



MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: NON-FLAMMABLE GAS MIXTURE

Containing One or More of the Following Components in a Nitrogen Balance Gas:
Oxygen, 0-23.5%; Methane, 0-2.5%; Hydrogen, 0-2.0%; Carbon Monoxide, 0.0001-1.0%

NOTE: MIXTURES COMPRISED OF AN AIR BALANCE GAS CONTAIN BETWEEN 19.5-23.5% OXYGEN.

SYNONYMS: Not Applicable CHEMICAL FAMILY NAME: Not Applicable FORMULA: Not Applicable
DRAEGER'S P/N's: 4594635, 4594638, 4594656, 4594945, 4594594, 4594596, 4594657

Note: The Material Safety Data Sheet is for this gas mixture supplied in cylinders with 33 cubic feet (935 liters) or less gas capacity (DOT - 39 cylinders). This MSDS has been developed for various gas mixtures with the composition of components within the ranges listed in Section 2 (Composition and Information on Ingredients). Refer to the product label for information on the actual composition of the product.

| | |
|---|---|
| PRODUCT USE: | Calibration of Monitoring and Research Equipment |
| U.S. SUPPLIER ADDRESS: | DRAEGER SAFETY Inc. 101 Technology Drive Pittsburgh, PA 15275-1057 |
| MANUFACTURER'S NAME: | CALGAZ |
| BUSINESS PHONE: | 1-410-228-6400 (8 a.m. to 5 p.m. U.S. EST) |
| General MSDS Information: | 1-713-868-0440 |
| Fax on Demand: | 1-800-231-1366 |
| EMERGENCY PHONE: | |
| Chemtrec: United States/Canada/Puerto Rico: | 1-800-424-9300 [24-hours] |
| Chemtrec International: | 1-703-527-3887 [24-hours] |

2. COMPOSITION and INFORMATION ON INGREDIENTS

| CHEMICAL NAME | CAS # | mole % | EXPOSURE LIMITS IN AIR | | | | | |
|-----------------|-----------|-------------|---|----------|--------------------------------|--|------------|--|
| | | | ACGIH-TLV | | OSHA-PEL | | NIOSH IDLH | OTHER ppm |
| | | | TWA ppm | STEL ppm | PEL ppm | STEL ppm | | |
| Carbon Monoxide | 630-08-0 | 0.0001-1.0% | 25 | NE | 50 35 (Vacated 1989 PEL) | 200 [ceiling] (Vacated 1989 PEL) | 1200 | NIOSH RELs:TWA = 35 STEL = 200 ceiling DFG MAKs:TWA = 30 PEAK = 2•MAK, 15 min., average value, 1 hr interval DFG MAK Pregnancy Risk Classification: B |
| Hydrogen | 1333-74-0 | 0-2.0% | There are no specific exposure limits for Hydrogen. Hydrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%. | | | | | |
| Methane | 74-82-8 | 0-2.5% | There are no specific exposure limits for Methane. Methane is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%. | | | | | |
| Oxygen | 7782-44-7 | 0-23.5% | There are no specific exposure limits for Oxygen. Oxygen levels should be maintained above 19.5%. | | | | | |
| Nitrogen | 7727-37-9 | Balance | There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%. | | | | | |

NE = Not Established.

See Section 16 for Definitions of Terms Used.

NOTE (1): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a colorless, odorless gas. Carbon Monoxide, a component of this gas mixture, is a chemical asphyxiant and can produce significant, adverse health effects at relatively low concentrations. Over-exposure to Carbon Monoxide can cause nausea, dizziness, headaches, and collapse. Additionally, releases of this product may produce oxygen-deficient atmospheres (especially in small confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: The most significant route of over-exposure for this product is by inhalation.

INHALATION: Due to the small size of an individual cylinder of this product, no unusual health effects from over-exposure to the product are anticipated under routine circumstances of use.

Inhalation over-exposures to atmospheres containing more than the Threshold Limit Value of Carbon Monoxide (25 ppm) can result in serious health consequences. Carbon Monoxide is classified as a chemical asphyxiant, producing a toxic action by combining with the hemoglobin of the blood and replacing the available oxygen. Through this replacement, the body is deprived of the required oxygen, and asphyxiation occurs. Since the affinity of carbon monoxide for hemoglobin is about 200-300 times that of oxygen, only a small amount of Carbon Monoxide will cause a toxic reaction to occur. Carbon Monoxide exposures in excess of 50 ppm will produce symptoms of poisoning if breathed for a sufficiently long time. If this product is released in a small, poorly ventilated area (i.e. an enclosed or confined space), symptoms which may develop include the following:

| HAZARDOUS MATERIAL IDENTIFICATION SYSTEM | | | |
|--|-------------|-------|------|
| HEALTH HAZARD | (BLUE) | 2 | |
| FLAMMABILITY HAZARD | (RED) | 0 | |
| PHYSICAL HAZARD | (YELLOW) | 0 | |
| PROTECTIVE EQUIPMENT | | | |
| EYES | RESPIRATORY | HANDS | BODY |
| See Section 8 | | | |
| For Routine Industrial Use and Handling Applications | | | |

3. HAZARD IDENTIFICATION

CONCENTRATION OF CARBON MONOXIDE

All exposure levels:
200 ppm:
400 ppm:
1,000 -2000 ppm:
2000-2500 ppm:
> 2500 ppm:

OBSERVED EFFECT

Over-exposure to Carbon Monoxide can be indicated by the lips and fingernails turning bright red. Slight symptoms (headache, discomfort) after several hours of exposure. Headache and discomfort experienced within 2-3 hours of exposure. Within 30 minutes, slight palpitations of the heart occurs. Within 1.5 hours, there is a tendency to stagger. Within 2 hours, there is mental confusion, headaches, and nausea. Unconsciousness within 30 minutes. Potential for collapse and death before warning symptoms are produced.

