
1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name 4 COMPONENT MIXTURE (CHCLF₂, CO₂, NO, BALANCE O₂)
Synonym(s) 1858 - SDS NUMBER • PRODUCT CODES: 285, 288 • SPECIAL GAS MIXTURE

1.2 Uses and uses advised against

Use(s) CALIBRATION • INDUSTRIAL APPLICATIONS

1.3 Details of the supplier of the product

Supplier name BOC LIMITED (AUSTRALIA)
Address 10 Julius Avenue, North Ryde, NSW, 2113, AUSTRALIA
Telephone 131 262, (02) 8874 4400
Fax 132 427 (24 hours)
Website <http://www.boc.com.au>

1.4 Emergency telephone number(s)

Emergency 1800 653 572 (24/7) (Australia only)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

GHS classification(s) Oxidizing Gases: Category 1
Gases Under Pressure: Compressed gas

2.2 Label elements

Signal word DANGER

Pictogram(s)



Hazard statement(s)

H270 May cause or intensify fire; oxidizer.
H280 Contains gas under pressure; may explode if heated.

Prevention statement(s)

P202 Do not handle until all safety precautions have been read and understood.
P220 Keep/Store away from clothing/incompatible materials/combustible materials.
P244 Keep reduction valves free from grease and oil.

Response statement(s)

P370 + P376 In case of fire: Stop leak if safe to do so.

Storage statement(s)

P410 + P403 Protect from sunlight. Store in a well-ventilated place.

Disposal statement(s)

None allocated.

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

| Ingredient | CAS Number | EC Number | Content (v/v) |
|---------------------------------|------------|-----------|---------------|
| OXYGEN | 7782-44-7 | 231-956-9 | Remainder |
| NITROUS OXIDE | 10024-97-2 | 233-032-0 | <50% |
| CARBON DIOXIDE | 124-38-9 | 204-696-9 | <6% |
| CHLORODIFLUOROMETHANE (HCFC-22) | 75-45-6 | 200-871-9 | <5% |

4. FIRST AID MEASURES

4.1 Description of first aid measures

| | |
|-----------------------------|--|
| Eye | None required. |
| Inhalation | If inhaled, remove from contaminated area. Apply artificial respiration if not breathing. For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor. |
| Skin | None required. |
| Ingestion | Due to product form and application, ingestion is considered unlikely. |
| First aid facilities | None allocated. |

4.2 Most important symptoms and effects, both acute and delayed

Non-toxic and non-irritating. An analgesic and a weak anaesthetic. May result in central nervous system effects such as euphoria and pain reduction.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use water fog to cool containers from protected area.

5.2 Special hazards arising from the substance or mixture

Non flammable - oxidising agent. Supports combustion and may cause fire/explosion in contact with incompatible substances, strong acids, reducing agents, combustibles and flammables.

5.3 Advice for firefighters

Temperatures in a fire may cause cylinders to rupture and internal pressure relief devices to be activated. Cool cylinders or containers exposed to fire by applying water from a protected location. Do not approach cylinders or containers suspected of being hot.

5.4 Hazchem code

2S
2 Fine Water Spray.
S Risk of violent reaction or explosion. Wear full fire kit and breathing apparatus. Dilute spill and run-off.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Use Personal Protective Equipment (PPE) as detailed in Section 8 of the SDS.

6.2 Environmental precautions

Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.3 Methods of cleaning up

Carefully move material to a well ventilated remote area, then allow to discharge if safe to do so. Do not attempt to repair leaking valve or cylinder safety devices.

6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Use of safe work practices are recommended to avoid inhalation. Do not drag, drop, slide or roll cylinders. The uncontrolled release of a gas under pressure may cause physical harm. Use a suitable hand truck for cylinder movement.

7.2 Conditions for safe storage, including any incompatibilities

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.

