AFROX
A Member of The Linde Group

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

Review Date: 02/09/2021 v01 **Emergency: 0860 02 02 02** **Document Number: AFX-SDS-0111**

1. PRODUCT AND COMPANY DENTIFICATION

Product Hydrocarbon Aerosol Propellant Mixtures

Chemical Formula C3H8 and C4H10

Trade Name % Ratio of mixture by mass: Butane content calculated at 10% Isobutane 90% n-Butane for the mixtures

Name	nButane	Isobutane	Propane
Butane	87.3%	9.7%	3.0%
CB31	80.9%	9.0%	10.1%
CB36	74.5%	8.3%	17.2%
CB40	69.4%	7.7%	23.0%
CB44	68.0%	7.6%	24.4%
CB45	66.7%	7.4%	25.9%
CB46	65.4%	7.3%	27.3%
CB48	62.9%	7.0%	30.1%
CB50	60.3%	6.7%	33.0%
CB56	56.4%	6.3%	37.3%
CB62	51.3%	5.7%	43.0%
CB66	47.4%	5.3%	47.3%
CB74	41.0%	4.6%	54.4%
Propane	0.9%	0.1%	99.0%

Colour Coding Dulux Light Weatherwork Grey body with Red (A11) circle, 250 mm diameter, below the valve

Valve Liquid: 3/8" SAE Flare (0.625-18 UNF)
Vapour: G5/8" LH-F (Con. 105 LPGA U.K) (SABS199)

Company Identification
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Emergency Numbers **0860 02 02 02**

2. HAZARD IDENTIFICATION

Emergency Overview
Colour: None
Odour: None
Taste: None
Physical State: Gas
Form: Liquified gas under pressure

Main Hazards
- Vapourised liquefied petroleum gas is highly flammable and can form explosive mixtures with air. The vapourised liquid does not support life. It can act as a simple asphyxiant by diluting the concentration of oxygen in the air below the levels necessary to support life, it can act as a simple asphyxiant.

Adverse Health Effects
- The liquefied petroleum gases are non-toxic.
- Prolonged inhalation of high concentrations has an anaesthetic effect.

Chemical Hazards
- Flammable and combustible
- Compressed Gas

Biological Hazards
- Contact with the liquid phase of liquefied petroleum gases with the skin can result in cold burns

Vapour Inhalation
- As the vapourised liquid acts as a simple asphyxiant death may result from errors in judgement, confusion, or loss of consciousness which prevents self-rescue. At low oxygen concentrations, unconsciousness and death may occur in seconds without warning.

Eye Contact
- The liquid can cause severe burn-like injuries

Skin Contact
- Contact with the liquid phase can cause severe burn-like injuries.

Ingestion
- Can cause severe burn-like injuries.

Pictogram

Signal Words Danger

Hazard Statements
- H220: Extremely Flammable gas
- Contains gas under pressure, may explode if heated

Precautionary Statements
- P210: Keep away from heat/sparks/open flame/hot surfaces-No smoking (manufacturer/supplier or competent authority to specify applicable ignition sources)
- P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely
- P381: Eliminate all ignition sources if safe to do so.
- P403: Store in a well-ventilated place if product is not volatile so as to generate a hazardous atmosphere.
- Disposal: Dispose ethically

Other Hazards that do not result in classification
- Asphyxiant
- Cold Burns

3. COMPOSITION OF INGREDIENTS

Chemical name
Isobutane (C4H10)
n-Butane (C4H10)
Propane (C3H8)

CAS No
n-Butane 106-97-8
Isobutane 72-28-5
Propane 74-98-6

UN No
Butane (C4H10) UN1011
Propane (C3H8) UN1098
LPG (Mixture) UN1075

ERG No 115

Hazard class 2.1

Hazchem Warning 2A-Flammable gas

4. FIRST AID

Prompt medical attention is mandatory in all cases of overexposure to vapourised liquefied petroleum gas. Rescue personnel should be equipped with self-contained breathing apparatus. In the case of frostbite from contact with the liquid phase, place the frost-bitten part in warm water, about 40°C. If warm water is not available, or is impractical to use, wrap the affected part gently in blankets. Encourage the patient to exercise the affected part whilst it is being warmed. Do not remove clothing while frosted. Quick removal from the contaminated area is most important. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Unconscious persons should be removed to an uncontaminated area and given mouth-to-mouth resuscitation and supplemental oxygen.

