

Danger



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

1.1. Product identifier

Trade name : C9 Calibration Gas in Methane
SDS no : AL731

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

Relevant identified uses : Industrial and professional. Perform risk assessment prior to use
Test gas/Calibration gas
Laboratory use
Contact supplier for more information on uses

Uses advised against : Consumer use

1.3. Details of the supplier of the safety data sheet

Company identification : Air Liquide Australia Limited
Level 9 / 380 St. Kilda Road
3004 Melbourne VIC Australia
+61 3 9697 9888
ALAEquiries@AirLiquide.com

1.4. Emergency telephone number

Emergency telephone number : 1800 812 588

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to WHS Regulation

Physical hazards : Flammable gases, Category 1 H220
Gases under pressure : Compressed gas H280

2.2. Label elements

Classification according to WHS Regulation

Hazard pictograms :



GHS02



GHS04

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
- 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

2.3. Other hazards

: None

SECTION 3: Composition/information on ingredients
3.1. Substance : Not applicable

3.2. Mixture

Name	Product identifier	%	Classification according to WHS Regulation
Methane	(CAS No) 74-82-8 (EC no) 200-812-7 (EC index no) 601-001-00-4 (REACH-no) *1	Balance	Flam. Gas 1, H220 Press. Gas (Comp.), H280
Carbon dioxide	(CAS No) 124-38-9 (EC no) 204-696-9 (EC index no) (REACH-no) *1	0.5 - 5	Press. Gas (Liq.), H280
Ethane	(CAS No) 74-84-0 (EC no) 200-814-8 (EC index no) 601-002-00-X (REACH-no) *2	2.5 - 5	Flam. Gas 1, H220 Press. Gas (Comp.), H280
Nitrogen	(CAS No) 7727-37-9 (EC no) 231-783-9 (EC index no) (REACH-no) *1	0.5 - 5	Press. Gas (Comp.), H280
Propane	(CAS No) 74-98-6 (EC no) 200-827-9 (EC index no) 601-003-00-5 (REACH-no) 01-2119486944-21	0.5 - 2	Flam. Gas 1, H220 Press. Gas (Liq.), H280
Isobutane	(CAS No) 75-28-5 (EC no) 200-857-2 (EC index no) 601-004-00-0 (REACH-no) 01-2119485395-27	0.05 - 0.5	Flam. Gas 1, H220 Press. Gas (Liq.), H280
Butane n-	(CAS No) 106-97-8 (EC no) 203-448-7 (EC index no) 601-004-00-0 (REACH-no) 01-2119474691-32	0.05 - 0.5	Flam. Gas 1, H220 Press. Gas (Liq.), H280
Isopentane	(CAS No) 78-78-4 (EC no) 201-142-8 (EC index no) 601-006-00-1	0.05 - 0.3	Flam. Liq. 1, H224 Asp. Tox. 1, H304 STOT SE 3, H336 Aquatic Chronic 2, H411
pentane	(CAS No) 109-66-0 (EC no) 203-692-4 (EC index no) 601-006-00-1	0.05 - 0.3	Flam. Liq. 2, H225 Asp. Tox. 1, H304 STOT SE 3, H336 Aquatic Chronic 2, H411
n-hexane	(CAS No) 110-54-3 (EC no) 203-777-6 (EC index no) 601-037-00-0	0.02 - 0.1	Flam. Liq. 2, H225 Repr. 2, H361f Asp. Tox. 1, H304 STOT RE 2, H373 Skin Irrit. 2, H315 STOT SE 3, H336 Aquatic Chronic 2, H411
octane, n-octane	(CAS No) 111-65-9 (EC no) 203-892-1 (EC index no) 601-009-00-8	0.01 - 0.03	Flam. Liq. 2, H225 Asp. Tox. 1, H304 Skin Irrit. 2, H315 STOT SE 3, H336 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
heptane, n-heptane	(CAS No) 142-82-5 (EC no) 205-563-8 (EC index no) 601-008-00-2	0.01 - 0.03	Flam. Liq. 2, H225 Asp. Tox. 1, H304 Skin Irrit. 2, H315 STOT SE 3, H336 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Nonane	(CAS No) 111-84-2 (EC no) 203-913-4 (EC index no)	0.01	Flam. Liq. 3, H226

Full text of R- and H-statements: see section 16

Contains no other components or impurities which will influence the classification of the product.

