Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, 2001/58 & 1272/2008/EC Standards	SDS Revision: 1	SDS Revision Date: 12/17/2021

1. PRODUCT & COMPANY IDENTIFICATION

1.1	**Product Name:**	**Propane+rDME (4%)**
1.2	**Chemical Name:**	Propane/Dimethyl Ether
1.3	**Synonyms:**	Propane/Dimethyl Ether
1.4	**Trade Names:**	Propane/DME
1.5	**Product Use:**	Fuel
1.6	**Distributor's Name:**	Oberon Fuels
1.7	**Distributor's Address:**	845 15th Street, Suite 103, #49216, San Diego, CA 92101
1.8	**Emergency Phone:**	**CHEMTREC: +1 (703) 527-3887 / +1 (800) 424-9300 (CCN 697087)**
1.9	**Business Phone / Fax:**	+1 (619) 255-9361

2. HAZARDS IDENTIFICATION

2.1	**Classification of Substance or Mixture:**	This product is classified as a hazardous substance and as dangerous goods according to the classification criteria of [NOHSC: 1088 (2004)] and ADG Code (Australia). **DANGER! EXTREMELY FLAMMABLE GAS. CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED.** Hazard Statements (H): H220 – Extremely flammable gas. H280 – Contains gas under pressure; may explode if heated. Precautionary Statements (P): P210 – Keep away from heat/sparks/open flames/hot surfaces – No Smoking. P410 + P403 – Protect from sunlight. Store in a well-ventilated place.
2.2	**Label Elements:**	GHS-US Labeling Hazard Pictograms (GHS-US)  GH S02 GH SO4 Single Word (GHS-US): Danger
2.3	**Other Hazards:**	Ingestion: Ingestion of the gas is unlikely. Eyes: Irritation, frostbite, swelling, redness. Skin: Irritation and frostbite at the site of contact. Inhalation: Irritation, cough, difficulty breathing, headache, drowsiness, dizziness, loss of coordination, blurred vision, and unconsciousness.
2.4	**Acute Health Effects:**	Contact with rapidly expanding gas may cause burns or frostbite. Acts as a simple asphyxiant.
2.5	**Chronic Health Effects:**	NA
2.6	**Target Organs:**	Eyes, skin, respiratory system.

NA = Not Available; ND = Not Determined; NE = Not Established; NF = Not Found; C = Ceiling Limit; See Section 16 for Additional Definitions of Terms
Used NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-2010 format.

3. COMPOSITION & INGREDIENT INFORMATION

3.1	**Substance**			
3.2	**Mixture**			
	Name	**Product Identifier (CAS No)**	**Percentage (%)**	**Classification (GHS-US)**
	Propane	74-98-6	>91	Simple Asphyxiant: Flammable Gas 1, H220; Liquid Gas, H280
	Dimethyl Ether	115-10-6	<5	Flammable Gas 1, H220; Liquid Gas, H280; STOT SE3, H336
	Isobutane	75-28-5	<3	Simple Asphyxiant: Flammable Gas 1, H220; Liquid Gas, H280
	Ethane	74-84-0	<1	Simple Asphyxiant: Flammable Gas 1, H220; Liquid Gas, H280

