1. Identification of Substance & Company

Product

Product name	Flammable Gas Mixture: Carbon Dioxide 2-87.49% / Methane 12.51-98%
Product code	013362
HSNO approval	HSR002532,
Approval description	Gases Under Pressure Mixtures (Flammable) Group Standard 2020
UN number	1954
Proper Shipping Name	COMPRESSED GAS, FLAMMABLE, N.O.S. (methane, carbon dioxide)
DG class	2.1
Packaging group	NA
Hazchem code	NA
Uses	Synthetic/Analytical chemistry`

Company Details

Company	**Accurate Instruments NZ Ltd**
Address	P.O Box 25586 St Heliers Auckland New Zealand
Telephone	0800 500 380
Website	www.accurate.kiwi

2. Hazard Identification

Approval

This product is an approved substance under the Hazardous Substances and New Organisms Act (HSNO, Approval HSR002532, Gases Under Pressure Mixtures (Flammable) Group Standard 2020). The substance has been classified as hazardous according to the criteria in the Hazardous substances (Hazard Classification) Notice 2020.

GHS 7 Classes	Hazard Statements
Highly flammable gas	H220 - Extremely flammable gas. H280 - Contains gas under pressure; may explode if heated.

SYMBOLS

DANGER

Other Classifications

There are no other classifications that are known to apply.

Precautionary Statements

Prevention	P103 - Read label before use. P210 - Keep away from ignition sources. No smoking.
Response	P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P381 - Eliminate all ignition sources if safe to do so.
Storage	P403 - Store in a well-ventilated place.
Disposal	P501 - Dispose of contents/container in accordance with local/regional/national/international regulation.

3. Composition / Information on Ingredients

Component	CAS/ Identification	Conc (%)
methane	74-82-8	12.51-98%
carbon dioxide	124-38-9	2-87.49%

This is a commercial product whose exact ratio of components may vary slightly. Trace quantities of impurities are also likely.

4. First Aid

General Information

If medical advice is needed, have product container or label at hand. You should call the National Poisons Centre if you feel that you may have been harmed or irritated by this product. The number is 0800 764 766 (0800 POISON) (24 hr emergency service).

Recommended first aid facilities Ready access to running water is recommended. Accessible eyewash is recommended.

Exposure

Swallowed The product is not considered toxic. Ingestion is unlikely due to product form (gaseous). In case of persistent symptoms, contact the National Poisons Centre or a Doctor.

Eye contact If product gets in eyes, this may result in a cold burn. Immediately flush eyes with tepid water or sterile saline solution. Holding eyelids apart, continue to wash for 15 mins. Seek medical advice.

Skin contact This product is non-irritating to skin. However, contact may result in a cold burn. Remove contaminated clothing and gently flush affected areas with tepid or cold water for 15 minutes. Apply sterile dressing and treat as for a thermal burn. For large burns, immerse in cold water for 15 minutes. DO NOT apply any form of direct heat. Seek immediate medical attention.

Inhaled Although the gas mixture is non toxic, it is considered to be an asphyxiant. Remove from area of exposure immediately. If assisting a victim avoid becoming a casualty, wear an Air-line respirator or Self Contained Breathing Apparatus (SCBA). 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. If patient is unconscious, place in the recovery position (on the side) for transport and contact a doctor.

Advice to Doctor

Treat symptomatically.

5. Firefighting Measures

Fire and explosion hazards: Gas may form an explosive mixture in air which can be ignited by many sources such as pilot lights, open flames, electrical motors, switches and static electricity.

Suitable extinguishing substances: Carbon dioxide, extinguishing powder, foam, fog sprays.

Unsuitable extinguishing substances: Unknown.

Products of combustion: Carbon dioxide, and if combustion is incomplete, carbon monoxide and smoke. Water. May form toxic mixtures in air and may accumulate in sumps, pits and other low-lying spaces, forming potentially explosive mixtures.