*1: Listed in Annex IV / V REACH, exempted from registration.

*2: Registration deadline not expired.

*3: Registration not required: Substance manufactured or imported < 1t/y.

SECTION 4: First aid measures

4.1. Description of first aid measures

- Inhalation : Remove person to fresh air and keep comfortable for breathing
Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped
- Skin contact : Wash skin with plenty of water
- Eye contact : Rinse eyes with water as a precaution
- Ingestion : Call a poison center or a doctor if you feel unwell

4.2. Most important symptoms and effects, both acute and delayed

- : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation
Refer to section 11

4.3. Indication of any immediate medical attention and special treatment needed

- : Treat symptomatically

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Water spray
Dry powder
Foam
- Unsuitable extinguishing media : Carbon dioxide
Do not use water jet to extinguish

5.2. Special hazards arising from the substance or mixture

- Specific hazards : Exposure to fire may cause containers to rupture/explode
- Hazardous combustion products : Incomplete combustion may form carbon monoxide
On exposure to high temperature, may decompose, releasing toxic gases

5.3. Advice for fire-fighters

- Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems
If possible, stop flow of product
Use water spray or fog to knock down fire fumes if possible
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire
Move containers away from the fire area if this can be done without risk
- Special protective equipment for fire fighters : In confined space use self-contained breathing apparatus
Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask
Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters
- :

SECTION 6: Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**

- : Try to stop release
- Evacuate area
- Consider the risk of potentially explosive atmospheres
- Eliminate ignition sources
- Ensure adequate air ventilation
- Act in accordance with local emergency plan
- Stay upwind

6.2. Environmental precautions

- : Avoid release to the environment
- Try to stop release

6.3. Methods and material for containment and cleaning up

- : Ventilate area

6.4. Reference to other sections

- : For further information refer to section 13
- See also sections 8 and 13

SECTION 7: Handling and storage**7.1. Precautions for safe handling**

Safe use of the product

- : The substance must be handled in accordance with good industrial hygiene and safety procedures
- Only experienced and properly instructed persons should handle gases under pressure
- Consider pressure relief device(s) in gas installations
- Ensure the complete gas system was (or is regularly) checked for leaks before use
- Do not smoke while handling product
- Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt
- Assess the risk of potentially explosive atmospheres and the need for explosion-proof equipment
- Purge air from system before introducing gas
- Take precautionary measures against static discharge
- Keep away from ignition sources (including static discharges)
- Consider the use of only non-sparking tools
- Do not breathe gas
- Avoid release of product into atmosphere.

Safe handling of the gas receptacle

- : Refer to supplier's container handling instructions
- Do not allow backfeed into the container
- Protect cylinders from physical damage; do not drag, roll, slide or drop
- When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders
- 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
- If user experiences any difficulty operating cylinder valve discontinue use and contact supplier
- Never attempt to repair or modify container valves or safety relief devices
- Damaged valves should be reported immediately to the supplier
- Keep container valve outlets clean and free from contaminants particularly oil and water
- Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment
- Close container valve after each use and when empty, even if still connected to equipment
- Never attempt to transfer gases from one cylinder/container to another
- Never use direct flame or electrical heating devices to raise the pressure of a container
- Do not remove or deface labels provided by the supplier for the identification of the cylinder contents
- Containers should be stored in the vertical position and properly secured to prevent them from falling over.

7.2. Conditions for safe storage, including any incompatibilities

- : Observe all regulations and local requirements regarding storage of containers
- Containers should not be stored in conditions likely to encourage corrosion
- Container valve guards or caps should be in place
- Containers should be stored in the vertical position and properly secured to prevent them from falling over
- Stored containers should be periodically checked for general condition and leakage
- Keep container below 50°C in a well ventilated place
- Store containers in location free from fire risk and away from sources of heat and ignition
- Keep away from combustible materials
- Segregate from oxidant gases and other oxidants in store
- All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere.