Eye contact - Immediately flush with large quantities of
- (with the liquid phase) tepid water, or with sterile saline solution. Seek medical attention.

Skin Contact - See above for handling of cold burns

Ingestion - No known effect

Inhalation - High concentrations of aliphatic hydrocarbon gases may cause CNS depression. Recent information suggest that C1-C4 aliphatic (alkane) hydrocarbon gases can cause potentially fatal cardiac arrhythmias. Cardiac sensitization to adrenalin in dogs has been noted following inhalation. In dogs, the heart is more sensitive to epinephrine induced ventricular fibrillations following exposure to 15-90% propane for 10 minutes. Ventricular fibrillations have been reported in humans following inhalation of n-butane

5. FIRE-FIGHTING

Extinguishing media - Do not extinguish fire unless the leakage can be stopped. DO NOT USE WATER JET - use dry chemical, CO2 or foam

Specific Hazards - The rupturing of cylinders or bulk containers due to excessive exposure to a fire could result in a BLEVE (Boiling liquid expanding vapour explosion), with disastrous effects. As the flammability limits in air for the main constituents of liquefied petroleum gas vary between approximately 2% and 10% extreme care must be taken when handling leaks.

Emergency Actions - If possible, shut off the source of the spillage. Evacuate area. Post notices "NO NAKED LIGHTS - NO SMOKING" Prevent liquid or vapour from entering sewers, basements and work pits. Keep cylinders or bulk vessels cool by spraying with water if exposed to a fire. If tanker has overturned, do not attempt to right or move it
- CONTACT LOCAL EMERGENCY SERVICES AND THE AFROX EMERGENCY NUMBER.

Protective Clothing - Self-contained breathing apparatus. Safety gloves and shoes or boots should be worn when handling containers

Environmental precaution - Vapourised liquefied petroleum gas is
- heavier than air and could form pockets of oxygen-deficient atmosphere in low lying areas

6. ACCIDENTAL RELEASE

Personal Precautions - Do not enter any area where liquefied petroleum gas has been spilled unless tests have shown that it is safe to do so.

Environmental Precautions - The danger of widespread formation of explosive LPG/Air mixtures should be considered. Accidental ignition could result in a massive explosion

Small Spills - DO NOT extinguish the fire unless the leakage can be stopped immediately. Once the fire has been extinguished and all spills have been stopped, ventilate the area.

Large Spills - Stop the source if it can be done without risk. Contain the leaking liquid, with sand or earth, or disperse with special water/fog spray nozzle. Allow to evaporate. Take the precautions as listed above under "Emergency Actions". Restrict access to the area until completion of the clean-up procedure. Ventilate the area using forced draft if necessary. All electrical equipment must be flameproof.

7. HANDLING AND STORAGE

Cylinders containing liquefied petroleum gas should only be handled and stored in the vertical position. Cylinders should never be rolled. Do not allow cylinders to slide or come into contact with sharp edges and they should be handled carefully. Ensure that cylinders are stored away from other oxidants. Comply with all local legislation. Keep out of reach of children.

Safe Handling - Cylinders containing Butane should only be handled and stored in the vertical position
- Cylinders should never be rolled. Do not allow cylinders to slide or come into contact with sharp edges, and they should be handled carefully

	- Ensure that cylinders are stored away from other oxidants - Comply with all local legislation. - Keep out of reach of children
Hygiene Measures	- When using do not eat, drink or smoke. - Handle in accordance with good industrial hygiene and safety practice.
Technical Measures/ Storage conditions	- Keep only in the original container. - Keep in properly labelled containers. - Keep in a contained area - Keep away from sources of ignition - No smoking. - Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Keep at temperatures below 52°C. - Use a "first in-first out" inventory system to prevent full cylinders from being stored for excessive periods of time - Full and empty cylinders should be segregated - Stored containers should be periodically - checked for general condition and leakage - Outside or detached storage is preferred.

