

Danger



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

1.1. Product identifier

Trade name : 5.0-27.2% CARBON MONOXIDE in CARBON DIOXIDE
 SDS no : AL656

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
 ALAEnquiries@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 Regulation (EC) No. 1272/2008 [CLP]

| | | |
|------------------|--|------|
| Physical hazards | Flammable gases, Category 1 | H220 |
| | Gases under pressure : Liquefied gas | H280 |
| Health hazards | Acute toxicity (inhalation:gas) Category 4 | H332 |
| | Reproductive toxicity, Category 1A | H360 |
| | Specific target organ toxicity — Repeated exposure, Category 1 | H372 |

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

Repr.Cat.1; R61
 F+; R12
 T; R23
 T; R48/23

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



Signal word (CLP) :

Danger

Hazard statements (CLP) :

H220 - Extremely flammable gas.
 H280 - Contains gas under pressure; may explode if heated.
 H332 - Harmful if inhaled.

H360 - May damage fertility or the unborn child.
H372 - Causes damage to organs through prolonged or repeated exposure.

Precautionary statements (CLP)

- Prevention : P202 - Do not handle until all safety precautions have been read and understood.
P260 - Do not breathe gas, vapours.
P280 - Wear protective gloves, protective clothing, eye protection, face protection.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Response : P304+P340+P315 - IF INHALED : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical advice / attention.
P308+P313 - IF exposed or concerned: Get medical advice/attention.

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 Directive 67/548/EEC | Classification according to Regulation (EC) No. 1272/2008 [CLP] |
|-----------------|---|-----------|---|--|
| Carbon dioxide | (CAS No) 124-38-9 (EC no) 204-696-9 (EC index no) (REACH-no) *1 | Balance | Not classified | Press. Gas (Liq.), H280 |
| Carbon monoxide | (CAS No) 630-08-0 (EC no) 211-128-3 (EC index no) 006-001-00-2 (REACH-no) 01-2119480165-39 | 5 - 29.92 | Repr.Cat.1; R61 F+; R12 T; R23 T; R48/23 | Flam. Gas 1, H220 Press. Gas (Comp.), H280 Acute Tox. 3 (Inhalation:gas), H331 Repr. 1A, H360D STOT RE 1, H372 |

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 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 : For liquid spillage - flush with water for at least 15 minutes.
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.
- Ingestion : Ingestion is not considered a potential route of exposure.

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

: Obtain medical assistance.

SECTION 5: Firefighting measures**5.1. Extinguishing media**

- Suitable extinguishing media : Water spray or fog.
- 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 : None that are more toxic than the product itself.

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.
Monitor concentration of released product.
Consider the risk of potentially explosive atmospheres.
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Eliminate ignition sources.
Ensure adequate air ventilation.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Act in accordance with local emergency plan.
Stay upwind.

6.2. Environmental precautions

- : Try to stop release.

6.3. Methods and material for containment and cleaning up

- : Ventilate area.

6.4. Reference to other sections

- : 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.
- Avoid exposure, obtain special instructions before use.
- Protect eyes, face and skin from liquid splashes.
- 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

| | | |
|------------------------------------|--------------------------------------|----------------------|
| Carbon monoxide (630-08-0) | | |
| OEL : Occupational Exposure Limits | | |
| United Kingdom | WEL - LTEL - UK [mg/m ³] | 35 mg/m ³ |
| | WEL - LTEL - UK [ppm] | 30 ppm |



5.0-27.2% CARBON MONOXIDE in CARBON DIOXIDE

SDS Ref.: AL656

| | | |
|--|--------------------------------------|-----------------------|
| | WEL - STEL - UK [mg/m ³] | 232 mg/m ³ |
| | WEL - STEL - UK [ppm] | 200 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 |

Carbon monoxide (630-08-0)

DNEL: Derived no effect level (Workers)

| | |
|--|---------|
| Acute - local effects, inhalation | 100 ppm |
| Acute - systemic effects, inhalation | 100 ppm |
| Long-term - local effects, inhalation | 20 ppm |
| Long-term - systemic effects, inhalation | 20 ppm |

Carbon monoxide (630-08-0)

8.2. Exposure controls

8.2.1. Appropriate engineering controls

- : Product to be handled in a closed system and under strictly controlled conditions. Provide adequate general and local exhaust ventilation. Preferably use only permanent leak-tight installations (e.g. welded pipes). Systems under pressure should be regularly checked for leakages. Ensure exposure is below occupational exposure limits (where available). Gas detectors should be used when toxic gases may be released. Keep concentrations well below lower explosion limits. 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

- : Wear safety glasses with side shields.
Wear goggles and a face shield when transfilling or breaking transfer connections.
Standard EN 166 - Personal eye-protection.

• Skin protection

- Hand protection
- Other

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

- : 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 and full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers.
Consult respiratory device supplier's product information for the selection of the appropriate device.
Gas filters do not protect against oxygen deficiency.
Standard EN 14387 - Gas filter(s), combined filter(s) and full face mask - EN 136.
Keep self contained breathing apparatus readily available for emergency use.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems.