Additionally, releases of this product may produce oxygen-deficient atmospheres (especially in small confined spaces or other poorly-ventilated environments); individuals in such atmospheres may be asphyxiated.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Over-exposure to this gas mixture may cause the following health effects:

ACUTE: Due to the small size of the individual cylinder of this product, no unusual health effects from exposure to the product are anticipated under routine circumstances of use. However, Carbon Monoxide (a component of this gas mixture) is toxic to humans. Symptoms of Carbon Monoxide poisoning can develop gradually, or can arise suddenly, depending on the concentration and duration of exposure. Lips and fingernails will turn bright red, which is a significant sign of Carbon Monoxide over-exposure. Other symptoms of over-exposure can include respiratory difficulty, headaches, shortness of breath, wheezing, headache, blurred vision, memory loss, dizziness, indigestion, nausea, unconsciousness, and death.

CHRONIC: Chronic exposure to oxygen-deficient atmospheres (below 18% oxygen in air) may effect the heart and nervous system. Clinical studies indicate that there is a relationship between exposure to Carbon Monoxide in specific occupations (i.e. fire-fighters, foundry workers) and an increased incidence of cardiovascular problems. Carbon Monoxide is a reproductive toxin. Refer to Section 11 (Toxicological Information) of this MSDS for further information.

TARGET ORGANS: ACUTE: Respiratory system, blood system. CHRONIC: Heart, cardiovascular system, central nervous system, reproductive system.

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF OVER-EXPOSURE TO THIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus and Fire-Retardant Personal Protective equipment should be worn. Adequate fire protection must be provided during rescue situations. Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s).

No unusual health effects are anticipated after exposure to this product, due to the small cylinder size. If any adverse symptom develops after over-exposure to this product, remove victim(s) to fresh air, as quickly as possible. Only Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Only trained personnel should administer supplemental oxygen.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing respiratory conditions may be aggravated by over-exposure to this product. The Carbon Monoxide component of this gas mixture can aggravate some diseases of the cardiovascular system, such as coronary artery disease and angina pectoris.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce over-exposure. Provide oxygen. Hyperbaric oxygen is the most efficient antidote to Carbon Monoxide poisoning, the optimum range being 2-2.5 atm. A special mask, or, preferably, a compression chamber to utilize oxygen at these pressures is required. Avoid administering stimulant drugs.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): Not applicable.

Upper (UEL): Not applicable.

FIRE EXTINGUISHING MATERIALS: Non-flammable gas mixture. Use extinguishing media appropriate for surrounding fire.

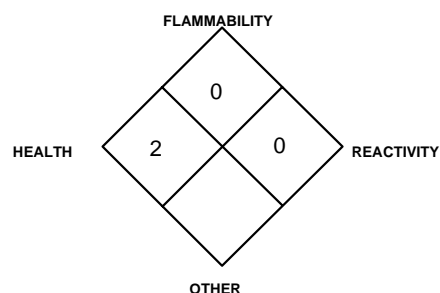
UNUSUAL FIRE AND EXPLOSION HAZARDS: This gas mixture is not flammable; however, containers, when involved in fire, may rupture or burst in the heat of the fire.

Explosion Sensitivity to Mechanical Impact: Not Sensitive.

Explosion Sensitivity to Static Discharge: Not Sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.

NFPA RATING



6. ACCIDENTAL RELEASE MEASURES

LEAK RESPONSE: Due to the small size and content of the cylinder, an accidental release of this product presents significantly less risk of an oxygen deficient environment and other safety hazards than a similar release from a larger cylinder. However, as with any chemical release, extreme caution must be used during emergency response procedures. In the event of a release in which the atmosphere is unknown, and in which other chemicals are potentially involved, evacuate immediate area. Such releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a leak, clear the affected area, protect people, and respond with trained personnel.

For emergency disposal, secure the cylinder and slowly discharge the gas to the atmosphere in a well-ventilated area or outdoors. Allow the gas mixture to dissipate. If necessary, monitor the surrounding area (and the original area of the release) for oxygen and Carbon Monoxide. Carbon Monoxide level must be below exposure level listed in Section 2 (Composition and Information on Ingredients) before non-emergency personnel are allowed to re-enter area.

If leaking incidentally from the cylinder or its valve, contact your supplier.

7. HANDLING and USE

WORK PRACTICES AND HYGIENE PRACTICES: Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of this product could occur without any significant warning symptoms, due to oxygen deficiency. Do not attempt to repair, adjust, or in any other way modify the cylinders containing Carbon Monoxide. If there is a malfunction or another type of operational problem, contact nearest distributor immediately.

STORAGE AND HANDLING PRACTICES: Cylinders should be firmly secured to prevent falling or being knocked-over. Cylinders must be protected from the environment, and preferably kept at room temperature (approximately 21°C, 70°F). Cylinders should be stored in dry, well-ventilated areas, away from sources of heat, ignition, and direct sunlight. Protect cylinders against physical damage. Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time. These cylinders are not refillable. **WARNING! Do not refill DOT 39 cylinders. To do so may cause personal injury or property damage.**

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: WARNING! Compressed gases can present significant safety hazards. During cylinder use, use equipment designed for these specific cylinders. Ensure all lines and equipment are rated for proper service pressure.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Always use product in areas where adequate ventilation is provided.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: No special ventilation systems or engineering controls are needed under normal circumstances of use. As with all chemicals, use this product in well-ventilated areas. If this product is used in a poorly-ventilated area, install automatic monitoring equipment to detect the levels of Carbon Monoxide and oxygen.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

RESPIRATORY PROTECTION: No special respiratory protection is required under normal circumstances of use. Use supplied air respiratory protection if Oxygen levels are below 19.5%, or unknown, during emergency response to a release of this product. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. Oxygen levels below 19.16.33% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998). In the event that exposure limits may be exceeded for Carbon Monoxide, the following NIOSH respiratory protection equipment guidelines should be consulted.