4. FIRST AID MEASURES

4.1	First Aid Measures:	**General**: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention. **After Inhalation**: Obtain medical attention if breathing difficulty persists. First, take proper precautions to ensure your own safety before attempting rescue (e.g., wear appropriate respiratory protective equipment, use the buddy system), then remove the exposed person to fresh air. Keep at rest in a position comfortable for breathing. **After Skin Contact**: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists. Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention. **After Eye Contact**: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention. **After Ingestion**: Rinse mouth. Do NOT induce vomiting. Obtain medical attention.
4.2	Most important symptoms and effects, both acute and delayed:	**Symptoms/Injuries:** May cause frostbite on contact with the liquid. Asphyxia by lack of oxygen: risk of death. **Symptoms/Injuries After Inhalation:** In elevated concentrations may cause asphyxiation, central nervous system effects, and increased breathing rate. Symptoms of asphyxiation include headache, dizziness, rapid breathing, increased pulse, mood changes, tremors, cyanosis, muscular weakness, narcosis, numbness of the extremities, unconsciousness, and death. **Symptoms/Injuries After Skin Contact:** Contact with gas/liquid escaping the container can cause frostbite and freeze burns. **Symptoms/Injuries After Eye Contact:** Contact with gas/liquid escaping the container can cause frostbite, freeze burns, and permanent eye damage. **Symptoms/Injuries After Ingestion:** Not considered a potential route of exposure but contact with gas/liquid escaping the container can cause freeze burns and frostbite. **Chronic Symptoms:** None expected under normal conditions of use.
4.3	Indication of Any Immediate Medical Attention and Special Treatment Needed	If exposed or concerned, get medical advice and attention. If medical advice is needed, have SDS available.

5. FIREFIGHTING MEASURES

5.1	Extinguishing Media	**Suitable Extinguishing Media:** Do not extinguish burning gas if flow cannot be shut off immediately. Extinguish secondary FIRES with appropriate materials. **Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.
5.2	Special Hazards Arising from the Substance or Mixture	**Fire Hazard:** Extremely flammable gas. **Explosion Hazard:** May form flammable/explosive vapor-air mixture. Container may explode in heat of fire. **Reactivity:** Hazardous reactions will not occur under normal conditions.
5.3	Advice for Firefighters	**Precautionary Measures Fire:** Exercise caution when fighting any chemical fire. **Firefighting Instructions:** Use water spray or fog for cooling exposed containers. Leaking gas fire: Do not extinguish unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. Fight fire remotely due to the risk of explosion. **Protection During Firefighting:** Do not enter fire area without proper protective equipment, including respiratory protection. **Other Information:** Use water spray to disperse vapors. Do not allow run-off from firefighting to enter drains or water courses. Stop flow of product if safe to do so.

6. ACCIDENTAL RELEASE MEASURES

6.1	Personal Precautions, Protective Equipment and Emergency Procedures	**General Measures**: Eliminate every possible source of ignition. Do not breathe gas. **For Non-emergency Personnel** **Protective Equipment:** Use appropriate personal protection equipment (PPE). **Emergency Procedures:** Evacuate unnecessary personnel. **For Emergency Responders** **Protective Equipment:** Equip cleanup crew with proper protection. **Emergency Procedures:** Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Evacuate unnecessary personnel, isolate, and ventilate area. Ventilate area.
6.2	Environmental Precautions	Prevent entry to sewers and public waters. Avoid release to environment.
6.3	Methods and Material for Containment and Cleanup	Stop leak, if possible, without risk. As an immediate precautionary measure, isolate spill, or leak area in all directions. Consider the use of water spray to disperse vapors. Isolate the area until gas has dispersed. Ventilate and gas test area before entering.

7. HANDLING & STORAGE INFORMATION

7.1	Precautions for Safe Handling:	Use only with adequate ventilation. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. High pressure gas. Do not puncture or incinerate container.
7.2	Storage & Handling:	Use equipment rated for cylinder pressure. Close valve after each use and when empty. Keep container closed. Keep away from heat, sparks and flame. To avoid fire, eliminate ignition sources. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Segregate from oxidizing materials. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. **Special Precautions:** Ethyl mercaptan might, under certain conditions (when oxygen, water, iron oxide or other oxidizers are present in containers and piping) react with oxidizers which diminish or eliminate entirely its distinct smell, thereby reducing or eliminating the ability of a person to detect a leak. The passage of odorized propane through soil because of an underground leak will also diminish or eliminate entirely the smell of odorized propane. If you suspect a leak, use a combustible gas indicator or similar device to check for gas leaks.
7.3	Specific End Use(s):	Fuel

8. EXPOSURE CONTROLS & PERSONAL PROTECTION

8.1	Control Parameters:	For substances listed in section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), or OSHA (PEL).