• Thermal hazards

- : Wear cold insulating gloves when transfilling or breaking transfer connections.
Standard EN 511 - Cold insulating gloves.

**8.2.3. Environmental exposure controls**

: Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

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 : Odourless.

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] : No reliable data available.

Vapour pressure [50°C] : No reliable data available.

Relative density, gas (air=1) : Heavier than air.

Solubility in water : Solubility in water of component(s) of the mixture :
• Carbon monoxide: 30 mg/l • Carbon dioxide: 2000 mg/l Completely soluble.

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 : Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity**10.1. Reactivity**

: No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

: Stable under normal conditions.

10.3. Possibility of hazardous reactions

: Violently oxidises organic material.
Can form explosive mixture with air.
May react violently with oxidants.

10.4. Conditions to avoid

: Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

10.5. Incompatible materials

: May react violently with combustible materials.
May react violently with reducing agents.

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 : Harmful by inhalation

Carbon monoxide (630-08-0)

| | |
|---------------------------|-----------------------------------|
| LC50 inhalation rat (ppm) | 3760 ppm/1h (P200) 1300 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 : May cause harm to the unborn child

STOT-single exposure : No known effects from this product.

STOT-repeated exposure : May cause damage to organs through prolonged or repeated exposure

Aspiration hazard : Not applicable for gases and gas mixtures.

SECTION 12: Ecological information
12.1. Toxicity

Assessment : Classification criteria are not met.

EC50 48h - Daphnia magna [mg/l]

No data available.

EC50 72h - Algae [mg/l]

No data available.

LC50 96 h - Fish [mg/l]

No data available.

Carbon monoxide (630-08-0)

| | |
|---------------------------------|-----------------------------------|
| EC50 48h - Daphnia magna [mg/l] | Study scientifically unjustified. |
| EC50 72h - Algae [mg/l] | Study scientifically unjustified. |
| LC50 96 h - Fish [mg/l] | Study scientifically unjustified. |

Carbon dioxide (124-38-9)

| | |
|---------------------------------|--------------------|
| EC50 48h - Daphnia magna [mg/l] | No data available. |
| EC50 72h - Algae [mg/l] | No data available. |
| LC50 96 h - Fish [mg/l] | No data available. |

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

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Contact supplier if guidance is required.
Avoid discharge to atmosphere.
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. : 3161

14.2. UN proper shipping name

Transport by road/rail (ADR/RID) : LIQUEFIED GAS, FLAMMABLE, N.O.S. (Carbon monoxide, Carbon dioxide)

Transport by air (ICAO-TI / IATA-DGR) : Liquefied gas, flammable, n.o.s. (Carbon monoxide, Carbon dioxide)

Transport by sea (IMDG) : LIQUEFIED GAS, FLAMMABLE, N.O.S. (Carbon monoxide, Carbon dioxide)

14.3. Transport hazard class(es)

Labelling



2.1 : Flammable gases

Transport by road/rail (ADR/RID)

Class : 2
Classification code : 2F
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****EU-Regulations**

Restrictions on use : Restricted to professional users (Annex XVII REACH).
Seveso directive 96/82/EC : Covered.

National regulations

National legislation : Ensure all national/local regulations are observed.
Water hazard class (WGK) : -

15.2. Chemical safety assessment

: A CSA does not need to be carried out for this product.

SECTION 16: Other information

- Indication of changes : Revised safety data sheet in accordance with commission regulation (EU) No 453/2010.
- Training advice : Ensure operators understand the flammability hazard. Users of breathing apparatus must be trained. Receptacle under pressure.
- Further information : This Safety Data Sheet has been established in accordance with the applicable European Union legislation. Classification in accordance with calculation methods of regulation (EC) 1272/2008 CLP / (EC) 1999/45 DPD.

Full text of R-, H- and EUH-statements

| | |
|-------------------------------|--|
| Acute Tox. 3 (Inhalation:gas) | Acute toxicity (inhalation:gas) Category 3 |
| Acute Tox. 4 (Inhalation:gas) | Acute toxicity (inhalation:gas) Category 4 |
| Flam. Gas 1 | Flammable gases, Category 1 |
| Press. Gas (Comp.) | Gases under pressure : Compressed gas |
| Press. Gas (Liq.) | Gases under pressure : Liquefied gas |
| Repr. 1A | Reproductive toxicity, Category 1A |
| Repr. 1A | Reproductive toxicity, Category 1A |
| STOT RE 1 | Specific target organ toxicity — Repeated exposure, Category 1 |
| H220 | Extremely flammable gas |
| H280 | Contains gas under pressure; may explode if heated |
| H331 | Toxic if inhaled |
| H332 | Harmful if inhaled |
| H360 | May damage fertility or the unborn child |
| H360D | May damage the unborn child |
| H372 | Causes damage to organs through prolonged or repeated exposure |
| R12 | Extremely flammable |
| R23 | Toxic by inhalation |
| R48/23 | Toxic: danger of serious damage to health by prolonged exposure through inhalation |
| R61 | May cause harm to the unborn child |
| F+ | Extremely flammable |
| T | Toxic |

- DISCLAIMER OF LIABILITY** : Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.