CARBON MONOXIDE CONCENTRATION

Up to 350 ppm:
Up to 875 ppm:
Up to 1200 ppm:

RESPIRATORY PROTECTION

Any Supplied-Air Respirator (SAR).

Any SAR operated in a continuous-flow mode.

Any Air-Purifying, Full-Facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against Carbon Monoxide, or any Self-Contained Breathing Apparatus(SCBA) with a full facepiece, or any SAR with a full facepiece.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.

Escape: Any Air-Purifying, Full-Facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against Carbon Monoxide, or any appropriate escape-type, SCBA.

EYE PROTECTION: Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.

HAND PROTECTION: No special protection is needed under normal circumstances of use. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

BODY PROTECTION: No special protection is needed under normal circumstances of use. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

9. PHYSICAL and CHEMICAL PROPERTIES

The following physical property values are for the main component, Nitrogen:

GAS DENSITY @ 32°F (0°C) and 1 atm: .072 lbs/ ft³ (1.153 kg/m³)

BOILING POINT: -320.4°F (-195.8°C)

FREEZING/MELTING POINT @ 10 psig -210°C (-345.8°F)

SPECIFIC GRAVITY (air = 1) @ 70°F (21.1°C): 0.906

SOLUBILITY IN WATER vol/vol @ 32°F (0°C) and 1 atm: 0.023

EVAPORATION RATE (nBuAc = 1): Not applicable.

ODOR THRESHOLD: Not applicable. Odorless.

VAPOR PRESSURE @ 70°F (21.1°C) psig: Not applicable.

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

pH: Not applicable.

MOLECULAR WEIGHT: 28.01

EXPANSION RATIO: Not applicable.

SPECIFIC VOLUME (ft³/lb): 13.8

The following values are for the gas mixture:

APPEARANCE, ODOR AND COLOR: This product is a colorless, odorless gas mixture.

HOW TO DETECT THIS SUBSTANCE (warning properties): There are no unusual warning properties associated with a release of this product.

10. STABILITY and REACTIVITY

STABILITY: Stable at normal temperature and pressure.

DECOMPOSITION PRODUCTS: The thermal decomposition products of Methane include carbon oxides. The other components of this gas mixture do not decompose, per se, but can react with other compounds in the heat of a fire.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Titanium will burn in Nitrogen (the main component of this product). Lithium reacts slowly with Nitrogen at ambient temperatures. Components of this product (Hydrogen, Carbon Monoxide, Methane) are also incompatible with strong oxidizers (i.e. chlorine, bromine pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride). Carbon Monoxide is mildly corrosive to nickel and iron (especially at high temperatures and pressures).

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials. Cylinders exposed to high temperatures or direct flame can rupture or burst.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology data are available for the components of this product:

CARBON MONOXIDE:

LC₅₀ (Inhalation-Rat) 1807 ppm/4 hours
LC₅₀ (Inhalation-Mouse) 2444 ppm/4 hours
LC₅₀ (Inhalation-Guinea Pig) 5718 ppm/4 hours
LC₅₀ (Inhalation-wild bird species) 1334 ppm
LCLo (Inhalation-Human) 4 mg/m³/12 hours:
Behavioral: coma; Vascular: BP lowering not characterized in autonomic section; Blood: methemoglobinemia-carboxyhemoglobin
LCLo (Inhalation-Man) 4000 ppm/30 minutes
LCLo (Inhalation-Human) 5000 ppm/5 minutes
LCLo (Inhalation-Dog) 4000 ppm/46 minutes
LCLo (Inhalation-Rabbit) 4000 ppm
LCLo (Inhalation-Mammal-species unspecified) 5000 ppm/5 minutes
hours/90 days-continuous: Blood: pigmented or nucleated red blood cells, other changes
TCLo (Inhalation-Rabbit) 200 mg/m³/3 hours/13 weeks-intermittent: Brain and Coverings: other degenerative changes; Cardiac: other changes; Blood: hemorrhage
TCLo (Inhalation-Rabbit) 50 ppm/24 hours/8 weeks-continuous: Blood: changes in platelet count
TCLo (Inhalation-Guinea Pig) 200 mg/m³/5 hours/4 weeks-intermittent: Endocrine: hyperglycemia
TCLo (Inhalation-Guinea Pig) 200 mg/m³/5 hours/30 weeks-continuous: Cardiac: arrhythmias (including changes in conduction),
EKG changes not diagnostic of specified effects, pulse rate increase, without fall in BP
TCLo (Inhalation-Guinea Pig) 200 ppm/24 hours/90 days-continuous: Blood: pigmented or nucleated red blood cells, other changes
TCLo (Inhalation-Rat) 75 ppm/24 hours: female 0-20 day(s) after conception: Reproductive: Maternal Effects: other effects; Effects on Newborn: behavioral
TCLo (Inhalation-Rat) 150 ppm/24 hours: female 1-22 day(s) after conception: Reproductive: Specific Developmental Abnormalities: cardiovascular (circulatory) system

