

SECTION 1: Product identifier

1.1. Product identifier

Product form : Mixture
Trade name : ≤0.9% I-C₄H₁₀/Air
Product code : 308

1.2. Recommended uses and restrictions

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

1.3. Supplier information

CAC GAS & Instrumentation Pty Ltd
Unit 3 36 Holbeche Rd
2148 Arndell Park - AUSTRALIA
T +61 2 8676 6500
cac@cacgas.com.au - <http://www.cacgas.com.au/>
Emergency telephone number: 02 8676 6500

SECTION 2: Hazards identification

2.1. Classification of the hazardous chemical

Classification (GHS AU)

Press. Gas (Comp.) H280

2.2. Label elements

Hazard pictograms (GHS AU) :



GHS04

Signal word (GHS AU) : Warning
Hazard statements (GHS AU) : H280 - Contains gas under pressure; may explode if heated.
Precautionary statements (GHS AU) : P410+P403 - Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards

Other hazards which do not result in classification : None.

SECTION 3: Composition/information on ingredients

Name	CAS-No.	Compound type	%	Classification according to the United Nations GHS (Rev. 4, 2011)
Nitrogen	7727-37-9		78.289	Press. Gas (Comp.), H280
oxygen	7782-44-7		20.811	Ox. Gas 1, H270 Press. Gas (Comp.), H280
isobutane	75-28-5		≤ 0.9	Flam. Gas 1, H220 Press. Gas (Liq.), H280

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Adverse effects not expected from this product.

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First-aid measures after skin contact	: Adverse effects not expected from this product.
First-aid measures after eye contact	: Adverse effects not expected from this product.
First-aid measures after ingestion	: Ingestion is not considered a potential route of exposure.

4.2. Symptoms caused by exposure

Most important symptoms and effects, both acute and delayed	: No effect on living tissue. See section 11.
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4.3. Indication of any immediate medical attention and special treatment needed

Other medical advice or treatment	: None.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Water spray or fog.
Unsuitable extinguishing media	: Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

General measures	: Try to stop release. Act in accordance with local emergency plan. Stay upwind.
Hazardous combustion products	: Incomplete combustion may form carbon monoxide.

5.3. Special protective equipment and precautions for fire-fighters

Special protective equipment for fire fighters	: Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters. Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
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. Move containers away from the fire area if this can be done without risk.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	: Try to stop release. Act in accordance with local emergency plan. Stay upwind.
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6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

None.

6.3. Methods and material for containment and cleaning up

Methods and material for containment and cleaning up	: None.
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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Safe handling of the gas receptacle	: Refer to supplier's container handling instructions. Do not allow backfeed into the container. Protect containers 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 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 content of the container. Suck back of water into the container must be prevented. Open valve slowly to avoid pressure shock. Containers should be stored in the vertical position and properly secured to prevent them from falling over.
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- Safe use of the product : The product 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. Use only oxygen approved lubricants and oxygen approved sealings. Avoid suck back of water, acid and alkalis. Do not breathe gas. Avoid release of product into work area.

7.2. Conditions for safe storage, including any incompatibilities

- 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.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters - exposure standards

isobutane (75-28-5)		
USA - ACGIH	Local name	Isobutane
USA - ACGIH	ACGIH OEL STEL [ppm]	1000 ppm (EX - Explosion hazard)
USA - ACGIH	Remark (ACGIH)	TLV® Basis: CNS impair
Nitrogen (7727-37-9)		
USA - ACGIH	Local name	Nitrogen
USA - ACGIH	Remark (ACGIH)	TLV® Basis: Simple Asphyxiant

Exposure limit values for the other components

No additional information available

8.2. Monitoring

No additional information available

8.3. Appropriate engineering controls

- Appropriate engineering controls : 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). Consider the use of a work permit system e.g. for maintenance activities.