Protective equipment: Self-contained breathing apparatus. Safety boots, non-flammable overalls, gloves, hat and eye protection.

Hazchem code: NA

6. Accidental Release Measures

Containment If greater than 200kg is stored, secondary containment and emergency plans to manage any potential spills must be in place. In all cases design storage to prevent discharge to storm water.

Emergency procedures Pressurised liquid leaks will immediately vaporise at normal air pressures. Avoid breathing gas. Avoid contact of the liquid with skin and eyes. Clear area of all unprotected personnel. Extinguish or remove all sources of ignition. Switch off power supplies. Shut off leak if safe to do so. Contact emergency authorities and advise of nature of hazard. For bulk containers, evacuate personnel and remove fire sources to beyond those at which the gas detector indicates a gas concentration less than 5% of the lower explosion limit. Regular monitoring is to be carried out until the area is free of dispersed gas. Determine safe distance by use of a combustible gas detector, or at least 50 metres away.

Clean-up method Increase ventilation.

Disposal Return empty cylinders to supplier or manufacturer. Inform supplier of leak. Do not attempt to repair leaking valves or cylinder safety devices.

Precautions Wear appropriate PPE (see section 8).

7. Storage & Handling

Storage Do not store near sources of ignition or incompatible materials. Cylinders should be stored below 45°C in a secure area, upright and restrained to prevent cylinders from falling. Cylinders should also be stored in a dry, well ventilated area constructed of non-combustible material with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits. Also store removed from oxidizers.

Handling Keep exposure to a minimum, and minimise the quantities kept in work areas. See section 8 with regard to personal protective equipment requirements.

8. Exposure Controls / Personal Protective Equipment

Workplace Exposure Standards

A workplace exposure standard (WES) has not been established by WorkSafe NZ for this product. There is a general limit of 3mg/m^3 for respirable particulates and 10mg/m^3 for inhalable particulates when limits have not otherwise been established.

NZ Workplace Exposure Stds	Ingredient	WES-TWA	WES-STEL
	methane	simple asphyxiant	not established
	carbon dioxide	5000ppm 9000mg/m^3	30000ppm 54000mg/m^3

Engineering Controls

In industrial situations, it is expected that employee exposure to hazardous substances will be controlled to a level as far below the WES as practicable by applying the hierarchy of control required by the Health and Safety at Work Act (2015) and the Health and Safety at Work (General Risk and Workplace Management) Regulations 2016. Exposure can be reduced by process modification, use of local exhaust ventilation, capturing substances at the source, or other methods. If you believe air borne concentrations of mists, dusts or vapours are high, you are advised to modify processes or increase ventilation.

Personal Protective Equipment

General Personal Protective Equipment (PPE) should not be used as the primary means of exposure protection, except in the event of an accident or emergency situation or where all other means of protection have proven to inadequate.
Clean PPE after use or dispose of as appropriate. Store PPE for re-use in a clean place. Regular training on the correct use of PPE should be provided. In particular the correct fitting and use of respirators and where applicable the cleaning of respirators should be undertaken.

Eyes Protective eyewear is not normally necessary when using this product. However, it always prudent to use protective eyewear if splashes are likely.

Skin Protective gloves and clothing are not normally necessary. However, it is prudent to wear gloves when handling chemicals in bulk or for an extended period of time.

Respiratory Respirator is not required under normal use. Ensure adequate natural ventilation. If product is being used in confined conditions, the use of a mask or respirator may be preferred.

