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Safety Data Sheet

according to
the Preparation of SDS for Hazardous Chemicals
Code of Practice February 2016 – Safe Work Australia

SECTION 1: Identification of the substance / mixture and of the company / undertaking

1.1 Product Identifier:

Trade name: Bunsen Gas, Recharge Gas, GP Vapour

Other names: LPG, LP Gas, Propane, Butane

1.2 Relevant identified uses of the substance or mixture and uses advised against

No further relevant information available.

Application of the substance/the preparation: Cleaning material. Detergent.

1.3 Details of the supplier for the safety data sheet

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1.4 Emergency Telephone: Poisons Information Centre (National) +61 2 9756 5699

SECTION 2: Hazards Identification

2.1 Classification of the substance or mixture:

FLAMMABLE GASES – Category 1

GASES UNDER PRESSURE – Liquefied Gas

2.2 Label Elements

GHS02 Flame

GHS04 Pressurised Gas

2.3 Label Elements

Labelling elements we prepared according to Code of Practice on Preparation of Safety Data Sheets for Hazardous Chemicals (Safe Work Australia, December 2011)

Hazard statements:

H220 – Extremely flammable gas

H280 – Contains gas under pressure; may explode if heated.

Precautionary statements:

Prevention: P210 – Keep away from heat/sparks/open flames/hot sources. No smoking

Response: P377 – Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

Storage: P410 + P403 – Protect from sunlight. Store in a well-ventilated space.

Disposal: Dispose in accordance with all applicable local regulations.

Hazard nototherwise classified: High levels of exposure can lead to asphyxiation and fatal arrhythmia. Refer to section 11 of SDS.

SECTION 3: Composition/information on ingredients

Chemical identity	CAS Number	Propane Proportion	Butane Proportion
LPG:	68476-85-7		
Propane:	0074-98-6	40-99%	<5%
Propene:	115-07-1	<60%	<5%
n-Butane, iso Butane:	106-97-8; 75-28-5	<7.5%	90-99%
Ethane:	74-84-0	<5%	<5%

SECTION 4: First aid measures

4.1 Description of first aid measures: In all cases, seek medical attention.

After inhalation:

Remove from area of exposure immediately.

Be aware of possible explosive atmospheres.

If Victim is not breathing, apply artificial respiration and seek urgent medical attention.

Give oxygen if available. Keep warm and rested.

After skin contact:

Cold Burns: Remove contaminated clothing and gently flush affected areas with warm water (30 C) for 15 minutes.

Apply non-adhesive sterile dressing and treat as for a thermal burn.

For large burns, immerse in warm water for 15 minutes.

DO NOT apply any form of direct heat. Seek immediate medical attention.

After eye contact:

Treatment for cold burns: Immediately flush with tepid water or with sterile saline solution. Hold eylids apart and irrigate for 15 minutes.

Seek medical attention.

After swallowing:

For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor. Ingestion is considered unlikely due to product form.

4.2 Most important symptoms and effects:

Acute exposure: In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Direct contact with the liquefied material or escaping compressed gas may cause cold burns.

Low Exposure: In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea, and loss of coordination.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physicians: Treat symptomatically. Severe inhalation over exposure may sensitise the heart to catecholamine-induced arrhythmias. Do not administer catecholamines to an overexposed person.

SECTION 5: Firefighting measures

5.1 Extinquishing media

WARNING: As this product is Unodourised, personnel undertaking firefighting measures should always be aware that they may not be able to smell the product. Handheld or equivalent gas detectors suitably calibrated for the product should therefore be carried.

Stop flow of gas if safe to do so, such as by closing valves or by activation Emergency Shutdown System. If the gas source cannot be isolated, do not extinguish the flame, since re-ignition and explosion could occur.

Drence and cool cylinders or vessels with water spray from a protected area at a safe distance.

If it is absolutely necessary to extinguish the flame, use only a dry chemical powder extinguisher.

Do not move cylinders for at least 24 hours. Avoid shock and bumps to cylinders Evacuate the area of persons not fighting the fire.

Carbon oxides (CO, CO_2) fumes may be produced should burning occur, especially within an enclosed space.

Firefighters should wear full protective clothing and be aware of the risk of possible explosion (especially in a confined space). Flashback may occur along vapour trail. Breahting apparatus is required in confined spaces.

Where possible, remove cool cylinders from the path of the fire. Do not re-use a fire-exposed vessel or cylinder – seek advice of supplier.

5.2 Special hazards arising from the substance or mixture:

Highly flammable.

Heating to decomposition produces acrid smoke and irritating fumes. Product will add fuel to a fire.

Eliminate all ignition sources including cigarettes, open flames, spark producing switches/tools, heaters, naked lights, pilot lights, mobile phones, etc. when handling.

5.3 Advice for firefighters

Protective equipment:

Highly flammable.

Temperatures in a fire may cause cylinders or pressure vessels to rupture and pressure relief devices to be activated (venting).