7.3. Specific end use(s)

: None.

SECTION 8: Exposure controls/personal protection
8.1. Control parameters

Nonane (111-84-2)		
OEL : Occupational Exposure Limits		
Australia	TWA (mg/m ³)	1050 mg/m ³
	TWA (ppm)	200 ppm
octane, n-octane (111-65-9)		
OEL : Occupational Exposure Limits		
Australia	TWA (mg/m ³)	1400 mg/m ³
	TWA (ppm)	300 ppm
	STEL (mg/m ³)	1750 mg/m ³
	STEL (ppm)	375 ppm
heptane, n-heptane (142-82-5)		
OEL : Occupational Exposure Limits		
Australia	TWA (mg/m ³)	1640 mg/m ³
	TWA (ppm)	400 ppm
	STEL (mg/m ³)	2050 mg/m ³
	STEL (ppm)	500 ppm
United Kingdom	WEL - LTEL - UK [mg/m ³]	2085 mg/m ³
	WEL - LTEL - UK [ppm]	500 ppm
n-hexane (110-54-3)		
OEL : Occupational Exposure Limits		
Australia	TWA (mg/m ³)	72 mg/m ³
	TWA (ppm)	20 ppm
United Kingdom	WEL - LTEL - UK [mg/m ³]	72 mg/m ³
	WEL - LTEL - UK [ppm]	20 ppm
pentane (109-66-0)		
OEL : Occupational Exposure Limits		
Australia	TWA (mg/m ³)	1770 mg/m ³
	TWA (ppm)	600 ppm
	STEL (mg/m ³)	2210 mg/m ³
	STEL (ppm)	750 ppm
United Kingdom	WEL - LTEL - UK [mg/m ³]	1800 mg/m ³
	WEL - LTEL - UK [ppm]	600 ppm
Isopentane (78-78-4)		
OEL : Occupational Exposure Limits		
United Kingdom	WEL - LTEL - UK [mg/m ³]	1800 mg/m ³
	WEL - LTEL - UK [ppm]	600 ppm
Butane n- (106-97-8)		
OEL : Occupational Exposure Limits		
United Kingdom	WEL - LTEL - UK [mg/m ³]	1450 mg/m ³

	WEL - LTEL - UK [ppm]	600 ppm
	WEL - STEL - UK [mg/m ³]	1810 mg/m ³
	WEL - STEL - UK [ppm]	750 ppm
Carbon dioxide (124-38-9)		
OEL : Occupational Exposure Limits		
United Kingdom	WEL - LTEL - UK [mg/m ³]	9150 mg/m ³
	WEL - LTEL - UK [ppm]	5000 ppm
	WEL - STEL - UK [mg/m ³]	27400 mg/m ³
	WEL - STEL - UK [ppm]	15000 ppm

DNEL (Derived-No Effect Level) : No data available.

PNEC (Predicted No-Effect Concentration) : No data available.

8.2. Exposure controls

8.2.1. Appropriate engineering controls

- : Ensure good ventilation of the work station
- Provide adequate general and local exhaust ventilation
- Systems under pressure should be regularly checked for leakages
- Ensure exposure is below occupational exposure limits (where available)
- Keep concentrations well below lower explosion limits
- Gas detectors should be used when flammable gases/vapours may be released
- Consider work permit system e.g. for maintenance activities

8.2.2. Individual protection measures, e.g. personal protective equipment

- : 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:
- PPE compliant to the recommended EN/ISO standards should be selected

• Eye/face protection

- : Safety glasses
- Wear safety glasses with side shields
- Standard EN 166 - Personal eye-protection

• Skin protection

- Hand protection

- : Wear working gloves when handling gas containers
- Standard EN 388 - Protective gloves against mechanical risk
- Protective gloves

- Other

- : Consider the use of flame resistant anti-static safety clothing
- Standard EN ISO 14116 - Limited flame spread materials
- Standard EN ISO 1149-5 - Protective clothing: Electrostatic properties
- Wear safety shoes while handling containers
- Standard EN ISO 20345 - Personal protective equipment - Safety footwear

• Respiratory protection

- : In case of insufficient ventilation, wear suitable respiratory equipment

• Thermal hazards

- : None necessary

8.2.3. Environmental exposure controls

- : Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

- Physical state at 20°C / 101.3kPa : Gas.
- Colour : Mixture contains one or more component(s) which have the following colour(s): Colourless.

