AFROX
A Member of The Linde Group

SAFETY DATA SHEET (SDS)
PROPANE
Please ensure that this SDS is received by the appropriate persons

Review Date: 29/10/2021 v01 **Emergency: 0860 02 02 02** **Document Number: AFX-SDS-0057**

1. PRODUCT AND COMPANY IDENTIFICATION

Product	Propane
Chemical Formula	C_3H_8
Trade Name	Propane, Technical Grade Propane, Instrument Grade Propane, Pure Propane
Colour Coding	**Propane Technical/Instrument Grade** Silver body with a red circle, 250 mm diameter, below the valve. **Propane Pure** Light Weatherwork Grey body with a Red shoulder. **Propane** Dark Admiralty Grey, with propane branding **Propane Liquid withdrawal (wet)** Dark Admiralty Grey, with propane branding and vertical yellow strip on length of cylinder
Product Code	34 LF 34 LF.W 34 LE 508413-LF-C 508403-LF-C
Company Identification	African Oxygen Limited Grayston Office Park Building 7 128 Peter Road Sandown, Sandton, 2196 Tel. No: (011) 490-0400 Fax No: (011) 490-0530 Email: customer.service@afrox.linde.com www.afrox.com
Emergency Numbers	**0860 02 02 02 (Afrox)**

2. HAZARD IDENTIFICATION

Classification	- Classification under South African Hazardous Chemical Substances Regulations subsequently amended. (HCS) - Classification under the Globally Harmonized System of classification and labelling of chemicals (GHS)
Emergency Overview	Colour: Liquid Clear Taste: None Physical State: Gas Form: Gas under pressure Odour: **Stenched** - Will have a pungent garlic or skunk-like smell **Unstenched** - odourless in low concentrations. Has a pleasant clinical smell.
Main Hazards	- The hazards due to the handling of propane stem mainly from its extreme flammability - Vaporised propane gas is highly flammable and can form an explosive mixture with air - The flammability limits in air are between 2.2 and 9.5% by volume
	- The vaporised liquid can act as a simple asphyxiant by diluting the concentration of oxygen in the air below the levels necessary to support life
Adverse Health Effects	- Propane has some degree of anaesthetic action and is mildly irritating to the mucous membranes
Chemical Hazards	- Propane is virtually non-toxic and is a stable gas
Biological Hazards	- Contact with the liquid phase of propane with the skin can result in frostbite
Vapour Inhalation	- Propane is non-toxic. Prolonged inhalation could have an anaesthetic effect. Since it can displace oxygen in the air it could also act as a simple asphyxiant
Skin Contact	- Liquid : Could cause serious cold burns. - Gas : No Known effect
Ingestion	- Liquid - Could cause serious cold burns
GHS Classification	- Flammable gas (Category 1) - Gas under pressure (Liquefied gas)
GHS Pictogram	
GHS Signal Words	**Danger**
Hazard Statements	- H280 : Contains gas under pressure; may explode if heated. - H220 : Extremely flammable gas
GHS Precautionary Statements	**Storage:** - P403 : Store in a well-ventilated place. **Prevention:** - P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. **Response:** - P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. - P381: In case of leakage, eliminate all ignition sources. **Disposal** - None
Other Hazards that do not result in classification	- Contact with evaporating liquid may cause frostbite or freezing of skin

3. COMPOSITION OF INGREDIENTS

Chemical name	Propane (C_3H_8)
CAS No	74-98-6
UN No	1978
ERG No	115
Hazard class	2.1
Hazchem Warning	2A Flammable Gas

4. FIRST AID

Eye contact	- Rinse the eye with water immediately. Remove contact lenses, if present and easy to do. Continue rinsing. Flush thoroughly with water for at least 15 minutes. Get immediate medical assistance. If medical assistance is not immediately available, flush an additional 15 minutes and seek medical attention as soon as possible.
Skin Contact	- Contact with evaporating liquid may cause frostbite or freezing of skin. In case of frostbite spray with water (DO NOT USE HOT WATER) for at least 15 minutes. Apply a sterile dressing. Seek medical attention.
Ingestion	- Not an expected route of exposure
Inhalation	- In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Seek medical advice. Apply artificial respiration if breathing stopped.
Most important symptoms and effects, both acute and delayed:	- Respiratory arrest. - Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling. - Loss of co-ordination. - In low concentrations may cause narcotic effects. Dizziness. Headache. Unconsciousness. Nausea, vomiting.

5. FIRE-FIGHTING

Suitable extinguishing media	- Water Spray or Fog Dry powder. Foam. - NOTE : with dry powder it is essential to have complete coverage of the fire to prevent flash back.
Unsuitable extinguishing media:	- Carbon dioxide - Hand units are suitable for small fires only
Specific Hazards	- EXTREMELY FLAMMABLE GAS. - May explode in a fire. - Incomplete combustion may form carbon monoxide
Special fire fighting procedures:	- In case of fire: Stop leak if safe to do so. Do not extinguish flames at leak because possibility of uncontrolled explosive re-ignition exists. Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire. Isolate the source of the fire or let it burn out.
Special protective equipment for firefighters:	- Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, self contained breathing apparatus.