8.4. Personal protective equipment

- 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.
- Hand protection : Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risk.
- Eye protection : Wear safety glasses with side shields. Standard EN 166 - Personal eye-protection - specifications
- Respiratory protection : Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known. Use gas filters with full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers. Gas filters do not protect against oxygen deficiency. Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres. Standard EN 14387 - Gas filter(s), combined filter(s) and standard EN136, full face masks . Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
- Thermal hazard protection : None necessary.
- Environmental exposure controls : None necessary.
- Other information : Wear safety shoes while handling containers. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

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9.1. SECTION 9: Physical and chemical properties

Physical state	: Gas
Appearance	:
Molecular mass	: Not applicable for gas mixtures.
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: Stenchant often added. Sweetish.
Odour threshold	: Odour threshold is subjective and inadequate to warn of overexposure. Odour threshold is subjective and inadequate to warn of overexposure.
pH	: Not applicable for gas mixtures.
Relative evaporation rate (butylacetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable for gas mixtures.
Melting point / Freezing point	: Melting point : Not applicable for gas mixtures.
Boiling point	: Not applicable for gas mixtures.
Flash point	: Not applicable for gas mixtures.
Auto-ignition temperature	: Non flammable.
Decomposition temperature	: Not applicable.
Flammability (solid, gas)	: No data available
Vapour pressure	: Vapour pressure : Not applicable. Vapour pressure at 50 °C : Not applicable.
Relative density	: Relative vapour density at 20 °C : Not applicable. Relative gas density : Lighter or similar to air.
Density	: No data available
Solubility	: No data available
Partition coefficient n-octanol/water (Log Pow)	: Not applicable for gas mixtures.
Viscosity	: Viscosity, kinematic : Not applicable. Viscosity, dynamic : Not applicable.
Explosive properties	: Not applicable.
Oxidising properties	: None.
Explosive limits	: Not applicable for gas mixtures.
Minimum ignition energy	: No data available
Fat solubility	: No data available
Gas group	: Compressed gas
Additional information	: None.

10.1. SECTION 10: Stability and reactivity

Reactivity	: No reactivity hazard other than the effects described in sub-sections below.No reactivity hazard other than the effects described in sub-sections below.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: None under normal use. None.
Conditions to avoid	: None under recommended storage and handling conditions (see section 7). None. Avoid moisture in installation systems.
Incompatible materials	: None. For additional information on compatibility refer to ISO 11114.
Hazardous decomposition products	: None.

11.1. SECTION 11: Toxicological information

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified

isobutane (75-28-5)

LC50 Inhalation - Rat [ppm]	3125 ppm/4h
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Skin corrosion/irritation	: No known effects from this product. pH: Not applicable for gas mixtures.
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Serious eye damage/irritation	: No known effects from this product. pH: Not applicable for gas mixtures.
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.
Reproductive toxicity	: Not classified
STOT-single exposure	: No known effects from this product.
STOT-repeated exposure	: No known effects from this product.
Aspiration hazard	:

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Viscosity, kinematic	Not applicable.
Viscosity, dynamic	Not applicable.
Viscosity, kinematic	Not applicable.

SECTION 12: Ecological information

According to the National Code of Practice for the Preparation of Material Safety Data Sheets, Environmental classification information is not mandatory. Information relevant for GHS classification is available on request

12.1. Ecotoxicity

Ecology - general	: No ecological damage caused by this product.
Hazardous to the aquatic environment, short-term (acute)	: Not classified
Hazardous to the aquatic environment, long-term (chronic)	: Not classified

≤0.9% I-C ₄ H ₁₀ /Air	
Partition coefficient n-octanol/water (Log Kow)	Not applicable for gas mixtures.
Partition coefficient n-octanol/water (Log Pow)	Not applicable for gas mixtures.

isobutane (75-28-5)	
LC50 96 h - Fish [mg/l]	24.11 – 147.54 mg/l
EC50 48h - Daphnia magna [mg/l]	14.22 – 69.43 mg/l
EC50 72h - Algae [mg/l]	7.71 – 19.37 mg/l
Partition coefficient n-octanol/water (Log Pow)	2.76

Nitrogen (7727-37-9)	
Partition coefficient n-octanol/water (Log Pow)	Not applicable for inorganic products.

oxygen (7782-44-7)	
Partition coefficient n-octanol/water (Log Pow)	Not applicable for inorganic products.