Odour	: There may be no odour warning properties, odour is subjective and inadequate to warn of overexposure. Mixture contains one or more component(s) which have the following odour(s): Stenchant often added. Sweetish.
Odour threshold	: Odour threshold is subjective and inadequate to warn of overexposure.
pH value	: Not applicable for gas-mixtures.
Molar mass	: Not applicable for gas-mixtures.
Melting point	: Not applicable for gas-mixtures.
Boiling point	: Not applicable for gas-mixtures.
Flash point	: Not applicable for gas-mixtures.
Evaporation rate (ether=1)	: Not applicable for gas-mixtures.
Flammability range	: Flammability range not available.
Vapour pressure [20°C]	: Not applicable.
Vapour pressure [50°C]	: Not applicable.
Relative density, gas (air=1)	: Lighter or similar to air.
Solubility in water	: No data available
Partition coefficient n-octanol/water [log Kow]	: Not applicable for gas-mixtures.
Auto-ignition temperature	: Not known.
Viscosity [20°C]	: Not applicable.
Explosive Properties	: Not applicable
Oxidising Properties	: Not applicable

9.2. Other information

Other data : None

SECTION 10: Stability and reactivity
10.1. Reactivity

: Extremely flammable gas

10.2. Chemical stability

: Stable under normal conditions

10.3. Possibility of hazardous reactions

: No dangerous reactions known under normal conditions of use
Can form explosive mixture with air
May react violently with oxidants

10.4. Conditions to avoid

: Avoid contact with hot surfaces
Heat
No flames, no sparks. Eliminate all sources of ignition
Keep away from heat/sparks/open flames/hot surfaces. – No smoking

10.5. Incompatible materials

: Air, Oxidiser
Halogens
Acids

10.6. Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Classification criteria are not met
 Toxicological effects not expected from this product if occupational exposure limit values are not exceeded

Nonane (111-84-2)	
LC50 inhalation rat (ppm)	6400 ppm/4h

Propane (74-98-6)	
LC50 inhalation rat (ppm)	20000 ppm/4h

Skin corrosion/irritation : No known effects from this product
Serious eye damage/irritation : No known effects from this product
Respiratory or skin sensitisation : No known effects from this product
Germ cell mutagenicity : No known effects from this product
Carcinogenicity : No known effects from this product
Toxic for reproduction : Fertility : No known effects from this product
Toxic for reproduction : unborn child : No known effects from this product
STOT-single exposure : No known effects from this product
STOT-repeated exposure : No known effects from this product
Aspiration hazard : Not applicable for gases and gas mixtures

SECTION 12: Ecological information
12.1. Toxicity

Assessment : The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.

12.2. Persistence and degradability

Assessment : No data available.

12.3. Bioaccumulative potential

Assessment : No data available.

12.4. Mobility in soil

Assessment : No data available.

12.5. Results of PBT and vPvB assessment

Assessment : Not classified as PBT or vPvB

12.6. Other adverse effects

Effect on ozone layer : None
 Effect on the global warming : Contains greenhouse gas(es) not covered by Regulation (EC) 842/2006.

SECTION 13: Disposal considerations
13.1. Waste treatment methods

Dispose of contents/container in accordance with licensed collector's sorting instructions
Contact supplier if guidance is required
Do not discharge into areas where there is a risk of forming an explosive mixture with air.
Waste gas should be flared through a suitable burner with flash back arrestor
Do not discharge into any place where its accumulation could be dangerous
Ensure that the emission levels from local regulations or operating permits are not exceeded
Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at
<http://www.eiga.org> for more guidance on suitable disposal methods

List of hazardous waste codes (from
Commission Decision 2001/118/EC)

: 16 05 04: Gases in pressure containers (including halons) containing dangerous substances