Propane (74-98-6)		
USA NIOSH	NIOSH REL (TWA) (mg/m³)	1800 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	1000 ppm
USA IDLH	US IDLH (ppm)	2100 ppm (10% LEL)
USA OSHA	OSHA PEL (TWA) (mg/m³)	1800 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm
Dimethyl Ether (115-10-6)		
USA ACGIH	Not Established	
USA OSHA	Not Established	

8. EXPOSURE CONTROLS & PERSONAL PROTECTION(Cont'd)

Isobutane (75-28-5)		
USA ACGIH	ACGIH STEL (ppm)	1000 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m³)	1900 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	800 ppm
Ethane (74-84-0)		
USA ACGIH	Not Established	
USA OSHA	Not Established	

8.2	**Exposure Controls** Engineering Controls:	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed. Gas detectors should be used when flammable gases or vapors may be released. Use explosion-proof equipment. Oxygen detectors should be used when asphyxiating gases may be released.
	Personal Protective Equipment:	Gloves. Protective clothing. Protective goggles. Insufficient ventilation: wear respiratory protection. 
	Materials for Protective Clothing:	Wear fire/flame resistant/retardant clothing.
	Hand Protection:	Wear protective gloves.
	Eye Protection:	Chemical safety goggles.
	Skin and Body Protection:	Wear suitable protective clothing
	Respiratory Protection:	Use a NIOSH-approved self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits.
	Thermal Hazard Protection:	Wear thermally resistant protective clothing.
	Other Information:	When using, do not eat, drink, or smoke.

9. PHYSICAL & CHEMICAL PROPERTIES

9.1	Appearance:	Liquefied gas
9.2	Odor:	Ethereal Sulfur (rotten eggs) odor
9.3	Odor Threshold:	NA
9.4	pH:	NA
9.5	Melting Point/Freezing Point:	-300.1 °F
9.6	Initial Boiling Point/Boiling Range:	-41.5°F
9.7	Flashpoint:	-137.0°F
9.8	Upper/Lower Flammability Limits:	9.7%/2.4%
9.9	Vapor Pressure:	107.4 psia @ 60°F
9.10	Vapor Density:	1.539 @ 20°C
9.11	Relative Liquid Density:	0.5154 @ 60°F
9.12	Solubility:	NA
9.13	Partition Coefficient (log P_{ow}):	NA
9.14	Autoignition Temperature:	446 °C
9.15	Decomposition Temperature:	NA
9.16	Viscosity:	NA
9.17	Other Information:	NA

10. STABILITY & REACTIVITY

10.1	Reactivity:	Hazardous reactions will not occur under normal conditions.
10.2	Chemical Stability:	Contains gas under pressure; may explode if heated.
10.3	Possibility of Hazardous Reactions:	Under normal conditions of storage and use, hazardous polymerization will not occur.
10.4	Conditions to Avoid:	Heat, flames, and sparks. Extremes of temperature and direct sunlight.
10.5	Incompatible Substances:	Strong acids, strong bases, strong oxidizers.
10.6	Hazardous decomposition Products:	Normal combustion produces carbon dioxide; incomplete combustion can produce carbon monoxide.

11. TOXICOLOGICAL INFORMATION

11.1	Toxicological Effects	Acute Toxicity: Not classified

Propane (74-98-6)	
LC50 Inhalation Rat	658 mg/l/4h
Dimethyl Ether (115-10-6)	
LC 50 inhalation rat (ppm)	163754 ppm/1h
ATE US (vapors)	308.5 mg/l/4h
ATE US (dust, mist)	308.5 mg/l/4h
Isobutane (75-28-5)	
LC50 Inhalation Rat	658 mg/l/4h
LC50 Inhalation Rat	11000 ppm
Ethane (74-84-0)	
ATE US (vapors)	658 mg/l/ hr.
ATE US (dust, mist)	658 mg/l/ hr.
LC 50 Inhalation- Rat	658 mg/l/ hr.

