1. IDENTIFICATION: PRODUCT IDENTIFIER AND CHEMICAL IDENTITY

Product Name	AutoGas and Forklift Gas
Proper Shipping Name	Petroleum Gases, Liquefied
Other Names	LPG, LP Gas, Liquefied petroleum gas, Automotive LPG, Automix.
Recommended Use	Fuel for vehicles.
Supplier Name	Wesfarmers Kleenheat Gas Pty Ltd (ABN 40 008 679 543)
Address	Building 161, Car Park 12, Murdoch University Murdoch, WA, 6150
Telephone No.	132 180
Website	www.kleenheat.com.au
Australian Emergency Contact No.	1800 093 336 (24 hours, 7 days)

2. HAZARDS IDENTIFICATION

GHS Classification

Physical Hazards
Flammable Gas – Category 1A
Liquefied Gas (Low Pressure)

Flame Gas Cylinder

Signal Word - DANGER

Hazard Statements
H220 Extremely flammable gas
H280 Contains gas under pressure; may explode if heated

Precautionary Statements
Prevention
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280 Contains gas under pressure; may explode if heated
Response
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 In case of leakage, eliminate all ignition sources.
Storage
P403 Store in well-ventilated place.
P410 Protect from sunlight.

Other Hazards
Deliberately concentrating and inhaling can be harmful or fatal.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

AutoGas and Forklift Gas supplied by Kleenheat are a highly variable mixture of hydrocarbons as listed below.
The gas complies with the specifications listed in the Autogas Fuel Quality Standard as controlled by the Fuel Standard (Autogas) Determination.
The values in the table attempt to cover the range of compositions which would meet the Autogas specification.
Ethyl Mercaptan is added as an odourant to assist with leak detection, it has a distinctive “rotten eggs” smell.
Do not rely solely on the smell for detection of leaks; check all connections with soapy water.

Chemical Identity of Ingredient	**Proportion (Mole %)**	**CAS Number**
Ethane	< 5 %	74-84-0
Propane	40 – 98 %	74-98-6
Propene	< 25 %	115-07-1
Iso-butane and n- butane	< 50 %	75-28-5, 106-97-8
Iso-Pentane, n-pentane (and heavier)	< 2.0 %	78-78-4, 109-66-0
1,3-butadiene	< 0.1 %	106-99-0
Ethyl mercaptan	25 – 50 ppm	75-08-1

4. FIRST AID MEASURES

Inhalation

Move patient to fresh air.

Administer high flow oxygen and assist ventilation as required.

If difficulty breathing persists or oxygen has been administered, seek medical attention.

Skin Contact

Cryogenic burns and Frostbite - Minor Injuries:

Ensure that clothing around the affected area is loose and does not restrict blood flow.

Do not attempt to remove clothing which has frozen onto the skin until flushing has allowed it to thaw completely. (Do not remove clothing if it remains adherent.)

Gently flush or immerse the affected areas with lukewarm water (30°C) for at least 15 minutes or longer as required for skin colour to change from waxy white / pale yellow through blue to pink or red.

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

DO NOT use hot water or apply any form of direct heat.

DO NOT RUB.

Seek immediate medical attention if clothing is adherent, if the burn is large, blistered or deep or if tissue freezing or frostbite has occurred.

Cryogenic burns and Frostbite - Major Injuries:

Send for Ambulance.

Follow minor injury procedure as far as possible.

Manage for shock.

Ingestion Due to product form and application, ingestion is considered extremely unlikely.

Symptoms caused by exposure

Direct contact with eyes or skin may cause severe frost-bite.

Intentionally concentrating and inhaling AutoGas may cause unconsciousness and death.

As the amount of oxygen inhaled is reduced from 21 - 14% volume, the pulse rate will accelerate and the rate and volume of breathing will increase. The ability to maintain attention and think clearly is diminished, muscular co-ordination is somewhat disturbed.

As oxygen decreases from 14 - 10% volume, judgement becomes faulty, severe injuries may cause no pain. Muscular effort will lead to rapid fatigue.

Further reduction to 6% may cause nausea and vomiting. Ability to move may be lost. Permanent brain damage may result even after resuscitation from exposure to this low level of oxygen.

Below 6% breathing is in gasps and convulsions may occur.

Inhalation of a mixture containing no oxygen may result in unconsciousness from the first breath and death will follow in minutes.

Medical attention and special treatment

Treatment is symptomatic and supportive.

Severe inhalation over exposure may sensitise the heart to catecholamine induced arrhythmias.

Do not administer catecholamines to an overexposed person.

5. FIREFIGHTING MEASURES

Suitable extinguishing equipment

For small fires only – use dry chemical extinguisher.

For larger fires – Do not attempt to extinguish but stop gas flow at the source if safe to do so and allow to burn out. Evacuate area and contact emergency services.

