: Not applicable.				
Classification	: Refer to Section 2: Hazards Identification of this SDS for classification of substance.				
State regulations					
Massachusetts	: This material is listed.				
New York	: This material is not listed.				
New Jersey	: This material is listed.				
Pennsylvania	: This material is listed.				
International regulations					
Chemical Weapon Convention List Schedules I, II & III Chemicals					
Not listed.					
Montreal Protocol (Annex	es A, B, C, E)				
Not listed.					
Stockholm Convention on	Persistent Organic Pollutants				
Not listed.					
Rotterdam Convention on Prior Informed Consent (PIC)					
Date of issue/Date of revision	: 6/11/2019 Date of previous issue : No previous validation Version : 1 9/11				

### Section 15. Regulatory information

Not listed.

#### **UNECE Aarhus Protocol on POPs and Heavy Metals**

Not listed.

Inventory list	
Australia	: This material is listed or exempted.
Canada	: This material is listed or exempted.
China	: This material is listed or exempted.
Europe	: This material is listed or exempted.
Japan	: Japan inventory (ENCS): This material is listed or exempted. Japan inventory (ISHL): This material is listed or exempted.
Malaysia	: Not determined.
New Zealand	: This material is listed or exempted.
Philippines	: This material is listed or exempted.
Republic of Korea	: This material is listed or exempted.
Taiwan	: This material is listed or exempted.
Thailand	: Not determined.
Turkey	: This material is listed or exempted.
United States	: This material is listed or exempted.
Viet Nam	: Not determined.

# Section 16. Other information

#### Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

#### National Fire Protection Association (U.S.A.)



Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

#### Procedure used to derive the classification

## Section 16. Other information

	Classification	Justification	
FLAMMABLE GASES - Category 1 GASES UNDER PRESSURE - Liquefied gas SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3		Expert judgment Expert judgment Expert judgment	
<u>History</u>			
Date of printing	: 6/11/2019		
Date of issue/Date of revision	: 6/11/2019		
Date of previous issue	: No previous validation		
Version	: 1		
Key to abbreviations	ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = International Air Transport Association IBC = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United Nations		
References	: Not available.		

#### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.