TCLo (Inhalation-Human) 600 mg/m³/10 minutes: Behavioral: headache
TCLo (Inhalation-Man) 650 ppm/45 minutes: Blood: methemoglobinemia-carboxyhemoglobin; Behavioral: changes in psychophysiological tests
TCLo (Inhalation-Rat) 1800 ppm/1 hour/14 days-intermittent: Cardiac: other changes
TCLo (Inhalation-Rat) 30 mg/m³/8 hours/10 weeks-intermittent: Brain and Coverings: other degenerative changes;
Behavioral: muscle contraction or spasticity
TCLo (Inhalation-Rat) 96 ppm/24 hours/90 days-continuous: Blood: pigmented or nucleated red blood cells, other changes
TCLo (Inhalation-Rat) 150 ppm/24 hours: female 1-22 day(s) after conception: Reproductive: Effects on Newborn: growth statistics (e.g.%, reduced weight gain), behavioral
TCLo (Inhalation-Rat) 1 mg/m³/24 hours: female 72 day(s) pre-mating: Reproductive: Maternal Effects: menstrual cycle changes or disorders, parturition; Fertility: female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated)
TCLo (Inhalation-Rat) 150 ppm/24 hours: female 0-20 day(s) after conception: Reproductive: Effects on Newborn: behavioral
TCLo (Inhalation-Rat) 75 ppm/24 hours: female 0-20 day(s) after conception: Reproductive: Specific Developmental Abnormalities: immune and reticuloendothelial system
TCLo (Inhalation-Mouse) 65 ppm/24 hours: female 7-18 day(s) after conception: Reproductive: Effects on Newborn: behavioral
TCLo (Inhalation-Mouse) 250 ppm/7 hours: female 6-15 day(s) after conception: Reproductive: Fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants); Specific Developmental Abnormalities: musculoskeletal system
TCLo (Inhalation-Mouse) 125 ppm/24 hours:

TCLo (Inhalation-Rat) 250 ppm/5 hours/20 days-intermittent: Blood :pigmented or nucleated red blood cells, changes in other cell count (unspecified), changes in erythrocyte (RBC) count
TDLo (Subcutaneous-Rat) 5983 mg/kg/18 weeks-intermittent: Blood: changes in serum composition (e.g. TP, bilirubin, cholesterol)
TCLo (Inhalation-Mouse) 50 ppm/30 days-intermittent: Lungs, Thorax, or Respiration: structural or functional change in trachea or bronchi
TCLo (Inhalation-Monkey) 200 ppm/24 female 7-18 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus)
TCLo (Inhalation-Mouse) 8 ppm/1 hour: female 8 day(s) after conception: Reproductive: Fertility: litter size (e.g. # fetuses per litter; measured before birth); Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus), fetal death
TCLo (Inhalation-Mouse) 8 ppm/1 hour: female 8 day(s) after conception: Reproductive: Specific Developmental Abnormalities: Central Nervous System
TCLo (Inhalation-Rabbit) 180 ppm/24 hours: female 1-30 day(s) after conception: Reproductive: Effects on Newborn: stillbirth, viability index (e.g., # alive at day 4 per # born alive)
Micronucleus Test (Inhalation-Mouse)1500 ppm/10 minutes
Sister Chromatid Exchange (Inhalation-Mouse) 2500 ppm/10 minutes

11. TOXICOLOGICAL INFORMATION (continued)

HYDROGEN:

There are no specific toxicology data for Hydrogen. Hydrogen is a simple asphyxiant (SA), which acts to displace oxygen in the environment.

METHANE:

There are no specific toxicology data for Methane. Methane is a simple asphyxiant, which acts to displace oxygen in the environment.

NITROGEN:

There are no specific toxicology data for Nitrogen. Nitrogen is a simple asphyxiant, which acts to displace oxygen in the environment.

OXYGEN:

The toxicity data for Oxygen are related to exposures in a hyperbaric environment and are not likely to occur in industrial exposure situations.

SUSPECTED CANCER AGENT: The components of this gas mixture are not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, and IARC; therefore are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: Contact with rapidly expanding gases can be irritating to exposed skin and eyes.

SENSITIZATION OF PRODUCT: The components of this gas mixture are not sensitizers.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this gas mixture on the human reproductive system.

Mutagenicity: The components of this gas mixture are not reported to cause mutagenic effects in humans.

Embryotoxicity: The components of this gas mixture are not reported to cause embryotoxic effects in humans.

Teratogenicity: This gas mixture is not expected to cause teratogenic effects in humans due to the small cylinder size and small total amount of all components. The Carbon Monoxide component of this gas mixture, which exists up to 1%, can cause teratogenic effects in humans. Severe exposure to Carbon Monoxide during pregnancy has caused adverse effects and the death of the fetus. In general, maternal symptoms are an indicator of the potential risk to the fetus since Carbon Monoxide is toxic to the mother before it is toxic to the fetus.

Reproductive Toxicity: The components of this gas mixture are not reported cause adverse reproductive effects in humans.

*A **mutagen** is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An **embryotoxin** is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance which interferes in any way with the reproductive process.*

BIOLOGICAL EXPOSURE INDICES (BEIs): Biological Exposure Indices (BEIs) have been determined for the Carbon Monoxide component, as follows:

| CHEMICAL DETERMINANT | SAMPLING TIME | BEI |
|---|----------------------------------|----------------------------------|
| CARBON MONOXIDE • Carboxyhemoglobin in blood • Carbon monoxide in end-exhaled air | • End of shift • End of shift | • 3.5% of hemoglobin • 20 ppm |

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The components of this gas mixture occur naturally in the atmosphere. The gas will be dissipated rapidly in well-ventilated areas.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on the effects of this gas mixture on plant and animal life. The Carbon Monoxide component of this gas mixture can be deadly to exposed animal life, producing symptoms similar to those experienced by humans. Carbon Monoxide may also be harmful to plant life.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on aquatic life. The presence of more than a trace of the Carbon Monoxide component of this product is a hazard to fish.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations and those of Canada and its Provinces. Cylinders with undesired residual product may be safely vented outdoors with the proper regulator. For further information, refer to Section 16 (Other Information)

14. TRANSPORTATION INFORMATION

THIS GAS MIXTURE IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (*Oxygen, Nitrogen,) or the gas component with the next highest concentration next to Nitrogen.

HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)

UN IDENTIFICATION NUMBER: UN 1956

PACKING GROUP: Not applicable.