8. EXPOSURE CONTROLS

Occupational Exposure Hazards	- TWA (8 hour) = 600 ppm - As vapourised LPG 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	- Engineering controls are preferred to reduce exposure to Oxygen-depleted atmospheres. General methods include forced-draft ventilation, separate from other exhaust ventilation systems. Ensure that sufficient fresh air enters at, or near, floor level. Ensure that all electrical equipment is flameproof.

9. PHYSICAL AND CHEMICAL PROPERTIES

Chemical Name	n-Butane	Iso-Butane	Propane
Chemical Symbol	C4H10	C4H10	C3H8
Molecular weight	58,123g/mol	58,123g/mol	44,10g/mol
Boiling point/range at 1 atm	-0.5208 °C	-11.67 °C	-42.04 °C
Absolute Vapor Pressure @ 20°C	208 kPa	302 kPa	837 kPa
Vapor density @ 1atm (air=1)	2.711 kg/m^3	2.711 kg/m^3	2.417 kg/m3
Critical Temperature	152.03 °C	134.70 °C	96.68 °C
Specific volume @ 20°C & 101,325 kPa	0.4006 m^3/kg	0.4023 m^3/kg	0.5362 m^3/kg
Auto-ignition temperature	288°C	460°C	450°C
Flammability limits in air	1.5% to 9.0%	1.8% to 8.4%	2.0% to 9.5%

10. STABILITY AND REACTIVITY

Conditions to avoid	- The dilution of the oxygen concentration in the atmosphere to levels which cannot support life. The formation of explosive gas/air mixtures
Incompatible Materials	- Any common, commercially available metals may be used with commercial (or higher) grades of liquefied petroleum gases because they are non-corrosive, though installations must be designed to withstand the pressures involved and must comply with all state and local regulations.
Hazardous Decomposition of Products	- The constituents of liquefied petroleum gas are relatively stable. However, on combustion, toxic compositions, typically carbon monoxide, may be formed, depending on conditions

11. TOXOLOGICAL INFORATION

Acute Toxicity	- No known effect
Skin & eye contact	- No known effect
Chronic Toxicity	- No known effect
Carcinogenicity	- Severe cold burns can result in carcinoma.
Mutagenicity	- No known effect
Reproductive Hazards	- No known effect

12. ECOLOGICAL INFORMATION

Vapourised liquefied petroleum gas is heavier than air and can cause pockets of oxygen-depleted atmosphere in low-lying areas. It does not pose a hazard to the ecology, unless the gas/air mixture is ignited.

Toxicity	- Not classified
Persistence and degradability	- No information available

Mobility in soil	- No information Available
Results of PBT and vPvB assessment	- No information Available
Other adverse effects	- No known significant effects or critical hazards

13. DISPOSAL CONSIDERATIONS

Disposal Methods	- Disposal of liquefied petroleum gases, 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 liquefied petroleum gases, 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.	Butane	UN1011
	Propane	UN1978
	LPG (Mixture)	UN1075
Shipping Name	Liquefied petroleum gases	
ERG No.	115	
Class	2.1	
Subsidiary Risk	Flam gas 1	
Hazchem Warning	2A-Flammable gas	

Sea Transportation

IMDG	Butane	UN1011
	Propane	UN1978
	LPG (Mixture)	UN1075
Shipping Name	Liquefied petroleum gases	
ERG No.	115	
Class	2.1	
Subsidiary Risk	Flammable gas 1	
Label	Flammable gas	

Air Transportation

ICAO/IATA Code	Butane	UN1011
	Propane	UN1978
	LPG (Mixture)	UN1075
Class	2.1	
Subsidiary risk	Flammable gas 1	
Packaging instructions	- Cargo: 200 - Passenger: Forbidden	
Maximum quantity allowed	- Cargo: 150 kg - Passenger: Forbidden	

15. REGULATORY INFORMATION

OHS Act and Regulations 85 of 1993

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)

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

Revision Date 02/09/2021 v01

Bibliography

Compressed Gas Association, Arlington, Virginia
Handbook of Compressed Gases - 3rd Edition
Matheson. Matheson Gas Data Book - 6th Edition
Perry's Chemical Engineers Handbook 8th Edition
SABS 0625 - Labelling of Dangerous Substances

EXCLUSION OF LIABILITY