WES Additional Information

Not applicable

9. Physical & Chemical Properties

Appearance	gas
Odour	no odour
Odour Threshold	no data
pH	no data
Freezing/melting point	-187.6°C
Boiling Point	no data
Flashpoint	no data
Flammability	flammable gas
Upper & lower flammable limits	no LEL or UEL
Vapour pressure	no data
Vapour density	highest known value 1.5 (Air = 1) (Carbon Dioxide). Weighted average: 1 (Air = 1)
Specific gravity/density	0.9611078kg/m^3

Solubility	miscible in water
Partition coefficient	no data
Auto-ignition temperature	no data
Decomposition temperature	no data
Viscosity	no data
Particle Characteristics	no data

10. Stability & Reactivity

Stability	Stable
Conditions to be avoided	Flammable substance. Keep away from heat and sources of ignition at all times.
Incompatible groups	Oxidizers, Acids.
Substance Specific Incompatibility	none known
Hazardous decomposition products	Carbon dioxide, and if combustion is incomplete, carbon monoxide and smoke.
Hazardous reactions	none known

11. Toxicological Information

Summary

IF SWALLOWED: Ingestion is unlikely due to product form (gaseous).
IF ON SKIN: This product is non-irritating to skin. However, contact may result in a cold burn.
IF IN EYES: If product gets in eyes, this may result in a cold burn.
IF INHALED: Although this mixtures are non toxic, it may be considered to be asphyxiants.

Supporting Data

Acute	**Oral**	Using LD_{50}'s for ingredients, the Acute Toxicity Estimate (ATE) (oral) for the mixture is >2,000 mg/kg.
	Aspiration	This mixture is not considered an aspiration hazard.
	Dermal	Using LD_{50}'s for ingredients, the Acute Toxicity Estimate (ATE) (dermal) for the mixture is >2,000 mg/kg.
	Inhaled	Using LD_{50}'s for ingredients, the Acute Toxicity Estimate (ATE) (inhalation) for the mixture is >5mg/L/4h.
	Eye	The mixture is not considered to be an eye irritant.
	Skin	The mixture is not considered to be a skin irritant.
Chronic	**Sensitisation**	No ingredient present at concentrations > 0.1% is considered a sensitizer.
	Mutagenicity	No ingredient present at concentrations > 0.1% is considered a mutagen.
	Carcinogenicity	No ingredient present at concentrations > 0.1% is considered a carcinogen.
	Reproductive / Developmental	No ingredient present at concentrations > 0.1% is considered a reproductive or developmental toxicant or have any effects on or via lactation.
	Systemic	No ingredient present at concentrations > 1% is considered a target organ toxicant.
	Aggravation of existing conditions	None known.

12. Ecological Data

Summary

This mixture is not considered ecotoxic.

Supporting Data

Aquatic	Using EC_{50}'s for ingredients, the calculated EC_{50} for the mixture is > 100 mg/L.
Bioaccumulation	No data
Degradability	No data
Soil	No data available for the mixture. This product is a gas and is not considered to be harmful in the soil environment.
Terrestrial vertebrate	See acute toxicity.
Terrestrial invertebrate	No evidence of ecotoxicity towards terrestrial invertebrates.
Biocidal	no data

13. Disposal Considerations

Restrictions	There are no product-specific restrictions, however, local council and resource consent conditions may apply.
Disposal method	Cylinders should be returned to the supplier or manufacturer for disposal.

14. Transport Information

Land Transport Rule: Dangerous Goods 2005 - NZS 5433:2007
Transport according to NZS 5433 (Transport of Hazardous Substances on Land). Considered a hazardous substance for transport.

UN number:	1954	**Proper shipping name:**	COMPRESSED GAS, FLAMMABLE, N.O.S. (methane, carbon dioxide)
Class(es)	2.1	**Packing group:**	NA
Precautions:	flammable, non toxic gas	**Hazchem code:**	2T

IMDG

UN number:	1954	**Proper shipping name:**	COMPRESSED GAS, FLAMMABLE, N.O.S. (methane, carbon dioxide)
Class(es)	2.1	**Packing group:**	NA
Precautions:	flammable, non toxic gas	**EmS**	F-D, S-U

IATA

UN number:	1954	**Proper shipping name:**	COMPRESSED GAS, FLAMMABLE, N.O.S. (methane, carbon dioxide)
Class(es)	2.1	**Packing group:**	NA
Precautions:	flammable, non toxic gas		

15. Regulatory Information

This product is an approved substance under the Hazardous Substances and New Organisms Act (HSNO). Approval code: HSR002532, Gases Under Pressure Mixtures (Flammable) Group Standard 2020. All ingredients appear on the New Zealand Inventory of Chemicals NZIoC.