DOT LABEL(S) REQUIRED: Class 2.2 (Non-Flammable Gas)

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126

MARINE POLLUTANT: The components of this gas mixture are not classified by the DOT as Marine Pollutants (as defined by 49 CFR 172.101, Appendix B)

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

Note: DOT 39 Cylinders ship in a strong outer carton (outer package). Pertinent shipping information goes on the outside of the outer package. DOT 39 Cylinders do not have transportation information on the cylinder itself.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This gas mixture is considered as Dangerous Goods, per regulations of Transport Canada.

PROPER SHIPPING NAME: Compressed gases, n.o.s. (*Oxygen, Nitrogen)*or the gas component with the next highest concentration next to Nitrogen.

HAZARD CLASS NUMBER and DESCRIPTION: 2.2 (Non-Flammable Gas)

UN IDENTIFICATION NUMBER: UN 1956

PACKING GROUP: Not Applicable

HAZARD LABEL: Class 2.2 (Non-Flammable Gas)

SPECIAL PROVISIONS: None

EXPLOSIVE LIMIT AND LIMITED QUANTITY INDEX: 0.12

ERAP INDEX: None

PASSENGER CARRYING SHIP INDEX: None

PASSENGER CARRYING ROAD VEHICLE OR PASSENGER CARRYING RAILWAY VEHICLE INDEX: 75

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 126

NOTE: Shipment of compressed gas cylinders via Public Passenger Road Vehicle is a violation of Canadian law (Transport Canada Transportation of Dangerous Goods Act, 1992)

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: The components of this gas mixture are not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act., as follows:

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this gas mixture. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

U.S. TSCA INVENTORY STATUS: The components of this gas mixture are listed on the TSCA Inventory.

U.S. CERCLA REPORTABLE QUANTITIES (RQ): Not applicable.

U.S. STATE REGULATORY INFORMATION: The components of this gas mixture are covered under the following specific State regulations:

Alaska - Designated Toxic and Hazardous Substances: Carbon Monoxide, Methane, Hydrogen.

California - Permissible Exposure Limits for Chemical Contaminants: Carbon Monoxide, Nitrogen, Methane, Hydrogen.

Florida - Substance List: Oxygen, Carbon Monoxide, Hydrogen.

Illinois - Toxic Substance List: Carbon Monoxide, Hydrogen.

Kansas - Section 302/313 List: No.

Massachusetts - Substance List: Oxygen, Carbon Monoxide, Methane, Hydrogen.

Michigan - Critical Materials Register: No.

Minnesota - List of Hazardous Substances: Carbon Monoxide, Methane, Hydrogen.

Missouri - Employer Information/Toxic Substance List: Methane, Hydrogen

New Jersey - Right to Know Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Methane, Hydrogen.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.

Pennsylvania - Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Methane, Hydrogen.

Rhode Island - Hazardous Substance List: Oxygen, Carbon Monoxide, Nitrogen, Methane, Hydrogen.

Texas - Hazardous Substance List: No.

West Virginia - Hazardous Substance List: No.

Wisconsin - Toxic and Hazardous Substances: No.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Carbon Monoxide is on the California Proposition 65 lists. **WARNING:** This gas mixture contains a chemical known to the State of California to cause birth defects or other reproductive harm.

OTHER U.S. FEDERAL REGULATIONS:

- Carbon Monoxide is subject to the reporting requirements of CFR 29 1910.1000. Carbon Monoxide is listed on Table Z.1.
- Hydrogen and Methane are subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for each of these gases is 10,000 pounds and so this mixture will not be affected by the regulation.
- This gas mixture does not contain any Class I or Class II ozone depleting chemicals (40 CFR part 82).
- Nitrogen and Oxygen are not listed as Regulated Substances, per 40 CFR, Part 68, of the Risk Management for Chemical Releases. Carbon Monoxide, Methane, and Hydrogen are listed under this regulation in Table 3 as Regulated Substances (Flammable Substances), in quantities of 10,000 lbs (4,553 kg) or greater, and so this mixture will not be affected by the regulation.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDL INVENTORY STATUS: The components of this gas mixture are on the DSL Inventory.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: The components of this gas mixture are not on the CEPA Priorities Substances Lists.

OTHER CANADIAN REGULATIONS: This gas mixture is categorized as a Controlled Product, Hazard Classes A and D2A, as per the Controlled Product Regulations.

16. OTHER INFORMATION

INFORMATION ABOUT DOT-39 NRC (Non-Refillable Cylinder) PRODUCTS

DOT 39 cylinders ship as hazardous materials when full. Once the cylinders are relieved of pressure (empty) they are not considered hazardous material or waste. Residual gas in this type of cylinder is not an issue because toxic gas mixtures are prohibited. Calibration gas mixtures typically packaged in these cylinders are Nonflammable n.o.s., UN 1956. A small percentage of calibration gases packaged in DOT 39 cylinders are flammable or oxidizing gas mixtures.

For disposal of used DOT-39 cylinders, it is acceptable to place them in a landfill if local laws permit. Their disposal is no different than that employed with other DOT containers such as spray paint cans, household aerosols, or disposable cylinders of propane (for camping, torch etc.). When feasible, we recommended recycling for scrap metal content. CALGAZ will do this for any customer that wishes to return cylinders to us prepaid. All that is required is a phone call to make arrangements so we may anticipate arrival. Scrapping cylinders involves some preparation before the metal dealer may accept them. We perform this operation as a service to valued customers who want to participate.

MIXTURES: When two or more gases or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about the handling of compressed gases can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703) 412-0900.

P-1 "Safe Handling of Compressed Gases in Containers"
AV-1 "Safe Handling and Storage of Compressed Gases"
"Handbook of Compressed Gases"



This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of CALGAZ knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

CO, H2, CH4, O2/N2
E50009N


T : Toxique


 2.2 : Gaz non inflammable
et non toxique.