Skin Corrosion/Irritation: Not classified

Serious Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: Notclassified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

11. TOXICOLOGICAL INFORMATION (cont'd)

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: In elevated concentrations may cause asphyxiation, central nervous system effects, and increased breathing rate. Symptoms of asphyxiation include headache, dizziness, rapid breathing, increased pulse, mood changes, tremors, cyanosis, muscular weakness, narcosis, numbness of the extremities, unconsciousness, and death.

Symptoms/Injuries After Skin Contact: Contact with gas/liquid escaping the container can cause frostbite and freeze burns.

Symptoms/Injuries After Eye Contact: Contact with gas/liquid escaping the container can cause frostbite, freeze burns, and permanent eye damage.

Symptoms/Injuries After Ingestion: Not considered a potential route of exposure but contact with gas/liquid escaping the container can cause freeze burns and frostbite.

Chronic Symptoms: None expected under normal conditions of use.

12. ECOLOGICAL INFORMATION

12.1	**Toxicity**	
	Propane	No ecological damage caused by this product
	DME	No ecological damage caused by this product
	Isobutane	No ecological damage caused by this product
12.2	**Persistence and degradability**:	Non persistent and readily biodegradable
12.3	**Bio accumulative Potential**:	
	Propane	Bio accumulative potential not established
	Propane (74-98-6) Log Pow	2.3
	Isobutane (75-28-5) Log Pow	2.88
	Dimethyl Ether (115-10-6) Log Pow	0.1
12.4	**Mobility in Soil**	No data available. Because of its high volatility, the fuel product is unlikely to cause soils or water pollution.
12.5	**Other Adverse Effects**	Avoid release to the environment

13. DISPOSAL CONSIDERATIONS

13.1	**Waste Treatment Methods**	Dispose of contents/container in accordance with local, regional, national, and international regulations. Container may remain hazardous when empty. Continue to observe all precautions. Handle empty containers with care because residual vapors are flammable. Empty gas cylinders should be returned to the vendor for recycling or refilling. Do not puncture or incinerate container.

14. TRANSPORTATION INFORMATION

14.1	**In Accordance with US DOT**	
	Proper Shipping Name(s)	Propane Petroleum Gases, Liquified
	Hazard Class	2.1
	Identification Number	UN1075, UN1978
	Label Codes	2.1
	ERG Number	115
14.2	**In Accordance with IMDG**	
	Proper Shipping Name(s)	Propane Petroleum Gases, Liquified
	Hazard Class	2
	Division	2.1
	Identification Number	UN1075, UN1978
	Label Codes	2.1
	EmS-No. (Fire)	F-D
	EmS-No. (Spillage)	S-U
14.3	**In Accordance with IATA**	
	Proper Shipping Name(s)	Propane Propane Gases, Liquified
	Hazard Identification Number	UN1075, UN1978
	Hazard Class	2
	Label Codes	2.1
	Division	2.1
	ERG Code (IATA)	10L

15. REGULATORY INFORMATION

15.1 US Federal Regulations

Propane	
SARA Section 311/312 Hazard Classes	Fire hazard Sudden release of pressure hazard Immediate (acute) health hazard
Propane (74-98-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Dimethyl Ether (115-10-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 313 - Emission Reporting	1.0 %
Isobutane (75-28-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	T - T - indicates a substance that is the subject of a Section 4 test rule under TSCA.