Specific Controls

Key workplace requirements are:	
SDS	To be available within 10 minutes in workplaces storing any quantity.
Inventory	An inventory of all hazardous substances must be prepared and maintained.
Packaging	All hazardous substances should be appropriately packaged including substances that have been decanted, transferred or manufactured for own use or have been supplied
Labelling	Must comply with the Hazardous Substances (Labelling) Notice 2017.
Emergency plan	Required if > 200kg is stored.
Certified handler	Not required.
Tracking	This substance is required to be tracked if > not required is present.
Bunding & secondary containment	Required if > 200kg is stored.
Signage	Required if > 100kg is stored.
Location compliance certificate	Required if > 100kg is stored.
Flammable zone	Must be established.
Fire extinguisher	If > 30kg present.

Note: The above workplace requirements apply if only this particular substance is present. The complete set of controls for a location will depend on the classification and total quantities of other substances present in that location.

Other Legislation

In New Zealand, the use of this product may come under the Resource Management Act and Regulations, the Health and Safety at Work Act 2015 and the Health and Safety at Work (General Risk and Workplace Management) Regulations 2016, local Council Rules and Regional Council Plans.

16. Other Information

Abbreviations

Approval Code	Approval HSR002532, Gases Under Pressure Mixtures (Flammable) Group Standard 2020 Controls, EPA. www.epa.govt.nz
CAS Number	Unique Chemical Abstracts Service Registry Number
EC_{50}	Ecotoxic Concentration 50% – concentration in water which is fatal to 50% of a test population (e.g. daphnia, fish species)
EPA	Environmental Protection Authority (New Zealand)
GHS	Globally Harmonised System of Classification and Labelling of Chemicals, 7th revised edition, 2017, published by the United Nations.
HAZCHEM Code	Emergency action code of numbers and letters that provide information to emergency services, especially fire fighters
HSNO	Hazardous Substances and New Organisms (Act and Regulations)
IARC	International Agency for Research on Cancer
LEL	Lower Explosive Limit
LD_{50}	Lethal Dose 50% – dose which is fatal to 50% of a test population (usually rats).
LC_{50}	Lethal Concentration 50% – concentration in air which is fatal to 50% of a test population (usually rats)
NZIoC	New Zealand Inventory of Chemicals
STEL	Short Term Exposure Limit - The maximum airborne concentration of a chemical or biological agent to which a worker may be exposed in any 15 minute period, provided the TWA is not exceeded
STOT RE	System Target Organ Toxicity – Repeated Exposure
STOT SE	System Target Organ Toxicity – Single Exposure
TWA	Time Weighted Average – generally referred to WES averaged over typical work day (usually 8 hours)
UEL	Upper Explosive Limit
UN Number	United Nations Number
WES	Workplace Exposure Standard - The airborne concentration of a biological or chemical agent to which a worker may be exposed during work hours (usually 8 hours, 5 days a week). The WES relates to exposure that has been measured by personal monitoring using procedures that gather air samples in the worker's breathing zone.

References

Data	Unless otherwise stated comes from the EPA HSNO chemical classification information database (CCID).
Controls	EPA notices, www.epa.govt.nz, Health and Safety at Work (Hazardous Substances) Regulations 2017, www.legislation.govt.nz
WES	The latest NZ Workplace Exposure Standards, published by WorkSafe NZ and available on their web site – www.worksafe.govt.nz.
Other References:	Suppliers SDS

Review

Date	Reason for review
February 2024	Not applicable - New SDS

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