7.3 Specific end use(s)

No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure standards

| Ingredient | Reference | TWA | | STEL | |
|------------------------------|-----------|-------|-------------------|-------|-------------------|
| | | ppm | mg/m ³ | ppm | mg/m ³ |
| Carbon dioxide | SWA (AUS) | 5000 | 9000 | 30000 | 54000 |
| Carbon dioxide in coal mines | SWA (AUS) | 12500 | 22500 | 30000 | 54000 |
| Chlorodifluoromethane | SWA (AUS) | 1000 | 3540 | -- | -- |
| Nitrous oxide | SWA (AUS) | 25 | 45 | -- | -- |

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain vapour levels below the recommended exposure standard.

PPE

- Eye / Face** Wear safety glasses.
- Hands** Wear leather gloves.
- Body** Wear safety boots.
- Respiratory** Where an inhalation risk exists, wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

| | |
|-------------------------|-------------------------------|
| Appearance | COLOURLESS GAS |
| Odour | SLIGHT SWEET ODOUR |
| Flammability | NON FLAMMABLE |
| Flash point | NOT RELEVANT |
| Boiling point | NOT AVAILABLE |
| Melting point | NOT AVAILABLE |
| Evaporation rate | NOT APPLICABLE |
| pH | NOT APPLICABLE |
| Vapour density | 1.3 (Air = 1) (Approximately) |
| Specific gravity | NOT APPLICABLE |

9.1 Information on basic physical and chemical properties

| | |
|---------------------------|--------------------|
| Solubility (water) | 0.032 L/L (Oxygen) |
| Vapour pressure | NOT AVAILABLE |
| Upper explosion limit | NOT RELEVANT |
| Lower explosion limit | NOT RELEVANT |
| Partition coefficient | NOT AVAILABLE |
| Autoignition temperature | NOT AVAILABLE |
| Decomposition temperature | NOT AVAILABLE |
| Viscosity | NOT AVAILABLE |
| Explosive properties | NOT AVAILABLE |
| Oxidising properties | OXIDISING GAS |
| Odour threshold | NOT AVAILABLE |

9.2 Other information

| | |
|-------------------------------|-------------------------|
| % Volatiles | 100 % |
| Cylinder pressure (when full) | 7000 - 12000 kPa @ 15°C |

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerization will not occur.

10.4 Conditions to avoid

Avoid contact with incompatible substances.

10.5 Incompatible materials

Combustible materials such as oil and grease can spontaneously ignite at low temperatures in oxygen enriched atmospheres. Materials which burn in air, will burn more vigorously in oxygen enriched atmospheres.

10.6 Hazardous decomposition products

May evolve nitrogen oxides when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity Based on available data, the classification criteria are not met. Nitrous oxide passes into all gas containing spaces in the body faster than nitrogen passes out, thus it should not be used with any condition where its expansion might be dangerous. May induce vomiting in susceptible individuals.

Information available for the ingredient(s):

| Ingredient | Oral Toxicity (LD50) | Dermal Toxicity (LD50) | Inhalation Toxicity (LC50) |
|---------------------------------|----------------------|------------------------|------------------------------|
| NITROUS OXIDE | -- | -- | 1068 mg/m ³ (rat) |
| CARBON DIOXIDE | -- | -- | 470000 ppm/30M (rat) |
| CHLORODIFLUOROMETHANE (HCFC-22) | -- | -- | 35 pph/15 minutes (rat) |

| | |
|-------------------------------|---|
| Skin | Not classified as a skin irritant. |
| Eye | Not classified as an eye irritant. |
| Sensitisation | Not classified as causing skin or respiratory sensitisation. |
| Mutagenicity | Not classified as a mutagen. |
| Carcinogenicity | Not classified as a carcinogen. |
| Reproductive | Reduced fertility in healthcare personnel has been reported where they have been repeatedly exposed to levels of nitrous oxide above the specified occupational exposure limits in inadequately ventilated rooms. There is no documented evidence to confirm or exclude the existence of any causal connection between these cases and exposure to nitrous oxide. |
| STOT – single exposure | Anaesthetic gas. May have short term effects on the central nervous system, including euphoria and anxiolytic and analgesic effects. |

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STOT - repeated exposure Chronic exposure to nitrous oxide can result in some symptoms of pernicious anaemia: Megaloblastic bone-marrow depression or peripheral and central neuropathy (tingling, numbness, impairment of equilibrium, difficulty in thinking clearly).