13.2. Additional information

: None

SECTION 14: Transport information

14.1. UN number

UN-No. : 1954

14.2. UN proper shipping name

Transport by road/rail (ADR/RID) : COMPRESSED GAS, FLAMMABLE, N.O.S. (Methane, Propane)

Transport by air (ICAO-TI / IATA-DGR) : Compressed gas, flammable, n.o.s. (Methane, Propane)

Transport by sea (IMDG) : COMPRESSED GAS, FLAMMABLE, N.O.S. (Methane, Propane)

14.3. Transport hazard class(es)

Labelling :



2.1 : Flammable gases

Transport by road/rail (ADG)

Class : 2

Hazard identification number : 23

Tunnel Restriction : B/D - Tank carriage : Passage forbidden through tunnels of category B, C, D and E. Other carriage : Passage forbidden through tunnels of category D and E

Transport by air (ICAO-TI / IATA-DGR)

Class / Div. (Sub. risk(s)) : 2.1

Transport by sea (IMDG)

Class / Div. (Sub. risk(s)) : 2.1

Emergency Schedule (EmS) - Fire : F-D

Emergency Schedule (EmS) - Spillage : S-U

14.4. Packing group

Transport by road/rail (ADR/RID) : Not applicable

Transport by air (ICAO-TI / IATA-DGR) : Not applicable

Transport by sea (IMDG) : Not applicable

14.5. Environmental hazards

Transport by road/rail (ADR/RID) : None.
 Transport by air (ICAO-TI / IATA-DGR) : None.
 Transport by sea (IMDG) : None.

14.6. Special precautions for user
Packing Instruction(s)

Transport by road/rail (ADR/RID) : P200
 Transport by air (ICAO-TI / IATA-DGR)
 Passenger and Cargo Aircraft : Forbidden
 Cargo Aircraft only : 200
 Transport by sea (IMDG) : P200

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment
 Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency
 Before transporting product containers:
 - Ensure there is adequate ventilation
 - Ensure that containers are firmly secured
 - Ensure cylinder valve is closed and not leaking
 - Ensure valve outlet cap nut or plug (where provided) is correctly fitted
 - Ensure valve protection device (where provided) is correctly fitted.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

: Not applicable.

SECTION 15: Regulatory information
15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
National regulations

Ensure all national/local regulations are observed.

15.2. Chemical safety assessment

: No chemical safety assessment has been carried out

SECTION 16: Other information

Training advice : Ensure operators understand the flammability hazard. Receptacle under pressure.

Full text of H-statements

Aquatic Acute 1	Hazardous to the aquatic environment — Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment — Chronic Hazard, Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment — Chronic Hazard, Category 2
Asp. Tox. 1	Aspiration hazard, Category 1
Flam. Gas 1	Flammable gases, Category 1
Flam. Liq. 1	Flammable liquids, Category 1
Flam. Liq. 2	Flammable liquids, Category 2
Flam. Liq. 3	Flammable liquids, Category 3
Press. Gas (Comp.)	Gases under pressure : Compressed gas

Press. Gas (Liq.)	Gases under pressure : Liquefied gas
Repr. 2	Reproductive toxicity, Category 2
Skin Irrit. 2	Skin corrosion/irritation, Category 2
STOT RE 2	Specific target organ toxicity — Repeated exposure, Category 2
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Narcosis
H220	Extremely flammable gas
H224	Extremely flammable liquid and vapour
H225	Highly flammable liquid and vapour
H226	Flammable liquid and vapour
H280	Contains gas under pressure; may explode if heated
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H336	May cause drowsiness or dizziness
H361f	Suspected of damaging fertility
H373	May cause damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects
H411	Toxic to aquatic life with long lasting effects
R10	Flammable
R11	Highly flammable
R12	Extremely flammable
R38	Irritating to skin
R48/20	Harmful: danger of serious damage to health by prolonged exposure through inhalation
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R62	Possible risk of impaired fertility
R65	Harmful: may cause lung damage if swallowed
R66	Repeated exposure may cause skin dryness or cracking
R67	Vapours may cause drowsiness and dizziness
F	Highly flammable
F+	Extremely flammable
N	Dangerous for the environment
Xi	Irritant
Xn	Harmful

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: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out
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