Water may be used to assist with cooling of cylinders.

Caution – Do not use water near electrical items.

Specific hazards

Extremely flammable.

Heating to decomposition produces acrid smoke and irritating fumes.

May also evolve carbon oxides when heated to decomposition.

Product will add fuel to a fire.

Temperatures in a fire may cause pressure relief devices to be activated and cylinders to rupture.

Excessive heating of pressurised containers may result in boiling liquid expanding vapour explosion (BLEVE). Timeframes of BLEVE are dependent upon the specific situation. BLEVE may occur within a relatively short timeframe

Special protective equipment and precautions for fire fighters

Evacuate area and contact emergency services.

AutoGas vapour is heavier than air and may collect in low lying areas and travel downwind and/or downhill to remote sources of ignition.

The explosive zone may extend beyond the limits of the visible vapour cloud.

Vapour may collect in any confined space.

Remain upwind and notify those downwind of hazard.

Breathing apparatus is required in confined spaces.

Do not approach vessels suspected of being hot.

Use water mist to cool all intact containers and nearby storage areas.

Immediately withdraw from fire area if vessel venting noise begins to cycle or the container becomes distorted**.**

Pressure relief valves from exposed cylinders may operate which will increase fire in localised areas.

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6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Wear long sleeves and trousers made of non-static producing fibres and safety glasses. Wear liquid impervious, thermally insulating gloves if contact with liquid is a possibility.

AutoGas will ignite easily under all normal Australian weather conditions.

Any spillage or leak creates a severe fire and/or explosion hazard.

Liquid leaks generate large volumes of flammable vapour which is heavier than air and may collect in low lying areas and travel downwind and/or downhill to remote sources of ignition.

The explosive zone may extend beyond the limits of the visible vapour cloud.

Vapour may collect in any confined space.

If a leak has not ignited:

- Evacuate the area of all unnecessary personnel
- Eliminate all sources of ignition.
- Stop the gas flow at the source if safe to do so.
- Do not enter a vapour cloud except for rescue; self-contained breathing apparatus must be worn.
- Under the direction of properly trained personnel, use water spray to disperse the vapour and to protect personnel attempting to stop the leakage.

Environmental precautions

AutoGas will evaporate rapidly on release.

It is unlikely to contaminate soil or waterways.

Methods and materials for containment and cleaning up

Isolate immediate area from pedestrian and vehicle traffic.
Eliminate other sources of ignition.
Monitor visible vapour cloud.
Consider alerting personnel downwind of hazard to evacuate and eliminate sources of ignition.

In case of leaking cylinder:
(18 kg or smaller), contact supplier on 1800 093 336.
Approach from upwind. Close valve if possible.
Place cylinder in well-ventilated area away from ignition sources.

In case of leaks from vehicle storage tank:
IMMEDIATELY CONTACT POLICE OR FIRE BRIGADE.
Tell them location, material, quantity, UN Number (1075) and emergency contact.
Indicate condition of vehicle and any damage observed. Warn other traffic.
Shut off engine and any electrical equipment and leave ‘off’.
Evacuate from vehicle to a safe distance. Keep upwind.
Keep unauthorised personnel away.

In case of leaks from bulk storage:
Contact emergency services and supplier.
Approach from upwind.
Isolate and shut off fuel where able.
Use water sprays to disperse vapours.

7. HANDLING AND STORAGE

Precautions for safe handling

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

Where appropriate ensure equipment is electrically bonded and earthed to prevent static accumulation.

Use safe work practices to avoid eye or skin contact with liquid or inhalation of vapours.

Wear protective footwear and gloves when handling cylinders.

Do not rely upon the smell for detection of leaks. Check all connections using soapy water. Gas leaking from the connection will cause the detergent to bubble.

Liquid or gaseous AutoGas spilt on clothing may become trapped within the weave of the fabric and ignite if later exposed to an ignition source.

Conditions for safe storage

The Australian Standard AS/NZS 1596; Storage and Handling of LP Gas details the requirements for safe storage and handling of AutoGas.

In Western Australia storage must conform to the Dangerous Goods Safety Act 2004 and relevant Regulations under the Act.

Refer to local regulations for other states - see Section 15 Regulatory Information.

Store in a well-ventilated area away from oxidising agents (eg pool chlorine), acids, alkalis, direct sunlight, heat or ignition sources and protected from physical damage.

Store and use only in cylinders and storage vessels designed for use with this product.

Store cylinders in an upright position even when empty, do not drop.

Forklift cylinders are to be laid on their side only when secured to the forklift within the cylinder cradle.

Ensure that cylinders are secure and stable in storage and in use.

Close valves when the product is not in use.

Check regularly for leaks.

Cylinders must be properly labelled.

Do not remove warning labels from cylinders.