15.2 US State Regulations

Propane (74-98-6)
U.S. - Massachusetts - Right to Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List
Dimethyl Ether (115-10-6)
U.S. - Massachusetts - Right to Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List
Isobutane (75-28-5)
U.S. - Massachusetts - Right to Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List
Ethane (74-84-0)
U.S. - Massachusetts - Right to Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

16. OTHER INFORMATION

16. 1 GHS Full Text Phrases:

Aquatic Acute 2	Hazardous to the aquatic environment - Acute Hazard Category 2
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Asp. Tox. 1	Aspiration hazard Category 1
Flam. Gas 1	Flammable gases Category 1
Flam. Liq. 1	Flammable liquids Category 1
Liquefied gas	Gases under pressure Liquefied gas
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H220	Extremely flammable gas
H224	Extremely flammable liquid and vapor
H280	Contains gas under pressure; may explode if heated
H304	May be fatal if swallowed and enters airways
H336	May cause drowsiness or dizziness
H401	Toxic to aquatic life
H411	Toxic to aquatic life with long lasting effects

16.2	**Disclaimer:**	This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR §1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Oberon Fuels' knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness is not guaranteed and no warranties of any type, either expressed or implied, are provided. The information contained herein relates only to the specific product(s). If this product(s) is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure, to consult the latest edition.	
16.3	**Prepared by:**	**Oberon Fuels** 2445 Fifth Avenue Suite 200 San Diego, CA 92101 Tel: +1 (619) 255-9361 http://www.oberonfuels.com	
16.4	**Preparation Date:**	December 17, 2021	Version: 2.0

4. FIRST AID MEASURES

4.1	First Aid Measures:	**General**: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). If frostbite or freezing occurs, immediately flush with plenty of lukewarm water to GENTLY warm the affected area. Do not use hot water. Do not rub affected area. Get immediate medical attention. **After Inhalation**: Obtain medical attention if breathing difficulty persists. First, take proper precautions to ensure your own safety before attempting rescue (e.g., wear appropriate respiratory protective equipment, use the buddy system), then remove the exposed person to fresh air. Keep at rest in a position comfortable for breathing. **After Skin Contact**: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists. Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention. **After Eye Contact**: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention. **After Ingestion**: Rinse mouth. Do NOT induce vomiting. Obtain medical attention.
4.2	Most important symptoms and effects, both acute and delayed:	**Symptoms/Injuries:** May cause frostbite on contact with the liquid. Asphyxia by lack of oxygen: risk of death. **Symptoms/Injuries After Inhalation:** In elevated concentrations may cause asphyxiation, central nervous system effects, and increased breathing rate. Symptoms of asphyxiation include headache, dizziness, rapid breathing, increased pulse, mood changes, tremors, cyanosis, muscular weakness, narcosis, numbness of the extremities, unconsciousness, and death. **Symptoms/Injuries After Skin Contact:** Contact with gas/liquid escaping the container can cause frostbite and freeze burns. **Symptoms/Injuries After Eye Contact:** Contact with gas/liquid escaping the container can cause frostbite, freeze burns, and permanent eye damage. **Symptoms/Injuries After Ingestion:** Not considered a potential route of exposure but contact with gas/liquid escaping the container can cause freeze burns and frostbite. **Chronic Symptoms:** None expected under normal conditions of use.
4.3	Indication of Any Immediate Medical Attention and Special Treatment Needed	If exposed or concerned, get medical advice and attention. If medical advice is needed, have SDS available.

5. FIREFIGHTING MEASURES

5.1	Extinguishing Media	**Suitable Extinguishing Media:** Do not extinguish burning gas if flow cannot be shut off immediately. Extinguish secondary FIRES with appropriate materials. **Unsuitable Extinguishing Media:** Do not use a heavy water stream. Use of heavy stream of water may spread fire.
5.2	Special Hazards Arising from the Substance or Mixture	**Fire Hazard:** Extremely flammable gas. **Explosion Hazard:** May form flammable/explosive vapor-air mixture. Container may explode in heat of fire. **Reactivity:** Hazardous reactions will not occur under normal conditions.
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