1 Identification de la substance/du mélange et de la société/l'entreprise

Nom commercial : CO, H2, CH4, O2/N2
N° FDS : E50009N
Identification de la société : CALGAZ INTERNATIONAL LLC
 Unit 5 Crown Royal Industrial Park
 Shawcross Street, Stockport
 Cheshire, SK1 3EY United Kingdom
 Office Tel: +44 (0)161 968 5060
 Website: www.calgaz.com
Numéro d'appel d'urgence : Chemtrec USA + 1 703 527 3887

2 Identification des dangers

Classification CE 67/548 ou CE 1999/45 : Repr. Cat. 1; R61
 Xn; R20-48/20
Etiquetage CE 67/548 ou CE 1999/45
Symbole(s) : T : Toxique
Phrase(s) R : R20 : Nocif par inhalation.
 R48/20 : Nocif : risque d'effets graves pour la santé en cas d'exposition prolongée par inhalation.
 R61 : Risque pendant la grossesse d'effets néfastes pour l'enfant.
Phrase(s) S : S9 : Conserver le récipient dans un endroit bien ventilé.
 S23 : Ne pas respirer les gaz.
 S45 : En cas d'accident ou de malaise, consulter immédiatement un médecin (si possible lui montrer l'étiquette).
 S53 : Eviter l'exposition - se procurer des instructions spéciales avant l'utilisation.

3 Composition/informations sur les composants

Substance / Préparation : Préparation.
Composants : Ce produit est dangereux.

| Nom de la substance | Contenance | No CAS | No CE | No Index | No. Enregistrement | Classification |
|---------------------|-----------------------|-----------|-----------|--------------|--------------------|---|
| Monoxyde de carbone | : Entre 0,0005 et 1 % | 630-08-0 | 211-128-3 | 006-001-00-2 | NOTE 2 | F+; R12 Repr. Cat. 1; R61 T; R23-48/23 ----- Flam. Gas 1 (H220) Repr. 1A (H360U) Acute Tox. 3 (H331) STOT RE 1 (H372) Press. Gas (H280) |
| Hydrogène | : <= 2 % | 1333-74-0 | 215-605-7 | 001-001-00-9 | NOTE 1 | F+; R12 ----- Flam. Gas 1 (H220) Press. Gas (H280) |
| Méthane | : <= 2,5 % | 74-82-8 | 200-812-7 | 601-001-00-4 | NOTE 1 | F+; R12 ----- Flam. Gas 1 (H220) Press. Gas (H280) |

CO, H2, CH4, O2/N2**E50009N****3 Composition/informations sur les composants (suite)**

| Nom de la substance | Contenance | No CAS | No CE | No Index | No. Enregistrement | Classification |
|---------------------|------------|-----------|-----------|--------------|--------------------|---|
| Oxygène | : <= 21 % | 7782-44-7 | 231-956-9 | 008-001-00-8 | NOTE 1 | O; R8 ----- Ox. Gas 1 (H270) Press. Gas (H280) |
| Azote | : Solde % | 7727-37-9 | 231-783-9 | ----- | NOTE 1 | ----- Press. Gas (H280) |

4 Premiers secours**Premiers secours****- Inhalation**

: Nocif par inhalation.

Déplacer la victime dans une zone non contaminée, en s'équipant d'un appareil respiratoire autonome. Laisser la victime au chaud et au repos. Appeler un médecin. Pratiquer la respiration artificielle si la victime ne respire plus.

- Ingestion

: L'ingestion n'est pas considérée comme un mode d'exposition possible.

5 Mesures de lutte contre l'incendie**Classe d'inflammabilité**

: Ininflammable.

Risques spécifiques

: L'exposition prolongée au feu peut entraîner la rupture et l'explosion des récipients.

Moyens d'extinction**- Agents d'extinction appropriés**

: Tous les agents d'extinction connus peuvent être utilisés.

Méthodes spécifiques

: Si possible, arrêter le débit gazeux.

S'éloigner du récipient et le refroidir avec de l'eau depuis un endroit protégé.

Equipements de protection spéciaux pour pompiers

: Utiliser un appareil respiratoire autonome.

6 Mesures à prendre en cas de dispersion accidentelle**Précautions pour les personnes**

: Evacuer la zone.

Assurer une ventilation d'air appropriée.

Porter un appareil respiratoire autonome pour entrer dans la zone, à moins d'avoir contrôlé que celle-ci est sûre.

Précautions pour la protection de l'environnement

: Essayer d'arrêter la fuite.

Méthodes de nettoyage

: Ventiler la zone.

7 Manipulation et stockage**Manipulation**

: Eviter l'exposition, se procurer des instructions spéciales avant l'utilisation.

Ne pas recharger.

Utiliser seulement l'équipement spécifié approprié à ce produit et à sa pression et température d'utilisation. Contacter votre fournisseur de gaz en cas de doute.

Se reporter aux instructions du fournisseur pour la manipulation du récipient.

Stockage

: Stocker le récipient dans un endroit bien ventilé, à température inférieure à 50°C.

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| CO, H2, CH4, O2/N2 | | E50009N |

8 Contrôles de l'exposition/protection individuelle

- Protection individuelle** : Ne pas fumer pendant la manipulation du produit.
Assurer une ventilation appropriée.
Disposer d'un appareil respiratoire autonome, prêt à être utilisé en cas d'urgence.
- Limites d'exposition professionnelle** : Monoxyde de carbone : TLV© -TWA [ppm] : 25
Monoxyde de carbone : TLV© -TWA [ppm] : 25

9 Propriétés physiques et chimiques

- Etat physique à 20 °C** : Gaz comprimé.
- Couleur** : Incolore.
- Odeur** : Inodore.
- Densité relative, gaz (air=1)** : Plus faible ou voisine de celle de l'air.
- Solubilité dans l'eau** : Partiellement soluble.