Large storage areas should be bunded and have appropriate fire protection and ventilation systems.

Where relief valves are fitted to bulk vessels or pipework, protection by rain caps or grease plugs must be provided at all times

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure control measures

Workplace Exposure Standards

Name	CAS Number	TWA (ppm)	TWA (mg/ m^3)	STEL (ppm)	STEL (mg/ m^3)
LPG (liquefied petroleum gas)	68476-85-7	1000	1800	-	-

Engineering controls

Do not inhale vapours.

Use in well ventilated areas.

Maintain vapour levels below the recommended exposure standard; minimise or eliminate vapour exposure if possible.

Flammable/explosive vapours may accumulate in poorly ventilated areas; mechanical explosion proof extraction ventilation is recommended.

Do not enter storage tanks. If entry to tanks is necessary it is to be treated as a Confined Space Entry. Contact the supplier.

Individual protection measures

Eye and face protection

Wear close fitting safety glasses with side protection.

Where contact with liquid is possible double eye protection such as safety glasses or goggles and a face shield should be considered.

Skin protection

Wear long sleeves and trousers or overalls made from specifically designed non static producing or natural fibres when handling Propane.

Wear liquid impervious, thermally insulating gloves when handling liquid. Aprons and gauntlets may also be appropriate in these situations.

Insulating gloves should also be worn where contact with pipework chilled by vaporising liquid is a possibility.

Wear protective footwear when handling cylinders.

Respiratory protection

In the event that personnel are required to work in areas where the exposure standards are exceeded, supplied air respirators or self-contained breathing apparatus should be used. Ensure that personnel are suitably trained in the use of the equipment and that all manufacturers' instructions are adhered to.

The possibility of an explosive atmosphere should be considered when assessing the need for personnel to enter areas where respiratory protection is required.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Clear, colourless liquid under pressure. Colourless gas at room temperature and pressure.
Odour	Sulphurous smell due to addition of Ethyl Mercaptan
Odour threshold	< 5000ppm (Detectible at 1/5 LEL by Autogas Fuel Quality Standard)
pH	Not available
Freezing point	< -180°C
Boiling point	- 45°C
Boiling range	- 88°C to 0°C (ethane to n-butane)
Flash point	Propane: -156°C
Evaporation rate	Not available
Flammability	Extremely flammable
Upper explosive limit	9.8 vol% in air
Lower explosive limit	2.0 vol% in air
Vapour pressure	800 to 1530 kPa (gauge) @ 40°C
Liquid Density	0.51to 0.54 kg/l @ 15°C
Vapour density	1.9 to 2.1 kg/m^3 @ 15°C
Relative vapour density	1.6 to 1.7 @ 15°C (relative to air)
Solubility	low; < 100 mg/l in water High solubility in hydrocarbons, benzene and ethanol.
Partition coefficient:	n-octanol/water Propane: log Kow = 2.36
Auto-ignition temperature	Butane: 287°C Propane: 450°C
Decomposition temperature	Not available

10. STABILITY AND REACTIVITY

Reactivity

Extremely flammable liquid and vapour.

Reacts violently with oxidising agents (eg. hypochlorites, peroxides).

Chemical stability

Stable under recommended conditions of storage.

Conditions to avoid

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

Incompatible materials

AutoGas is incompatible with oxidising agents (eg. hypochlorites, peroxides), acids (eg. sulphuric acid), strong alkalis (eg.hydroxides), heat and ignition sources.
AutoGas can damage and reduce the integrity of some plastics and rubbers. Confirm with the manufacturer that materials used in hoses and fittings are suitable for AutoGas service.

Decomposition Products

When heated to decomposition emits acrid smoke and irritating fumes.

May also evolve carbon oxides when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Non-toxic – simple asphyxiant.

Effects are proportional to oxygen displacement.

No LD50 data available for main components of this product.

Skin corrosion/irritation

Vapour is non-irritating.

Contact with liquid, cold vessels or pipes containing low pressure liquid, may result in cold burns or frost-bite with severe tissue damage

Serious eye damage/irritation

Vapour is non-irritating.

Contact with liquid may result in severe cold burns with possible permanent damage.

Respiratory or skin sensitisation

Not known to cause sensitisation.

Germ cell mutagenicity

Not expected to cause germ cell mutations.

AutoGas meeting the Autogas Fuel Quality Standard specification may contain trace amounts of 1,3-butadiene (<0.1%) which is a Category 1B Mutagen by the criteria of the Globally Harmonised System of classification. The amount potentially present falls below the threshold concentration of for classifying the mixture as mutagenic.

Carcinogenicity

Not expected to cause cancer.

AutoGas meeting the Autogas Fuel Quality Standard specification may contain up to 25% propene (also known as propylene) which is listed by the International Agency for Research on Cancer (IARC) in Group 3 – Not classifiable as to its carcinogenicity to humans.