12.2. Persistence and degradability

≤0.9% I-C ₄ H ₁₀ /Air	
Persistence and degradability	No data available.

isobutane (75-28-5)	
Persistence and degradability	The substance is readily biodegradable. Unlikely to persist.

Nitrogen (7727-37-9)	
Persistence and degradability	No ecological damage caused by this product.

oxygen (7782-44-7)	
Persistence and degradability	No ecological damage caused by this product.

12.3. Bioaccumulative potential

≤0.9% I-C ₄ H ₁₀ /Air	
Partition coefficient n-octanol/water (Log Pow)	See section 12.1 on ecotoxicology
Partition coefficient n-octanol/water (Log Kow)	See section 12.1 on ecotoxicology
Bioaccumulative potential	No data available.

isobutane (75-28-5)	
Partition coefficient n-octanol/water (Log Pow)	See section 12.1 on ecotoxicology
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). See section 9.

Nitrogen (7727-37-9)	
Partition coefficient n-octanol/water (Log Pow)	See section 12.1 on ecotoxicology

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Nitrogen (7727-37-9)	
Bioaccumulative potential	No ecological damage caused by this product.

oxygen (7782-44-7)	
Partition coefficient n-octanol/water (Log Pow)	See section 12.1 on ecotoxicology
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

≤0.9% I-C ₄ H ₁₀ /Air	
Mobility in soil	No data available.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.

isobutane (75-28-5)	
Partition coefficient n-octanol/water (Log Pow)	See section 12.1 on ecotoxicology
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.

Nitrogen (7727-37-9)	
Partition coefficient n-octanol/water (Log Pow)	See section 12.1 on ecotoxicology
Ecology - soil	No ecological damage caused by this product.

oxygen (7782-44-7)	
Partition coefficient n-octanol/water (Log Pow)	See section 12.1 on ecotoxicology
Ecology - soil	No ecological damage caused by this product.

12.5. Other adverse effects

Ozone	: Not classified
Other adverse effects	: No known effects from this product.
Effect on the ozone layer	: None.

≤0.9% I-C ₄ H ₁₀ /Air	
Effect on the ozone layer	None.
Fluorinated greenhouse gases	False
GWPmix comment	Contains greenhouse gas(es).

isobutane (75-28-5)	
Effect on the ozone layer	No effect on the ozone layer.
Effect on global warming	When discharged in large quantities may contribute to the greenhouse effect. Contains greenhouse gas(es).
Fluorinated greenhouse gases	False
GWP 100 years	3

Nitrogen (7727-37-9)	
Effect on the ozone layer	No effect on the ozone layer.
Effect on global warming	None.
Fluorinated greenhouse gases	False

oxygen (7782-44-7)	
Effect on the ozone layer	No effect on the ozone layer.
Effect on global warming	None.
Fluorinated greenhouse gases	False

SECTION 13: Disposal considerations

Waste treatment methods	: Contact supplier if guidance is required. May be vented to atmosphere. May be vented to atmosphere in a well ventilated place. Do not discharge into any place where its accumulation could be dangerous. Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at http://www.eiga.eu for more guidance on suitable disposal methods. Return unused product in original container to supplier.
Additional information	: None. External treatment and disposal of waste should comply with applicable local and/or national regulations.
List of hazardous waste codes (from Commission Decision 2000/532/EC as amended)	: 16 05 05 : Gases in pressure containers other than those mentioned in 16 05 04.