10 Stabilité et réactivité

- Stabilité et réactivité** : Stable dans les conditions normales.

11 Informations toxicologiques

- Informations toxicologiques** : Nocif par inhalation.
Ce produit peut compromettre la fertilité et nuire au fœtus.
- Toxique pour la reproduction : fœtus** : Catégorie 1 : Substances connues pour provoquer des effets toxiques sur le développement dans l'espèce humaine.

12 Informations écologiques

- Effet sur la couche d'ozone** : Aucun(e).

13 Considérations relatives à l'élimination

- Généralités** : Ne pas rejeter dans tout endroit où son accumulation pourrait être dangereuse.
Eviter de rejeter à l'atmosphère.
Contacter le fournisseur si des instructions sont souhaitées.
- Méthode d'élimination** : Consulter le fournisseur pour des recommandations spécifiques.

14 Informations relatives au transport

- Numéro ONU** : 1956
- Etiquetage ADR** : 2.2 : Gaz non inflammable et non toxique.
- ADR/RID**
- I.D. n°** : 20
- Nom d'expédition des Nations unies** : GAZ COMPRIMÉ, N.S.A (Oxygène, Azote)
- Classe(s) de danger pour le transport** : 2
- Code de classification ADR/RID** : 1 A
- Eviter le transport dans des véhicules dont le compartiment du chargement n'est pas séparé de la cabine de conduite.
S'assurer que le conducteur du véhicule connaît les dangers potentiels du chargement ainsi que les mesures à prendre en cas d'accident ou autres éventualités.

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|---|-------------------------------------|------------------------|
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| CO, H2, CH4, O2/N2 | | E50009N |

14 Informations relatives au transport (suite)

Avant de transporter les récipients :

- S'assurer que les récipients sont fermement arrimés.
- S'assurer que le robinet de bouteille est fermé et ne fuit pas.
- S'assurer que le bouchon de protection de sortie du robinet (quand il existe) est correctement mis en place.
- S'assurer que le dispositif de protection du robinet (quand il existe) est correctement mis en place.
- Assurer une ventilation convenable.
- Se conformer à la réglementation en vigueur.

16 Autres informations

Les utilisateurs d'appareils respiratoires doivent être formés.

Récepteur sous pression.

S'assurer que toutes les réglementations nationales ou locales sont respectées.

La présente Fiche de Données de Sécurité a été établie conformément aux Directives Européennes en vigueur et est applicable à tous les pays qui ont traduit les Directives dans leur droit national.

DENEGATION DE RESPONSABILITE : Avant d'utiliser ce produit pour une expérience ou un procédé nouveaux, examiner attentivement la compatibilité et la sécurité du matériel mis en oeuvre.
Les informations données dans ce document sont considérées comme exactes au moment de son impression. Malgré le soin apporté à sa rédaction, aucune responsabilité ne saurait être acceptée en cas de dommage ou d'accident résultant de son utilisation.

Fin du document

CO, H2, CH4, O2/N2**E50009N**

T : Tóxico

2.2 : Gas no inflamable,
no tóxico.**1 Identificación de la sustancia o la mezcla y de la sociedad o la empresa**

Nombre comercial : CO, H2, CH4, O2/N2
Número de la Ficha de Datos de Seguridad : E50009N
Identificación de la Compañía : CALGAZ INTERNATIONAL LLC
 Unit 5 Crown Royal Industrial Park
 Shawcross Street, Stockport
 Cheshire, SK1 3EY United Kingdom
 Office Tel: +44 (0)161 968 5060
 Website: www.calgaz.com
Teléfono de emergencia : Chemtrec USA + 1 703 527 3887

2 Identificación de los peligros

Clasificación 67/548 CE o 1999/45 CE : Repr. Cat. 1; R61
 Xn; R20-48/20
Etiquetado 67/548 CE o 1999/45 CE
Símbolo(s) : T : Tóxico
Frase(s) R : R20 : Nocivo por inhalación.
 R48/20 : Nocivo : riesgo de efectos graves para la salud en caso de exposición prolongada por inhalación.
 R61 : Riesgo durante el embarazo de efectos adversos para el feto.
Frase(s) S : S9 : Consérvese el recipiente en lugar bien ventilado.
 S23 : No respirar los gases.
 S45 : En caso de accidente o malestar, acúdase inmediatamente al médico (si es posible, muéstresele la etiqueta).
 S53 : Evítese la exposición - recábense instrucciones especiales antes del uso.

3 Composición/información sobre los componentes

Sustancia / Mezcla : Mezcla.
Componentes : El producto es peligroso.

| Nombre del componente | Contenido | N° CAS | N° EC | N° índice | Clasificación |
|-----------------------|----------------------|-----------|-----------|--------------|---|
| Monóxido de carbono | : Entre 0.0005 y 1 % | 630-08-0 | 211-128-3 | 006-001-00-2 | NOTE 2 F+; R12 Repr. Cat. 1; R61 T; R23-48/23 ----- Flam. Gas 1 (H220) Repr. 1A (H360U) Acute Tox. 3 (H331) STOT RE 1 (H372) Press. Gas (H280) |
| Hidrógeno | : <= 2 % | 1333-74-0 | 215-605-7 | 001-001-00-9 | NOTE 1 F+; R12 ----- Flam. Gas 1 (H220) Press. Gas (H280) |
| Metano | : <= 2.5 % | 74-82-8 | 200-812-7 | 601-001-00-4 | NOTE 1 F+; R12 ----- Flam. Gas 1 (H220) Press. Gas (H280) |

CO, H2, CH4, O2/N2**E50009N****3 Composición/información sobre los componentes /...**

| Nombre del componente | Contenido | N° CAS | N° EC | N° índice | Clasificación |
|-----------------------|-----------|-----------|-----------|--------------|---|
| Oxígeno | : <= 21 % | 7782-44-7 | 231-956-9 | 008-001-00-8 | NOTE 1 O; R8 ----- Ox. Gas 1 (H270) Press. Gas (H280) |
| Nitrógeno | : Saldo % | 7727-37-9 | 231-783-9 | ----- | NOTE 1 ----- Press. Gas (H280) |

4 Primeros auxilios**Primeros auxilios****- Inhalación**

: Nocivo por inhalación.