It may also contain trace amounts of 1,3-butadiene (<0.1%) which is listed by the IARC in Group 1 – Carcinogenic to humans. The amount potentially present falls below the threshold concentration for classifying the mixture as carcinogenic.

The other components are not listed by the IARC.

Reproductive toxicity

Not known to cause reproductive toxicity.

Specific Target Organ Toxicity (STOT) – single exposure

Non-toxic – simple asphyxiant.

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.

Specific Target Organ Toxicity (STOT) – repeated exposure

Non-toxic – simple asphyxiant.

Aspiration hazard

Not an Aspiration Hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicity

No data available for ecotoxicity of AutoGas components.

Persistence and degradability

All components of AutoGas are expected to be in the vapour phase at normal atmospheric conditions. They are degraded in the atmosphere by photochemically-produced hydroxyl radicals.

Bioaccumulative potential

AutoGas will evaporate rapidly if released to the environment so is expected to have low bioaccumulation potential in an aquatic environment.

Mobility in soil

AutoGas has moderate mobility in soil. It is expected to evaporate from the soil with the final environmental fate being atmospheric.

Other adverse effects

AutoGas may cause frost damage to vegetation.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

WARNING! - 'EMPTY' cylinders retain liquid and vapour residue and can be dangerous.

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

DO NOT INCINERATE LP Gas cylinders.

Do not attempt to clean the internals of a cylinder or storage vessel.

Any unused product and cylinders should be returned to the supplier when no longer required.

Small customer owned cylinders should be made safe at a Gas Cylinder Test Station before disposal.

Check with local Council regarding acceptance for disposal to landfill.

14. TRANSPORT INFORMATION

UN number 1075

Proper shipping name PETROLEUM GASES, LIQUEFIED.

Transport hazard class Class 2.1, Flammable gas

Packing Group Not specified

Environmental hazards for Transport Purposes

No Specific information. Refer to Section 6 in the event of a spill.

Special Precautions for user

Do not transport with chemicals of class;

1 Explosives
3 Flammable liquids
4.2 Spontaneously combustibles
5.1 Oxidising agents
5.2 Organic peroxides
6 Toxics
7 Radioactives and foodstuffs.

Additional Information

Forbidden for transport on passenger aircraft.

Before transporting ensure that cylinders are firmly secured and that valve is closed and not leaking.

See Section 15 for applicable transport legislation.

Hazchem Code 2YE

15. REGULATORY INFORMATION

Safety, Health and Environment Regulations

Storage and Transport is subject to state based legislation.

Western Australia - Dangerous Goods Safety Act 2004 and relevant regulations under the Act.
Northern Territory - Dangerous Goods Act and the Transport of Dangerous Goods by Road and Rail (National Uniform Legislation) Act and relevant regulations under the Acts.

Liquefied Petroleum Gas is listed in the Australian Inventory of Chemical Substances under the Industrial Chemicals (Notification and Assessment) Act 1989 (Commonwealth) as a Hazardous Substance and also as a High Volume Industrial Chemical. All individual components of AutoGas are also listed.

16. OTHER INFORMATION

1. To the best of our knowledge this document complies with the Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals, Safe Work Australia.
2. This Safety Data Sheet summarises our best knowledge of the health and safety hazard information of the product and how to safely handle and use the product in the workplace.

   Each user should read this Safety Data Sheet and consider the information in the context of how the product will be handled and used in the workplace, including in conjunction with other products.
3. If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact the Wesfarmers Chemicals, Energy and Fertilisers (WesCEF) Health, Safety and Environment Department by calling the switchboard on (08) 9312 9222 during normal business hours. In the event of an emergency please contact 1800 093 336.
4. Kleenheat reserves the right to make change to safety data sheets without notice.

References

Preparation of Safety Data Sheets for Hazardous Chemicals – Code of Practice, Safe Work Australia

https://www.safeworkaustralia.gov.au/doc/model-code-practice-preparation-safety-data-sheets-hazardous-chemicals

Globally Harmonized System of Classification and Labelling of Chemicals (GHS), 7th revised edition, United Nations, 2017, https://unece.org/ghs-rev7-2017

Hazardous Chemical Information System (HCIS), http://hcis.safeworkaustralia.gov.au

Hazardous Substances Data Bank (HSDB), https://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB

Australian Dangerous Goods Transport code – 7th Edition

END OF SDS

Document Revision Table		
Version	**Details**	**Publication Date**
6.0	Updated to GHS 7	Jan 2023
5.0	Full Review	June 2018
4.0	Updated first aid measures for skin contact.	Mar 2017
3.0	Logo update only – no review of content	Jan 2016
2.0	Full Review and update to 2011 Code of Practice, including GHS classification.	July 2013
1.0	Initial release of document	Apr 2012