Cool cylinders and vessels exposed to fire by applying water from a protected location and with water spray directing spray primarily onto the upper surface. Do not approach any LPG container suspected of being hot.

HAZCHEM CODE: 2YE

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

If the cylinder is leaking, eliminate all potential ignition sources and evacuate area of personnel. Inform manufacturer/supplier of leak.

If safe to enter the area, wear appropriate PPE as detailed in section 8 of the SDS.

Carefully move the cylinder to a well ventilated remote area, then allow to discharge. For vessels, operate the Emergency Shutdown System (where fitted) and proceed as above.

6.2 Environmental precautions:

As this product has a very low flash point, any spillage or leak is a fire and/or explosion hazard. If a leak has not ignited, stop gas flow, isolate sources of ignition and evacuate personnel.

Ensure good ventilation.

Liquid leaks generate large volumes of heavier than air flammable vapour, which may travel to remote sources of ignition (e.g. along drainage systems).

Where appropriate, use water spray to disperse the gas or vapour and to protect personnel attempting to stop leakage.

Vapour may collect in any confined space.

6.3 Methods and material for containment and cleaning up:

Stop the flow of material, if this is without risk. If the leak is irreparable, move the cylinder to a safe and well-ventilated area, and allow to discharge. Keep area evacuated and free from ignition sources until any leaked or spilled liquid has evaporated.

LPG is unlikely to contaminate water or soil.

SECTION 7: Handling and storage

7.1 Precautions for safe handling:

Avoid inhalation of vapour.

Avoid contact with liquid and cold storage containers.

Avoid contact with eyes.

When handling cylinders wear protective footwear and suitable gloves.

Always ensure that cylinders are within test date, are fit for use, and are leak checked prior to use.

Check for leaks by sound and smell and by locating with soapy water or with approved detection devices.

Do not fill dented gouged or rusty containers (refer AS2337.1). Only fill cylinders to 80% fill level (ullage tube via decanting or mass via mechanical filling).

The maximum fill level for vessels is dependent upon their size and location as detailed in AS/NZS 1596.

Use only equipment and pipework designed and approved (where applicable) for LPG gas applications.

Ensure that cylinders cannot be struck by vehicles or by dropped or rolled objects, etc.

Class 2.1 Flammable Gas products may only be loaded in the same vehicle or packed in the same freight container with the classes of products as permitted in the ADG Code (See references).

Cylinders shall only be transported in an upright secure position in accordance with the National Road Transport Commission Load Restraint Guide and shall not be dropped.

7.2 Conditions for safe storage, including any incompatibilities

Store and use only in equipment/containers designed for use with this product.

Store and dispense only in well-ventilated areas away from heat and sources of ignition. Do not sore in unventilated buildings.

Do not transport in unventilated vehicle compartments.

Do not enter storage vessels. If entry to a vessel is necessary, contact the supplier.

Cylinders and vessels must be properly labelled. Do not remove warning labels.

LPG cylinders shall be stored in accordance with the requirements of AS/NZS 1596 and AS 4332.

Do not store in pits and basements where vapour may collect.

Store cylinders securely in an upright position. Note: Forklift cylinders may be sotred horizontally.

Store away from incompatible materials, particularly oxidising agents.

Check vessels and cylinders are clearly labelled.

Do not contaminate cylinders or vessels with other products.

As the product is unodourised, the use of a flammable gas detection system is strongly recommended.

7.3 Specific end use(s) No further relevant information available.

SECTION 8: Exposure and controls/personal protection

Exposure standards:

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

Chemical name	Occupational Exposure Limits
Unodourised Liquefied Petroleum Gas (LPG)	**NOHSC** TWA: 1000 ppm 8 hours
Butane	**NOHSC** TWA: 1900 mg/m^3 8 hours TWA: 800 ppm 8 hours
Propane	**ACGIH TLV** TWA: 1000 ppm 8 hours
Propene	**ACGIH TLV** TWA: 500 ppm 8 hours

Engineering controls:

Avoid Inhalation.

Use in well ventilated areas.

In poorly ventilated areas where flammable vapours may accumulate, mechanical explosion proof extraction ventilation is recommended.

Do not enter confined area (e.g. tanks). Contact the supplier

Individual protection measures:

Eye and face protection: Wear safety goggles or face shield.

Skin protection (hands): Wear impervious and insulating gloves to prevent cold burns and frostbite.

Skin protection (body): Wear coverall clothing of the anti-static, low flame spread type. When handling cylinders, wear protective footwear.

Respiratory protection: Where an inhalation risk exists, wear a Self Contained Breathing Apparatus or Airline Respirator.