6. ACCIDENTAL RELEASE

Personal precautions, protective equipment and emergency procedures:	- Evacuate area. - Provide adequate ventilation. - Consider the risk of potentially explosive atmospheres. - In case of leakage, eliminate all ignition sources. Stop leak if safe to do so. - Monitor the concentration of the released product. - Prevent from persons entering sewers, basements and workpits, or any place where its accumulation can be dangerous. - Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Environmental Precautions	- Prevent further leakage or spillage if safe to do so.
Methods and material for containment and cleaning up:	- Provide adequate ventilation. Eliminate sources of ignition.

7. HANDLING AND STORAGE

Safe Handling	- Only experienced and properly instructed persons should handle gases under pressure. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Purge air from system before introducing gas. Containers, which contain or have contained flammable or explosive substances, must not be inerted with liquid carbon dioxide. Assess the risk of a potentially explosive atmosphere and the need for suitable equipment i.e. explosion-proof. Take precautionary measures against static discharges. Keep away from ignition sources (including static discharges). Provide electrical earthing of equipment and electrical equipment usable in explosive atmospheres. Use non-sparking tools. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Ensure

	the complete system has been (or is regularly) checked for leaks before use. Protect containers from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the container contents. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Secure cylinders in an upright position at all times, close all valves when not in use. Provide adequate ventilation. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Avoid suckback of water, acid and alkalis. Observe all regulations and local requirements regarding storage of containers. When using do not eat, drink or smoke. Store in accordance with local/regional/national/international regulations. Never use direct flame or electrical heating devices to raise the pressure of a container. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Damaged valves should be reported immediately to the supplier Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Replace valve outlet caps or plugs and container caps were supplied as soon as container is disconnected from equipment. Keep container valve outlets clean and free from contaminates particularly oil and water. If user experiences any difficulty operating container valve discontinue use and contact supplier. Never attempt to transfer gases from one container to another. Container valve guards or caps should be in place.
Conditions for safe storage, including any incompatibilities	- All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere. - Segregate from oxidant gases and other oxidants being stored. - Containers should not be stored in conditions likely to encourage corrosion. - Stored containers should be periodically checked for general conditions and leakage. - Container valve guards or caps should be in place. - Store containers in location free from fire risk and away from sources of heat and ignition. - Keep away from combustible material. - Keep container below 50°C in a well ventilated place.

8. EXPOSURE CONTROLS

Occupational Exposure Hazards (HCS)	- None of the components have assigned exposure limits - As vapourised propane is a simple asphyxiant, avoid any areas where spillage has taken place. Only enter once testing has proved the atmosphere to be safe.
Engineering Control Measures	- Consider a work permit system e.g. for maintenance activities. - Ensure adequate air ventilation. Provide adequate general and local exhaust ventilation. Keep concentrations well below lower explosion limits. Gas detectors should be used when quantities of flammable gases or vapours may be released. - Systems under pressure should be regularly checked for leakages. Product to be handled in a closed system. - Use only permanent leak tight installations (e.g. welded pipes). Take precautionary measures against static discharges. Gas detectors should be used when toxic quantities may be released.
Personal Protection	- A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. - Keep self-contained breathing apparatus readily available for emergency use. - Personal protective equipment for the body should be selected based on the task being performed and the risks involved.
Eyes	- Wear safety glasses with side shields or face shield.
Hands	- Protective gloves against mechanical risks. Wear gloves while handling containers - Protective gloves against cold. Protective gloves should be used if there is a risk of direct contact or splash.
Body protection:	- Wear fire resistant or flame-retardant clothing.
Feet	- Wear safety shoes while handling containers

9. PHYSICAL AND CHEMICAL PROPERTIES

Chemical Name	**Propane**
Chemical Symbol	C_3H_8
Physical state	Gas
Form:	Liquefied gas
Colour:	Colourless

Odour:	Odourless
Odour Threshold:	Odour threshold is subjective and is inadequate to warn of over-exposure.
pH:	Not applicable.
Melting Point:	-187.6 °C Experimental result, Key study
Boiling Point:	-42.1 °C (1,013 hPa) Experimental result, Key study
Sublimation Point:	Not applicable.
Critical Temp. (°C):	96.7 °C
Flash Point:	-104 °C
Evaporation Rate:	Not applicable.
Flammability (solid, gas):	Flammable Gas
Flammability limit - upper (%):	10.9 %(V) International standards
Flammability limit - lower(%):	1.7 %(V)
Vapour pressure:	953.25 kPa (25 °C)
Vapour density (air=1)	1.56 (0 °C) AIR=1
Relative density:	0.5853 (-45 °C)
Solubility(ies)	
Solubility in Water:	75 mg/l
Partition coefficient (n-octanol/water):	2.36
Autoignition Temperature:	450 °C Experimental result, Key study
Decomposition Temperature:	650 °C Decomp to ethylene and ethane.
Viscosity	
Kinematic viscosity:	No data available.
Dynamic viscosity:	0.08 mPa.s (17.9 °C)
Explosive properties:	Not applicable
Oxidising Properties:	Not applicable
Molecular weight	44.09 g/mol (C_3H_8)
Minimum ignition energy:	0.25 mJ