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SECTION 14: Transport information

14.1. UN number

UN-No. (ADG)	: 1956
UN-No. (IMDG)	: 1956
UN-No. (IATA)	: 1956

14.2. Proper Shipping Name - Addition

Proper Shipping Name (ADG)	: COMPRESSED GAS, N.O.S. (oxygen ; Nitrogen MIXTURE)
Transport by air (ICAO-TI / IATA-DGR)	: Compressed gas, n.o.s. (oxygen ; Nitrogen MIXTURE)
Transport by sea (IMDG)	: COMPRESSED GAS, N.O.S. (oxygen ; Nitrogen MIXTURE)

14.3. Transport hazard class(es)

ADG

Transport hazard class(es) (ADG)	: 2.2
Danger labels (ADG)	: 2.2
	:



IMDG

Transport hazard class(es) (IMDG)	: 2.2
Danger labels (IMDG)	: 2.2
	:



IATA

Transport hazard class(es) (IATA)	: 2.2
Danger labels (IATA)	: 2.2
	:



14.4. Packing group

Packing group (ADG)	: Not applicable
Packing group (IMDG)	: Not applicable
Packing group (IATA)	: Not applicable

14.5. Environmental hazards

Marine pollutant	: No
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14.6. Special precautions for user

Specific storage requirement	: No data available
Shock sensitivity	: No data available

14.7. Additional information

Other information	: No supplementary information available
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 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.

Transport by road and rail

UN-No. (ADG)	: 1956
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Special provision (ADG)	: 274, 292
Limited quantities (ADG)	: 120ml
Packing instructions (ADG)	: P200

Transport by sea

UN-No. (IMDG)	: 1956
Special provisions (IMDG)	: 274
Limited quantities (IMDG)	: 120 ml
Excepted quantities (IMDG)	: E1
Packing instructions (IMDG)	: P200
EmS-No. (Fire)	: F-C - FIRE SCHEDULE Charlie - NON-FLAMMABLE GASES
EmS-No. (Spillage)	: S-V - SPILLAGE SCHEDULE Victor - GASES (NON-FLAMMABLE, NON-TOXIC)
Stowage category (IMDG)	: A

Air transport

UN-No. (IATA)	: 1956
PCA Excepted quantities (IATA)	: E1
PCA Limited quantities (IATA)	: Forbidden
PCA limited quantity max net quantity (IATA)	: Forbidden
PCA packing instructions (IATA)	: 200
PCA max net quantity (IATA)	: 75kg
CAO packing instructions (IATA)	: 200
CAO max net quantity (IATA)	: 150kg
ERG code (IATA)	: 2L

14.8. Hazchem or Emergency Action Code

Hazchem Code	: 2TE
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SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

No additional information available

15.2. International agreements

No additional information available

SECTION 16: Other information

Abbreviations and acronyms	: ATE - Acute Toxicity Estimate CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008 REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006 EINECS - European Inventory of Existing Commercial Chemical Substances CAS# - Chemical Abstract Service number PPE - Personal Protection Equipment LC50 - Lethal Concentration to 50 % of a test population RMM - Risk Management Measures PBT - Persistent, Bioaccumulative and Toxic vPvB - Very Persistent and Very Bioaccumulative STOT- SE : Specific Target Organ Toxicity - Single Exposure CSA - Chemical Safety Assessment EN - European Standard UN - United Nations ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road IATA - International Air Transport Association IMDG code - International Maritime Dangerous Goods RID - Regulations concerning the International Carriage of Dangerous Goods by Rail WGK - Water Hazard Class STOT - RE : Specific Target Organ Toxicity - Repeated Exposure
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Other information : Classification using data from databases maintained by the European Industrial Gases Association (EIGA). Data is maintained in EIGA doc 169 : 'Classification and Labelling Guide', downloadable at : <http://www.eiga.eu>. Classification in accordance with calculation methods of regulation (EC) 1272/2008 CLP.

Classification:

Press. Gas (Comp.)	H280
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Full text of H-statements:

Flam. Gas 1	Flammable gases, Category 1
Ox. Gas 1	Oxidising Gases, Category 1
Press. Gas (Comp.)	Gases under pressure : Compressed gas
Press. Gas (Liq.)	Gases under pressure : Liquefied gas
H220	Extremely flammable gas.
H270	May cause or intensify fire; oxidiser.
H280	Contains gas under pressure; may explode if heated.

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.