SECTION 9: Physical and chemical properties

Property	**Propane**		**Butane**	
Appearance	Colourless Gas		Colourless Gas	
Odour	No odour		No odour	
Chemical Formula	C_3H_8		C_4H_{10}	
Molecular Weight	44.1		58.1	
Boiling point	-42^{0}C		-0.5^{0}C	
Vapour Pressure @ 40^{0}C	1530 kPa (max)		520 kPa (max)	
	Liquid at 15^{0}C	**Gas at 101kPa & 15^{0}C**	**Liquid at 15^{0}C**	**Gas at 101kPa & 15^{0}C**
Density (kg/m^3)	510	1.86	568	2.47
Relative density: water = 1.0 air = 1.0	0.51	 1.53	0.568	 2
Litres/tonne m^3/tonne m^3/m^3 of liquid	1961 1.961 1	536000 536 274	1760 1.76 1	405000 405 235
Specific heat of liquid (kJ/kg/^{0}C	2.512		2.386	
Latent heat of vapourisation (MJ/m3) (MJ/kg = GJ/t)	 232		 239	
	0.358		0.372	
Heat combustion (MJ/m^3) (MJ/kg = GJ/t)	 25000 50.1	 93.3 50.1	 28800 49.47	 121.9 49.47
Volume of air (m^3) to burn 1m^3 of gas		23.7		31.0
Flash point		-107^{0}C		-60^{0}C
Auto-ignition temperature		493-549^{0}C		482-538^{0}C
Maximum flame temperature		1970^{0}C		1990^{0}C
Flammability	Extremely Flammable	Extremely Flammable	Extremely Flammable	Extremely Flammable
Limits of Flammability in air (% by volume): Upper % Lower %	 	 9.6 2.4	 	 8.6 1.9
Other Properties	Solubility (water): 0.07 cm^3 / cm^3			
Other name/numbers: LPG:	UN 1075			
Propane	UN 1978			
Butane	UN 1011			
IsoButane	UN 1969			

SECTION 10: Stability and reactivity

10.1 Reactivity

Extremely flammable.

Reacts violently with oxidising agents

10.2 Chemical stability

Stable under recommended conditions of storage.

10.4 Conditions to avoid:

Avoid heat, sparks, open flames and other ignition sources.

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.

10.5 Incompatible materials:

Incompatible with oxidising agents, acids, heat and ignition sources. Do not use natural rubber flexible hoses. Also incompatible (potentially violently) with oxygen, halogens and metal halides.

10.6 Hazardous decomposition products:

Heating to decomposition produces acrid smoke and irritating fumes.

SECTION 11: Toxicology information

Information on toxicological effects

11.1 Acute toxicity: Non toxic.

11.2 Primary irritant effect:

On the skin: Non irritating. Contact with evaporating liquid or supercold vessels or pipes may result in frost-bite with sever tissue damage.

On the eye: Non irritating. Direct contact with evaporating liquid may result in severe cold burns with possible permanent damage.

11.3 Sensitization: Not classified as causing skin or respiratory sensitisation

11.4 Germ cellmutagenicity: Not classified as a mutagen.

11.5 Carcinogenicity: Not classified as a carcinogen.

11.6 Reproductive toxicity: Not classified as a reproductive toxin.

11.7 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 vapour are inhaled.

Specific Target Organ Toxicity (STOT) – Multiple exposure: Not classified as causing organ effects from repeated exposure.

11.8 Aspiration hazard: Not classified as an aspiration hazard.

11.9 Further information:

Routes of entry anticipated: inhalation

May cause cardiac arrythmia.

Rapid evaporation of the liquid may cause frostbite.

SECTION 12: Ecological information

12.1 Ecotoxicity:

Not toxic to flora, fauna or soil organisms.

Will not cause long-term adverse effects in the environment and is not dangerous to the ozone layer.

12.2 Persistence and degradability: Unlikely to cause long term adverse effects in the environment.

12.3 Bioaccumulative potential: This material is not expected to bio-accumulate.

12.4 Mobility in soil:

Spillages are unlikely to penetrate the soil.

The product is likely to volatilise rapidly into the air.

12.5 Other adverse effects: Unlikely to cause long term effects in the aquatic environment.

SECTION 13: Disposal considerations

13.1 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.

13.2 Physical/chemical properties affecting disposal options:

Empty cylinders or vessels may contain some remaining product, which is highly flammable.

Hazard warning labels are a guide to the safe handling of empty packaging and should not be removed. LPG cylinders or vessels should never be inadvertently disposed of in any land fill facility with being rendered visually and physically unusable before disposal.

WARNING: “empty” containers can sometimes retain residue (liquid and/or vapour) and can be dangerous.

DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, AND OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean.

SECTION 14: Transport information

14.1 UN-Number: 1075

14.2 UN proper shipping name: Petroleum Gases, Liquefied

14.3 Transport hazard class(es): 2.1

14.4 Packing group: None allocated.

14.5 Environmental hazards: No

14.6 Special precautions for user: Do not transport with dangerous goods of Class 1, 2, 4, 5 and 7. Refer to ADG Code for detailed and specific restrictions.

14.7 Additional information: Transport of LPG 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

15.1 Poisons Schedule: None allocated to this substance using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

15.2 AICS: All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

SECTION 16: Other information

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

Abbreviations and acronyms:

ACGIH: American Conference of Governmental Industrial Hygienists

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.