Aspiration Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No information provided.

12.2 Persistence and degradability

No information provided.

12.3 Bioaccumulative potential

No information provided.

12.4 Mobility in soil

No information provided.

12.5 Other adverse effects

No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal Cylinders should be returned to the manufacturer or supplier for disposal of contents.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

| | LAND TRANSPORT (ADG) | SEA TRANSPORT (IMDG / IMO) | AIR TRANSPORT (IATA / ICAO) |
|--------------------------------------|---|---|---|
| 14.1 UN Number | 3156 | 3156 | 3156 |
| 14.2 Proper Shipping Name | COMPRESSED GAS, OXIDIZING, N.O.S. (Contains oxygen and nitrous oxide) | COMPRESSED GAS, OXIDIZING, N.O.S. (Contains oxygen and nitrous oxide) | COMPRESSED GAS, OXIDIZING, N.O.S. (Contains oxygen and nitrous oxide) |
| 14.3 Transport hazard classes | 2.2, 5.1 | 2.2, 5.1 | 2.2, 5.1 |
| 14.4 Packing Group | None allocated. | None allocated. | None allocated. |

14.5 Environmental hazards

No information provided.

14.6 Special precautions for user

Hazchem code 2S
GTEPG 2B1
EMS F-C, S-W

Other information Ensure cylinder is separated from driver and that outlet of relief device is not obstructed. Refer to Commonwealth, State and Territory Dangerous Goods Legislation which contain requirements which affect gas storage and transport.

15. REGULATORY INFORMATION

PRODUCT NAME 4 COMPONENT MIXTURE (CHCLF2, CO2, NO, BALANCE O2)**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

| | |
|-----------------------------|---|
| Poison schedule | Classified as a Schedule 4 (S4) Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP). |
| Classifications | Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals. The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)]. |
| Hazard codes | O Oxidising |
| Risk phrases | R8 Contact with combustible material may cause fire. |
| Safety phrases | S17 Keep away from combustible material. S51 Use only in well ventilated areas. |
| Inventory listing(s) | AUSTRALIA: AICS (Australian Inventory of Chemical Substances) All components are listed on AICS, or are exempt. |

16. OTHER INFORMATION

Additional information The storage of significant quantities of gas cylinders must comply with AS4332 The storage and handling of gases in cylinders.

Application Method: Gas regulator of suitable pressure and flow rating fitted to cylinder valve or manifold with low pressure gas distribution to equipment.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

| | | |
|----------------------|-------------------|---|
| Abbreviations | ACGIH | American Conference of Governmental Industrial Hygienists |
| | CAS # | Chemical Abstract Service number - used to uniquely identify chemical compounds |
| | CNS | Central Nervous System |
| | EC No. | EC No - European Community Number |
| | EMS | Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods) |
| | GHS | Globally Harmonized System |
| | GTEPG | Group Text Emergency Procedure Guide |
| | IARC | International Agency for Research on Cancer |
| | LC50 | Lethal Concentration, 50% / Median Lethal Concentration |
| | LD50 | Lethal Dose, 50% / Median Lethal Dose |
| | mg/m ³ | Milligrams per Cubic Metre |
| | OEL | Occupational Exposure Limit |
| | pH | relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline). |
| | ppm | Parts Per Million |
| | STEL | Short-Term Exposure Limit |
| | STOT-RE | Specific target organ toxicity (repeated exposure) |
| | STOT-SE | Specific target organ toxicity (single exposure) |
| | SUSMP | Standard for the Uniform Scheduling of Medicines and Poisons |
| | SWA | Safe Work Australia |
| | TLV | Threshold Limit Value |
| | TWA | Time Weighted Average |

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Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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