10. STABILITY AND REACTIVITY

Reactivity	- No reactivity hazard other than the effects described in sub-sections below.
Chemical stability	- Stable under normal conditions.
Possibility of hazardous reactions	- Can form a potentially explosive atmosphere in air. May react violently with oxidants.
Conditions to avoid	- Keep away from heat, hot surfaces, sparks, open flames and other ignition - sources. No smoking.
	- Never use cylinders as rollers or supports; or for any other purpose than storage.
Incompatible Materials	- Air, oxidisers. Chlorine dioxide For material compatibility see latest version of ISO-11114.
Hazardous Decomposition of Products	- Under normal conditions of storage and use, hazardous decomposition products - should not be produced.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity	- Based on available data, the classification criteria are not met.
Skin & eye contact	- Based on available data, the classification criteria are not met.
Chronic Toxicity	- Based on available data, the classification criteria are not met.
Carcinogenicity	- Based on available data, the classification criteria are not met.
Mutagenicity	- Based on available data, the classification criteria are not met.
Reproductive Hazards	- Based on available data, the classification criteria are not met.

12. ECOLOGICAL INFORMATION

Toxicity	- No known ecological damage caused by this product.
Persistence and degradability	- The substance is biodegradable. Unlikely to persist
Bioaccumulative potential	- The subject product is expected to biodegrade and is not expected to persist for long periods in an aquatic environment.
Mobility in soil	- Because of its high volatility, the product is unlikely to cause ground or water pollution.
Ecology - soil	- Because of its high volatility, the product is unlikely to cause ground or water pollution.
Results of PBT and vPvB assessment	- Not classified as persistent, bioaccumulating and toxic (PBT). - Not classified as persistent, very persistent and very bioaccumulating (vPvB).
Other adverse effects	- May cause pH changes in aqueous ecological systems.
Effect on ozone layer	- None
Effect on the global warming	- Global warming potential: 3 - Contains greenhouse gas(es). When discharged in large quantities

	may contribute to the greenhouse effect.

13. DISPOSAL CONSIDERATIONS

Disposal Methods	- Disposal of Propane, as with other gases, should be undertaken only by personnel familiar with the gas and the procedures for disposal. - Contact the supplier for instructions. In general, should it become necessary to dispose of propane, the best procedure, as for other flammable gases, is to burn them in any suitable burning unit available in the plant. This should be done in accordance with appropriate regulations
Disposal of Packaging	- The disposal of cylinders must only be handled by the gas supplier

14. TRANSPORT INFORMATION

Road Transportation	
UN No.	1978
Shipping Name	Propane
ERG No.	115
Class	2.1
Subsidiary Risk	Flam gas 1
Hazchem Warning	2A-Flammable gas
Sea Transportation	
IMDG	1978
Shipping Name	Propane
ERG No.	115
Class	2.1
Subsidiary Risk	Flam gas 1
Label	Flammable gas
Air Transportation	
ICAO/IATA Code	1978
Class	2.1
Subsidiary risk	Flam gas 1
Packaging instructions	- Cargo: 200kg - Passenger: Forbidden
Maximum quantity allowed	- Cargo: 150 kg - Passenger: Forbidden

15. REGULATORY INFORMATION

SANS 11014:2010 Edition 1	Safety data sheet for chemical products - Content and order of sections
SANS 10228:2012 Edition 6	The identification and classification of dangerous goods for transport by road and rail modes
SANS 10234:2019 Edition 2	Globally Harmonized System of classification and labelling of chemicals (GHS)
SUPPLEMENT TO SANS 10234 Edition 1	List of classification and labelling of chemicals in accordance with the Globally Harmonized System (GHS)
	NATIONAL LEGISLATION: OHSA 85 OF 1993

16. OTHER INFORMATION

- Ensure all national/local regulations are observed.
- Ensure users and relevant persons understand the asphyxiation hazard.
- Regularly check supplier's information sources for updated versions of SDS's.
- Ensure all national/local regulations are observed.
- Ensure operators understand the flammability hazard. Users of breathing apparatus must be trained.
- Before using this product in any new process or experiment, a through material compatibility and safety study should be carried out

Revision Date	29/10/2021 v01

Bibliography

Compressed Gas Association, Arlington, Virginia Handbook of Compressed Gases - 3rd Edition
Matheson. Matheson Gas Data Book - 6th Edition
SANS 10265 – The classification and Labelling of Dangerous Substances
SANS 10234 - List of classification and labelling of chemicals in accordance with the Globally Harmonized System (GHS)
SANS 11014-1 - Safety data sheet for chemical products: Content and order of sections

EXCLUSION OF LIABILITY