Retirar a la víctima a un área no contaminada llevando colocado el equipo de respiración autónoma. Mantener a la víctima caliente y en reposo. Llamar al doctor. Aplicar la respiración artificial si se para la respiración.

- Ingestión

: La ingestión no está considerada como una vía potencial de exposición.

5 Medidas de lucha contra incendios**Tipo de inflamabilidad**

: No inflamable.

Riesgos específicos

: La exposición al fuego puede causar la rotura o explosión de los recipientes.

Medios de extinción**- Medios de extinción adecuados**

: Se pueden utilizar todos los extintores conocidos.

Métodos específicos

: Si es posible detener la fuga de producto.

Colocarse lejos del recipiente y enfriarlo con agua desde un recinto protegido.

Equipo de protección especial para la intervención en incendios : Utilizar equipos de respiración autónoma de presión positiva.**6 Medidas en caso de vertido accidental****Precauciones personales**

: Evacuar el área.

Asegurar la adecuada ventilación de aire.

Utilizar equipos de respiración autónoma cuando entren en el área a menos que esté probado que la atmósfera es segura.

Precauciones relativas al medio ambiente

: Intentar parar el escape/derrame.

Métodos de limpieza

: Ventilar la zona.

7 Manipulación y almacenamiento**Manipulación**: Evítase la exposición, recabese instrucciones especiales antes del uso.
No rellenar.

Utilizar solo equipo específicamente apropiado para este producto y para su presión y temperatura de suministro, en caso de duda contacte con su suministrador.

Solicitar del suministrador las instrucciones de manipulación de los contenedores.

Almacenamiento

: Mantener el contenedor por debajo de 50°C, en un lugar bien ventilado.

CO, H2, CH4, O2/N2**E50009N****8 Controles de exposición/protección individual**

- Protección personal** : No fumar cuando se manipule el producto.
Asegurar una ventilación adecuada.
Disponer de aparato de respiración autónomo para uso en caso de emergencia.
- Límite de exposición laboral** : Monóxido de carbono : TLV[©] -TWA [ppm] : 25
Monóxido de carbono : TLV[©] -TWA [ppm] : 25

9 Propiedades físicas y químicas

- Estado físico a 20°C** : Gas comprimido.
- Color** : Incoloro.
- Olor** : Inodoro.
- Densidad relativa del gas (aire=1)** : Más ligero que el aire.
- Solubilidad en agua** : Parcialmente soluble.

10 Estabilidad y reactividad

- Estabilidad y reactividad** : Estable en condiciones normales.

11 Información toxicológica

- Información sobre Toxicidad** : Nocivo por inhalación.
Puede dañar la fertilidad y causar daños a los fetos.
- Tóxico para la reproducción : feto** : Primera categoría : Sustancias de las que se sabe producen toxicidad para el desarrollo de seres humanos.

12 Información ecológica


- Efectos sobre la capa de ozono** : Ninguno.

13 Consideraciones relativas a la eliminación

- General** : No descargar dentro de ningún lugar donde su acumulación pudiera ser peligrosa.
Evitar la descarga en la atmósfera.
Contactar con el suministrador si se necesita orientación.
- Método de eliminación** : Consulte al proveedor acerca de posibles recomendaciones específicas.

14 Información relativa al transporte

- Número ONU** : 1956
- Etiquetado según ADR** : 2.2 : Gas no inflamable, no tóxico.
- ADR/RID**
- H.I. n°** : 20
- Designación oficial de transporte de las Naciones Unidas** : GAS COMPRIMIDO, N.E.P. (Oxígeno, Nitrógeno)
- Clase(s) de peligro para el transporte** : 2
- Código de clasificación ADR/RID** : 1 A

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14 Información relativa al transporte /...

Evitar el transporte en los vehículos donde el espacio de la carga no esté separado del compartimiento del conductor. Asegurar que el conductor está enterado de los riesgos potenciales de la carga y que conoce que hacer en caso de un accidente o de una emergencia.

Antes de transportar las botellas :

- Asegúrese de que los recipientes están ben fixados.
- Asegurarse que las válvulas de las botellas están cerradas y no fugan.
- Asegurarse que el tapón del acoplamiento de la válvula (cuando exista) está adecuadamente apretado.
- Asegurarse que la caperuza de la válvula o la tulipa, (cuando exista), está adecuadamente apretada.
- Asegurar una ventilación adecuada.
- Asegurarse de cumplir con la legislación aplicable.

16 Otras informaciones

Los usuarios de los aparatos de respiración deben ser entrenados.

Recipiente a presión.

Asegúrese que se cumplen las normativas nacionales y locales.

La presente Ficha de Datos de Seguridad está establecida de acuerdo con las Directivas Europeas en vigor y se aplica a todos los países que han transpuesto las Directivas en su derecho nacional.

RENUNCIA DE RESPONSABILIDAD : Antes de utilizar el producto en un nuevo proceso o experimento, debe llevarse a cabo un estudio completo de seguridad y de compatibilidad de los materiales. Los detalles dados son ciertos y correctos en el momento de llevarse este documento a impresión. A pesar de que durante la preparación de este documento se ha tomado especial cuidado, no se acepta ninguna responsabilidad por las lesiones o los daños resultantes.

Fin del documento